datalad Documentation

Release 0.10.0

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Contents

CHAPTER 1

Getting started

1.1 Installation

1.1.1 When there isn't anything more convenient

Unless system packages are available for your operating system (see below), DataLad can be installed via pip (**P**ip **I**nstalls **P**ython). To automatically install datalad with all its Python dependencies type:

```
pip install datalad
```

In addition, it is necessary to have a current version of git-annex installed which is not set up automatically by using the pip method.

Note: If you do not have admin powers...

`pip` supports installation into a user's home directory with `--user`. Git-annex can be deployed by extracting pre-built binaries from a tarball (that also includes an up-to-date Git installation). Obtain the tarball, extract it, and set the `PATH` environment variable to include the root of the extracted tarball. Fingers crossed and good luck!

Advanced users can chose from several installation schemes (e.g. `publish`, `metadata`, `tests` or `crawl`):

```
pip install datalad[SCHEME]
```

where `SCHEME` could be

- `crawl` to also install *scrapy* which is used in some crawling constructs
- `tests` to also install dependencies used by unit-tests battery of the datalad
- `full` to install all dependencies

1.1.2 (Neuro)Debian, Ubuntu, and similar systems

For Debian-based operating systems the most convenient installation method is to enable the NeuroDebian repository. The following command installs datalad and all its software dependencies (including the git-annex-standalone package):

```
sudo apt-get install datalad
```

1.1.3 MacOSX

A simple way to get things installed is the homebrew package manager, which in itself is fairly easy to install. Git-annex is installed by the command:

```
brew install git-annex
```

Once Git-annex is available, datalad can be installed via `pip` as described above. `pip` comes with Python distributions like anaconda.

1.1.4 HPC environments or any system with singularity installed

If you want to use DataLad in a high-performance computing (HPC) environment, such as a computer cluster, or a similar multi-user machine, where you don't have admin privileges, chances are that Singularity is installed. Even if it isn't installed, singularity helps you make a solid case why your admin might want to install it.

On any system with Singularity installed, you can pull a container with a full installation of DataLad (~300 MB) straight from Singularity Hub. The following command pulls the latest container for the DataLad development version (check on Singularity Hub for alternative container variants):

```
singularity pull shub://datalad/datalad:fullmaster
```

This will produce an executable image file. You can rename this image to `datalad`, and put the directory it is located in into your `PATH` environment variable. From there on, you will have a `datalad` command in the commandline that transparently executes all DataLad functionality in the container.

With Singularity version 2.4.2 you can choose the image name directly in the download command:

```
singularity pull --name datalad shub://datalad/datalad:fullmaster
```

1.2 First steps

DataLad can be queried for information about known datasets. Doing a first search query, datalad automatically offers assistence to obtain a *superdataset* first. The superdataset is a lightweight container that contains meta information about known datasets but does not contain actual data itself.

For example, we might want to look for datasets that were funded by, or acknowledge the US National Science Foundation (NSF):

```
~ % datalad search NSF
No DataLad dataset found at current location
Would you like to install the DataLad superdataset at '/home/yoh/datalad'? (choices:␣
↪yes, no): yes
[INFO   ] Cloning http://datasets.datalad.org/ to '/home/yoh/datalad'
```

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```
From now on you can refer to this dataset using the label '///'
[INFO   ] Performing search using DataLad superdataset '/home/yoh/datalad'
search(ok): /home/yoh/datalad/crcns/cai-2 (dataset)
search(ok): /home/yoh/datalad/crcns/hc-11 (dataset)
search(ok): /home/yoh/datalad/hbnssi (dataset)
search(ok): /home/yoh/datalad/labs/haxby/attention (dataset)
search(ok): /home/yoh/datalad/labs/haxby/life (dataset)
search(ok): /home/yoh/datalad/openfmri/ds000001 (dataset)
search(ok): /home/yoh/datalad/openfmri/ds000002 (dataset)
...
```

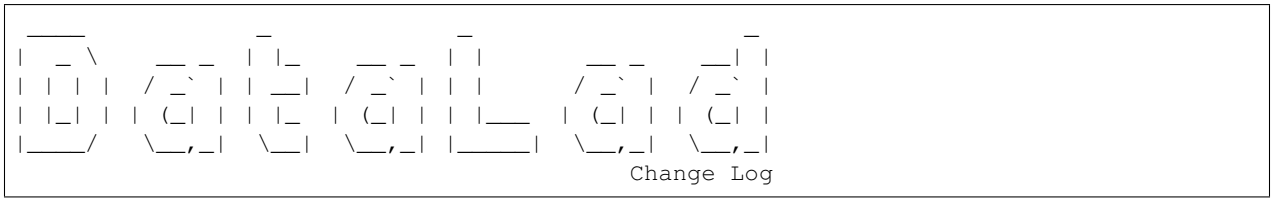
Any known dataset can now be installed inside the local superdataset with a command like this:

```
datalad install ///openfmri/ds000002
```

Now, have a look at the demos on the DataLad website, some *common data management scenarios*, and a bit of background info on the *fundamental concepts* the DataLad API(s) are built on.

CHAPTER 2

Change log



This is a high level and scarce summary of the changes between releases. We would recommend to consult log of the DataLad git repository for more details.

2.1 0.11.0 (Oct 23, 2018) – Soon-to-be-perfect

2.1.1 Major refactoring and deprecations

- `datalad.consts.LOCAL_CENTRAL_PATH` constant was deprecated in favor of `datalad.locations.default-dataset` configuration variable (#2835)

2.1.2 Minor refactoring

- `"notneeded"` messages are no longer reported by default results renderer
- run would no longer show "commit instructions" if run failed (#2922)
- `get_git_dir` moved into GitRepo (#2886)
- `_gitpy_custom_call` removed from GitRepo (#2894)
- Eliminated majority of uses of GitPython's `.repo.rev_parse` by adding `GitRepo.format_commit` (#2902)
- `GitRepo.get_merge_base` argument is now called `commitishes` instead of `treeishes` (#2903)

2.1.3 Fixes

- update should not leave the dataset in non-clean state (#2858) and some other enhancements (#2859)
- Fixed chunking of the long command lines to account for decorators and other arguments (#2864)
- Progress bar should not crash the process on some missing progress information (#2891)
- Default value for `jobs` set to be `"auto"` (not `None`) to take advantage of possible parallel get if in `-g` mode (#2861)
- [wtf] must not crash if `git-annex` is not installed etc (#2865), (#2865), ([#2918]), (#2917)
- Fixed paths (with spaces etc) handling while reporting annex error output ([#2892]), (#2893)
- `__del__` should not access `.repo` but `._repo` to avoid attempts for reinstantiation etc (#2901)
- Fix up submodule `.git` right in `GitRepo.add_submodule` to avoid added added submodules being non git-annex friendly ([#2909]), (#2904)
- run-procedure (#2905)
  - now will provide dataset into the procedure if called within dataset
  - will not crash if procedure is an executable without `.py` or `.sh` suffixes
- Use centralized `.gitattributes` handling while setting annex backend (#2912)
- Fixed `GlobbedPaths.expand` to use stored expanded paths (#2921)

2.1.4 Enhancements and new features

- Report progress on clone when installing from "smart" git servers (#2876)
- Stale/unused `sth_like_file_has_content` was removed (#2860)
- Enhancements to search to operate on "improved" metadata layouts (#2878)
- Output of `git annex init` operation is now logged (#2881)
- New `GitRepo.cherry_pick` method (#2900)
- run-procedure (#2905)
  - procedures can now recursively be discovered in subdatasets as well. The uppermost has highest priority

2.2 0.10.3.1 (Sep 13, 2018) – Nothing-is-perfect

Emergency bugfix to address forgotten boost of version in `datalad/version.py`.

2.3 0.10.3 (Sep 13, 2018) – Almost-perfect

This is largely a bugfix release which addressed many (but not yet all) issues of working with git-annex direct and version 6 modes, and operation on Windows in general. Among enhancements you will see the support of public S3 buckets (even with periods in their names), ability to configure new providers interactively, and improved `egrep` search backend.

Although we do not require with this release, it is recommended to make sure that you are using a recent `git-annex` since it also had a variety of fixes and enhancements in the past months.

2.3.1 Fixes

- Parsing of combined short options has been broken since DataLad v0.10.0. (#2710)
- The `datalad save` instructions shown by `datalad run` for a command with a non-zero exit were incorrectly formatted. (#2692)
- Decompression of zip files (e.g., through `datalad add-archive-content`) failed on Python 3. (#2702)
- Windows:
- colored log output was not being processed by colorama. (#2707)
- more codepaths now try multiple times when removing a file to deal with latency and locking issues on Windows. (#2795)
- Internal git fetch calls have been updated to work around a GitPython `BadName` issue. ([#2712]), (#2794)
- The progess bar for annex file transferring was unable to handle an empty file. (#2717)
- `datalad add-readme` halted when no aggregated metadata was found rather than displaying a warning. (#2731)
- `datalad rerun` failed if `--onto` was specified and the history contained no run commits. (#2761)
- Processing of a command's results failed on a result record with a missing value (e.g., absent field or subfield in metadata). Now the missing value is rendered as "N/A". (#2725).
- A couple of documentation links in the "Delineation from related solutions" were misformatted. (#2773)
- With the latest git-annex, several known V6 failures are no longer an issue. (#2777)
- In direct mode, commit changes would often commit annexed content as regular Git files. A new approach fixes this and resolves a good number of known failures. (#2770)
- The reporting of command results failed if the current working directory was removed (e.g., after an unsuccessful `install`). (#2788)
- When installing into an existing empty directory, `datalad install` removed the directory after a failed clone. (#2788)
- `datalad run` incorrectly handled inputs and outputs for paths with spaces and other characters that require shell escaping. (#2798)
- Globbing inputs and outputs for `datalad run` didn't work correctly if a subdataset wasn't installed. (#2796)
- Minor (in)compatibility with git 2.19 - (no) trailing period in an error message now. (#2815)

2.3.2 Enhancements and new features

- Anonymous access is now supported for S3 and other downloaders. (#2708)
- A new interface is available to ease setting up new providers. (#2708)
- Metadata: changes to egrep mode search (#2735)
- Queries in egrep mode are now case-sensitive when the query contains any uppercase letters and are case-insensitive otherwise. The new mode egrepcs can be used to perform a case-sensitive query with all lower-case letters.
- Search can now be limited to a specific key.
- Multiple queries (list of expressions) are evaluated using AND to determine whether something is a hit.
- A single multi-field query (e.g., `pa*:findme`) is a hit, when any matching field matches the query.

- All matching key/value combinations across all (multi-field) queries are reported in the query_matched result field.
- egrep mode now shows all hits rather than limiting the results to the top 20 hits.
- The documentation on how to format commands for `datalad run` has been improved. (#2703)
- The method for determining the current working directory on Windows has been improved. (#2707)
- `datalad --version` now simply shows the version without the license. (#2733)
- `datalad export-archive` learned to export under an existing directory via its `--filename` option. (#2723)
- `datalad export-to-figshare` now generates the zip archive in the root of the dataset unless `--filename` is specified. (#2723)
- After importing `datalad.api`, `help(datalad.api)` (or `datalad.api?` in IPython) now shows a summary of the available DataLad commands. (#2728)
- Support for using `datalad` from IPython has been improved. (#2722)
- `datalad wtf` now returns structured data and reports the version of each extension. (#2741)
- The internal handling of gitattributes information has been improved. A user-visible consequence is that `datalad create --force` no longer duplicates existing attributes. (#2744)
- The "annex" metadata extractor can now be used even when no content is present. (#2724)
- The `add_url_to_file` method (called by commands like `datalad download-url` and `datalad add-archive-content`) learned how to display a progress bar. (#2738)

2.4 0.10.2 (Jul 09, 2018) – Thesecuriestever

Primarily a bugfix release to accommodate recent git-annex release forbidding file:// and http://localhost/ URLs which might lead to revealing private files if annex is publicly shared.

2.4.1 Fixes

- fixed testing to be compatible with recent git-annex (6.20180626)
- [download-url] will now download to current directory instead of the top of the dataset

2.4.2 Enhancements and new features

- do not quote ~ in URLs to be consistent with quote implementation in Python 3.7 which now follows RFC 3986
- run support for user-configured placeholder values
- documentation on native git-annex metadata support
- handle 401 errors from LORIS tokens
- `yoda` procedure will instantiate `README.md`
- `--discover` option added to run-procedure to list available procedures

2.5 0.10.1 (Jun 17, 2018) – OHBM polish

The is a minor bugfix release.

2.5.1 Fixes

- Be able to use backports.lzma as a drop-in replacement for pyliblzma.
- Give help when not specifying a procedure name in `run-procedure`.
- Abort early when a downloader received no filename.
- Avoid `rerun` error when trying to unlock non-available files.

2.6 0.10.0 (Jun 09, 2018) – The Release

This release is a major leap forward in metadata support.

2.6.1 Major refactoring and deprecations

- Metadata
- Prior metadata provided by datasets under `.datalad/meta` is no longer used or supported. Metadata must be reaggregated using 0.10 version
- Metadata extractor types are no longer auto-guessed and must be explicitly specified in `datalad.metadata.nativetype` config (could contain multiple values)
- Metadata aggregation of a dataset hierarchy no longer updates all datasets in the tree with new metadata. Instead, only the target dataset is updated. This behavior can be changed via the –update-mode switch. The new default prevents needless modification of (3rd-party) subdatasets.
- Neuroimaging metadata support has been moved into a dedicated extension: https://github.com/datalad/datalad-neuroimaging
- Crawler
- moved into a dedicated extension: https://github.com/datalad/datalad-crawler
- `export_tarball` plugin has been generalized to `export_archive` and can now also generate ZIP archives.
- By default a dataset X is now only considered to be a super-dataset of another dataset Y, if Y is also a registered subdataset of X.

2.6.2 Fixes

A number of fixes did not make it into the 0.9.x series:

- Dynamic configuration overrides via the `-c` option were not in effect.
- `save` is now more robust with respect to invocation in subdirectories of a dataset.
- `unlock` now reports correct paths when running in a dataset subdirectory.
- `get` is more robust to path that contain symbolic links.

- symlinks to subdatasets of a dataset are now correctly treated as a symlink, and not as a subdataset
- `add` now correctly saves staged subdataset additions.
- Running `datalad save` in a dataset no longer adds untracked content to the dataset. In order to add content a path has to be given, e.g. `datalad save .`
- `wtf` now works reliably with a DataLad that wasn't installed from Git (but, e.g., via pip)
- More robust URL handling in `simple_with_archives` crawler pipeline.

2.6.3 Enhancements and new features

- Support for DataLad extension that can contribute API components from 3rd-party sources, incl. commands, metadata extractors, and test case implementations. See https://github.com/datalad/datalad-extension-template for a demo extension.
- Metadata (everything has changed!)
- Metadata extraction and aggregation is now supported for datasets and individual files.
- Metadata query via `search` can now discover individual files.
- Extracted metadata can now be stored in XZ compressed files, is optionally annexed (when exceeding a configurable size threshold), and obtained on demand (new configuration option `datalad.metadata.create-aggregate-annex-limit`).
- Status and availability of aggregated metadata can now be reported via `metadata --get-aggregates`
- New configuration option `datalad.metadata.maxfieldsize` to exclude too large metadata fields from aggregation.
- The type of metadata is no longer guessed during metadata extraction. A new configuration option `datalad.metadata.nativetype` was introduced to enable one or more particular metadata extractors for a dataset.
- New configuration option `datalad.metadata.store-aggregate-content` to enable the storage of aggregated metadata for dataset content (i.e. file-based metadata) in contrast to just metadata describing a dataset as a whole.
- `search` was completely reimplemented. It offers three different modes now:
- 'egrep' (default): expression matching in a plain string version of metadata
- 'textblob': search a text version of all metadata using a fully featured query language (fast indexing, good for keyword search)
- 'autofield': search an auto-generated index that preserves individual fields of metadata that can be represented in a tabular structure (substantial indexing cost, enables the most detailed queries of all modes)
- New extensions:
- addurls, an extension for creating a dataset (and possibly subdatasets) from a list of URLs.
- export_to_figshare
- extract_metadata
- add_readme makes use of available metadata
- By default the wtf extension now hides sensitive information, which can be included in the output by passing `--senstive=some` or `--senstive=all`.
- Reduced startup latency by only importing commands necessary for a particular command line call.
- `datalad create -d <parent> --nosave` now registers subdatasets, when possible.

- `datalad run` now provides a way for the caller to save the result when a command has a non-zero exit status.
- `datalad rerun` now has a `--script` option that can be used to extract previous commands into a file.
- A DataLad Singularity container is now available on Singularity Hub.
- More casts have been embedded in the use case section of the documentation.
- `datalad --report-status` has a new value 'all' that can be used to temporarily re-enable reporting that was disable by configuration settings.

2.7 0.9.3 (Mar 16, 2018) – pi+0.02 release

Some important bug fixes which should improve usability

2.7.1 Fixes

- `datalad-archives` special remote now will lock on acquiring or extracting an archive - this allows for it to be used with -J flag for parallel operation
- relax introduced in 0.9.2 demand on git being configured for datalad operation - now we will just issue a warning
- `datalad ls` should now list "authored date" and work also for datasets in detached HEAD mode
- `datalad save` will now save original file as well, if file was "git mv"ed, so you can now `datalad run git mv old new` and have changes recorded

2.7.2 Enhancements and new features

- `--jobs` argument now could take `auto` value which would decide on # of jobs depending on the # of available CPUs. `git-annex` > 6.20180314 is recommended to avoid regression with -J.
- memoize calls to `RI` meta-constructor – should speed up operation a bit
- `DATALAD_SEED` environment variable could be used to seed Python RNG and provide reproducible UUIDs etc (useful for testing and demos)

2.8 0.9.2 (Mar 04, 2017) – it is (again) better than ever

Largely a bugfix release with a few enhancements.

2.8.1 Fixes

- Execution of external commands (git) should not get stuck when lots of both stdout and stderr output, and should not loose remaining output in some cases
- Config overrides provided in the command line (-c) should now be handled correctly
- Consider more remotes (not just tracking one, which might be none) while installing subdatasets
- Compatibility with git 2.16 with some changed behaviors/annotations for submodules
- Fail `remove` if `annex drop` failed
- Do not fail operating on files which start with dash (-)

- URL unquote paths within S3, URLs and DataLad RIs (///)
- In non-interactive mode fail if authentication/access fails
- Web UI:
- refactored a little to fix incorrect listing of submodules in subdirectories
- now auto-focuses on search edit box upon entering the page
- Assure that extracted from tarballs directories have executable bit set

2.8.2 Enhancements and new features

- A log message and progress bar will now inform if a tarball to be downloaded while getting specific files (requires git-annex > 6.20180206)
- A dedicated `datalad rerun` command capable of rerunning entire sequences of previously `run` commands. **Reproducibility through VCS. Use ‘‘run‘‘ even if not interested in ‘‘rerun‘‘**
- Alert the user if `git` is not yet configured but git operations are requested
- Delay collection of previous ssh connections until it is actually needed. Also do not require ‘:’ while specifying ssh host
- AutomagicIO: Added proxying of isfile, lzma.LZMAFile and io.open
- Testing:
- added DATALAD_DATASETS_TOPURL=http://datasets-tests.datalad.org to run tests against another website to not obscure access stats
- tests run against temporary HOME to avoid side-effects
- better unit-testing of interactions with special remotes
- CONTRIBUTING.md describes how to setup and use `git-hub` tool to “attach” commits to an issue making it into a PR
- DATALAD_USE_DEFAULT_GIT env variable could be used to cause DataLad to use default (not the one possibly bundled with git-annex) git
- Be more robust while handling not supported requests by annex in special remotes
- Use of `swallow_logs` in the code was refactored away – less mysteries now, just increase logging level
- `wtf` plugin will report more information about environment, externals and the system

0.9.1 (Oct 01, 2017) – “DATALAD!”(JBTM)

Minor bugfix release

2.8.3 Fixes

- Should work correctly with subdatasets named as numbers of bool values (requires also GitPython >= 2.1.6)
- Custom special remotes should work without crashing with git-annex >= 6.20170924

2.9 0.9.0 (Sep 19, 2017) – isn't it a lucky day even though not a Friday?

2.9.1 Major refactoring and deprecations

- the `files` argument of save has been renamed to `path` to be uniform with any other command
- all major commands now implement more uniform API semantics and result reporting. Functionality for modification detection of dataset content has been completely replaced with a more efficient implementation
- publish now features a `--transfer-data` switch that allows for a disambiguous specification of whether to publish data – independent of the selection which datasets to publish (which is done via their paths). Moreover, publish now transfers data before repository content is pushed.

2.9.2 Fixes

- drop no longer errors when some subdatasets are not installed
- install will no longer report nothing when a Dataset instance was given as a source argument, but rather perform as expected
- remove doesn't remove when some files of a dataset could not be dropped
- publish
- no longer hides error during a repository push
- publish behaves "correctly" for `--since=` in considering only the differences the last "pushed" state
- data transfer handling while publishing with dependencies, to github
- improved robustness with broken Git configuration
- search should search for unicode strings correctly and not crash
- robustify git-annex special remotes protocol handling to allow for spaces in the last argument
- UI credentials interface should now allow to Ctrl-C the entry
- should not fail while operating on submodules named with numerics only or by bool (true/false) names
- [crawl] templates should not now override settings for `largefiles` if specified in `.gitattributes`

2.9.3 Enhancements and new features

- **Exciting new feature** run command to protocol execution of an external command and rerun computation if desired. See screencast
- save now uses Git for detecting with sundatasets need to be inspected for potential changes, instead of performing a complete traversal of a dataset tree
- add looks for changes relative to the last commited state of a dataset to discover files to add more efficiently
- [diff] can now report untracked files in addition to modified files
- [uninstall] will check itself whether a subdataset is properly registered in a superdataset, even when no superdataset is given in a call
- [subdatasets] can now configure subdatasets for exclusion from recursive installation (`datalad-recursiveinstall` submodule configuration property)

- precrafted pipelines of [crawl] now will not override `annex.largefiles` setting if any was set within `.gitattributes` (e.g. by `datalad create --text-no-annex`)
- framework for screencasts: `tools/cast*` tools and sample cast scripts under `doc/casts` which are published at datalad.org/features.html
- new project YouTube channel
- tests failing in direct and/or v6 modes marked explicitly

2.10 0.8.1 (Aug 13, 2017) – the best birthday gift

Bugfixes

2.10.1 Fixes

- Do not attempt to update a not installed sub-dataset
- In case of too many files to be specified for get or copy_to, we will make multiple invocations of underlying git-annex command to not overfill command line
- More robust handling of unicode output in terminals which might not support it

2.10.2 Enhancements and new features

- Ship a copy of numpy.testing to facilitate [test] without requiring numpy as dependency. Also allow to pass to command which test(s) to run
- In get and copy_to provide actual original requested paths, not the ones we deduced need to be transferred, solely for knowing the total

2.11 0.8.0 (Jul 31, 2017) – it is better than ever

A variety of fixes and enhancements

2.11.1 Fixes

- publish would now push merged `git-annex` branch even if no other changes were done
- publish should be able to publish using relative path within SSH URI (git hook would use relative paths)
- publish should better tollerate publishing to pure git and `git-annex` special remotes

2.11.2 Enhancements and new features

- plugin mechanism came to replace export. See export_tarball for the replacement of export. Now it should be easy to extend datalad's interface with custom functionality to be invoked along with other commands.
- Minimalistic coloring of the results rendering
- publish/`copy_to` got progress bar report now and support of `--jobs`
- minor fixes and enhancements to crawler (e.g. support of recursive removes)

2.12 0.7.0 (Jun 25, 2017) – when it works - it is quite awesome!

New features, refactorings, and bug fixes.

2.12.1 Major refactoring and deprecations

- add-sibling has been fully replaced by the siblings command
- create-sibling, and [unlock] have been re-written to support the same common API as most other commands

2.12.2 Enhancements and new features

- siblings can now be used to query and configure a local repository by using the sibling name `here`
- siblings can now query and set annex preferred content configuration. This includes `wanted` (as previously supported in other commands), and now also `required`
- New metadata command to interface with datasets/files meta-data
- Documentation for all commands is now built in a uniform fashion
- Significant parts of the documentation of been updated
- Instantiate GitPython's Repo instances lazily

2.12.3 Fixes

- API documentation is now rendered properly as HTML, and is easier to browse by having more compact pages
- Closed files left open on various occasions (Popen PIPEs, etc)
- Restored basic (consumer mode of operation) compatibility with Windows OS

2.13 0.6.0 (Jun 14, 2017) – German perfectionism

This release includes a **huge** refactoring to make code base and functionality more robust and flexible

- outputs from API commands could now be highly customized. See `--output-format`, `--report-status`, `--report-type`, and `--report-type` options for datalad command.
- effort was made to refactor code base so that underlying functions behave as generators where possible
- input paths/arguments analysis was redone for majority of the commands to provide unified behavior

2.13.1 Major refactoring and deprecations

- `add-sibling` and `rewrite-urls` were refactored in favor of new siblings command which should be used for siblings manipulations
- 'datalad.api.alwaysrender' config setting/support is removed in favor of new outputs processing

2.13.2 Fixes

- Do not flush manually git index in pre-commit to avoid "Death by the Lock" issue
- Deployed by publish `post-update` hook script now should be more robust (tolerate directory names with spaces, etc.)
- A variety of fixes, see list of pull requests and issues closed for more information

2.13.3 Enhancements and new features

- new annotate-paths plumbing command to inspect and annotate provided paths. Use `--modified` to summarize changes between different points in the history
- new clone plumbing command to provide a subset (install a single dataset from a URL) functionality of install
- new [diff] plumbing command
- new siblings command to list or manipulate siblings
- new [subdatasets] command to list subdatasets and their properties
- drop and remove commands were refactored
- `benchmarks/` collection of Airspeed velocity benchmarks initiated. See reports at http://datalad.github.io/datalad/
- crawler would try to download a new url multiple times increasing delay between attempts. Helps to resolve problems with extended crawls of Amazon S3
- CRCNS crawler pipeline now also fetches and aggregates meta-data for the datasets from datacite
- overall optimisations to benefit from the aforementioned refactoring and improve user-experience
- a few stub and not (yet) implemented commands (e.g. `move`) were removed from the interface
- Web frontend got proper coloring for the breadcrumbs and some additional caching to speed up interactions. See http://datasets.datalad.org
- Small improvements to the online documentation. See e.g. summary of differences between git/git-annex/datalad

2.14 0.5.1 (Mar 25, 2017) – cannot stop the progress

A bugfix release

2.14.1 Fixes

- add was forcing addition of files to annex regardless of settings in `.gitattributes`. Now that decision is left to annex by default
- `tools/testing/run_doc_examples` used to run doc examples as tests, fixed up to provide status per each example and not fail at once
- `doc/examples`
- 3rdparty_analysis_workflow.sh was fixed up to reflect changes in the API of 0.5.0.
- progress bars

- should no longer crash **datalad** and report correct sizes and speeds
- should provide progress reports while using Python 3.x

2.14.2 Enhancements and new features

- `doc/examples`
- nipype_workshop_dataset.sh new example to demonstrate how new super- and sub- datasets were established as a part of our datasets collection

2.15 0.5.0 (Mar 20, 2017) – it's huge

This release includes an avalanche of bug fixes, enhancements, and additions which at large should stay consistent with previous behavior but provide better functioning. Lots of code was refactored to provide more consistent code-base, and some API breakage has happened. Further work is ongoing to standardize output and results reporting (#1350)

2.15.1 Most notable changes

- requires git-annex >= 6.20161210 (or better even >= 6.20161210 for improved functionality)
- commands should now operate on paths specified (if any), without causing side-effects on other dirty/staged files
- save
  - `-a` is deprecated in favor of `-u` or `--all-updates` so only changes known components get saved, and no new files automagically added
  - `-S` does no longer store the originating dataset in its commit message
- add
  - can specify commit/save message with `-m`
- add-sibling and create-sibling
  - now take the name of the sibling (remote) as a `-s` (`--name`) option, not a positional argument
  - `--publish-depends` to setup publishing data and code to multiple repositories (e.g. github + web-serve) should now be functional see this comment
  - got `--publish-by-default` to specify what refs should be published by default
  - got `--annex-wanted`, `--annex-groupwanted` and `--annex-group` settings which would be used to instruct annex about preferred content. publish then will publish data using those settings if `wanted` is set.
  - got `--inherit` option to automagically figure out url/wanted and other git/annex settings for new remote sub-dataset to be constructed
- publish
  - got `--skip-failing` refactored into `--missing` option which could use new feature of create-sibling `--inherit`

2.15.2 Fixes

- More consistent interaction through ssh - all ssh connections go through sshrun shim for a "single point of authentication", etc.
- More robust ls operation outside of the datasets
- A number of fixes for direct and v6 mode of annex

2.15.3 Enhancements and new features

- New drop and remove commands
- clean
  - got `--what` to specify explicitly what cleaning steps to perform and now could be invoked with `-r`
- `datalad` and `git-annex-remote*` scripts now do not use setuptools entry points mechanism and rely on simple import to shorten start up time
- Dataset is also now using Flyweight pattern, so the same instance is reused for the same dataset
- progressbars should not add more empty lines

2.15.4 Internal refactoring

- Majority of the commands now go through `_prep` for arguments validation and pre-processing to avoid recursive invocations

2.16 0.4.1 (Nov 10, 2016) – CA release

Requires now GitPython >= 2.1.0

2.16.1 Fixes

- save
  - to not save staged files if explicit paths were provided
- improved (but not yet complete) support for direct mode
- update to not crash if some sub-datasets are not installed
- do not log calls to `git config` to avoid leakage of possibly sensitive settings to the logs

2.16.2 Enhancements and new features

- New rfc822-compliant metadata format
- save
  - -S to save the change also within all super-datasets
- add now has progress-bar reporting
- create-sibling-github to create a :term:`sibling` of a dataset on github

- OpenfMRI crawler and datasets were enriched with URLs to separate files where also available from openfmri s3 bucket (if upgrading your datalad datasets, you might need to run `git annex enableremote datalad` to make them available)
- various enhancements to log messages
- web interface
  - populates "install" box first thus making UX better over slower connections

2.17 0.4 (Oct 22, 2016) – Paris is waiting

Primarily it is a bugfix release but because of significant refactoring of the install and get implementation, it gets a new minor release.

2.17.1 Fixes

- be able to get or install while providing paths while being outside of a dataset
- remote annex datasets get properly initialized
- robust detection of outdated git-annex

2.17.2 Enhancements and new features

- interface changes
  - get `--recursion-limit=existing` to not recurse into not-installed subdatasets
  - get `-n` to possibly install sub-datasets without getting any data
  - install `--jobs|-J` to specify number of parallel jobs for annex get call could use (ATM would not work when data comes from archives)
- more (unit-)testing
- documentation: see http://docs.datalad.org/en/latest/basics.html for basic principles and useful shortcuts in referring to datasets
- various webface improvements: breadcrumb paths, instructions how to install dataset, show version from the tags, etc.

2.18 0.3.1 (Oct 1, 2016) – what a wonderful week

Primarily bugfixes but also a number of enhancements and core refactorings

2.18.1 Fixes

- do not build manpages and examples during installation to avoid problems with possibly previously outdated dependencies
- install can be called on already installed dataset (with `-r` or `-g`)

2.18.2 Enhancements and new features

- complete overhaul of datalad configuration settings handling (see Configuration documentation), so majority of the environment. Now uses git format and stores persistent configuration settings under `.datalad/config` and local within `.git/config` variables we have used were renamed to match configuration names
- create-sibling does not now by default upload web front-end
- export command with a plug-in interface and `tarball` plugin to export datasets
- in Python, `.api` functions with rendering of results in command line got a _-suffixed sibling, which would render results as well in Python as well (e.g., using `search_` instead of `search` would also render results, not only output them back as Python objects)
- get
  - `--jobs` option (passed to `annex get`) for parallel downloads
  - total and per-download (with git-annex >= 6.20160923) progress bars (note that if content is to be obtained from an archive, no progress will be reported yet)
- install `--reckless` mode option
- search
  - highlights locations and fieldmaps for better readability
  - supports `-d^` or `-d///` to point to top-most or centrally installed meta-datasets
  - "complete" paths to the datasets are reported now
  - `-s` option to specify which fields (only) to search
- various enhancements and small fixes to meta-data handling, ls, custom remotes, code-base formatting, downloaders, etc
- completely switched to `tqdm` library (`progressbar` is no longer used/supported)

2.19 0.3 (Sep 23, 2016) – winter is coming

Lots of everything, including but not limited to

- enhanced index viewer, as the one on http://datasets.datalad.org
- initial new data providers support: Kaggle, BALSA, NDA, NITRC
- initial meta-data support and management
- new and/or improved crawler pipelines for BALSA, CRCNS, OpenfMRI
- refactored install command, now with separate get
- some other commands renaming/refactoring (e.g., create-sibling)
- datalad search would give you an option to install datalad's super-dataset under ~/datalad if ran outside of a dataset

2.19.1 0.2.3 (Jun 28, 2016) – busy OHBM

New features and bugfix release

- support of /// urls to point to http://datasets.datalad.org

- variety of fixes and enhancements throughout

2.19.2 0.2.2 (Jun 20, 2016) – OHBM we are coming!

New feature and bugfix release

- greately improved documentation
- publish command API RFing allows for custom options to annex, and uses –to REMOTE for consistent with annex invocation
- variety of fixes and enhancements throughout

2.19.3 0.2.1 (Jun 10, 2016)

- variety of fixes and enhancements throughout

2.20 0.2 (May 20, 2016)

Major RFing to switch from relying on rdf to git native submodules etc

2.21 0.1 (Oct 14, 2015)

Release primarily focusing on interface functionality including initial publishing

CHAPTER 3

Acknowledgments

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DataLad is built atop the git-annex software that is being developed and maintained by Joey Hess.

CHAPTER 4

Concepts and technologies

4.1 Background and motivation

4.1.1 Vision

Data is at the core of science, and unobstructed access promotes scientific discovery through collaboration between data producers and consumers. The last years have seen dramatic improvements in availability of data resources for collaborative research, and new data providers are becoming available all the time.

However, despite the increased availability of data, their accessibility is far from being optimal. Potential consumers of these public datasets have to manually browse various disconnected warehouses with heterogeneous interfaces. Once obtained, data is disconnected from its origin and data versioning is often ad-hoc or completely absent. If data consumers can be reliably informed about data updates at all, review of changes is difficult, and re-deployment is tedious and error-prone. This leads to wasteful friction caused by outdated or faulty data.

The vision for this project is to transform the state of data-sharing and collaborative work by providing uniform access to available datasets – independent of hosting solutions or authentication schemes – with reliable versioning and versatile deployment logistics. This is achieved by means of a *dataset* handle, a lightweight representation of a dataset that is capable of tracking the identity and location of a dataset's content as well as carry meta-data. Together with associated software tools, scientists are able to obtain, use, extend, and share datasets (or parts thereof) in a way that is traceable back to the original data producer and is therefore capable of establishing a strong connection between data consumers and the evolution of a dataset by future extension or error correction.

Moreover, DataLad aims to provide all tools necessary to create and publish *data distributions* — an analog to software distributions or app-stores that provide logistics middleware for software deployment. Scientific communities can use these tools to gather, curate, and make publicly available specialized collections of datasets for specific research topics or data modalities. All of this is possible by leveraging existing data sharing platforms and institutional resources without the need for funding extra infrastructure of duplicate storage. Specifically, this project aims to provide a comprehensive, extensible data distribution for neuroscientific datasets that is kept up-to-date by an automated service.

4.1.2 Technological foundation: git-annex

The outlined task is not unique to the problem of data-sharing in science. Logistical challenges such as delivering data, long-term storage and archiving, identity tracking, and synchronization between multiple sites are rather common. Consequently, solutions have been developed in other contexts that can be adapted to benefit scientific data-sharing.

The closest match is the software tool git-annex. It combines the features of the distributed version control system (dVCS) Git — a technology that has revolutionized collaborative software development – with versatile data access and delivery logistics. Git-annex was originally developed to address use cases such as managing a collection of family pictures at home. With git-annex, any family member can obtain an individual copy of such a picture library — the *annex*. The annex in this example is essentially an image repository that presents individual pictures to users as files in a single directory structure, even though the actual image file contents may be distributed across multiple locations, including a home-server, cloud-storage, or even off-line media such as external hard-drives.

Git-annex provides functionality to obtain file contents upon request and can prompt users to make particular storage devices available when needed (e.g. a backup hard-drive kept in a fire-proof compartment). Git-annex can also remove files from a local copy of that image repository, for example to free up space on a laptop, while ensuring a configurable level of data redundancy across all known storage locations. Lastly, git-annex is able to synchronize the content of multiple distributed copies of this image repository, for example in order to incorporate images added with the git-annex on the laptop of another family member. It is important to note that git-annex is agnostic of the actual file types and is not limited to images.

We believe that the approach to data logistics taken by git-annex and the functionality it is currently providing are an ideal middleware for scientific data-sharing. Its data repository model *annex* readily provides the majority of principal features needed for a dataset handle such as history recording, identity tracking, and item-based resource locators. Consequently, instead of a from-scratch development, required features, such as dedicated support for existing data-sharing portals and dataset meta-information, can be added to a working solution that is already in production for several years. As a result, DataLad focuses on the expansion of git-annex's functionality and the development of tools that build atop Git and git-annex and enable the creation, management, use, and publication of dataset handles and collections thereof.

4.1.3 Objective

Building atop git-annex, DataLad aims to provide a single, uniform interface to access data from various data-sharing initiatives and data providers, and functionality to create, deliver, update, and share datasets for individuals and portal maintainers. As a command-line tool, it provides an abstraction layer for the underlying Git-based middleware implementing the actual data logistics, and serves as a foundation for other future user front-ends, such as a web-interface.

4.2 Delineation from related solutions

To our knowledge, there is no other effort with a scope as broad as DataLad's. DataLad aims to unify access to vast arrays of (scientific) data in a domain and data modality agnostic fashion with as few and universally available software dependencies as possible.

The most comparable project regarding the idea of federating access to various data providers is the iRODS-based INCF Dataspace project. IRODS is a powerful, NSF-supported framework, but it requires non-trivial deployment and management procedures. As a representative of *data grid* technology, it is more suitable for an institutional deployment, as data access, authentication, permission management, and versioning are complex and not-feasible to be performed directly by researchers. DataLad on the other hand federates institutionally hosted data, but in addition enables individual researchers and small labs to contribute datasets to the federation with minimal cost and without the need for centralized coordination and permission management.

4.2.1 Data catalogs

Existing data-portals, such as DataDryad, or domain-specific ones (e.g. Human Connectome, OpenfMRI), concentrate on collecting, cataloging, and making data available. They offer an abstraction from local data management peculiarities (organization, updates, sharing). Ad-hoc collections of pointers to available data, such as reddit datasets and Inside-R datasets, do not provide any unified interface to assemble and manage such data. Data portals can be used as seed information and data providers for DataLad. These portals could in turn adopt DataLad to expose readily usable data collections via a federated infrastructure.

4.2.2 Data delivery/management middleware

Even though there are projects to manage data directly with dVCS (e.g. Git), such as the Rdatasets Git repository this approach does not scale, for example to the amount of data typically observed in a scientific context. DataLad uses git-annex to support managing large amounts of data with Git, while avoiding the scalability issues of putting data directly into Git repositories.

In scientific software development, frequently using Git for source code management, many projects are also confronted with the problem of managing large data arrays needed, for example, for software testing. An exemplar project is ITK Data which is conceptually similar to git-annex: data content is referenced by unique keys (checksums), which are made redundantly available through multiple remote key-store farms and can be obtained using specialized functionality in the CMake software build system. However, the scope of this project is limited to software QA, and only provides an ad-hoc collection of guidelines and supporting scripts.

The git-annex website provides a comparison of Git-annex to other available distributed data management tools, such as git-media, git-fat, and others. None of the alternative frameworks provides all of the features of git-annex, such as integration with native Git workflows, distributed redundant storage, and partial checkouts in one project. Additional features of git-annex which are not necessarily needed by DataLad (git-annex assistant, encryption support, etc.) make it even more appealing for extended coverage of numerous scenarios. Moreover, neither of the alternative solutions has already reached a maturity, availability, and level of adoption that would be comparable to that of git-annex.

4.2.3 Git/Git-annex/DataLad

Although it is possible, and intended, to use DataLad without ever invoking git or git-annex commands directly, it is useful to appreciate that DataLad is build atop of very flexible and powerful tools. Knowing basics of git and git-annex in addition to DataLad helps to not only make better use of DataLad but also to enable more advanced and more efficient data management scenarios. DataLad makes use of lower-level configuration and data structures as much as possible. Consequently, it is possible to manipulate DataLad datasets with low-level tools if needed. Moreover, DataLad datasets are compatible with tools and services designed to work with plain Git repositories, such as the popular GitHub service.

To better illustrate the different scopes, the following table provides an overview of the features that are contributed by each software technology layer.

Feature	Git	Git-annex	DataLad
Version control (text, code)	✓	✓can mix	✓can mix
Version control (binary data)	(not advised)	✓	✓
Auto-crawling available resources		✓RSS feeds	✓flexible
Unified dataset handling			✓
• recursive operation on datasets			✓
• seamless operation across datasets boundaries			✓
• meta-data support		✓per-file	✓
• meta-data aggregation			✓flexible
Unified authentication interface			✓

4.3 Basic principles

DataLad is designed to be used both as a command-line tool, and as a Python module. The sections *Command line reference* and *Python module reference* provide detailed description of the commands and functions of the two interfaces. This section presents common concepts. Although examples will frequently be presented using command line interface commands, all functionality with identically named functions and options are available through Python API as well.

4.3.1 Datasets

A DataLad *dataset* is a Git repository that may or may not have a data *annex* that is used to manage data referenced in a dataset. In practice, most DataLad datasets will come with an annex.

Types of IDs used in datasets

Four types of unique identifiers are used by DataLad to enable identification of different aspects of datasets and their components.

Dataset ID A UUID that identifies a dataset as a whole across its entire history and flavors. This ID is stored in a dataset's own configuration file (`<dataset root>/.datalad/config`) under the configuration key `datalad.dataset.id`. As this configuration is stored in a file that is part of the Git history of a dataset, this ID is identical for all "clones" of a dataset and across all its versions. If the purpose or scope of a dataset changes enough to warrant a new dataset ID, it can be changed by altering the dataset configuration setting.

Annex ID A UUID assigned to an annex of each individual clone of a dataset repository. Git-annex uses this UUID to track file content availability information. The UUID is available under the configuration key `annex.uuid` and is stored in the configuration file of a local clone (`<dataset root>/.git/config`). A single dataset instance (i.e. clone) can only have a single annex UUID, but a dataset with multiple clones will have multiple annex UUIDs.

Commit ID A Git hexsha or tag that identifies a version of a dataset. This ID uniquely identifies the content and history of a dataset up to its present state. As the dataset history also includes the dataset ID, a commit ID of a DataLad dataset is unique to a particular dataset.

Content ID Git-annex key (typically a checksum) assigned to the content of a file in a dataset's annex. The checksum reflects the content of a file, not its name. Hence the content of multiple identical files in a single (or across) dataset(s) will have the same checksum. Content IDs are managed by Git-annex in a dedicated `annex` branch of the dataset's Git repository.

Dataset nesting

Datasets can contain other datasets (*subdataset*s), which can in turn contain subdatasets, and so on. There is no limit to the depth of nesting datasets. Each dataset in such a hierarchy has its own annex and its own history. The parent or *superdataset* only tracks the specific state of a subdataset, and information on where it can be obtained. This is a powerful yet lightweight mechanism for combining multiple individual datasets for a specific purpose, such as the combination of source code repositories with other resources for a tailored application. In many cases DataLad can work with a hierarchy of datasets just as if it were a single dataset. Here is a demo:

```
~ % datalad create demo
[INFO   ] Creating a new annex repo at /demo/demo
create(ok): /demo/demo (dataset)
~ % cd demo
```

A DataLad dataset is just a Git repo with some initial configuration

```
~/demo % git log --oneline
472e34b (HEAD -> master) [DATALAD] new dataset
f968257 [DATALAD] Set default backend for all files to be MD5E
```

We can generate nested datasets, by telling DataLad to register a new dataset in a parent dataset

```
~/demo % datalad create -d . sub1
[INFO   ] Creating a new annex repo at /demo/demo/sub1
add(ok): sub1 (dataset) [added new subdataset]
add(notneeded): sub1 (dataset) [nothing to add from /demo/demo/sub1]
add(notneeded): .gitmodules (file) [already included in the dataset]
save(ok): /demo/demo (dataset)
create(ok): sub1 (dataset)
action summary:
  add (notneeded: 2, ok: 1)
  create (ok: 1)
  save (ok: 1)
```

A subdataset is nothing more than regular Git submodule

```
~/demo % git submodule
 5f0cddf2026e3fb4864139f27e7415fd72c7d4d0 sub1 (heads/master)
```

Of course subdatasets can be nested

```
~/demo % datalad create -d . sub1/justadir/sub2
[INFO   ] Creating a new annex repo at /demo/demo/sub1/justadir/sub2
add(ok): sub1/justadir/sub2 (dataset) [added new subdataset]
add(notneeded): sub1/justadir/sub2 (dataset) [nothing to add from /demo/demo/sub1/
↪justadir/sub2]
add(notneeded): sub1/.gitmodules (file) [already included in the dataset]
add(notneeded): sub1 (dataset) [already known subdataset]
save(ok): /demo/demo/sub1 (dataset)
save(ok): /demo/demo (dataset)
create(ok): sub1/justadir/sub2 (dataset)
action summary:
  add (notneeded: 3, ok: 1)
  create (ok: 1)
  save (ok: 2)
```

Unlike Git, DataLad automatically takes care of committing all changes associated with the added subdataset up to the given parent dataset

```
~/demo % git status
On branch master
nothing to commit, working tree clean
```

Let's create some content in the deepest subdataset

```
~/demo % mkdir sub1/justadir/sub2/anotherdir
~/demo % touch sub1/justadir/sub2/anotherdir/afile
```

Git can only tell us that something underneath the top-most subdataset was modified

```
~/demo % git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)
  (commit or discard the untracked or modified content in submodules)

     modified:   sub1 (untracked content)

no changes added to commit (use "git add" and/or "git commit -a")
```

DataLad saves us from further investigation

```
~/demo % datalad diff -r
   modified(dataset): sub1
   modified(dataset): sub1/justadir/sub2
untracked(directory): sub1/justadir/sub2/anotherdir
```

Like Git, it can report individual untracked files, but also across repository boundaries

```
~/demo % datalad diff -r --report-untracked all
   modified(dataset): sub1
   modified(dataset): sub1/justadir/sub2
     untracked(file): sub1/justadir/sub2/anotherdir/afile
```

Adding this new content with Git or git-annex would be an exercise

```
~/demo % git add sub1/justadir/sub2/anotherdir/afile
fatal: Pathspec 'sub1/justadir/sub2/anotherdir/afile' is in submodule 'sub1'
```

DataLad does not require users to determine the correct repository in the tree

```
~/demo % datalad add -d . sub1/justadir/sub2/anotherdir/afile
add(ok): sub1/justadir/sub2/anotherdir/afile (file)
save(ok): /demo/demo/sub1/justadir/sub2 (dataset)
save(ok): /demo/demo/sub1 (dataset)
save(ok): /demo/demo (dataset)
action summary:
  add (ok: 1)
  save (ok: 3)
```

Again, all associated changes in the entire dataset tree, up to the given parent dataset, were committed

```
~/demo % git status
On branch master
nothing to commit, working tree clean
```

DataLad's 'diff' is able to report the changes from these related commits throughout the repository tree

```
~/demo % datalad diff --revision @~1 -r
   modified(dataset): sub1
   modified(dataset): sub1/justadir/sub2
         added(file): sub1/justadir/sub2/anotherdir/afile
```

Dataset collections

A superdataset can also be seen as a curated collection of datasets, for example, for a certain data modality, a field of science, a certain author, or from one project (maybe the resource for a movie production). This lightweight coupling between super and subdatasets enables scenarios where individual datasets are maintained by a disjoint set of people, and the dataset collection itself can be curated by a completely independent entity. Any individual dataset can be part of any number of such collections.

Benefiting from Git's support for workflows based on decentralized "clones" of a repository, DataLad's datasets can be (re-)published to a new location without loosing the connection between the "original" and the new "copy". This is extremely useful for collaborative work, but also in more mundane scenarios such as data backup, or temporary deployment fo a dataset on a compute cluster, or in the cloud. Using git-annex, data can also get synchronized across different locations of a dataset (*sibling*s in DataLad terminology). Using metadata tags, it is even possible to configure different levels of desired data redundancy across the network of dataset, or to prevent publication of sensitive data to publicly accessible repositories. Individual datasets in a hierarchy of (sub)datasets need not be stored at the same location. Continuing with an earlier example, it is possible to post a curated collection of datasets, as a superdataset, on Github, while the actual datasets live on different servers all around the world.

4.3.2 Basic command line usage

All of DataLad's functionality is available through a single command: *datalad*

Running the datalad command without any arguments, gives a summary of basic options, and a list of available sub-commands.

```
~ % datalad
usage: datalad [-h] [-l LEVEL] [--pbs-runner {condor}] [-C PATH] [--version]
               [--dbg] [--idbg] [-c KEY=VALUE]
               [-f {default,json,json_pp,tailored,'<template>'}]
               [--report-status {success,failure,ok,notneeded,impossible,error}]
               [--report-type {dataset,file}]
```

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```
               [--on-failure {ignore,continue,stop}] [--cmd]
               {create,install,get,add,publish,uninstall,drop,remove,update,create-
↪sibling,create-sibling-github,unlock,save,search,metadata,aggregate-metadata,test,
↪ls,clean,add-archive-content,download-url,run,rerun,addurls,export-archive,extract-
↪metadata,export-to-figshare,no-annex,wtf,add-readme,annotate-paths,clone,create-
↪test-dataset,diff,siblings,sshrun,subdatasets}
               ...
[ERROR  ] Please specify the command
~ % #
```

More comprehensive information is available via the –help long-option (we will truncate the output here)

```
~ % datalad --help       | head -n20
Usage: datalad [global-opts] command [command-opts]

DataLad provides a unified data distribution with the convenience of git-annex
repositories as a backend.  DataLad command line tools allow to manipulate
(obtain, create, update, publish, etc.) datasets and their collections.

*Commands for dataset operations*

  create
      Create a new dataset from scratch
  install
      Install a dataset from a (remote) source
  get
      Get any dataset content (files/directories/subdatasets)
  add
      Add files/directories to an existing dataset
  publish
      Publish a dataset to a known sibling
  uninstall
      Uninstall subdatasets
```

Getting information on any of the available sub commands works in the same way – just pass –help AFTER the sub-command (output again truncated)

```
~ % datalad create --help       | head -n20
Usage: datalad create [-h] [-f] [-D DESCRIPTION] [-d PATH] [--no-annex]
                      [--nosave] [--annex-version ANNEX_VERSION]
                      [--annex-backend ANNEX_BACKEND]
                      [--native-metadata-type LABEL] [--shared-access MODE]
                      [--git-opts STRING] [--annex-opts STRING]
                      [--annex-init-opts STRING] [--text-no-annex]
                      [PATH]

Create a new dataset from scratch.

This command initializes a new dataset at a given location, or the
current directory. The new dataset can optionally be registered in an
existing superdataset (the new dataset's path needs to be located
within the superdataset for that, and the superdataset needs to be given
explicitly). It is recommended to provide a brief description to label
the dataset's nature *and* location, e.g. "Michael's music on black
laptop". This helps humans to identify data locations in distributed
scenarios.  By default an identifier comprised of user and machine name,
plus path will be generated.
```

4.3.3 API principles

You can use DataLad's `install` command to download datasets. The command accepts URLs of different protocols (`http`, `ssh`) as an argument. Nevertheless, the easiest way to obtain a first dataset is downloading the default *superdataset* from http://datasets.datalad.org/ using a shortcut.

Downloading DataLad's default superdataset

http://datasets.datalad.org provides a super-dataset consisting of datasets from various portals and sites. Many of them were crawled, and periodically updated, using datalad-crawler extension. The argument `///` can be used as a shortcut that points to the superdataset located at http://datasets.datalad.org/. Here are three common examples in command line notation:

`datalad install ///` installs this superdataset (metadata without subdatasets) in a *datasets.datalad.org/* subdirectory under the current directory

`datalad install -r ///openfmri` installs the openfmri superdataset into an *openfmri/* subdirectory. Additionally, the `-r` flag recursively downloads all metadata of datasets available from http://openfmri.org as subdatasets into the *openfmri/* subdirectory

`datalad install -g -J3 -r ///labs/haxby` installs the superdataset of datasets released by the lab of Dr. James V. Haxby and all subdatasets' metadata. The `-g` flag indicates getting the actual data, too. It does so by using 3 parallel download processes (`-J3` flag).

datalad search command, if ran outside of any dataset, will install this default superdataset under a path specified in `datalad.locations.default-dataset` *configuration* variable (by default `$HOME/datalad`).

Downloading datasets via http

In most places where DataLad accepts URLs as arguments these URLs can be regular `http` or `https` protocol URLs. For example:

```
datalad install https://github.com/psychoinformatics-de/studyforrest-data-phase2.
git
```

Downloading datasets via ssh

DataLad also supports SSH URLs, such as `ssh://me@localhost/path`.

```
datalad install ssh://me@localhost/path
```

Finally, DataLad supports SSH login style resource identifiers, such as `me@localhost:/path`.

```
datalad install me@localhost:/path
```

–dataset argument

All commands which operate with/on datasets (practically all commands) have a `dataset` argument (`-d` or `--dataset` for the command line API) which takes a path to the dataset that the command should operate on. If a dataset is identified this way then any relative path that is provided as an argument to the command will be interpreted as being relative to the topmost directory of that dataset. If no dataset argument is provided, relative paths are considered to be relative to the current directory.

There are also some useful pre-defined "shortcut" values for dataset arguments:

/// refers to the "default" dataset located under *$HOME/datalad/*. So running `datalad install -d/// crcns` will install the `crcns` subdataset under `$HOME/datalad/crcns`. This is the same as running `datalad install $HOME/datalad/crcns`.

^ topmost superdataset containing the dataset the current directory is part of. For example, if you are in `$HOME/datalad/openfmri/ds000001/sub-01` and want to search metadata of the entire superdataset you are under (in this case `///`), run `datalad search -d^ [something to search]`.

Commands *install* vs *get*

The `install` and `get` commands might seem confusingly similar at first. Both of them could be used to install any number of subdatasets, and fetch content of the data files. Differences lie primarily in their default behaviour and outputs, and thus intended use. Both `install` and `get` take local paths as their arguments, but their default behavior and output might differ;

- **install** primarily operates and reports at the level of **datasets**, and returns as a result dataset(s) which either were just installed, or were installed previously already under specified locations. So result should be the same if the same `install` command ran twice on the same datasets. It **does not fetch** data files by default
- **get** primarily operates at the level of **paths** (datasets, directories, and/or files). As a result it returns only what was installed (datasets) or fetched (files). So result of rerunning the same `get` command should report that nothing new was installed or fetched. It **fetches** data files by default.

In how both commands operate on provided paths, it could be said that `install == get -n`, and `install -g == get`. But `install` also has ability to install new datasets from remote locations given their URLs (e.g., `http://datasets.datalad.org/` for our super-dataset) and SSH targets (e.g., `[login@]host:path`) if they are provided as the argument to its call or explicitly as `--source` option. If `datalad install --source URL DESTINATION` (command line example) is used, then dataset from URL gets installed under PATH. In case of `datalad install URL` invocation, PATH is taken from the last name within URL similar to how `git clone` does it. If former specification allows to specify only a single URL and a PATH at a time, later one can take multiple remote locations from which datasets could be installed.

So, as a rule of thumb – if you want to install from external URL or fetch a sub-dataset without downloading data files stored under annex – use `install`. In Python API `install` is also to be used when you want to receive in output the corresponding Dataset object to operate on, and be able to use it even if you rerun the script. In all other cases, use `get`.

4.4 Data management use cases

4.4.1 Basic provenance tracking

It is often helpful to keep track of the origin of data files. When generating data from other data, it is also useful to know what process led to these new data and what inputs were used.

DataLad can be used to keep such a record...

We start with a dataset

```
~ % datalad create demo
[INFO   ] Creating a new annex repo at /demo/demo
create(ok): /demo/demo (dataset)
~ % cd demo
```

Let's say we are taking a mosaic image composed of flowers from Wikimedia. We want extract some of them into individual files – maybe to use them in an art project later.

We can use git-annex to obtain this image straight from the web

```
~/demo % git annex addurl https://upload.wikimedia.org/wikipedia/commons/a/a5/Flower_
↪poster_2.jpg --file sources/flowers.jpg
addurl sources/flowers.jpg (downloading https://upload.wikimedia.org/wikipedia/
↪commons/a/a5/Flower_poster_2.jpg ...)
/demo/demo/.git/ann 100%[===================>]   4.28M  5.19MB/s    in 0.8s
2018-03-15 15:47:37 URL:https://upload.wikimedia.org/wikipedia/commons/a/a5/Flower_
↪poster_2.jpg [4487679/4487679] -> "/demo/demo/.git/annex/tmp/URL-s4487679--https&c%
↪%upload.wikimedia.org%wi-f0864ab780277edffb909382d1d1bb88" [1]
ok
(recording state in git...)
```

We save it in the dataset

```
~/demo % datalad save -m 'Added flower mosaic from wikimedia'
save(ok): /demo/demo (dataset)
```

Now we can use DataLad's 'run' command to process this image and extract one of the mosaic tiles into its own JPEG file. Let's extract the St. Bernard's Lily from the upper left corner.

```
~/demo % datalad run convert -extract 1522x1522+0+0 sources/flowers.jpg st-bernard.jpg
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): st-bernard.jpg (file)
save(ok): /demo/demo (dataset)
action summary:
  add (ok: 1)
  save (ok: 1)
```

All we have to do is prefix ANY command with 'datalad run'. DataLad will inspect the dataset after the command has finished and save all modifications.

In order to reliably detect modifications, a dataset must not contain unsaved modifications prior to running a command. For example, if we try to extract the Scarlet Pimpernel image with unsaved changes...

```
~/demo % touch dirt
~/demo % datalad run convert -extract 1522x1522+1470+1470 sources/flowers.jpg␣
↪pimpernel.jpg
run(impossible): /demo/demo (dataset) [unsaved modifications present, cannot detect␣
↪changes by command]
```

It has to be clean

```
~/demo % rm dirt
~/demo % datalad run convert -extract 1522x1522+1470+1470 sources/flowers.jpg␣
↪pimpernel.jpg
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): pimpernel.jpg (file)
save(ok): /demo/demo (dataset)
action summary:
  add (ok: 1)
  save (ok: 1)
```

Every processing step is saved in the dataset, including the exact command and the content that was changed.

```
~/demo % git show --stat
commit 73832b3af2a24d7cdaea964b934f1ede23a69c69 (HEAD -> master)
Author: DataLad Demo <demo@datalad.org>
Date:   Thu Mar 15 15:48:34 2018 +0100

    [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou...

    === Do not change lines below ===
    {
     "pwd": ".",
     "cmd": [
      "convert",
      "-extract",
      "1522x1522+1470+1470",
      "sources/flowers.jpg",
      "pimpernel.jpg"
     ],
     "exit": 0,
     "chain": []
    }
    ^^^ Do not change lines above ^^^

 pimpernel.jpg | 1 +
 1 file changed, 1 insertion(+)
```

On top of that, the origin of any dataset content obtained from elsewhere is on record too

```
~/demo % git annex whereis sources/flowers.jpg
whereis sources/flowers.jpg (2 copies)
     00000000-0000-0000-0000-000000000001 -- web
     3b96f81f-2e68-4848-a30c-4bd31c555cb3 -- mih@meiner:~/demo [here]

  web: https://upload.wikimedia.org/wikipedia/commons/a/a5/Flower_poster_2.jpg
ok
```

Based on this information, we can always reconstruct how any data file came to be – across the entire life-time of a project

```
~/demo % git log --oneline @~3..@
73832b3 (HEAD -> master) [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou...
cce0c79 [DATALAD RUNCMD] convert -extract 1522x1522+0+0 sources/f...
8a21b21 Added flower mosaic from wikimedia
~/demo % datalad diff --revision @~3..@
         added(file): pimpernel.jpg
         added(file): sources/flowers.jpg
         added(file): st-bernard.jpg
```

We can also rerun any previous commands with 'datalad rerun'. Without any arguments, the command from the last commit will be executed.

```
~/demo % datalad rerun
unlock(ok): pimpernel.jpg (file)
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): pimpernel.jpg (file)
save(notneeded): /demo/demo (dataset)
action summary:
```

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```
  add (ok: 1)
  save (notneeded: 1)
  unlock (ok: 1)
~/demo % git log --oneline --graph --name-only @~3..@
* 73832b3 (HEAD -> master) [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou..
↪.
| pimpernel.jpg
* cce0c79 [DATALAD RUNCMD] convert -extract 1522x1522+0+0 sources/f...
| st-bernard.jpg
* 8a21b21 Added flower mosaic from wikimedia
  sources/flowers.jpg
```

In this case, a new commit isn't created because the output file didn't change. But let's say we add a step that displaces the Lily's pixels by a random amount.

```
~/demo % datalad run convert -spread 10 st-bernard.jpg st-bernard-displaced.jpg
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): st-bernard-displaced.jpg (file)
save(ok): /demo/demo (dataset)
action summary:
  add (ok: 1)
  save (ok: 1)
```

Now, if we rerun the previous command, a new commit is created because the output's content changed.

```
~/demo % datalad rerun
unlock(ok): st-bernard-displaced.jpg (file)
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): st-bernard-displaced.jpg (file)
save(ok): /demo/demo (dataset)
action summary:
  add (ok: 1)
  save (ok: 1)
  unlock (ok: 1)
~/demo % git log --graph --oneline --name-only @~2..
* 3b8c46b (HEAD -> master) [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber..
↪.
| st-bernard-displaced.jpg
* 40b2c50 [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber...
  st-bernard-displaced.jpg
```

(We don't actually want the repeated 'spread' command, so let's reset to the parent commit.)

```
~/demo % git reset --hard @^
HEAD is now at 40b2c50 [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber...
```

We can also rerun multiple commits (with '–since') and choose where HEAD is when we start rerunning from (with –onto). When both arguments are set to empty strings, it means 'rerun all command with HEAD at the parent of the first commit a command'.

In other words, you can 'replay' the commands.

```
~/demo % datalad rerun --since= --onto= --branch=verify
unlock(notneeded): st-bernard.jpg (file) [not controlled by annex, nothing to unlock]
[INFO   ] == Command start (output follows) =====
```

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```
[INFO   ] == Command exit (modification check follows) =====
add(ok): st-bernard.jpg (file)
save(ok): /demo/demo (dataset)
unlock(notneeded): pimpernel.jpg (file) [not controlled by annex, nothing to unlock]
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): pimpernel.jpg (file)
save(ok): /demo/demo (dataset)
unlock(notneeded): st-bernard-displaced.jpg (file) [not controlled by annex, nothing␣
↪to unlock]
[INFO   ] == Command start (output follows) =====
[INFO   ] == Command exit (modification check follows) =====
add(ok): st-bernard-displaced.jpg (file)
save(ok): /demo/demo (dataset)
action summary:
  add (ok: 3)
  save (ok: 3)
  unlock (notneeded: 3)
```

Now we're on a new branch, 'verify', that contains the replayed history.

```
~/demo % git log --oneline --graph master verify
* e58b078 (HEAD -> verify) [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber..
↪.
* 35623fd [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou...
* 9f8f54d [DATALAD RUNCMD] convert -extract 1522x1522+0+0 sources/f...
| * 40b2c50 (master) [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber...
| * 73832b3 [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou...
| * cce0c79 [DATALAD RUNCMD] convert -extract 1522x1522+0+0 sources/f...
|/
* 8a21b21 Added flower mosaic from wikimedia
* 14f64a7 [DATALAD] new dataset
* 3b50eb8 [DATALAD] Set default backend for all files to be MD5E
```

Let's compare the two branches.

```
~/demo % datalad diff --revision master..verify
      modified(file): st-bernard-displaced.jpg
```

We can see that the step that involved a random component produced different results.

And these are just two branches, so you can compare them using normal Git operations. The next command, for example, marks which commits are 'patch-equivalent'.

```
~/demo % git log --oneline --left-right --cherry-mark master...verify
> e58b078 (HEAD -> verify) [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber..
↪.
= 35623fd [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou...
= 9f8f54d [DATALAD RUNCMD] convert -extract 1522x1522+0+0 sources/f...
< 40b2c50 (master) [DATALAD RUNCMD] convert -spread 10 st-bernard.jpg st-ber...
= 73832b3 [DATALAD RUNCMD] convert -extract 1522x1522+1470+1470 sou...
= cce0c79 [DATALAD RUNCMD] convert -extract 1522x1522+0+0 sources/f...
```

Notice that all commits are marked as equivalent (=) except the 'random spread' ones.

4.4.2 A typical collaborative data management workflow

In this demo we will look at how datalad can be used in a rather common data management workflow: A 3rd-party dataset is obtained to serve as input for an analysis. The data processing is then collaboratively performed by two colleagues. Upon completion the results are published alongside the original data for further consumption.

Build atop 3rd-party data

Now, meet Bob. Bob has just started in the lab and has never used the version control system Git before. The first thing he does, is to configure his identity as it will be used to track changes in the datasets he will be working with. This step only needs to be done once on his first day in the lab.

```
# enter Bob's home directory
HOME="$BOBS_HOME"
cd ~
git config --global --add user.name Bob
git config --global --add user.email bob@example.com
```

After this initial setup, Bob is ready to go and can create his first *dataset*.

```
datalad create myanalysis --description "my phd in a day"
cd myanalysis
```

A datalad dataset can contain other datasets. As any content of a dataset is tracked and its precise state is recorded, this is a powerful method to specify and later resolve data dependencies. In this example, Bob wants to work with structural MRI data from the studyforrest project, a public brain imaging data resource. These data are made available through GitHub, so Bob can simply install the relevant dataset from this service and into his own dataset:

```
datalad install -d . --source https://github.com/psychoinformatics-de/studyforrest-
↪data-structural.git src/forrest_structural
```

and see that the forrest_structural was registered as a git submodule, which is a *subdataset* of his myanalysis dataset, but no data was fetched (`datalad ls -L` provides size_installed/total_size column):

```
# mostly for a test
grep src/forrest_structural .gitmodules
# to demonstrate ls
datalad ls -r -L .
```

Bob has decided to collect all data inputs for his project in a subdirectory `src/`, to make it obvious which parts of his analysis steps and code require 3rd-party data. Upon completion of the above command, Bob has now access to the entire dataset content, and precise current version of that dataset got linked to his `myanalysis`. However, no data was actually downloaded (yet). DataLad datasets primarily contain information on a dataset's content and where to obtain it, hence the installation above was done rather quickly, and will still be relatively lean even for a dataset that contains several hundred GBs of data.

For his first steps Bob just needs a single file of the dataset. In order to make it available locally, Bob can use the get command, and datalad will obtain requested data files from a remote data provider.

```
datalad get src/forrest_structural/sub-01/anat/sub-01_T1w.nii.gz
# just test data for now, could be
#datalad get src/forrest_structural/sub-*/anat/sub-*_T1w.nii.gz
```

Although we originally installed the dataset from Github, the actual data is hosted elsewhere. DataLad supports multiple redundant data providers per each file in a dataset, and will transparently attempt to obtain data from an alternative location if a particular data provider is not available.

Bob wants his analysis to be easily reproducible, and therefore manages his analysis scripts in the same dataset repository as the input data. Managing input data, analysis code, and results the same version control system creates a precise record of what version of code and input data was used to create which particular results. DataLad datasets are regular Git repositories and therefore provide the same powerful source code management features, as any other Git repository, and make them available for data too.

Bob decided to adopt the convention to collect all of his analysis code in a subdirectory `code/` in the root of his dataset. His first "analysis" script is rather simple:

```
mkdir code
echo "file src/forrest_structural/sub-01/anat/sub-*_T1w.nii.gz > result.txt" > code/
↪run_analysis.sh
```

In order to definitively document which data file his analysis needs at this point, Bob creates a second script that can (re-)obtain the required files:

```
echo "datalad get src/forrest_structural/sub-01/anat/sub-01_T1w.nii.gz" > code/get_
↪required_data.sh
```

In the future, this won't be necessary anymore as datalad itself will be able to record this information upon request.

At this point Bob is satisfied with his initial progress. He wants to record this precise state. In order to do that, Bob needs to make his just created scripts a part of his dataset. Again the `install` command is used for this purpose. However, Bob doesn't just want datalad to track these files and facilitate future downloads. He wants all Git features for working with them, so he adds them directly to the Git repository underlying his dataset.

```
# add all content in the code/ directory directly to git
datalad add --to-git code
```

At this point, datalad is aware of all changes that were made to the dataset and all the changes Bob made were automatically recorded, as you could easily check with `git log` command.

As Bob's analysis is completely scripted, he can now run it in full:

```
bash code/get_required_data.sh
bash code/run_analysis.sh
```

and add generated results to the dataset and provide a custom message to better describe accomplished work:

```
datalad add  -m "First analysis results" result.txt
```

You could also use `--nosave` option with add, and invoke `datalad save` later on to group multiple changes into a single commit.

```
# git log
```

Local collaboration

Some time later, Bob needs help with his analysis. He turns to his colleague Alice for help. Alice and Bob both work on the same computing server. Alice initially went through a similar configuration procedure of her Git identity as Bob.

```
HOME="$ALICES_HOME"
cd
git config --global --add user.name Alice
git config --global --add user.email alice@example.com
```

Bob has told Alice in which directory he keeps his analysis dataset. The colleagues' directories are configured to have permissions that allow for read-access for all lab-member, so Alice can obtain Bob's work directly from his home directory, including the `studyforrest-structural` *subdataset* he had:

```
# TODO: needs to get --description to avoid confusion
datalad install -r --source "$BOBS_HOME/myanalysis" bobs_analysis
cd bobs_analysis
```

At this point, Alice has a complete copy of Bob's entire dataset in the exact same state that Bob last saved. She is free to make any changes without affecting Bob's version of the dataset. Initially, all the datasets are as lightweight as possible.

```

```

With the script Bob created, Alice can obtain all required data content. DataLad knows that necessary file is available in Bob's version of the dataset on the same machine, so it won't even attempt to download it from its original location.

```
bash code/get_required_data.sh
```

Likewise, Alice can use datalad to obtain the results that Bob had generated.

```
datalad get result.txt
#cat result.txt
```

She can modify Bob's code to help him with his analysis...

```
echo "file src/forrest_structural/sub-*/anat/sub-*_T1w.nii.gz > result.txt" > code/
↪run_analysis.sh
```

... and execute it.

```
# `|| true` is only there for the purpose of testing this script
bash code/run_analysis.sh || true
```

However, when she performs actions that attempt to modify data files managed by datalad she will get an error. DataLad, by default, prevents modification of data files. If modification is desired (as in this case), datalad can *unlock* individual files, or the entire dataset. Afterwards modifications are possible.

```
# unlock the entire dataset
datalad unlock
bash code/run_analysis.sh
```

Once Alice is satisfied with her modifications she can save the new state.

```
# -a make datalad auto-detect modifications
datalad save -u -m "Alice always helps"
```

Full circle

Now that Alice has improved Bob's analysis, Bob wants to obtain the changes she made. To achieve that, he registers Alice's version of the dataset as a *sibling*. As both are working on the same machine, Bob can just point to the respective directory, but it would also be possible to refer to a dataset via an http URL, or an SSH login and path.

```
HOME="$BOBS_HOME"
cd ~/myanalysis
datalad siblings add -s alice --url "$ALICES_HOME/bobs_analysis"
```

Once registered, Bob can update his dataset based on Alice's version, and merge here changes with his own.

```
datalad update -s alice --merge
```

He can, once again, use the `get` command to obtain the latest version of data files to get access to data contributed by Alice.

```
datalad get result.txt
```

Going public

Lastly, let's assume that Bob completed his analysis and he is ready to share the results with the world, or a remote collaborator. One way to make datasets available, is to upload them to a webserver via SSH. DataLad supports this by creating a *sibling* for the dataset on the server, to which the dataset can by published (repeatedly).

```
# this generated sibling for the dataset and all subdatasets
datalad create-sibling --recursive -s public "$SERVER_URL"
```

Once the remote sibling is created and registered under the name "public", Bob can publish his version to it.

```
datalad publish -r --to public .
```

This command can be repeated as often as desired. DataLad checks the state of both the local and the remote sibling and transmits the changes.

```
```

4.5 Metadata

4.5.1 Overview

DataLad has built-in, modular, and extensible support for metadata in various formats. Metadata is extracted from a dataset and its content by one or more extractors that have to be enabled in a dataset's configuration. Extractors yield metadata in a JSON-LD-like structure that can be arbitrarily complex and deeply nested. Metadata from each extractor is kept unmodified, unmangled, and separate from metadata of other extractors. This design enables tailored applications using particular metadata that can use Datalad as a content-agnostic aggregation and transport layer without being limited or impacted by other metadata sources and schemas.

Extracted metadata is stored in a dataset in (compressed) files using a JSON stream format, separately for metadata describing a dataset as a whole, and metadata describing individual files in a dataset. This limits the amount of metadata that has to be obtained and processed for applications that do not require all available metadata.

DataLad provides a content-agnostic metadata aggregation mechanism that stores metadata of sub-datasets (with arbitrary nesting levels) in a superdataset, where it can then be queried without having the subdatasets locally present.

Lastly, DataLad comes with a *search* command that enable metadata queries via a flexible query language. However, alternative applications for metadata queries (e.g. graph-based queries) can be built on DataLad, by requesting a complete or partial dump of aggregated metadata available in a dataset.

4.5.2 Supported metadata sources

This following sections provide an overview of included metadata extractors for particular types of data structures and file formats. Note that *DataLad extension packages*, such as the neuroimaging extension, can provide additional

extractors for particular domains and formats.

Only *annex* and *datalad_core* extractors are enabled by default. Any additional metadata extractor should be enabled by setting the datalad.metadata.nativetype *configuration* variable via the `git config` command or by editing `.datalad/config` directly. For example, `git config -f .datalad/config --add datalad.metadata.nativetype audio` would add *audio* metadata extractor to the list.

Annex metadata (`annex`)

Content tracked by git-annex can have associated metadata records. From DataLad's perspective, git-annex metadata is just another source of metadata that can be extracted and aggregated.

You can use the git-annex metadata command to assign git-annex metadata. And, if you have a table or records that contain data sources and metadata, you can use *datalad addurls* to quickly populate a dataset with files and associated git-annex metadata. (///labs/openneurolab/metasearch is an example of such a dataset.)

Pros of git-annex level metadata

- Many git-annex commands, such as git-annex get and git-annex copy, can use metadata to decide which files (keys) to operate on, making it possible to automate file (re)distribution based on their metadata annotation
- Assigned metadata is available for use by git-annex right away without requiring any additional "aggregation" step
- git-annex view can be used to quickly generate completely new layouts of the repository solely based on the metadata fields associated with the files

Cons of git-annex level metadata

- Metadata fields are actually stored per git-annex key rather than per file. If multiple files contain the same content, metadata will be shared among them.
- Files whose content is tracked directly by git cannot have git-annex metadata assigned.
- No per repository/directory metadata, and no mechanism to use/aggregate metadata from sub-datasets
- Field names cannot contain some symbols, such as ':'
- Metadata is stored within the *git-annex* branch, so it is distributed across all clones of the dataset, making it hard to scale for large metadata sizes or to work with sensitive metadata (not intended to be redistributed)
- It is a generic storage with no prescribed vocabularly, making it very flexible but also requiring consistency and harmonization to make the stored metadata useful for search

Example uses of git-annex metadata

Annotating files for different purposes

FreeSurfer project uses *git-annex* for managing their source code+data base within a single git/git-annex repository. Files necessary for different scenarios (deployment, testing) are annotated and can be fetched selectively for the scenario at hand.

Automating "non-distribution" of sensitive files

In the ReproIn framework for automated conversion of BIDS dataset and in some manually prepared datasets (such as ///labs/gobbini/famface/data and ///labs/haxby/raiders), we annotated materials that must not be publicly shared with a git-annex metadata field *distribution-restrictions*. We used the following of values to describe why any particular file (content) should not be redistributed:

- **sensitive** - files which potentially contain participant sensitive information, such as non-defaced anatomicals
- **proprietary** - files which contain proprietary data, which we have no permissions to share (e.g., movie video files)

Having annotated files this way, we could instruct git-annex to *publish* all but those restricted files to our server: *git annex wanted datalad-public "not metadata=distribution-restrictions=*"*.

Flexible directory layout

If you are maintaining a collection of music files or PDFs for the lab, you may want to display the files in an alternative or filtered hierarchy. git-annex view could be of help. Example:

```
datalad install ///labs/openneurolab/metasearch
cd metasearch
git annex view sex=* handedness=ambidextrous
```

would give you two directories (Male, Female) with only the files belonging to ambidextrous subjects.

Various audio file formats (`audio`)

This extractor uses the mutagen package to extract essential metadata from a range of audio file formats. For the most common metadata properties a constrained vocabulary, based on the Music Ontology is employed.

datacite.org compliant datasets (`datacite`)

This extractor can handle dataset-level metadata following the datacite.org specification. No constrained vocabulary is identified at the moment.

Datalad's internal metadata storage (`datalad_core`)

This extractor can express Datalad's internal metadata representation, such as the relationship of a super- and a sub-dataset. It uses DataLad's own constrained vocabulary.

RFC822-compliant metadata (`datalad_rfc822`)

This is a custom metadata format, inspired by the standard used for Debian software packages that is particularly suited for manual entry. This format is a good choice when metadata describing a dataset as a whole cannot be obtained from some other structured format. The syntax is **RFC 822**-compliant. In other words: this is a text-based format that uses the syntax of email headers. Metadata must be placed in `DATASETROOT/.datalad/meta.rfc822` for this format.

Here is an example:

```
Name: myamazingdataset
Version: 1.0.0-rc3
Description: Basic summary
 A text with arbitrary length and content that can span multiple
 .
 paragraphs (this is a new one)
License: CC0
 The person who associated a work with this deed has dedicated the work to the
 public domain by waiving all of his or her rights to the work worldwide under
 copyright law, including all related and neighboring rights, to the extent
 allowed by law.
 .
 You can copy, modify, distribute and perform the work, even for commercial
 purposes, all without asking permission.
Homepage: http://example.com
Funding: Grandma's and Grandpa's support
Issue-Tracker: https://github.com/datalad/datalad/issues
Cite-As: Mike Author (2016). We made it. The breakthrough journal of unlikely
  events. 1, 23-453.
DOI: 10.0000/nothere.48421
```

The following fields are supported:

Audience: A description of the target audience of the dataset.

Author: A comma-delimited list of authors of the dataset, preferably in the format. `Firstname Lastname <Email Adress>`

Cite-as: Instructions on how to cite the dataset, or a structured citation.

Description: Description of the dataset as a whole. The first line should represent a compact short description with no more than 6-8 words.

DOI: A digital object identifier for the dataset.

Funding: Information on potential funding for the creation of the dataset and/or its content. This field can also be used to acknowledge non-monetary support.

Homepage: A URL to a project website for the dataset.

Issue-tracker: A URL to an issue tracker where known problems are documented and/or new reports can be submitted.

License: A description of the license or terms of use for the dataset. The first lines should contain a list of license labels (e.g. CC0, PPDL) for standard licenses, if possible. Full license texts or term descriptions can be included.

Maintainer: Can be used in addition and analog to `Author`, when authors (creators of the data) need to be distinguished from maintainers of the dataset.

Name: A short name for the dataset. It may be beneficial to avoid special characters, umlauts, spaces, etc. to enable widespread use of this name for URL, catalog keys, etc. in unmodified form.

Version: A version for the dataset. This should be in a format that is alphanumerically sortable and lead to a "greater" version for an update of a dataset.

Metadata keys used by this extractor are defined in DataLad's own constrained vocabulary.

Friction-less data packages (`frictionless_datapackage`)

DataLad has basic support for extraction of essential dataset-level metadata from friction-less data packages (`datapackage.json`). file. Metadata keys are constrained to DataLad's own vocabulary.

Exchangeable Image File Format (`exif`)

The extractor yields EXIF metadata from any compatible file. It uses the W3C EXIF vocabulary (http://www.w3.org/2003/12/exif/ns/).

Various image/photo formats (`image`)

Standard image metadata is extractor using the Pillow package. Core metadata is available using an adhoc vocabulary defined by the extractor.

Extensible Metadata Platform (`xmp`)

This extractor yields any XMP-compliant metadata from any supported file (e.g. PDFs, photos). XMP metadata uses fully qualified terms from standard vocabularies that are simply passed through by the extractor. At the moment metadata extraction from side-car files is not supported, but would be easy to add.

4.5.3 Metadata aggregation and query

Metadata aggregation can be performed with the *aggregate-metadata* command. Aggregation is done for two interrelated but distinct reasons:

- Fast uniform metadata access, independent of local data availability
- Comprehensive data discovery without access to or knowledge of individual datasets

In an individual dataset, metadata aggregation engages any number of enabled metadata extractors to build a JSON-LD based metadata representation that is separate from the original data files. These metadata objects are added to the dataset and are tracked with the same mechanisms that are used for any other dataset content. Based on this metadata, DataLad can provide fast and uniform access to metadata for any dataset component (individual files, subdatasets, the whole dataset itself), based on the relative path of a component within a dataset (available via the *metadata* command). This extracted metadata can be kept or made available locally for any such query, even when it is impossible or undesirable to keep the associated data files around (e.g. due to size constraints).

For any superdataset (a dataset that contains subdatasets as components), aggregation can go one step further. In this case, aggregation imports extracted metadata from subdatasets into the superdataset to offer the just described query feature for any aggregated subdataset too. This works across any number of levels of nesting. For example, a subdataset that contains the aggregated metadata for eight other datasets (that might have never been available locally) can be aggregated into a local superdataset with all its metadata. In that superdataset, a DataLad user is then able to query information on any content of any subdataset, regardless of their actual availability. This principle also allows any user to install the superdataset from http://datasets.datalad.org and perform *local and offline* queries about any dataset available online from this server.

Besides full access to all aggregated metadata by path (via the *metadata* command), DataLad also comes with a *search* command that provides different search modes to query the entirety of the locally available metadata. Its capabilities include simple keyword searches as well as more complex queries using date ranges or logical conjunctions.

4.5.4 Internal metadata representation

Warning: The information in this section is meant to provide insight into how DataLad structures extracted and aggregated metadata. However, this representation is not considered stable or part of the public API, hence these data should not be accessed directly. Instead, all metadata access should happen via the **`metadata`** API command.

A dataset's metadata is stored in the *.datalad/metadata* directory. This directory contains two main elements:

- a metadata inventory or catalog
- a store for metadata "objects"

The metadata inventory

The inventory is kept in a JSON file, presently named `aggregate_v1.json`. It contains a single top-level dictionary/object. Each element in this dictionary represents one subdataset from which metadata has been extracted and aggregated into the dataset at hand. Keys in this dictionary are paths to the respective (sub)datasets (relative to the root of the dataset). If a dataset has no subdataset and metadata extraction was performed, the dictionary will only have a single element under the key `"."`.

Here is an excerpt of an inventory dictionary showing the record of the root dataset itself.


```
{

   ".": {
      "content_info":
         "objects/0c/cn-b046b2c3a5e2b9c5599c980c7b5fab.xz",
      "datalad_version":
         "0.10.0.rc4.dev191",
      "dataset_info":
         "objects/0c/ds-b046b2c3a5e2b9c5599c980c7b5fab",
      "extractors": [
         "datalad_core",
         "annex",
         "bids",
         "nifti1"
      ],
      "id":
         "00ce405e-6589-11e8-b749-a0369fb55db0",
      "refcommit":
         "d170979ef33a82c67e6fefe3084b9fe7391b422b"
   },

}
```


The record of each dataset contains the following elements:

`id` The DataLad dataset UUID of the dataset metadata was extracted and aggregated from.

`refcommit` The SHA sum of the last metadata-relevant commit in the history of the dataset metadata was extracted from. Metadata-relevant commits are any commits that modify dataset content that is not exclusively concerning DataLad's own internal status and configuration.

`datalad_version` The version string of the DataLad version that was used to perform the metadata extraction (not necessarily the metadata aggregation, as pre-extracted metadata can be aggregated from other superdatasets for a dataset that is itself not available locally).

`extractors` A list with the names of all enabled metadata extractors for this dataset. This list may include names for extractors that are provided by extensions, and may not be available for any given DataLad installation.

`content_info`, `dataset_info` Path to the object files containing the actual metadata on the dataset as a whole, and on individual files in a dataset (content). Paths are to be interpreted relative to the inventory file, and point to the metadata object store.

Read-access to the metadata inventory is available via the `metadata` command and its `--get-aggregates` option.

The metadata object store

The object store holds the files containing dataset and content metadata for each aggregated dataset. The object store is located in *.datalad/metadata/objects*. However, this directory itself and the subdirectory structure within it have no significance, they are completely defined and exclusively discoverable via the `content_info` and `dataset_info` values in the metadata inventory records.

Metadata objects for datasets and content use a slightly different internal format. Both files could be either compressed (XZ) or uncompressed. Current practice uses compression for content metadata, but not for dataset metadata. Any metadata object file could be directly committed to Git, or it could be tracked via Git-annex. Reasons to choose one over the other could be file size, or privacy concerns.

Read-access to the metadata objects of dataset and individual files is available via the `metadata` command. Importantly, metadata can be requested

Metadata objects for datasets

These files have a single top-level JSON object/dictionary as content. A JSON-LD `@content` field is used to assign a semantic markup to allow for programmatic interpretation of metadata as linked data. Any other top-level key identifies the name of a metadata extractor, and the value stored under this key represents the output of the corresponding extractor.

Structure and content of an extractor's output are unconstrained and completely up to the implementation of that particular extractor. Extractor can report additional JSON-LD context information (but there is no requirement).

The output of one extractor does not interfere or collide with the output of any other extractor.

Metadata objects for content/file

In contrast to metadata objects for entire datasets, these files use a JSON stream format, i.e. one JSON object/dictionary per line (no surrounding list). This makes it possible to process the content line-by-line instead of having to load an entire files (with potentially millions of records).

The only other difference to dataset metadata objects is an additional top-level key `path` that identifies the relative path (relative to the root of its parent dataset) of the file the metadata record is associated with.

Otherwise, the extractor-specific metadata structure and content is unconstrained.

Content metadata objects tend to contain massively redundant information (e.g. a dataset with a thousand 12 megapixel images will report the identical resolution information a thousand times). Therefore, content metadata objects are by default XZ compressed – as this compressor is particularly capable discovering such redundancy and yield a very compact file size.

The reason for gathering all metadata into a single file across all content files and metadata extractors is to limit the impact on the performance of the underlying Git repository. Large superdataset could otherwise quickly grow into dimensions where tens of thousands of files would be required just to manage the metadata. Such a configuration would also limit the compatibility of DataLad datasets with constrained storage environments (think e.g. inode limits on super computers), as these files are tracked in Git and would therefore be present in any copy, regardless of whether metadata access is desired or not.

4.5.5 Vocabulary

The following sections describe details and changes in the metadata specifications implemented in datalad.

v2.0

- Current development version that will be released together with DataLad v0.10.

v1.0

- Original implementation that did not really see the light of the day.

4.6 Customization and extension of functionality

DataLad provides numerous commands that cover many use cases. However, there will always be a demand for further customization or extensions of built-in functionality at a particular site, or for an individual user. DataLad addresses this need with two mechanisms:

- *Plugins*
- *Extension packages*

Plugins are a quick'n'dirty way to implement a single additional command with very little overhead. They are, however, not the method of choice for extending particular Datalad functionality, such as metadata extractor, or providing entire command suites for a specialized purpose. For all these scenarios extension packages are the recommended method.

4.6.1 Plugins

A number of plugins are shipped with DataLad. This includes plugins which operate on a particular dataset, but also general functionality that can be used outside the context of a specific dataset. The following table provides an overview of plugins included in this DataLad release.

add_readme	add a README file to a dataset
addurls	Create and update a dataset from a list of URLs.
check_dates	Extension for checking dates within repositories.
export_archive	export a dataset as a compressed TAR/ZIP archive
export_to_figshare	export a dataset as a TAR/ZIP archive to figshare
no_annex	configure which dataset parts to never put in the annex
wtf	provide information about this DataLad installation

datalad.plugin.add_readme

add a README file to a dataset

class datalad.plugin.add_readme.**AddReadme**
Bases: datalad.interface.base.Interface

Add basic information about DataLad datasets to a README file

The README file is added to the dataset and the addition is saved in the dataset.

class EnsureDataset
Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class EnsureStr(*min_len=0*)
Bases: datalad.support.constraints.Constraint

Ensure an input is a string.

No automatic conversion is attempted.

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns
Return type string or list of strings (if indent is None)

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()
Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

datalad.plugin.addurls

Create and update a dataset from a list of URLs.

class datalad.plugin.addurls.**Addurls**
Bases: datalad.interface.base.Interface

Create and update a dataset from a list of URLs.

Format specification

Several arguments take format strings. These are similar to normal Python format strings where the names from *URL-FILE* (column names for a CSV or properties for JSON) are available as placeholders. If *URL-FILE* is a CSV file, a positional index can also be used (i.e., "{0}" for the first column). Note that a placeholder cannot contain a ':' or '!'.

In addition, the *FILENAME-FORMAT* arguments has a few special placeholders.

- _repindex

  The constructed file names must be unique across all fields rows. To avoid collisions, the special placeholder "_repindex" can be added to the formatter. Its value will start at 0 and increment every time a file name repeats.

- _url_hostname, _urlN, _url_basename*

  Various parts of the formatted URL are available. Take "http://datalad.org/asciicast/seamless_nested_repos.sh" as an example.

  "datalad.org" is stored as "_url_hostname". Components of the URL's path can be referenced as "_urlN". "_url0" and "_url1" would map to "asciicast" and "seamless_nested_repos.sh", respectively. The final part of the path is also available as "_url_basename".

  This name is broken down further. "_url_basename_root" and "_url_basename_ext" provide access to the root name and extension. These values are similar to the result of os.path.splitext, but, in the case of multiple periods, the extension is identified using the same length heuristic that git-annex uses. As a result, the extension of "file.tar.gz" would be ".tar.gz", not ".gz". In addition, the fields "_url_basename_root_py" and "_url_basename_ext_py" provide access to the result of os.path.splitext.

- _url_filename*

  These are similar to _url_basename* fields, but they are obtained with a server request. This is useful if the file name is set in the Content-Disposition header.

Examples

Consider a file "avatars.csv" that contains:

```
who,ext,link
neurodebian,png,https://avatars3.githubusercontent.com/u/260793
datalad,png,https://avatars1.githubusercontent.com/u/8927200
```

To download each link into a file name composed of the 'who' and 'ext' fields, we could run:

```
$ datalad addurls -d avatar_ds --fast avatars.csv '{link}' '{who}.{ext}'
```

The *-d avatar_ds* is used to create a new dataset in "$PWD/avatar_ds".

If we were already in a dataset and wanted to create a new subdataset in an "avatars" subdirectory, we could use "//" in the *FILENAME-FORMAT* argument:

```
$ datalad addurls --fast avatars.csv '{link}' 'avatars//{who}.{ext}'
```

Note: For users familiar with 'git annex addurl': A large part of this plugin's functionality can be viewed as transforming data from *URL-FILE* into a "url filename" format that fed to 'git annex addurl –batch –with-files'.

class EnsureChoice(**values*)
Bases: datalad.support.constraints.Constraint

Ensure an input is element of a set of possible values

long_description()

short_description()

class EnsureDataset
Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class EnsureStr(*min_len=0*)
Bases: datalad.support.constraints.Constraint

Ensure an input is a string.

No automatic conversion is attempted.

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns
Return type string or list of strings (if indent is None)

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()
Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

class datalad.plugin.addurls.**Formatter**(*idx_to_name=None*, *missing_value=None*)
Bases: string.Formatter

Formatter that gives precedence to custom keys.

The first positional argument to the *format* call should be a mapping whose keys are exposed as placeholders (e.g., "{key1}.py").

Parameters

- **idx_to_name** (*dict*) – A mapping from a positional index to a key. If not provided, "{N}" elements are not supported.
- **missing** (*str, optional*) – When column lookup results in an empty string, use this value in its place.

convert_field(*value*, *conversion*)

format(*format_string*, **args*, ***kwargs*)

get_value(*key*, *args*, *kwargs*)
Look for key's value in *args[0]* mapping first.

class datalad.plugin.addurls.**RepFormatter**(**args*, ***kwargs*)
Bases: *datalad.plugin.addurls.Formatter*

Extend Formatter to support a {_repindex} placeholder.

format(**args*, ***kwargs*)

get_value(*key*, *args*, *kwargs*)
Look for key's value in *args[0]* mapping first.

datalad.plugin.addurls.**add_extra_filename_values**(*filename_format*, *rows*, *urls*, *dry_run*)
Extend *rows* with values for special formatting fields.

datalad.plugin.addurls.**clean_meta_args**(*args*)
Process metadata arguments.

Parameters **args** (*iterable of str*) – Formatted metadata arguments for 'git-annex metadata –set'.

Returns

Return type A dict mapping field names to values.

datalad.plugin.addurls.**extract**(*stream*, *input_type*, *url_format='{0}'*, *filename_format='{1}'*, *exclude_autometa=None*, *meta=None*, *dry_run=False*, *missing_value=None*)

Extract and format information from *url_file*.

Parameters

- **stream** (*file object*) – Items used to construct the file names and URLs.
- **input_type** (*{'csv', 'json'}*) –
- **other parameters match those described in AddUrls.** (*All*) –

Returns

- *A tuple where the first item is a list with a dict of extracted information*
- for each row in *stream* and the second item is a set that contains all the
- *subdataset paths.*

datalad.plugin.addurls.**filter_legal_metafield**(*fields*)

Remove illegal names from *fields*.

Note: This is like *filter(is_legal_metafield, fields)* but the dropped values are logged.

datalad.plugin.addurls.**fmt_to_name**(*format_string*, *num_to_name*)

Try to map a format string to a single name.

Parameters

- **format_string** (*string*) –
- **num_to_name** (*dict*) – A dictionary that maps from an integer to a column name. This enables mapping the format string to an integer to a name.

Returns

- A placeholder name if *format_string* consists of a single
- *placeholder and no other text. Otherwise, None is returned.*

datalad.plugin.addurls.**get_file_parts**(*filename*, *prefix='name'*)

Assign a name to various parts of a file.

Parameters

- **filename** (*str*) – A file name (no leading path is permitted).
- **prefix** (*str*) – Prefix to prepend to the key names.

Returns

Return type A dict mapping each part to a value.

datalad.plugin.addurls.**get_fmt_names**(*format_string*)

Yield field names in *format_string*.

datalad.plugin.addurls.**get_subpaths**(*filename*)

Convert "//" marker in *filename* to a list of subpaths.

```
>>> from datalad.plugin.addurls import get_subpaths
>>> get_subpaths("p1/p2//p3/p4//file")
('p1/p2/p3/p4/file', ['p1/p2', 'p1/p2/p3/p4'])
```

Note: With Python 3, the subpaths could be generated with

itertools.accumulate(filename.split("//")[:-1], os.path.join)

Parameters **filename** (*str*) – File name with "//" marking subpaths.

Returns

- *A tuple of the filename with any "//" collapsed to a single*
- *separator and a list of subpaths (str).*

datalad.plugin.addurls.**get_url_parts**(*url*)
Assign a name to various parts of the URL.

Parameters **url** (*str*) –

Returns

- A dict with keys *_url_hostname* and, for a path with N+1 parts,
- '_url0' through '_urlN' . There is also a *_url_basename* key for
- *the rightmost part of the path.*

datalad.plugin.addurls.**is_legal_metafield**(*name*)
Test whether *name* is a valid metadata field.

The set of permitted characters is taken from git-annex's MetaData.hs:legalField.

datalad.plugin.addurls.**split_ext**(*filename*)
Use git-annex's splitShortExtensions rule for splitting extensions.

Parameters **filename** (*str*) –

Returns

Return type A tuple with (root, extension)

Examples

```
>>> from datalad.plugin.addurls import split_ext
>>> split_ext("filename.py")
('filename', '.py')
```

```
>>> split_ext("filename.tar.gz")
('filename', '.tar.gz')
```

```
>>> split_ext("filename.above4chars.ext")
('filename.above4chars', '.ext')
```

datalad.plugin.check_dates

Extension for checking dates within repositories.

class datalad.plugin.check_dates.**CheckDates**
Bases: datalad.interface.base.Interface

Find repository dates that are more recent than a reference date.

The main purpose of this tool is to find "leaked" real dates in repositories that are configured to use fake dates. It checks dates from three sources: (1) commit timestamps (author and committer dates), (2) timestamps within files of the "git-annex" branch, and (3) the timestamps of annotated tags.

class EnsureChoice(**values*)
Bases: datalad.support.constraints.Constraint

Ensure an input is element of a set of possible values

long_description()

short_description()

class EnsureDataset
Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class EnsureStr(*min_len=0*)
Bases: datalad.support.constraints.Constraint

Ensure an input is a string.

No automatic conversion is attempted.

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns
Return type string or list of strings (if indent is None)

ac = <module 'datalad.support.ansi_colors' from '/home/docs/checkouts/readthedocs.org/

static custom_result_renderer(*res*, ***kwargs*)
Like 'json_pp', but skip non-error results without flagged objects.

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()
Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line

per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

result_renderer = 'tailored'

datalad.plugin.export_archive

export a dataset as a compressed TAR/ZIP archive

class datalad.plugin.export_archive.**ExportArchive**
Bases: datalad.interface.base.Interface

Export the content of a dataset as a TAR/ZIP archive.

class EnsureDataset
Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class EnsureStr(*min_len=0*)
Bases: datalad.support.constraints.Constraint

Ensure an input is a string.

No automatic conversion is attempted.

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns
Return type string or list of strings (if indent is None)

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()
Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

datalad.plugin.export_to_figshare

export a dataset as a TAR/ZIP archive to figshare

class datalad.plugin.export_to_figshare.**ExportToFigshare**
Bases: datalad.interface.base.Interface

Export the content of a dataset as a ZIP archive to figshare

Very quick and dirty approach. Ideally figshare should be supported as a proper git annex special remote. Unfortunately, figshare does not support having directories, and can store only a flat list of files. That makes it impossible for any sensible publishing of complete datasets.

The only workaround is to publish dataset as a zip-ball, where the entire content is wrapped into a .zip archive for which figshare would provide a navigator.

class EnsureDataset
Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureInt
Bases: datalad.support.constraints.EnsureDType

Ensure that an input (or several inputs) are of a data type 'int'.

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class EnsureStr(*min_len=0*)
Bases: datalad.support.constraints.Constraint

Ensure an input is a string.

No automatic conversion is attempted.

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns
Return type string or list of strings (if indent is None)

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()
Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

class datalad.plugin.export_to_figshare.**FigshareRESTLaison**
Bases: object

A little helper to provide minimal interface to interact with Figshare

API_URL = 'https://api.figshare.com/v2'

create_article(*title*)

get(**args*, ***kwargs*)

get_article_ids()

post(**args*, ***kwargs*)

put(**args*, ***kwargs*)

token

upload_file(*fname*, *files_url*)

datalad.plugin.no_annex

configure which dataset parts to never put in the annex

class datalad.plugin.no_annex.**NoAnnex**
Bases: datalad.interface.base.Interface

Configure a dataset to never put some content into the dataset's annex

This can be useful in mixed datasets that also contain textual data, such as source code, which can be efficiently and more conveniently managed directly in Git.

Patterns generally look like this:

```
code/*
```

which would match all file in the code directory. In order to match all files under `code/`, including all its subdirectories use such a pattern:

```
code/**
```

Note that the plugin works incrementally, hence any existing configuration (e.g. from a previous plugin run) is amended, not replaced.

Parameters

- **ref_dir**(*str, optional*) –
- **makedirs**(*bool, optional*) –

class EnsureDataset
Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns

Return type string or list of strings (if indent is None)

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()

Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

datalad.plugin.wtf

provide information about this DataLad installation

class datalad.plugin.wtf.**WTF**

Bases: datalad.interface.base.Interface

Generate a report about the DataLad installation and configuration

IMPORTANT: Sharing this report with untrusted parties (e.g. on the web) should be done with care, as it may include identifying information, and/or credentials or access tokens.

class EnsureChoice(**values*)

Bases: datalad.support.constraints.Constraint

Ensure an input is element of a set of possible values

long_description()

short_description()

class EnsureDataset

Bases: datalad.support.constraints.Constraint

long_description()

short_description()

class EnsureNone
Bases: datalad.support.constraints.Constraint

Ensure an input is of value *None*

long_description()

short_description()

class Parameter(*constraints=None*, *doc=None*, *args=None*, ***kwargs*)
Bases: object

This class shall serve as a representation of a parameter.

get_autodoc(*name*, *indent=' '*, *width=70*, *default=None*, *has_default=False*)
Docstring for the parameter to be used in lists of parameters
Returns
Return type string or list of strings (if indent is None)

static custom_result_renderer(*res*, ***kwargs*)

datasetmethod(*name=None*, *dataset_argname='dataset'*)

eval_results()
Decorator for return value evaluation of datalad commands.

Note, this decorator is only compatible with commands that return status dict sequences!

Two basic modes of operation are supported: 1) "generator mode" that *yields* individual results, and 2) "list mode" that returns a sequence of results. The behavior can be selected via the kwarg *return_type*. Default is "list mode".

This decorator implements common functionality for result rendering/output, error detection/handling, and logging.

Result rendering/output can be triggered via the *datalad.api.result-renderer* configuration variable, or the *result_renderer* keyword argument of each decorated command. Supported modes are: 'default' (one line per result with action, status, path, and an optional message); 'json' (one object per result, like git-annex), 'json_pp' (like 'json', but pretty-printed spanning multiple lines), 'tailored' custom output formatting provided by each command class (if any).

Error detection works by inspecting the *status* item of all result dictionaries. Any occurrence of a status other than 'ok' or 'notneeded' will cause an IncompleteResultsError exception to be raised that carries the failed actions' status dictionaries in its *failed* attribute.

Status messages will be logged automatically, by default the following association of result status and log channel will be used: 'ok' (debug), 'notneeded' (debug), 'impossible' (warning), 'error' (error). Logger instances included in the results are used to capture the origin of a status report.

Parameters **func** (*function*) – __call__ method of a subclass of Interface, i.e. a datalad command definition

result_renderer = 'tailored'

datalad.plugin.wtf.**get_max_path_length**(*top_path=None*, *maxl=1000*)
Deduce the maximal length of the filename in a given path

In previous versions of DataLad, plugins were invoked differently than regular DataLad commands, but they can now be called like any other command. The `wtf` plugin, for example, is exposed as

```
% datalad wtf
```

Plugin detection

DataLad will discover plugins at three locations:

1. official plugins that are part of the local DataLad installation
2. system-wide plugins, provided by the local admin

   The location where plugins need to be placed depends on the platform. On GNU/Linux systems this will be `/etc/xdg/datalad/plugins`, whereas on Windows it will be `C:\ProgramData\datalad.org\datalad\plugins`.

   This default location can be overridden by setting the `datalad.locations.system-plugins` configuration variable in the local or global Git configuration.
3. user-supplied plugins, customizable by each user

   Again, the location will depend on the platform. On GNU/Linux systems this will be `$HOME/.config/datalad/plugins`, whereas on Windows it will be `C:\Users\<username>\AppData\Local\datalad.org\datalad\plugins`.

   This default location can be overridden by setting the `datalad.locations.user-plugins` configuration variable in the local or global Git configuration.

Identically named plugins in latter location replace those in locations searched before. This can be used to alter the behavior of plugins provided with DataLad, and enables users to adjust a site-wide configuration.

Writing own plugins

The best way to go about writing your own plugin, is to have a look at the source code of those include in DataLad. Writing a plugin a rather simple when following the following rules.

Language and location

Plugins are written in Python. In order for DataLad to be able to find them, plugins need to be placed in one of the supported locations described above. Plugin file names have to have a '.py' extensions and must not start with an underscore ('_').

Skeleton of a plugin

The basic structure of a plugin looks like this:

```
from datalad.interface.base import build_doc, Interface


@build_doc
class MyPlugin(Interface):
    """Help message description (parameters will be added automatically)"""
    from datalad.distribution.dataset import datasetmethod, EnsureDataset
    from datalad.interface.utils import eval_results
    from datalad.support.constraints import EnsureNone
    from datalad.support.param import Parameter

    _params_ = dict(
        dataset=Parameter(
            args=("-d", "--dataset"),
```

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```
            doc="""specify the dataset to report on.
            no dataset is given, an attempt is made to identify the dataset
            based on the current working directory.""",
            constraints=EnsureDataset() | EnsureNone()))

    @staticmethod
    @datasetmethod(name='my-plugin')
    @eval_results
    def __call__(dataset):
        # Do things and yield status dicts.
        pass


__datalad_plugin__ = MyPlugin
```

In this example, the plugin is called `my-plugin`. Any number of parameters can be added by extending both the `_params_` dictionary and the signature of `__call__`. The help message for the plugin command is generated using the docstring of the plugin class and the *_params_* dictionary.

Expected behavior

The plugin's `__call__` method must yield its results as a Python generator. Results are DataLad status dictionaries. There are no constraints on the number of results, or the number and nature of result properties. However, conventions exists and must be followed for compatibility with the result evaluation and rendering performed by DataLad.

The following property keys must exist:

"status" {'ok', 'notneeded', 'impossible', 'error'}

"action" label for the action performed by the plugin. In many cases this could be the plugin's name.

The following keys should exists if possible:

"path" absolute path to a result on the file system

"type" label indicating the nature of a result (e.g. 'file', 'dataset', 'directory', etc.)

"message" string message annotating the result, particularly important for non-ok results. This can be a tuple with 'logging'-style string expansion.

4.6.2 Extension packages

As the name suggests, an extension package is a proper Python package. Consequently, there is a significant amount of boilerplate code involved in the creation of a new Datalad extension. However, this overhead enables a number of useful features for extension developers:

- extensions can provide any number of additional commands that can be grouped into labeled command suites, and are automatically exposed via the standard DataLad commandline and Python API
- extensions can define *entry_points* for any number of additional metadata extractors that become automatically available to DataLad
- extensions can define *entry_points* for their test suites, such that the standard *datalad test* command will automatically run these tests in addition to the tests shipped with Datalad core
- extensions can ship additional dataset procedures by installing them into a directory `resources/procedures` underneath the extension module directory

Using an extension

A DataLad extension is a standard Python package. Beyond installation of the package there is no additional setup required.

Writing your own extensions

A good starting point for implementing a new extension is the "helloworld" demo extension available at https://github.com/datalad/datalad-extension-template. This repository can be cloned and adjusted to suit one's needs. It includes:

- a basic Python package setup
- simple demo command implementation
- Travis test setup

A more complex extension setup can be seen in the DataLad Neuroimaging extension: https://github.com/datalad/datalad-neuroimaging, including additional metadata extractors, test suite registration, and a sphinx-based documentation setup for a DataLad extension.

As a DataLad extension is a standard Python package, an extension should declare dependencies on an appropriate DataLad version, and possibly other extensions via the standard mechanisms.

4.7 Glossary

DataLad purposefully uses a terminology that is different from the one used by its technological foundations Git and git-annex. This glossary provides definitions for terms used in the datalad documentation and API, and relates them to the corresponding Git/git-annex concepts.

annex Extension to a Git repository, provided and managed by git-annex as means to track and distribute large (and small) files without having to inject them directly into a Git repository (which would slow Git operations significantly and impair handling of such repositories in general).

dataset A regular Git repository with an (optional) *annex*.

sibling A *dataset* (location) that is related to a particular dataset, by sharing content and history. In Git terminology, this is a *clone* of a dataset that is configured as a *remote*.

subdataset A *dataset* that is part of another dataset, by means of being tracked as a Git submodule. As such, a subdataset is also a complete dataset and not different from a standalone dataset.

superdataset A *dataset* that contains at least one *subdataset*.

CHAPTER 5

Commands and API

5.1 Command line reference

5.1.1 Main command

datalad

Synopsis

```
datalad [-l LEVEL] [--pbs-runner {condor}] [-C PATH] [--version] [--dbg] [--idbg] [-c␣
↪KEY=VALUE] [-f {default,json,json_pp,tailored,'<template>'}] [--report-status
↪{success,failure,ok,notneeded,impossible,error}] [--report-type {dataset,file}] [--
↪on-failure {ignore,continue,stop}] [--proc-pre <PROCEDURE NAME> [ARGS ...]] [--proc-
↪post <PROCEDURE NAME> [ARGS ...]] [--cmd] [-h] {create,install,get,add,publish,
↪uninstall,drop,remove,update,create-sibling,create-sibling-github,unlock,save,
↪search,metadata,aggregate-metadata,extract-metadata,wtf,test,ls,clean,add-archive-
↪content,download-url,run,rerun,run-procedure,addurls,no-annex,export-to-figshare,
↪add-readme,check-dates,export-archive,annotate-paths,clone,create-test-dataset,diff,
↪siblings,sshrun,subdatasets} ...
```

Description

Comprehensive data management solution

DataLad provides a unified data distribution system built on the Git and Git-annex. DataLad command line tools allow to manipulate (obtain, create, update, publish, etc.) datasets and provide a comprehensive toolbox for joint management of data and code. Compared to Git/annex it primarly extends their functionality to transparently and simultaneously work with multiple inter-related repositories.

Options

{create,install,get,add,publish,uninstall,drop,remove,update,create-sibling,create-sibling-github,unlock,save,search,metadata,aggregate-metadata,extract-metadata,wtf,test,ls,clean,add-archive-content,download-url,run,rerun,run-procedure,addurls,no-annex,export-to-figshare,add-readme,check-dates,export-archive,annotate-paths,clone,create-test-dataset,diff,siblings,sshrun,subdatasets}

-l LEVEL, –log-level LEVEL

set logging verbosity level. Choose among critical, error, warning, info, debug. Also you can specify an integer <10 to provide even more debugging information

–pbs-runner {condor}

execute command by scheduling it via available PBS. For settings, config file will be consulted

-C PATH

run as if datalad was started in <path> instead of the current working directory. When multiple -C options are given, each subsequent non-absolute -C <path> is interpreted relative to the preceding -C <path>. This option affects the interpretations of the path names in that they are made relative to the working directory caused by the -C option

–version

show the program's version

–dbg

enter Python debugger when uncaught exception happens

–idbg

enter IPython debugger when uncaught exception happens

-c KEY=VALUE

configuration variable setting. Overrides any configuration read from a file, but is potentially overridden itself by configuration variables in the process environment.

-f {default,json,json_pp,tailored,'<template>'}, –output-format {default,json,json_pp,tailored,'<template>'}

select format for returned command results. 'default' give one line per result reporting action, status, path and an optional message; 'json' renders a JSON object with all properties for each result (one per line); 'json_pp' pretty-prints JSON spanning multiple lines; 'tailored' enables a command-specific rendering style that is typically tailored to human consumption (no result output otherwise), '<template>' reports any value(s) of any result properties in

any format indicated by the template (e.g. '{path}'; compare with JSON output for all key-value choices). The template syntax follows the Python "format() language". It is possible to report individual dictionary values, e.g. '{metadata[name]}'. If a 2nd-level key contains a colon, e.g. 'music:Genre', ':' must be substituted by '#' in the template, like so: '{metadata[music#Genre]}'.

–report-status {success,failure,ok,notneeded,impossible,error}

constrain command result report to records matching the given status. 'success' is a synonym for 'ok' OR 'notneeded', 'failure' stands for 'impossible' OR 'error'.

–report-type {dataset,file}

constrain command result report to records matching the given type. Can be given more than once to match multiple types.

–on-failure {ignore,continue,stop}

when an operation fails: 'ignore' and continue with remaining operations, the error is logged but does not lead to a non-zero exit code of the command; 'continue' works like 'ignore', but an error causes a non-zero exit code; 'stop' halts on first failure and yields non-zero exit code. A failure is any result with status 'impossible' or 'error'.

–proc-pre <PROCEDURE NAME> [ARGS . . .]

Dataset procedure to run before the main command (see run-procedure command for details). This option can be given more than once to run multiple procedures in the order in which they were given. It is important to specify the target dataset via the –dataset argument of the main command.

–proc-post <PROCEDURE NAME> [ARGS . . .]

Like –proc-pre, but procedures are executed after the main command has finished.

–cmd

syntactical helper that can be used to end the list of global command line options before the subcommand label. Options like –proc-pre can take an arbitrary number of arguments and may require to be followed by a single –cmd in order to enable identification of the subcommand.

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

"Be happy!"

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.1.2 Dataset operations

datalad add

Synopsis

```
datalad add [-h] [-d PATH] [--to-git] [--nosave] [-m MESSAGE] [-r] [--recursion-limit␣
↪LEVELS] [-S] [--git-opts STRING] [--annex-opts STRING] [--annex-add-opts STRING] [-
↪J NJOBS] PATH [PATH ...]
```

Description

Add files/directories to an existing dataset.

Typically, files and directories to be added to a dataset would be placed into a directory of a dataset, and subsequently this command can be used to register this new content with the dataset. With recursion enabled, files will be added to their respective subdatasets as well.

By default all files are added to the dataset's annex, i.e. only their content identity and availability information is tracked with Git. This results in lightweight datasets. If desired, the –to-git flag can be used to tell datalad to inject files directly into Git. While this is not recommended for binary data or large files, it can be used for source code and meta-data to be able to benefit from Git's track and merge capabilities. Files checked directly into Git are always and unconditionally available immediately after installation of a dataset.

NOTE Power-user info: This command uses git annex add or git add to incorporate new dataset content.

Options

PATH

path/name of the component to be added. The component must exist on the filesystem already. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d PATH, –dataset PATH

specify the dataset to perform the add operation on. If no dataset is given, an attempt is made to identify the dataset based on the current working directory and/or the PATH given. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–to-git

flag whether to add data directly to Git, instead of tracking data identity only. Usually this is not desired, as it inflates dataset sizes and impacts flexibility of data transport. If not specified - it will be up to git-annex to decide, possibly on .gitattributes options. [Default: None]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

-m MESSAGE, –message MESSAGE

a description of the state or the changes made to a dataset. Constraints: value must be a string [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

-S, –ds2super, –datasets-to-super

given paths of dataset (toplevel) locations will cause these datasets to be added to their respective superdatasets underneath a given base DATASET (instead of all their content to themselves). If no base DATASET is provided, this flag has no effect. Regular files and directories are always added to their respective datasets, regardless of this setting. [Default: False]

–git-opts STRING

option string to be passed to git calls. Constraints: value must be a string [Default: None]

–annex-opts STRING

option string to be passed to git annex calls. Constraints: value must be a string [Default: None]

–annex-add-opts STRING

option string to be passed to git annex add calls. Constraints: value must be a string [Default: None]

-J NJOBS, –jobs NJOBS

how many parallel jobs (where possible) to use. Constraints: value must be convertible to type 'int', or value must be one of ('auto',) [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad create

Synopsis

```
datalad create [-h] [-f] [-D DESCRIPTION] [-d PATH] [--no-annex] [--nosave] [--annex-
↪version ANNEX_VERSION] [--annex-backend ANNEX_BACKEND] [--native-metadata-type␣
↪LABEL] [--shared-access MODE] [--git-opts STRING] [--annex-opts STRING] [--annex-
↪init-opts STRING] [--text-no-annex] [--fake-dates] [PATH]
```

Description

Create a new dataset from scratch.

This command initializes a new dataset at a given location, or the current directory. The new dataset can optionally be registered in an existing superdataset (the new dataset's path needs to be located within the superdataset for that, and the superdataset needs to be given explicitly). It is recommended to provide a brief description to label the dataset's nature *and* location, e.g. "Michael's music on black laptop". This helps humans to identify data locations in distributed scenarios. By default an identifier comprised of user and machine name, plus path will be generated.

This command only creates a new dataset, it does not add any content to it, even if the target directory already contains additional files or directories.

Plain Git repositories can be created via the –no-annex flag. However, the result will not be a full dataset, and, consequently, not all features are supported (e.g. a description).

To create a local version of a remote dataset use the *install* command instead.

NOTE Power-user info: This command uses git init and git annex init to prepare the new dataset. Registering to a superdataset is performed via a git submodule add operation in the discovered superdataset.

Options

PATH

path where the dataset shall be created, directories will be created as necessary. If no location is provided, a dataset will be created in the current working directory. Either way the command will error if the target directory is not empty. Use FORCE to create a dataset in a non-empty directory. Constraints: value must be a string, or Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-f, –force

enforce creation of a dataset in a non-empty directory. [Default: False]

-D *DESCRIPTION*, –description *DESCRIPTION*

short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., “mike’s dataset on lab server”). Note that when a dataset is published, this information becomes available on the remote side. Constraints: value must be a string [Default: None]

-d PATH, –dataset PATH

specify the dataset to perform the create operation on. If a dataset is given, a new subdataset will be created in it. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–no-annex

if set, a plain Git repository will be created without any annex. [Default: False]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

–annex-version *ANNEX_VERSION*

select a particular annex repository version. The list of supported versions depends on the available git-annex version. This should be left untouched, unless you know what you are doing. Constraints: value must be convertible to type ‘int’ [Default: None]

–annex-backend *ANNEX_BACKEND*

set default hashing backend used by the new dataset. For a list of supported backends see the git-annex documentation. The default is optimized for maximum compatibility of datasets across platforms (especially those with limited path lengths). Constraints: value must be a string [Default: ‘MD5E’]

–native-metadata-type LABEL

Metadata type label. Must match the name of the respective parser implementation in DataLad (e.g. “xmp”). This option can be given multiple times. Constraints: value must be a string [Default: None]

–shared-access MODE

configure shared access to a dataset, see *git init –shared* documentation for complete details on the supported scenarios. Possible values include: ‘false’, ‘true’, ‘group’, and ‘all’. [Default: None]

–git-opts STRING

option string to be passed to git calls. Constraints: value must be a string [Default: None]

–annex-opts STRING

option string to be passed to git annex calls. Constraints: value must be a string [Default: None]

–annex-init-opts STRING

option string to be passed to git annex init calls. Constraints: value must be a string [Default: None]

–text-no-annex

if set, all text files in the future would be added to Git, not annex. Achieved by adding an entry to .GITATTRIBUTES file. See http://git- annex.branchable.com/tips/largefiles/ and NO_ANNEX DataLad plugin to establish even more detailed control over which files are placed under annex control. [Default: None]

–fake-dates

Configure the repository to use fake dates. The date for a new commit will be set to one second later than the latest commit in the repository. This can be used to anonymize dates. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad create-sibling

Synopsis

```
datalad create-sibling [-h] [-s [NAME]] [--target-dir PATH] [--target-url URL] [--
↪target-pushurl URL] [--dataset DATASET] [-r] [--recursion-limit LEVELS] [--existing␣
↪MODE] [--shared false|true|umask|group|all|world|everybody|0xxx] [--ui␣
↪false|true|html_filename] [--as-common-datasrc NAME] [--publish-by-default REFSPEC]␣
↪[--publish-depends SIBLINGNAME] [--annex-wanted EXPR] [--annex-group EXPR] [--annex-
↪groupwanted EXPR] [--inherit] [--since SINCE] [SSHURL]
```

Description

Create a dataset sibling on a UNIX-like SSH-accessible machine

Given a local dataset, and SSH login information this command creates a remote dataset repository and configures it as a dataset sibling to be used as a publication target (see PUBLISH command).

Various properties of the remote sibling can be configured (e.g. name location on the server, read and write access URLs, and access permissions.

Optionally, a basic web-viewer for DataLad datasets can be installed at the remote location.

This command supports recursive processing of dataset hierarchies, creating a remote sibling for each dataset in the hierarchy. By default, remote siblings are created in hierarchical structure that reflects the organization on the local file system. However, a simple templating mechanism is provided to produce a flat list of datasets (see –target-dir).

Options

SSHURL

Login information for the target server. This can be given as a URL (ssh://host/path) or SSH-style (user@host:path). Unless overridden, this also serves the future dataset's access URL and path on the server. Constraints: value must be a string

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-s [NAME], –name [NAME]

sibling name to create for this publication target. If RECURSIVE is set, the same name will be used to label all the subdatasets' siblings. When creating a target dataset fails, no sibling is added. Constraints: value must be a string [Default: None]

–target-dir PATH

path to the directory *on the server* where the dataset shall be created. By default the SSH access URL is used to identify this directory. If a relative path is provided here, it is interpreted as being relative to the user's home directory on the server. Additional features are relevant for recursive processing of datasets with subdatasets. By default, the local dataset structure is replicated on the server. However, it is possible to provide a template for generating different target directory names for all (sub)datasets. Templates can contain certain placeholder that are substituted for each (sub)dataset. For example: "/mydirectory/dataset%RELNAME". Supported placeholders: %RELNAME - the name of the datasets, with any slashes replaced by dashes. Constraints: value must be a string [Default: None]

–target-url URL

"public" access URL of the to-be-created target dataset(s) (default: SSHURL). Accessibility of this URL determines the access permissions of potential consumers of the dataset. As with TARGET_DIR, templates (same set of placeholders) are supported. Also, if specified, it is provided as the annex description. Constraints: value must be a string [Default: None]

–target-pushurl URL

In case the TARGET_URL cannot be used to publish to the dataset, this option specifies an alternative URL for this purpose. As with TARGET_URL, templates (same set of placeholders) are supported. Constraints: value must be a string [Default: None]

–dataset *DATASET*, -d *DATASET*

specify the dataset to create the publication target for. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

–existing MODE

action to perform, if a sibling is already configured under the given name and/or a target directory already exists. In this case, a dataset can be skipped ('skip'), an existing target directory be forcefully re-initialized, and the sibling (re-)configured ('replace', implies 'reconfigure'), the sibling configuration be updated only ('reconfigure'), or to error ('error'). Constraints: value must be one of ('skip', 'replace', 'error', 'reconfigure') [Default: 'error']

–shared false|true|umask|group|all|world|everybody|0xxx

if given, configures the access permissions on the server for multi-users (this could include access by a webserver!). Possible values for this option are identical to those of *git init –shared* and are described in its documentation. Constraints: value must be a string, or value must be convertible to type bool [Default: None]

–ui false|true|html_filename

publish a web interface for the dataset with an optional user-specified name for the html at publication target. defaults to INDEX.HTML at dataset root. Constraints: value must be convertible to type bool, or value must be a string [Default: False]

–as-common-datasrc NAME

configure the created sibling as a common data source of the dataset that can be automatically used by all consumers of the dataset (technical: git-annex auto- enabled special remote). [Default: None]

–publish-by-default REFSPEC

add a refspec to be published to this sibling by default if nothing specified. Constraints: value must be a string [Default: None]

–publish-depends SIBLINGNAME

add a dependency such that the given existing sibling is always published prior to the new sibling. This equals setting a configuration item 'remote.SIBLINGNAME .datalad-publish-depends'. This option can be given more than once to configure multiple dependencies. Constraints: value must be a string [Default: None]

–annex-wanted EXPR

expression to specify 'wanted' content for the repository/sibling. See https ://git-annex.branchable.com/git-annex-wanted/ for more information. Constraints: value must be a string [Default: None]

–annex-group EXPR

expression to specify a group for the repository. See https://git- annex.branchable.com/git-annex-group/ for more information. Constraints: value must be a string [Default: None]

–annex-groupwanted EXPR

expression for the groupwanted. Makes sense only if –annex-wanted="groupwanted" and annex-group is given too. See https://git-annex.branchable.com/git-annex- groupwanted/ for more information. Constraints: value must be a string [Default: None]

–inherit

if sibling is missing, inherit settings (git config, git annex wanted/group/groupwanted) from its super-dataset. [Default: False]

–since *SINCE*

limit processing to datasets that have been changed since a given state (by tag, branch, commit, etc). This can be used to create siblings for recently added subdatasets. Constraints: value must be a string [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad create-sibling-github

Synopsis

```
datalad create-sibling-github [-h] [--dataset DATASET] [-r] [--recursion-limit␣
↪LEVELS] [-s NAME] [--existing MODE] [--github-login NAME] [--github-passwd␣
↪PASSWORD] [--github-organization NAME] [--access-protocol ACCESS_PROTOCOL] [--
↪publish-depends SIBLINGNAME] [--dryrun] REPONAME
```

Description

Create dataset sibling on Github.

A repository can be created under a user's Github account, or any organization a user is a member of (given appropriate permissions).

Recursive sibling creation for subdatasets is supported. A dataset hierarchy is represented as a flat list of Github repositories.

Github cannot host dataset content. However, in combination with other data sources (and siblings), publishing a dataset to Github can facilitate distribution and exchange, while still allowing any dataset consumer to obtain actual data content from alternative sources.

For Github authentication user credentials can be given as arguments. Alternatively, they are obtained interactively or queried from the systems credential store. Lastly, an *oauth* token stored in the Git configuration under variable *hub.oauthtoken* will be used automatically. Such a token can be obtained, for example, using the commandline Github interface (https://github.com/sociomantic/git-hub) by running: git hub setup.

Options

REPONAME

Github repository name. When operating recursively, a suffix will be appended to this name for each subdataset. Constraints: value must be a string

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

–dataset *DATASET*, -d *DATASET*

specify the dataset to create the publication target for. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type ‘int’ [Default: None]

-s NAME, –name NAME

name to represent the Github repository in the local dataset installation. Constraints: value must be a string [Default: ‘github’]

–existing MODE

desired behavior when already existing or configured siblings are discovered. ‘skip’: ignore; ‘error’: fail immediately; ‘reconfigure’: use the existing repository and reconfigure the local dataset to use it as a sibling. Constraints: value must be one of (‘skip’, ‘error’, ‘reconfigure’) [Default: ‘error’]

–github-login NAME

Github user name or access token. Constraints: value must be a string [Default: None]

–github-passwd PASSWORD

Github user password. Constraints: value must be a string [Default: None]

–github-organization NAME

If provided, the repository will be created under this Github organization. The respective Github user needs appropriate permissions. Constraints: value must be a string [Default: None]

–access-protocol *ACCESS_PROTOCOL*

Which access protocol/URL to configure for the sibling. Constraints: value must be one of ('https', 'ssh') [Default: 'https']

–publish-depends SIBLINGNAME

add a dependency such that the given existing sibling is always published prior to the new sibling. This equals setting a configuration item 'remote.SIBLINGNAME .datalad-publish-depends'. This option can be given more than once to configure multiple dependencies. Constraints: value must be a string [Default: None]

–dryrun

If this flag is set, no communication with Github is performed, and no repositories will be created. Instead would-be repository names are reported for all relevant datasets. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad drop

Synopsis

```
datalad drop [-h] [-d DATASET] [-r] [--recursion-limit LEVELS] [--nocheck] [--if-
↪dirty {fail,save-before,ignore}] [PATH [PATH ...]]
```

Description

Drop file content from datasets

This command takes any number of paths of files and/or directories. If a common (super)dataset is given explicitly, the given paths are interpreted relative to this dataset.

Recursion into subdatasets needs to be explicitly enabled, while recursion into subdirectories within a dataset is done automatically. An optional recursion limit is applied relative to each given input path.

By default, the availability of at least one remote copy is verified before file content is dropped. As these checks could lead to slow operation (network latencies, etc), they can be disabled.

Examples:

Drop all file content in a dataset:

```
~/some/dataset$ datalad drop
```

Drop all file content in a dataset and all its subdatasets:

```
~/some/dataset$ datalad drop --recursive
```

Options

PATH

path/name of the component to be dropped. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d DATASET, –dataset DATASET

specify the dataset to perform the operation on. If no dataset is given, an attempt is made to identify a dataset based on the PATH given. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type ‘int’ [Default: None]

–nocheck

whether to perform checks to assure the configured minimum number (remote) source for data. Give this option to skip checks. [Default: True]

–if-dirty {fail,save-before,ignore}

desired behavior if a dataset with unsaved changes is discovered: 'fail' will trigger an error and further processing is aborted; 'save-before' will save all changes prior any further action; 'ignore' let's datalad proceed as if the dataset would not have unsaved changes. [Default: 'save-before']

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad get

Synopsis

```
datalad get [-h] [-s LABEL] [-d PATH] [-r] [--recursion-limit LEVELS] [-n] [-D␣
↪DESCRIPTION] [--reckless] [-J NJOBS] [-v] [PATH [PATH ...]]
```

Description

Get any dataset content (files/directories/subdatasets).

This command only operates on dataset content. To obtain a new independent dataset from some source use the INSTALL command.

By default this command operates recursively within a dataset, but not across potential subdatasets, i.e. if a directory is provided, all files in the directory are obtained. Recursion into subdatasets is supported too. If enabled, relevant subdatasets are detected and installed in order to fulfill a request.

Known data locations for each requested file are evaluated and data are obtained from some available location (according to git-annex configuration and possibly assigned remote priorities), unless a specific source is specified.

NOTE Power-user info: This command uses git annex get to fulfill file handles.

Options

PATH

path/name of the requested dataset component. The component must already be known to a dataset. To add new components to a dataset use the ADD command. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-s LABEL, –source LABEL

label of the data source to be used to fulfill requests. This can be the name of a dataset sibling or another known source. Constraints: value must be a string [Default: None]

-d PATH, –dataset PATH

specify the dataset to perform the add operation on, in which case PATH arguments are interpreted as being relative to this dataset. If no dataset is given, an attempt is made to identify a dataset for each input PATH. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Alternatively, 'existing' will limit recursion to subdatasets that already existed on the filesystem at the start of processing, and prevent new subdatasets from being obtained recursively. Constraints: value must be convertible to type 'int', or value must be one of ('existing',) [Default: None]

-n, –no-data

whether to obtain data for all file handles. If disabled, GET operations are limited to dataset handles. This option prevents data for file handles from being obtained. [Default: True]

-D *DESCRIPTION*, –description *DESCRIPTION*

short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. Constraints: value must be a string [Default: None]

–reckless

Set up the dataset to be able to obtain content in the cheapest/fastest possible way, even if this poses a potential risk the data integrity (e.g. hardlink files from a local clone of the dataset). Use with care, and limit to "read-only" use cases. With this flag the installed dataset will be marked as untrusted. [Default: False]

-J NJOBS, –jobs NJOBS

how many parallel jobs (where possible) to use. Constraints: value must be convertible to type 'int', or value must be one of ('auto',) [Default: 'auto']

-v, –verbose

print out more detailed information while executing a command. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad install

Synopsis

```
datalad install [-h] [-s SOURCE] [-d DATASET] [-g] [-D DESCRIPTION] [-r] [--recursion-
↪limit LEVELS] [--nosave] [--reckless] [-J NJOBS] [PATH [PATH ...]]
```

Description

Install a dataset from a (remote) source.

This command creates a local sibling of an existing dataset from a (remote) location identified via a URL or path. Optional recursion into potential subdatasets, and download of all referenced data is supported. The new dataset can be optionally registered in an existing superdataset by identifying it via the DATASET argument (the new dataset's path needs to be located within the superdataset for that).

It is recommended to provide a brief description to label the dataset's nature *and* location, e.g. "Michael's music on black laptop". This helps humans to identify data locations in distributed scenarios. By default an identifier comprised of user and machine name, plus path will be generated.

When only partial dataset content shall be obtained, it is recommended to use this command without the GET-DATA flag, followed by a *get* operation to obtain the desired data.

NOTE Power-user info: This command uses git clone, and git annex init to prepare the dataset. Registering to a superdataset is performed via a git submodule add operation in the discovered superdataset.

Options

PATH

path/name of the installation target. If no PATH is provided a destination path will be derived from a source URL similar to git clone. [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-s SOURCE, –source SOURCE

URL or local path of the installation source. Constraints: value must be a string [Default: None]

-d *DATASET*, –dataset *DATASET*

specify the dataset to perform the install operation on. If no dataset is given, an attempt is made to identify the dataset in a parent directory of the current working directory and/or the PATH given. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-g, –get-data

if given, obtain all data content too. [Default: False]

-D *DESCRIPTION*, –description *DESCRIPTION*

short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. Constraints: value must be a string [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

–reckless

Set up the dataset to be able to obtain content in the cheapest/fastest possible way, even if this poses a potential risk the data integrity (e.g. hardlink files from a local clone of the dataset). Use with care, and limit to "read-only" use cases. With this flag the installed dataset will be marked as untrusted. [Default: False]

-J NJOBS, –jobs NJOBS

how many parallel jobs (where possible) to use. Constraints: value must be convertible to type 'int', or value must be one of ('auto',) [Default: 'auto']

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad publish

Synopsis

```
datalad publish [-h] [-d DATASET] [--to LABEL] [--since SINCE] [--missing MODE] [-f]␣
↪[--transfer-data TRANSFER_DATA] [-r] [--recursion-limit LEVELS] [--git-opts STRING]␣
↪[--annex-opts STRING] [--annex-copy-opts STRING] [-J NJOBS] [PATH [PATH ...]]
```

Description

Publish a dataset to a known sibling.

This makes the last saved state of a dataset available to a sibling or special remote data store of a dataset. Any target sibling must already exist and be known to the dataset.

Optionally, it is possible to limit publication to change sets relative to a particular point in the version history of a dataset (e.g. a release tag). By default, the state of the local dataset is evaluated against the last known state of the target sibling. Actual publication is only attempted if there was a change compared to the reference state, in order to speed up processing of large collections of datasets. Evaluation with respect to a particular "historic" state is only supported in conjunction with a specified reference dataset. Change sets are also evaluated recursively, i.e. only those subdatasets are published where a change was recorded that is reflected in to current state of the top-level reference dataset. See "since" option for more information.

Only publication of saved changes is supported. Any unsaved changes in a dataset (hierarchy) have to be saved before publication.

NOTE Power-user info: This command uses git push, and git annex copy to publish a dataset. Publication targets are either configured remote Git repositories, or git-annex special remotes (if they support data upload).

Options

PATH

path(s), that may point to file handle(s) to publish including their actual content or to subdataset(s) to be published. If a file handle is published with its data, this implicitly means to also publish the (sub)dataset it belongs to. '.' as a path is treated in a special way in the sense, that it is passed to subdatasets in case RECURSIVE is also given. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d DATASET, –dataset DATASET

specify the (top-level) dataset to be published. If no dataset is given, the datasets are determined based on the input arguments. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–to LABEL

name of the target sibling. If no name is given an attempt is made to identify the target based on the dataset's configuration (i.e. a configured tracking branch, or a single sibling that is configured for publication). Constraints: value must be a string [Default: None]

–since *SINCE*

When publishing dataset(s), specifies commit (treeish, tag, etc) from which to look for changes to decide whether updated publishing is necessary for this and which children. If empty argument is provided, then we would take from the previously published to that remote/sibling state (for the current branch). Constraints: value must be a string [Default: None]

–missing MODE

action to perform, if a sibling does not exist in a given dataset. By default it would fail the run ('fail' setting). With 'inherit' a 'create-sibling' with '–inherit-settings' will be used to create sibling on the remote. With 'skip' - it simply will be skipped. Constraints: value must be one of ('fail', 'inherit', 'skip') [Default: 'fail']

-f, –force

enforce doing publish activities (git push etc) regardless of the analysis if they seemed needed. [Default: False]

–transfer-data *TRANSFER_DATA*

ADDME. Constraints: value must be one of ('auto', 'none', 'all') [Default: 'auto']

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

–git-opts STRING

option string to be passed to git calls. Constraints: value must be a string [Default: None]

–annex-opts STRING

option string to be passed to git annex calls. Constraints: value must be a string [Default: None]

–annex-copy-opts STRING

option string to be passed to git annex copy calls. Constraints: value must be a string [Default: None]

-J NJOBS, –jobs NJOBS

how many parallel jobs (where possible) to use. Constraints: value must be convertible to type 'int', or value must be one of ('auto',) [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad remove

Synopsis

```
datalad remove [-h] [-d DATASET] [-r] [--nocheck] [--nosave] [-m MESSAGE] [--if-dirty
↪{fail,save-before,ignore}] [PATH [PATH ...]]
```

Description

Remove components from datasets

This command can remove subdatasets and paths, including non-empty directories, from datasets. Removing a component implies dropping present content and uninstalling associated subdatasets. Subsequently, the component is "unregistered" from the respective dataset. This means that the component is no longer present on the file system.

By default, the availability of at least one remote copy is verified before file content is dropped. As these checks could lead to slow operation (network latencies, etc), they can be disabled.

Examples:

Permanently remove a subdataset from a dataset and wipe out the subdataset association too:

```
~/some/dataset$ datalad remove somesubdataset1
```

Options

PATH

path/name of the component to be removed. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d DATASET, –dataset DATASET

specify the dataset to perform the operation on. If no dataset is given, an attempt is made to identify a dataset based on the PATH given. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–nocheck

whether to perform checks to assure the configured minimum number (remote) source for data. Give this option to skip checks. [Default: True]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

-m MESSAGE, –message MESSAGE

a description of the state or the changes made to a dataset. Constraints: value must be a string [Default: None]

–if-dirty {fail,save-before,ignore}

desired behavior if a dataset with unsaved changes is discovered: 'fail' will trigger an error and further processing is aborted; 'save-before' will save all changes prior any further action; 'ignore' let's datalad proceed as if the dataset would not have unsaved changes. [Default: 'save-before']

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad save

Synopsis

```
datalad save [-h] [-m MESSAGE] [-d DATASET] [-u] [--version-tag ID] [-r] [--recursion-
↪limit LEVELS] [-S] [-F MESSAGE_FILE] [PATH [PATH ...]]
```

Description

Save the current state of a dataset

Saving the state of a dataset records changes that have been made to it. This change record is annotated with a user-provided description. Optionally, an additional tag, such as a version, can be assigned to the saved state. Such tag enables straightforward retrieval of past versions at a later point in time.

Examples:

Save any content underneath the current directory, without altering any potential subdataset (use –recursive for that):

```
% datalad save .
```

Save any modification of known dataset content, but leave untracked files (e.g. temporary files) untouched:

```
% dataset save -d <path_to_dataset>
```

Tag the most recent saved state of a dataset:

```
% dataset save -d <path_to_dataset> --version-tag bestyet
```

Options

PATH

path/name of the dataset component to save. If given, only changes made to those components are recorded in the new state. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-m MESSAGE, –message MESSAGE

a description of the state or the changes made to a dataset. Constraints: value must be a string [Default: None]

-d *DATASET*, –dataset *DATASET*

“specify the dataset to save. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-u, –all-updated

if no explicit paths are given, save changes of all known components in a datasets. [Default: True]

–version-tag ID

an additional marker for that state. Constraints: value must be a string [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

-S, –super-datasets

if set, save a change in a dataset also in its superdataset. [Default: False]

-F *MESSAGE_FILE*, –message-file *MESSAGE_FILE*

take the commit message from this file. This flag is mutually exclusive with -m. Constraints: value must be a string [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad update

Synopsis

```
datalad update [-h] [-s SIBLING] [--merge] [-d DATASET] [-r] [--recursion-limit␣
↪LEVELS] [--fetch-all] [--reobtain-data] [PATH [PATH ...]]
```

Description

Update a dataset from a sibling.

Options

PATH

path to a dataset that shall be updated. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-s *SIBLING*, –sibling *SIBLING*

name of the sibling to update from. If no sibling is given, updates from all siblings are obtained. Constraints: value must be a string [Default: None]

–merge

merge obtained changes from the given or the default sibling. [Default: False]

-d *DATASET*, –dataset *DATASET*

“specify the dataset to update. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type ‘int’ [Default: None]

–fetch-all

this option has no effect and will be removed in a future version. When no siblings are given, an all-sibling update will be performed. [Default: None]

–reobtain-data

if enabled, file content that was present before an update will be re-obtained in case a file was changed by the update. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad uninstall

Synopsis

```
datalad uninstall [-h] [-d DATASET] [-r] [--nocheck] [--if-dirty {fail,save-before,
↪ignore}] [PATH [PATH ...]]
```

Description

Uninstall subdatasets

This command can be used to uninstall any number of installed subdatasets. This command will error if individual files or non-dataset directories are given as input (use the drop or remove command depending on the desired goal), nor will it uninstall top-level datasets (i.e. datasets that are not a subdataset in another dataset; use the remove command for this purpose).

By default, the availability of at least one remote copy for each currently available file in any dataset is verified. As these checks could lead to slow operation (network latencies, etc), they can be disabled.

Any number of paths to process can be given as input. Recursion into subdatasets needs to be explicitly enabled, while recursion into subdirectories within a dataset is done automatically. An optional recursion limit is applied relative to each given input path.

Examples:

Uninstall a subdataset (undo installation):

```
~/some/dataset$ datalad uninstall somesubdataset1
```

Options

PATH

path/name of the component to be uninstalled. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d DATASET, –dataset DATASET

specify the dataset to perform the operation on. If no dataset is given, an attempt is made to identify a dataset based on the PATH given. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–nocheck

whether to perform checks to assure the configured minimum number (remote) source for data. Give this option to skip checks. [Default: True]

–if-dirty {fail,save-before,ignore}

desired behavior if a dataset with unsaved changes is discovered: 'fail' will trigger an error and further processing is aborted; 'save-before' will save all changes prior any further action; 'ignore' let's datalad proceed as if the dataset would not have unsaved changes. [Default: 'save-before']

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad unlock

Synopsis

```
datalad unlock [-h] [-d DATASET] [-r] [--recursion-limit LEVELS] [path [path ...]]
```

Description

Unlock file(s) of a dataset

Unlock files of a dataset in order to be able to edit the actual content

Options

path

file(s) to unlock. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

"specify the dataset to unlock files in. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. If the latter fails, an attempt is made to identify the dataset based on PATH. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.1.3 Metadata handling

datalad search

Synopsis

```
datalad search [-h] [-d DATASET] [--reindex] [--max-nresults MAX_NRESULTS] [--mode
↪{egrep,textblob,autofield}] [--full-record] [--show-keys {name,short,full}] [--show-
↪query] [QUERY [QUERY ...]]
```

Description

Search dataset metadata

DataLad can search metadata extracted from a dataset and/or aggregated into a superdataset (see the AGGREGATE-METADATA command). This makes it possible to discover datasets, or individual files in a dataset even when they are not available locally.

Ultimately DataLad metadata are a graph of linked data structures. However, this command does not (yet) support queries that can exploit all information stored in the metadata. At the moment the following search modes are implemented that represent different trade-offs between the expressiveness of a query and the computational and storage resources required to execute a query.

- egrep (default)
- egrepcs [case-sensitive egrep]
- textblob
- autofield

An alternative default mode can be configured by tuning the configuration variable 'datalad.search.default-mode':

```
[datalad "search"]
  default-mode = egrepcs
```

Each search mode has its own default configuration for what kind of documents to query. The respective default can be changed via configuration variables:

```
[datalad "search"]
  index-<mode_name>-documenttype = (all|datasets|files)
```

Mode: egrep/egrepcs

These search modes are largely ignorant of the metadata structure, and simply perform matching of a search pattern against a flat string-representation of metadata. This is advantageous when the query is simple and the metadata structure is irrelevant, or precisely known. Moreover, it does not require a search index, hence results can be reported without an initial latency for building a search index when the underlying metadata has changed (e.g. due to a dataset update). By default, these search modes only consider datasets and do not investigate records for individual files for speed reasons. Search results are reported in the order in which they were discovered.

Queries can make use of Python regular expression syntax (https://docs.python.org/3/library/re.html). In EGREP mode, matching is case-insensitive when the query does not contain upper case characters, but is case-sensitive when it does. In EGREPCS mode, matching is always case-sensitive. Expressions will match anywhere in a metadata string, not only at the start.

When multiple queries are given, all queries have to match for a search hit (AND behavior).

It is possible to search individual metadata key/value items by prefixing the query with a metadata key name, separated by a colon (':'). The key name can also be a regular expression to match multiple keys. A query match happens when any value of an item with a matching key name matches the query (OR behavior). See examples for more information.

Examples:

Query for (what happens to be) an author:

```
% datalad search haxby
```

Queries are case-INsensitive when the query contains no upper case characters, and can be regular expressions. Use EGREPCS mode when it is desired to perform a case-sensitive lowercase match:

```
% datalad search --mode egrepcs halchenko.*haxby
```

This search mode performs NO analysis of the metadata content. Therefore queries can easily fail to match. For example, the above query implicitly assumes that authors are listed in alphabetical order. If that is the case (which may or may not be true), the following query would yield NO hits:

```
% datalad search Haxby.*Halchenko
```

The TEXTBLOB search mode represents an alternative that is more robust in such cases.

For more complex queries multiple query expressions can be provided that all have to match to be considered a hit (AND behavior). This query discovers all files (non-default behavior) that match 'bids.type=T1w' AND 'nifti1.qform_code=scanner':

```
% datalad -c datalad.search.index-egrep-documenttype=all search bids.
↪type:T1w nifti1.qform_code:scanner
```

Key name selectors can also be expressions, which can be used to select multiple keys or construct "fuzzy" queries. In such cases a query matches when any item with a matching key matches the query (OR behavior). However, multiple queries are always evaluated using an AND conjunction. The following query extends the example above to match any files that have either 'nifti1.qform_code=scanner' or 'nifti1.sform_code=scanner':

```
% datalad -c datalad.search.index-egrep-documenttype=all search bids.
↪type:T1w nifti1.(q|s)form_code:scanner
```

Mode: textblob

This search mode is very similar to the EGREP mode, but with a few key differences. A search index is built from the string-representation of metadata records. By default, only datasets are included in this index, hence the indexing is usually completed within a few seconds, even for hundreds of datasets. This mode uses its own query language (not regular expressions) that is similar to other search engines. It supports logical conjunctions and fuzzy search terms. More information on this is available from the Whoosh project (search engine implementation):

- Description of the Whoosh query language: http://whoosh.readthedocs.io/en/latest/querylang.html)
- Description of a number of query language customizations that are enabled in DataLad, such as, fuzzy term matching: http://whoosh.readthedocs.io/en/latest/parsing.html#common-customizations

Importantly, search hits are scored and reported in order of descending relevance, hence limiting the number of search results is more meaningful than in the 'egrep' mode and can also reduce the query duration.

Examples:

Search for (what happens to be) two authors, regardless of the order in which those names appear in the metadata:

```
% datalad search --mode textblob halchenko haxby
```

Fuzzy search when you only have an approximate idea what you are looking for or how it is spelled:

```
% datalad search --mode textblob haxbi~
```

Very fuzzy search, when you are basically only confident about the first two characters and how it sounds approximately (or more precisely: allow for three edits and require matching of the first two characters):

```
% datalad search --mode textblob haksbi~3/2
```

Combine fuzzy search with logical constructs:

```
% datalad search --mode textblob 'haxbi~ AND (hanke OR halchenko)'
```

Mode: autofield

This mode is similar to the 'textblob' mode, but builds a vastly more detailed search index that represents individual metadata variables as individual fields. By default, this search index includes records for datasets and individual fields, hence it can grow very quickly into a huge structure that can easily take an hour or more to build and require more than a GB of storage. However, limiting it to documents on datasets (see above) retains the enhanced expressiveness of queries while dramatically reducing the resource demands.

Examples:

List names of search index fields (auto-discovered from the set of indexed datasets):

```
% datalad search --mode autofield --show-keys name
```

Fuzzy search for datasets with an author that is specified in a particular metadata field:

```
% datalad search --mode autofield bids.author:haxbi~ type:dataset
```

Search for individual files that carry a particular description prefix in their 'nifti1' metadata:

```
% datalad search --mode autofield nifti1.description:FSL* type:file
```

Reporting

Search hits are returned as standard DataLad results. On the command line the '–output-format' (or '-f') option can be used to tweak results for further processing.

Examples:

Format search hits as a JSON stream (one hit per line):

```
% datalad -f json search haxby
```

Custom formatting: which terms matched the query of particular results. Useful for investigating fuzzy search results:

```
$ datalad -f '{path}: {query_matched}' search --mode autofield bids.
↪author:haxbi~
```

Options

QUERY

query string, supported syntax and features depends on the selected search mode (see documentation). [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

specify the dataset to perform the query operation on. If no dataset is given, an attempt is made to identify the dataset based on the current working directory and/or the PATH given. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–reindex

force rebuilding the search index, even if no change in the dataset's state has been detected, for example, when the index documenttype configuration has changed. [Default: False]

–max-nresults *MAX_NRESULTS*

maxmimum number of search results to report. Setting this to 0 will report all search matches. Depending on the mode this can search substantially slower. If not specified, a mode-specific default setting will be used. Constraints: value must be convertible to type 'int' [Default: None]

–mode {egrep,textblob,autofield}

Mode of search index structure and content. See section SEARCH MODES for details. [Default: None]

–full-record, -f

If set, return the full metadata record for each search hit. Depending on the search mode this might require additional queries. By default, only data that is available to the respective search modes is returned. This always includes essential information, such as the path and the type. [Default: False]

–show-keys {name,short,full}

if given, a list of known search keys is shown. If 'name' - only the name is printed one per line. If 'short' or 'full', statistics (in how many datasets, and how many unique values) are printed. 'short' truncates the listing of unique values. No other action is performed (except for reindexing), even if other arguments are given. Each key is accompanied by a term definition in parenthesis (TODO). In most cases a definition is given in the form of a URL. If an ontology definition for a term is known, this URL can resolve to a webpage that provides a comprehensive definition of the term. However, for speed reasons term resolution is solely done on information contained in a local dataset's metadata, and definition URLs might be outdated or point to no longer existing resources. [Default: None]

–show-query

if given, the formal query that was generated from the given query string is shown, but not actually executed. This is mostly useful for debugging purposes. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad metadata

Synopsis

```
datalad metadata [-h] [-d DATASET] [--get-aggregates] [--reporton TYPE] [-r] [PATH␣
↪[PATH ...]]
```

Description

Metadata reporting for files and entire datasets

Two types of metadata are supported:

1. metadata describing a dataset as a whole (dataset-global metadata), and
2. metadata for files in a dataset (content metadata).

Both types can be accessed with this command.

Examples:

Report the metadata of a single file, as aggregated into the closest locally available dataset, containing the query path:

```
% datalad metadata somedir/subdir/thisfile.dat
```

Sometimes it is helpful to get metadata records formatted in a more accessible form, here as pretty-printed JSON:

```
% datalad -f json_pp metadata somedir/subdir/thisfile.dat
```

Same query as above, but specify which dataset to query (must be containing the query path):

```
% datalad metadata -d . somedir/subdir/thisfile.dat
```

Report any metadata record of any dataset known to the queried dataset:

```
% datalad metadata --recursive --reporton datasets
```

Get a JSON-formatted report of aggregated metadata in a dataset, incl. information on enabled metadata extractors, dataset versions, dataset IDs, and dataset paths:

```
% datalad -f json metadata --get-aggregates
```

Options

PATH

path(s) to query metadata for. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

dataset to query. If given, metadata will be reported as stored in this dataset. Otherwise, the closest available dataset containing a query path will be consulted. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–get-aggregates

if set, yields all (sub)datasets for which aggregate metadata are available in the dataset. No other action is performed, even if other arguments are given. The reported results contain a datasets's ID, the commit hash at which metadata aggregation was performed, and the location of the object file(s) containing the aggregated metadata. [Default: False]

–reporton TYPE

choose on what type result to report on: 'datasets', 'files', 'all' (both datasets and files), or 'none' (no report). Constraints: value must be one of ('all', 'datasets', 'files', 'none') [Default: 'all']

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad aggregate-metadata

Synopsis

```
datalad aggregate-metadata [-h] [-d DATASET] [-r] [--recursion-limit LEVELS] [--
↪update-mode UPDATE_MODE] [--incremental] [--force-extraction] [--nosave] [PATH␣
↪[PATH ...]]
```

Description

Aggregate metadata of one or more datasets for later query.

Metadata aggregation refers to a procedure that extracts metadata present in a dataset into a portable representation that is stored a single standardized format. Moreover, metadata aggregation can also extract metadata in this format from one dataset and store it in another (super)dataset. Based on such collections of aggregated metadata it is possible to discover particular datasets and specific parts of their content, without having to obtain the target datasets first (see the DataLad 'search' command).

To enable aggregation of metadata that are contained in files of a dataset, one has to enable one or more metadata extractor for a dataset. DataLad supports a number of common metadata standards, such as the Exchangeable Image File Format (EXIF), Adobe's Extensible Metadata Platform (XMP), and various audio file metadata systems like ID3. DataLad extension packages can provide metadata data extractors for additional metadata sources. For example, the neuroimaging extension provides extractors for scientific (meta)data standards like BIDS, DICOM, and NIfTI1. Some metadata extractors depend on particular 3rd-party software. The list of metadata extractors available to a particular DataLad installation is reported by the 'wtf' command ('datalad wtf').

Enabling a metadata extractor for a dataset is done by adding its name to the 'datalad.metadata.nativetype' configuration variable – typically in the dataset's configuration file (.datalad/config), e.g.:

```
[datalad "metadata"]
  nativetype = exif
  nativetype = xmp
```

If an enabled metadata extractor is not available in a particular DataLad installation, metadata extraction will not succeed in order to avoid inconsistent aggregation results.

Enabling multiple extractors is supported. In this case, metadata are extracted by each extractor individually, and stored alongside each other. Metadata aggregation will also extract DataLad's own metadata (extractors 'datalad_core', and 'annex').

Metadata aggregation can be performed recursively, in order to aggregate all metadata across all subdatasets, for example, to be able to search across any content in any dataset of a collection. Aggregation can also be performed for subdatasets that are not available locally. In this case, pre-aggregated metadata from the closest available superdataset will be considered instead.

Depending on the versatility of the present metadata and the number of dataset or files, aggregated metadata can grow prohibitively large. A number of configuration switches are provided to mitigate such issues.

datalad.metadata.aggregate-content-<extractor-name> If set to false, content metadata aggregation will not be performed for the named metadata extractor (a potential underscore '_' in the extractor name must be replaced by a dash '-'). This can substantially reduce the runtime for metadata extraction, and also reduce the size of the generated metadata aggregate. Note, however, that some extractors may not produce any metadata when this is disabled, because their metadata might come from individual file headers only. 'datalad.metadata.store-aggregate-content' might be a more appropriate setting in such cases.

datalad.metadata.aggregate-ignore-fields Any metadata key matching any regular expression in this configuration setting is removed prior to generating the dataset-level metadata summary (keys and their unique values across

all dataset content), and from the dataset metadata itself. This switch can also be used to filter out sensitive information prior aggregation.

datalad.metadata.generate-unique-<extractor-name> If set to false, DataLad will not auto-generate a summary of unique content metadata values for a particular extractor as part of the dataset-global metadata (a potential underscore '_' in the extractor name must be replaced by a dash '-'). This can be useful if such a summary is bloated due to minor uninformative (e.g. numerical) differences, or when a particular extractor already provides a carefully designed content metadata summary.

datalad.metadata.maxfieldsize Any metadata value that exceeds the size threshold given by this configuration setting (in bytes/characters) is removed.

datalad.metadata.store-aggregate-content If set, extracted content metadata are still used to generate a dataset-level summary of present metadata (all keys and their unique values across all files in a dataset are determined and stored as part of the dataset-level metadata aggregate, see datalad.metadata.generate-unique-<extractor-name>), but metadata on individual files are not stored. This switch can be used to avoid prohibitively large metadata files. Discovery of datasets containing content matching particular metadata properties will still be possible, but such datasets would have to be obtained first in order to discover which particular files in them match these properties.

Options

PATH

path to datasets that shall be aggregated. When a given path is pointing into a dataset, the metadata of the containing dataset will be aggregated. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

topmost dataset metadata will be aggregated into. All dataset between this dataset and any given path will receive updated aggregated metadata from all given paths. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

–update-mode *UPDATE_MODE*

which datasets to update with newly aggregated metadata: all datasets from any leaf dataset to the top-level target dataset including all intermediate datasets (all), or just the top-level target dataset (target). Constraints: value must be one of ('all', 'target') [Default: 'target']

–incremental

If set, all information on metadata records of subdatasets that have not been (re-)aggregated in this run will be kept unchanged. This is useful when (re-)aggregation only a subset of a dataset hierarchy, for example, because not all subdatasets are locally available. [Default: False]

–force-extraction

If set, all enabled extractors will be engaged regardless of whether change detection indicates that metadata has already been extracted for a given dataset state. [Default: False]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad extract-metadata

Synopsis

```
datalad extract-metadata [-h] --type NAME [-d DATASET] [FILE [FILE ...]]
```

Description

Run one or more of DataLad's metadata extractors on a dataset or file.

The result(s) are structured like the metadata DataLad would extract during metadata aggregation. There is one result per dataset/file.

Examples:

Extract metadata with two extractors from a dataset in the current directory and also from all its files:

```
$ datalad extract-metadata -d . --type frictionless_datapackage --type␣
↪datalad_core
```

Extract XMP metadata from a single PDF that is not part of any dataset:

```
$ datalad extract-metadata --type xmp Downloads/freshfromtheweb.pdf
```

Options

FILE

Path of a file to extract metadata from. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

–type NAME

Name of a metadata extractor to be executed. This option can be given more than once.

-d *DATASET*, –dataset *DATASET*

“Dataset to extract metadata from. If no FILE is given, metadata is extracted from all files of the dataset. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.1.4 Reproducible execution

datalad run

Synopsis

```
datalad run [-h] [-d DATASET] [--input PATH] [--output PATH] [--expand WHICH] [--
↪explicit] [-m MESSAGE] [--sidecar yes|no] [--rerun] ...
```

Description

Run an arbitrary shell command and record its impact on a dataset.

It is recommended to craft the command such that it can run in the root directory of the dataset that the command will be recorded in. However, as long as the command is executed somewhere underneath the dataset root, the exact location will be recorded relative to the dataset root.

If the executed command did not alter the dataset in any way, no record of the command execution is made.

If the given command errors, a COMMANDERROR exception with the same exit code will be raised, and no modifications will be saved.

Command format

A few placeholders are supported in the command via Python format specification. "{pwd}" will be replaced with the full path of the current working directory. "{dspath}" will be replaced with the full path of the dataset that run is invoked on. "{inputs}" and "{outputs}" represent the values specified by –input and –output. If multiple values are specified, the values will be joined by a space. The order of the values will match that order from the command line, with any globs expanded in alphabetical order (like bash). Individual values can be accessed with an integer index (e.g., "{inputs[0]}").

Note that the representation of the inputs or outputs in the formatted command string depends on whether the command is given as a list of arguments or as a string (quotes surrounding the command). The concatenated list of inputs or outputs will be surrounded by quotes when the command is given as a list but not when it is given as a string. This means that the string form is required if you need to pass each input as a separate argument to a preceding script (i.e., write the command as "./script {inputs}", quotes included). The string form should also be used if the input or output paths contain spaces or other characters that need to be escaped.

To escape a brace character, double it (i.e., "{{" or "}}").

Custom placeholders can be added as configuration variables under "datalad.run.substitutions". As an example:

Add a placeholder "name" with the value "joe":

```
% git config --file=.datalad/config datalad.run.substitutions.name joe
% datalad add -m "Configure name placeholder" .datalad/config
```

Access the new placeholder in a command:

```
% datalad run "echo my name is {name} >me"
```

Options

COMMAND

command for execution. [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

specify the dataset to record the command results in. An attempt is made to identify the dataset based on the current working directory. If a dataset is given, the command will be executed in the root directory of this dataset. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–input PATH

A dependency for the run. Before running the command, the content of this file will be retrieved. A value of "." means "run datalad get .". The value can also be a glob. This option can be given more than once. [Default: None]

–output PATH

Prepare this file to be an output file of the command. A value of "." means "run datalad unlock ." (and will fail if some content isn't present). For any other value, if the content of this file is present, unlock the file. Otherwise, remove it. The value can also be a glob. This option can be given more than once. [Default: None]

–expand WHICH

Expand globs when storing inputs and/or outputs in the commit message. Constraints: value must be NONE, or value must be one of ('inputs', 'outputs', 'both') [Default: None]

–explicit

Consider the specification of inputs and outputs to be explicit. Don't warn if the repository is dirty, and only save modifications to the listed outputs. [Default: False]

-m MESSAGE, –message MESSAGE

a description of the state or the changes made to a dataset. Constraints: value must be a string [Default: None]

–sidecar yes|no

By default, the configuration variable 'datalad.run.record-sidecar' determines whether a record with information on a command's execution is placed into a separate record file instead of the commit message (default: off). This option can be used to override the configured behavior on a case-by-case basis. Sidecar files are placed into the dataset's '.datalad/runinfo' directory (customizable via the 'datalad.run.record-directory' configuration variable). Constraints: value must be NONE, or value must be convertible to type bool [Default: None]

–rerun

re-run the command recorded in the last saved change (if any). Note: This option is deprecated since version 0.9.2 and will be removed in a later release. Use *datalad rerun* instead. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad rerun

Synopsis

```
datalad rerun [-h] [--since SINCE] [-d DATASET] [-b NAME] [-m MESSAGE] [--onto base]␣
↪[--script FILE] [--report] [REVISION]
```

Description

Re-execute previous *datalad run* commands.

This will unlock any dataset content that is on record to have been modified by the command in the specified revision. It will then re-execute the command in the recorded path (if it was inside the dataset). Afterwards, all modifications will be saved.

Report mode

When called with –report, this command reports information about what would be re-executed as a series of records. There will be a record for each revision in the specified revision range. Each of these will have one of the following "rerun_action" values:

- run: the revision has a recorded command that would be re-executed
- skip: the revision does not have a recorded command and would be skipped
- pick: the revision does not have a recorded command and would be cherry picked

The decision to skip rather than cherry pick a revision is based on whether the revision would be reachable from HEAD at the time of execution.

In addition, when a starting point other than HEAD is specified, there is a rerun_action value "checkout", in which case the record includes information about the revision the would be checked out before rerunning any commands.

Examples:

Re-execute the command from the previous commit:

```
% datalad rerun
```

Re-execute any commands in the last five commits:

```
% datalad rerun --since=HEAD~5
```

Do the same as above, but re-execute the commands on top of HEAD~5 in a detached state:

```
% datalad rerun --onto= --since=HEAD~5
```

Re-execute all previous commands and compare the old and new results:

```
% # on master branch
% datalad rerun --branch=verify --since=
% # now on verify branch
% datalad diff --revision=master..
% git log --oneline --left-right --cherry-pick master...
```

NOTE Currently the "onto" feature only sets the working tree of the current dataset to a previous state. The working trees of any subdatasets remain unchanged.

Options

REVISION

rerun command(s) in REVISION. By default, the command from this commit will be executed, but –since can be used to construct a revision range. Constraints: value must be a string [Default: 'HEAD']

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

–since *SINCE*

If SINCE is a commit-ish, the commands from all commits that are reachable from REVISION but not SINCE will be re-executed (in other words, the commands in git log SINCE..REVISION). If SINCE is an empty string, it is set to the parent of the first commit that contains a recorded command (i.e., all commands in git log REVISION will be re-executed). Constraints: value must be a string [Default: None]

-d *DATASET*, –dataset *DATASET*

specify the dataset from which to rerun a recorded command. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. If a dataset is given, the command will be executed in the root directory of this dataset. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-b NAME, –branch NAME

create and checkout this branch before rerunning the commands. Constraints: value must be a string [Default: None]

-m MESSAGE, –message MESSAGE

use MESSAGE for the reran commit rather than the recorded commit message. In the case of a multi-commit rerun, all the reran commits will have this message. Constraints: value must be a string [Default: None]

–onto base

start point for rerunning the commands. If not specified, commands are executed at HEAD. This option can be used to specify an alternative start point, which will be checked out with the branch name specified by –branch or in a detached state otherwise. As a special case, an empty value for this option means to use the commit specified by –since. Constraints: value must be a string [Default: None]

–script FILE

extract the commands into FILE rather than rerunning. Use - to write to stdout instead. This option implies –report. Constraints: value must be a string [Default: None]

–report

Don’t actually re-execute anything, just display what would be done. Note: If you give this option, you most likely want to set –output-format to ‘json’ or ‘json_pp’. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad run-procedure

Synopsis

```
datalad run-procedure [-h] [-d PATH] [--discover] [--help-proc] ...
```

Description

Run prepared procedures (DataLad scripts) on a dataset

Concept

A "procedure" is an algorithm with the purpose to process a dataset in a particular way. Procedures can be useful in a wide range of scenarios, like adjusting dataset configuration in a uniform fashion, populating a dataset with particular content, or automating other routine tasks, such as synchronizing dataset content with certain siblings.

Implementations of some procedures are shipped together with DataLad, but additional procedures can be provided by 1) any DataLad extension, 2) any (sub-)dataset, 3) a local user, or 4) a local system administrator. DataLad will look for procedures in the following locations and order:

Directories identified by the configuration settings

- 'datalad.locations.user-procedures' (determined by appdirs.user_config_dir; defaults to '$HOME/.config/datalad/procedures' on GNU/Linux systems)
- 'datalad.locations.system-procedures' (determined by appdirs.site_config_dir; defaults to '/etc/xdg/datalad/procedures' on GNU/Linux systems)
- 'datalad.locations.dataset-procedures'

and subsequently in the 'resources/procedures/' directories of any installed extension, and, lastly, of the DataLad installation itself.

Please note that a dataset that defines 'datalad.locations.dataset-procedures' provides its procedures to any dataset it is a subdataset of. That way you can have a collection of such procedures in a dedicated dataset and install it as a subdataset into any dataset you want to use those procedures with. In case of a naming conflict with such a dataset hierarchy, the dataset you're calling run-procedures on will take precedence over its subdatasets and so on.

Each configuration setting can occur multiple times to indicate multiple directories to be searched. If a procedure matching a given name is found (filename without a possible extension), the search is aborted and this implementation will be executed. This makes it possible for individual datasets, users, or machines to override externally provided procedures (enabling the implementation of customizable processing "hooks").

Procedure implementation

A procedure can be any executable. Executables must have the appropriate permissions and, in the case of a script, must contain an appropriate "shebang" line. If a procedure is not executable, but its filename ends with '.py', it is automatically executed by the 'python' interpreter (whichever version is available in the present environment). Likewise, procedure implementations ending on '.sh' are executed via 'bash'.

Procedures can implement any argument handling, but must be capable of taking at least one positional argument (the absolute path to the dataset they shall operate on).

For further customization there are two configuration settings per procedure available:

- 'datalad.procedures.<NAME>.call-format' fully customizable format string to determine how to execute procedure NAME (see also datalad-run). It currently requires to include the following placeholders:
  - '{script}': will be replaced by the path to the procedure
  - '{ds}': will be replaced by the absolute path to the dataset the procedure shall operate on
  - '{args}': (not actually required) will be replaced by all additional arguments passed into run-procedure after NAME

    As an example the default format string for a call to a python script is: "python {script} {ds} {args}"
- 'datalad.procedures.<NAME>.help' will be shown on *datalad run-procedure –help-proc NAME* to provide a description and/or usage info for procedure NAME

Customize other commands with procedures

On execution of any commands, DataLad inspects two additional configuration settings:

- 'datalad.<name>.proc-pre'
- 'datalad.<name>.proc-post'

where '<name>' is the name of a DataLad command. Using this mechanism DataLad can be instructed to run one or more procedures before or after the execution of a given command. For example, configuring a set of metadata types in any newly created dataset can be achieved via:

% datalad -c 'datalad.create.proc-post=cfg_metadatatypes xmp image' create -d myds

As procedures run on datasets, it is necessary to explicitly identify the target dataset via the -d (–dataset) option.

Options

NAME [ARGS]

Name and possibly additional arguments of the to-be-executed procedure. Note, that all options to run-procedure need to be put before NAME, since all ARGS get assigned to NAME. [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d PATH, –dataset PATH

specify the dataset to run the procedure on. An attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–discover

if given, all configured paths are searched for procedures and one result record per discovered procedure is yielded, but no procedure is executed. [Default: False]

–help-proc

if given, get a help message for procedure NAME from config setting datalad.procedures.NAME.help. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.1.5 Miscellaneous commands

datalad add-archive-content

Synopsis

```
datalad add-archive-content [-h] [--annex ANNEX] [--add-archive-leading-dir] [--strip-
↪leading-dirs] [--leading-dirs-depth LEADING_DIRS_DEPTH] [--leading-dirs-consider␣
↪LEADING_DIRS_CONSIDER] [--use-current-dir] [-d] [--key] [-e EXCLUDE] [-r RENAME] [--
↪existing {fail,overwrite,archive-suffix,numeric-suffix}] [-o ANNEX_OPTIONS] [--
↪copy] [--no-commit] [--allow-dirty] [--stats STATS] [--drop-after] [--delete-after]␣
↪archive
```

Description

Add content of an archive under git annex control.

This results in the files within archive (which must be already under annex control itself) added under annex referencing original archive via custom special remotes mechanism

Example:

> annex-repo$ datalad add-archive-content my_big_tarball.tar.gz

Options

archive

archive file or a key (if –key specified). Constraints: value must be a string

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

–annex *ANNEX*

annex instance to use. [Default: None]

–add-archive-leading-dir

flag to place extracted content under a directory which would correspond to archive name with suffix stripped. E.g. for archive EXAMPLE.ZIP its content will be extracted under a directory EXAMPLE/. [Default: False]

–strip-leading-dirs

flag to move all files directories up, from how they were stored in an archive, if that one contained a number (possibly more than 1 down) single leading directories. [Default: False]

–leading-dirs-depth *LEADING_DIRS_DEPTH*

maximal depth to strip leading directories to. If not specified (None), no limit. [Default: None]

–leading-dirs-consider *LEADING_DIRS_CONSIDER*

regular expression(s) for directories to consider to strip away. Constraints: value must be a string [Default: None]

–use-current-dir

flag to extract archive under the current directory, not the directory where archive is located. Note that it will be of no effect if –key is given. [Default: False]

-d, –delete

flag to delete original archive from the filesystem/git in current tree. Note that it will be of no effect if –key is given. [Default: False]

–key

flag to signal if provided archive is not actually a filename on its own but an annex key. [Default: False]

-e *EXCLUDE*, –exclude *EXCLUDE*

regular expressions for filenames which to exclude from being added to annex. Applied after –rename if that one is specified. For exact matching, use anchoring. Constraints: value must be a string [Default: None]

-r *RENAME*, –rename *RENAME*

regular expressions to rename files before being added under git. First letter defines how to split provided string into two parts: Python regular expression (with groups), and replacement string. Constraints: value must be a string [Default: None]

–existing {fail,overwrite,archive-suffix,numeric-suffix}

what operation to perform a file from archive tries to overwrite an existing file with the same name. ‘fail’ (default) leads to RuntimeError exception. ‘overwrite’ silently replaces existing file. ‘archive-suffix’ instructs to add a suffix (prefixed with a ‘-‘) matching archive name from which file gets extracted, and if that one present, ‘numeric-suffix’ is in effect in addition, when incremental numeric suffix (prefixed with a ‘.’) is added until no name collision is longer detected. [Default: ‘fail’]

-o *ANNEX_OPTIONS*, –annex-options *ANNEX_OPTIONS*

additional options to pass to git-annex. Constraints: value must be a string [Default: None]

–copy

flag to copy the content of the archive instead of moving. [Default: False]

–no-commit

flag to not commit upon completion. [Default: True]

–allow-dirty

flag that operating on a dirty repository (uncommitted or untracked content) is ok. [Default: False]

–stats *STATS*

ActivityStats instance for global tracking. [Default: None]

–drop-after

drop extracted files after adding to annex. [Default: False]

–delete-after

extract under a temporary directory, git-annex add, and delete after. To be used to "index" files within annex without actually creating corresponding files under git. Note that *annex dropunused* would later remove that load. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad clean

Synopsis

```
datalad clean [-h] [-d DATASET] [--what [{cached-archives,annex-tmp,search-index} [
↪{cached-archives,annex-tmp,search-index} ...]]] [-r] [--recursion-limit LEVELS]
```

Description

Clean up after DataLad (possible temporary files etc.)

Removes extracted temporary archives, etc.

Examples:

$ datalad clean

Options

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

specify the dataset to perform the clean operation on. If no dataset is given, an attempt is made to identify the dataset in current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–what [{cached-archives,annex-tmp,search-index} [{cached-archives,annex-tmp,search-index} . . .]]

What to clean. If none specified – all known targets are cleaned. [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type ‘int’ [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad download-url

Synopsis

```
datalad download-url [-h] [-d PATH] [-O PATH] [-o] [--archive] [--nosave] [-m␣
↪MESSAGE] url [url ...]
```

Description

Download content

It allows for a uniform download interface to various supported URL schemes, re-using or asking for authentication details maintained by datalad.

Examples:

$ datalad download-url http://example.com/file.dat s3://bucket/file2.dat

Options

url

URL(s) to be downloaded. Constraints: value must be a string

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d PATH, –dataset PATH

specify the dataset to add files to. If no dataset is given, an attempt is made to identify the dataset based on the current working directory and/or the PATH given. Use –nosave to prevent adding files to the dataset. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-O *PATH*, –path *PATH*

path (filename or directory path) where to store downloaded file(s). In case of multiple URLs provided, must point to a directory. Otherwise current directory is used. Constraints: value must be a string [Default: None]

-o, –overwrite

flag to overwrite it if target file exists. [Default: False]

–archive

pass the downloaded files to datalad add-archive-content –delete. [Default: False]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

-m MESSAGE, –message MESSAGE

a description of the state or the changes made to a dataset. Constraints: value must be a string [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad ls

Synopsis

```
datalad ls [-h] [-r] [-F] [-a] [-L] [--config-file CONFIG_FILE] [--list-content {None,
↪first10,md5,full}] [--json {file,display,delete}] [PATH/URL [PATH/URL ...]]
```

Description

List summary information about URLs and dataset(s)

ATM only s3:// URLs and datasets are supported

Examples:

$ datalad ls s3://openfmri/tarballs/ds202 # to list S3 bucket $ datalad ls # to list current dataset

Options

PATH/URL

URL or path to list, e.g. s3://... Constraints: value must be a string

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-r, –recursive

recurse into subdirectories. [Default: False]

-F, –fast

only perform fast operations. Would be overridden by –all. [Default: False]

-a, –all

list all (versions of) entries, not e.g. only latest entries in case of S3. [Default: False]

-L, –long

list more information on entries (e.g. acl, urls in s3, annex sizes etc). [Default: False]

–config-file *CONFIG_FILE*

path to config file which could help the 'ls'. E.g. for s3:// URLs could be some ~/.s3cfg file which would provide credentials. Constraints: value must be a string [Default: None]

–list-content {None,first10,md5,full}

list also the content or only first 10 bytes (first10), or md5 checksum of an entry. Might require expensive transfer and dump binary output to your screen. Do not enable unless you know what you are after. [Default: False]

–json {file,display,delete}

metadata json of dataset for creating web user interface. display: prints jsons to stdout or file: writes each subdir metadata to json file in subdir of dataset or delete: deletes all metadata json files in dataset. [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad test

Synopsis

```
datalad test [-h] [-v] [-s] [--pdb] [-x] [module [module ...]]
```

Description

Run internal DataLad (unit)tests.

This can be used to verify correct operation on the system. It is just a thin wrapper around a call to nose, so number of exposed options is minimal

Options

module

test name(s), by default all tests of DataLad core and any installed extensions are executed. [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-v, –verbose

be verbose - list test names. [Default: False]

-s, –nocapture

do not capture stdout. [Default: False]

–pdb

drop into debugger on failures or errors. [Default: False]

-x, –stop

stop running tests after the first error or failure. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.1.6 Plugin commands

datalad add-readme

Synopsis

```
datalad add-readme [-h] [-d DATASET] [--existing skip|append|replace] [PATH]
```

Description

Add basic information about DataLad datasets to a README file

The README file is added to the dataset and the addition is saved in the dataset.

Options

PATH

Path of the README file within the dataset. Constraints: value must be a string [Default: 'README.md']

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

Dataset to add information to. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path)

–existing skip|append|replace

How to react if a file with the target name already exists: 'skip': do nothing; 'append': append information to the existing file; 'replace': replace the existing file with new content. Constraints: value must be a string [Default: 'skip']

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad addurls

Synopsis

```
datalad addurls [-h] [-d DATASET] [-t TYPE] [-x REGEXP] [-m FORMAT] [--message␣
↪MESSAGE] [-n] [--fast] [--ifexists ACTION] [--missing-value VALUE] [--nosave] [--
↪version-urls] URL-FILE URL-FORMAT FILENAME-FORMAT
```

Description

Create and update a dataset from a list of URLs.

Format specification

Several arguments take format strings. These are similar to normal Python format strings where the names from URL-FILE (column names for a CSV or properties for JSON) are available as placeholders. If URL-FILE is a CSV file, a positional index can also be used (i.e., "{0}" for the first column). Note that a placeholder cannot contain a ':' or '!'.

In addition, the FILENAME-FORMAT arguments has a few special placeholders.

- _repindex

  The constructed file names must be unique across all fields rows. To avoid collisions, the special placeholder "_repindex" can be added to the formatter. Its value will start at 0 and increment every time a file name repeats.

- _url_hostname, _urlN, _url_basename*

  Various parts of the formatted URL are available. Take "http://datalad.org/asciicast/seamless_nested_repos.sh" as an example.

  "datalad.org" is stored as "_url_hostname". Components of the URL's path can be referenced as "_urlN". "_url0" and "_url1" would map to "asciicast" and "seamless_nested_repos.sh", respectively. The final part of the path is also available as "_url_basename".

  This name is broken down further. "_url_basename_root" and "_url_basename_ext" provide access to the root name and extension. These values are similar to the result of os.path.splitext, but, in the case of multiple periods, the extension is identified using the same length heuristic that git-annex uses. As a result, the extension of "file.tar.gz" would be ".tar.gz", not ".gz". In addition, the fields "_url_basename_root_py" and "_url_basename_ext_py" provide access to the result of os.path.splitext.

- _url_filename*

  These are similar to _url_basename* fields, but they are obtained with a server request. This is useful if the file name is set in the Content-Disposition header.

Examples

Consider a file "avatars.csv" that contains:

```
who,ext,link
neurodebian,png,https://avatars3.githubusercontent.com/u/260793
datalad,png,https://avatars1.githubusercontent.com/u/8927200
```

To download each link into a file name composed of the 'who' and 'ext' fields, we could run:

```
$ datalad addurls -d avatar_ds --fast avatars.csv '{link}' '{who}.{ext}'
```

The *-d avatar_ds* is used to create a new dataset in "$PWD/avatar_ds".

If we were already in a dataset and wanted to create a new subdataset in an "avatars" subdirectory, we could use "//" in the FILENAME-FORMAT argument:

```
$ datalad addurls --fast avatars.csv '{link}' 'avatars//{who}.{ext}'
```

NOTE

For users familiar with 'git annex addurl': A large part of this plugin's functionality can be viewed as transforming data from URL-FILE into a "url filename" format that fed to 'git annex addurl –batch –with-files'.

Options

URL-FILE

A file that contains URLs or information that can be used to construct URLs. Depending on the value of –input-type, this should be a CSV file (with a header as the first row) or a JSON file (structured as a list of objects with string values).

URL-FORMAT

A format string that specifies the URL for each entry. See the 'Format Specification' section above.

FILENAME-FORMAT

Like URL-FORMAT, but this format string specifies the file to which the URL's content will be downloaded. The file name may contain directories. The separator "//" can be used to indicate that the left-side directory should be created as a new subdataset. See the 'Format Specification' section above.

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

Add the URLs to this dataset (or possibly subdatasets of this dataset). An empty or non-existent directory is passed to create a new dataset. New subdatasets can be specified with FILENAME-FORMAT. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path)

-t TYPE, –input-type TYPE

Whether URL-FILE should be considered a CSV file or a JSON file. The default value, “ext”, means to consider URL-FILE as a JSON file if it ends with “.json”. Otherwise, treat it as a CSV file. Constraints: value must be one of (‘ext’, ‘csv’, ‘json’) [Default: ‘ext’]

-x REGEXP, –exclude-autometa REGEXP

By default, metadata field=value pairs are constructed with each column in URL- FILE, excluding any single column that is specified via URL-FORMAT. This argument can be used to exclude columns that match a regular expression. If set to ‘*’ or an empty string, automatic metadata extraction is disabled completely. This argument does not affect metadata set explicitly with –meta. [Default: None]

-m FORMAT, –meta FORMAT

A format string that specifies metadata. It should be structured as “<field>=<value>”. As an example, “location={3}” would mean that the value for the “location” metadata field should be set the value of the fourth column. This option can be given multiple times. [Default: None]

–message MESSAGE

Use this message when committing the URL additions. Constraints: value must be NONE, or value must be a string [Default: None]

-n, –dry-run

Report which URLs would be downloaded to which files and then exit. [Default: False]

–fast

If True, add the URLs, but don’t download their content. Underneath, this passes the –fast flag to *git annex addurl*. [Default: False]

–ifexists ACTION

What to do if a constructed file name already exists. The default behavior is to proceed with the *git annex addurl*, which will fail if the file size has changed. If set to ‘overwrite’, remove the old file before adding the new one. If set to ‘skip’, do not add the new file. Constraints: value must be NONE, or value must be one of (‘overwrite’, ‘skip’) [Default: None]

–missing-value VALUE

When an empty string is encountered, use this value instead. Constraints: value must be NONE, or value must be a string [Default: None]

–nosave

by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]

–version-urls

Try to add a version ID to the URL. This currently only has an effect on URLs for AWS S3 buckets. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad check-dates

Synopsis

```
datalad check-dates [-h] [-D DATE] [--rev REVISION] [--annex all|tree|none] [--no-
↪tags] [--older] [PATH [PATH ...]]
```

Description

Find repository dates that are more recent than a reference date.

The main purpose of this tool is to find "leaked" real dates in repositories that are configured to use fake dates. It checks dates from three sources: (1) commit timestamps (author and committer dates), (2) timestamps within files of the "git-annex" branch, and (3) the timestamps of annotated tags.

Options

PATH

Root directory in which to search for Git repositories. The current working directory will be used by default. Constraints: value must be a string

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-D DATE, –reference-date DATE

Compare dates to this date. If dateutil is installed, this value can be any format that its parser recognizes. Otherwise, it should be a unix timestamp that starts with a "@". The default value corresponds to 01 Jan, 2018 00:00:00 -0000. Constraints: value must be a string [Default: '@1514764800']

–rev REVISION

Search timestamps from commits that are reachable from REVISION. Any revision specification supported by git log, including flags like –all and –tags, can be used. This option can be given multiple times. [Default: None]

–annex all|tree|none

Mode for "git-annex" branch search. If 'all', all blobs within the branch are searched. 'tree' limits the search to blobs that are referenced by the tree at the tip of the branch. 'none' disables search of "git-annex" blobs. Constraints: value must be one of ('all', 'tree', 'none') [Default: 'all']

–no-tags

Don't check the dates of annotated tags. [Default: False]

–older

Find dates which are older than the reference date rather than newer. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad export-archive

Synopsis

```
datalad export-archive [-h] [-d DATASET] [-t tar|zip] [-c gz|bz2|] [--missing-content␣
↪error|continue|ignore] [PATH]
```

Description

Export the content of a dataset as a TAR/ZIP archive.

Options

PATH

File name of the generated TAR archive. If no file name is given the archive will be generated in the current directory and will be named: datalad_<dataset_uuid>.(tar.*|zip). To generate that file in a different directory, provide an existing directory as the file name. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

“specify the dataset to export. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path)

-t tar|zip, –archivetype tar|zip

Type of archive to generate. Constraints: value must be a string [Default: ‘tar’]

-c gz|bz2|, –compression gz|bz2|

Compression method to use. ‘bz2’ is not supported for ZIP archives. No compression is used when an empty string is given. Constraints: value must be a string [Default: ‘gz’]

–missing-content error|continue|ignore

By default, any discovered file with missing content will result in an error and the export is aborted. Setting this to ‘continue’ will issue warnings instead of failing on error. The value ‘ignore’ will only inform about problem at the ‘debug’ log level. The latter two can be helpful when generating a TAR archive from a dataset where some file content is not available locally. Constraints: value must be a string [Default: ‘error’]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad export-to-figshare

Synopsis

```
datalad export-to-figshare [-h] [-d DATASET] [--missing-content␣
↪error|continue|ignore] [--no-annex] [--article-id ID] [PATH]
```

Description

Export the content of a dataset as a ZIP archive to figshare

Very quick and dirty approach. Ideally figshare should be supported as a proper git annex special remote. Unfortunately, figshare does not support having directories, and can store only a flat list of files. That makes it impossible for any sensible publishing of complete datasets.

The only workaround is to publish dataset as a zip-ball, where the entire content is wrapped into a .zip archive for which figshare would provide a navigator.

Options

PATH

File name of the generated ZIP archive. If no file name is given the archive will be generated in the top directory of the dataset and will be named: datalad_<dataset_uuid>.zip. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

“specify the dataset to export. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path)

–missing-content error|continue|ignore

By default, any discovered file with missing content will result in an error and the plugin is aborted. Setting this to ‘continue’ will issue warnings instead of failing on error. The value ‘ignore’ will only inform about problem at the ‘debug’ log level. The latter two can be helpful when generating a TAR archive from a dataset where some file content is not available locally. Constraints: value must be a string [Default: ‘error’]

–no-annex

By default the generated .zip file would be added to annex, and all files would get registered in git-annex to be available from such a tarball. Also upon upload we will register for that archive to be a possible source for it in annex. Setting this flag disables this behavior. [Default: False]

–article-id ID

Which article to publish to. Constraints: value must be convertible to type ‘int’ [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad no-annex

Synopsis

```
datalad no-annex [-h] [-d DATASET] [--pattern PATTERN [PATTERN ...]] [--ref-dir REF_
↪DIR] [--makedirs]
```

Description

Configure a dataset to never put some content into the dataset's annex

This can be useful in mixed datasets that also contain textual data, such as source code, which can be efficiently and more conveniently managed directly in Git.

Patterns generally look like this:

```
code/*
```

which would match all file in the code directory. In order to match all files under CODE/, including all its subdirectories use such a pattern:

```
code/**
```

Note that the plugin works incrementally, hence any existing configuration (e.g. from a previous plugin run) is amended, not replaced.

Parameters

ref_dir : str, optional makedirs : bool, optional

Options

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

"specify the dataset to configure. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path)

–pattern *PATTERN* [*PATTERN* . . .]

list of path patterns. Any content whose path is matching any pattern will not be annexed when added to a dataset, but instead will be tracked directly in Git. Path pattern have to be relative to the directory given by the REF_DIR option. By default, patterns should be relative to the root of the dataset.

–ref-dir *REF_DIR*

Relative path (within the dataset) to the directory that is to be configured. All patterns are interpreted relative to this path, and configuration is written to a .GITATTRIBUTES file in this directory. [Default: '.']

–makedirs

If set, any missing directories will be created in order to be able to place a file into –REF-DIR. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad wtf

Synopsis

```
datalad wtf [-h] [-d DATASET] [-s SENSITIVE] [-c]
```

Description

Generate a report about the DataLad installation and configuration

IMPORTANT: Sharing this report with untrusted parties (e.g. on the web) should be done with care, as it may include identifying information, and/or credentials or access tokens.

Options

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

"specify the dataset to report on. no dataset is given, an attempt is made to identify the dataset based on the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-s *SENSITIVE*, –sensitive *SENSITIVE*

if set to 'some' or 'all', it will display sections such as config and metadata which could potentially contain sensitive information (credentials, names, etc.). If 'some', the fields which are known to be sensitive will still be masked out. Constraints: value must be one of ('some', 'all') [Default: None]

-c, –clipboard

if set, do not print but copy to clipboard (requires pyperclip module. [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.1.7 Plumbing commands

datalad annotate-paths

Synopsis

```
datalad annotate-paths [-h] [-d DATASET] [-r] [--recursion-limit LEVELS] [--action␣
↪LABEL] [--unavailable-path-status LABEL] [--unavailable-path-msg message] [--
↪nondataset-path-status LABEL] [--no-parentds-discovery] [--no-subds-discovery] [--
↪revision-change-discovery] [--no-untracked-discovery] [--modified [MODIFIED]] [PATH␣
↪[PATH ...]]
```

Description

Analyze and act upon input paths

Given paths (or more generally location requests) are inspected and annotated with a number of properties. A list of recognized properties is provided below.

Recognized path properties

“action” label of the action that triggered the path annotation

“annexkey” annex key for the content of a file

“logger” logger for reporting a message

“message” message (plus possible tsring expansion arguments)

“orig_request” original input by which a path was determined

“parentds” path of dataset containing the annotated path (superdataset for subdatasets)

“path” absolute path that is annotated

“process_content” flag that content underneath the path is to be processed

“process_updated_only” flag that only known dataset components are to be processed

“raw_input” flag whether this path was given as raw (non-annotated) input

“refds” path of a reference/base dataset the annotated path is part of

“registered_subds” flag whether a dataset is known to be a true subdataset of PARENTDS

“revision” the recorded commit for a subdataset in a superdataset

“revision_descr” a human-readable description of REVISION

“source_url” URL a dataset was installed from

“staged” flag whether a path is known to be “staged” in its containing dataset

“state” state indicator for a path in its containing dataset (clean, modified, absent (also for files), conflict)

“status” action result status (ok, notneeded, impossible, error)

“type” nature of the path (file, directory, dataset)

“url” registered URL for a subdataset in a superdataset

In the case of enabled modification detection the results may contain additional properties regarding the nature of the modification. See the documentation of the DIFF command for details.

Options

PATH

path to be annotated. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

an optional reference/base dataset for the paths. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type ‘int’ [Default: None]

–action LABEL

an “action” property value to include in the path annotation. Constraints: value must be a string [Default: None]

–unavailable-path-status LABEL

a “status” property value to include in the annotation for paths that are underneath a dataset, but do not exist on the filesystem. Constraints: value must be a string [Default: ‘’]

–unavailable-path-msg message

a "message" property value to include in the annotation for paths that are underneath a dataset, but do not exist on the filesystem. Constraints: value must be a string [Default: None]

–nondataset-path-status LABEL

a "status" property value to include in the annotation for paths that are not underneath any dataset. Constraints: value must be a string [Default: 'error']

–no-parentds-discovery

Flag to disable reports of parent dataset information for any path, in particular dataset root paths. Disabling saves on command run time, if this information is not needed. [Default: True]

–no-subds-discovery

Flag to disable reporting type='dataset' for subdatasets, even when they are not installed, or their mount point directory doesn't exist. Disabling saves on command run time, if this information is not needed. [Default: True]

–revision-change-discovery

Flag to disable discovery of changes which were not yet committed. Disabling saves on command run time, if this information is not needed. [Default: True]

–no-untracked-discovery

Flag to disable discovery of untracked changes. Disabling saves on command run time, if this information is not needed. [Default: True]

–modified [*MODIFIED*]

comparison reference specification for modification detection. This can be (mostly) anything that *git diff* understands (commit, treeish, tag, etc). See the documentation of *datalad diff –revision* for details. Unmodified paths will not be annotated. If a requested path was not modified but some content underneath it was, then the request is replaced by the modified paths and those are annotated instead. This option can be used without an argument to test against changes that have been made, but have not yet been staged for a commit. Constraints: value must be a string, or value must be convertible to type bool [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad clone

Synopsis

```
datalad clone [-h] [-d DATASET] [-D DESCRIPTION] [--reckless] [--alternative-sources␣
↪SOURCE [SOURCE ...]] SOURCE [PATH]
```

Description

Obtain a dataset copy from a URL or local source (path)

The purpose of this command is to obtain a new clone (copy) of a dataset and place it into a not-yet-existing or empty directory. As such CLONE provides a strict subset of the functionality offered by INSTALL. Only a single dataset can be obtained, recursion is not supported. However, once installed, arbitrary dataset components can be obtained via a subsequent GET command.

Primary differences over a direct *git clone* call are 1) the automatic initialization of a dataset annex (pure Git repositories are equally supported); 2) automatic registration of the newly obtained dataset as a subdataset (submodule), if a parent dataset is specified; 3) support for datalad's resource identifiers and automatic generation of alternative access URL for common cases (such as appending '.git' to the URL in case the accessing the base URL failed); and 4) ability to take additional alternative source locations as an argument.

Options

SOURCE

URL, DataLad resource identifier, local path or instance of dataset to be cloned. Constraints: value must be a string

PATH

path to clone into. If no PATH is provided a destination path will be derived from a source URL similar to git clone. [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

(parent) dataset to clone into. If given, the newly cloned dataset is registered as a subdataset of the parent. Also, if given, relative paths are interpreted as being relative to the parent dataset, and not relative to the working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-D *DESCRIPTION*, –description *DESCRIPTION*

short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. Constraints: value must be a string [Default: None]

–reckless

Set up the dataset to be able to obtain content in the cheapest/fastest possible way, even if this poses a potential risk the data integrity (e.g. hardlink files from a local clone of the dataset). Use with care, and limit to "read-only" use cases. With this flag the installed dataset will be marked as untrusted. [Default: False]

–alternative-sources SOURCE [SOURCE . . .]

Alternative sources to be tried if a dataset cannot be obtained from the main SOURCE. Constraints: value must be a string [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad create-test-dataset

Synopsis

```
datalad create-test-dataset [-h] [--spec SPEC] [--seed SEED] path
```

Description

Create test (meta-)dataset.

Options

path

path/name where to create (if specified, must not exist). Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

–spec *SPEC*

spec for hierarchy, defined as a min-max (min could be omitted to assume 0) defining how many (random number from min to max) of sub-datasets to generate at any given level of the hierarchy. Each level separated from each other with /. Example: 1-3/-2 would generate from 1 to 3 subdatasets at the top level, and up to two within those at the 2nd level. Constraints: value must be a string [Default: None]

–seed *SEED*

seed for rng. Constraints: value must be convertible to type 'int' [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad diff

Synopsis

```
datalad diff [-h] [-d DATASET] [--revision [REVISION EXPRESSION]] [--staged] [--
↪ignore-subdatasets IGNORE_SUBDATASETS] [--report-untracked REPORT_UNTRACKED] [-r] [-
↪-recursion-limit LEVELS] [PATH [PATH ...]]
```

Description

Report changes of dataset components.

Reports can be generated for changes between recorded revisions, or between a revision and the state of a dataset's work tree.

Unlike 'git diff', this command also reports untracked content when comparing a revision to the state of the work tree. Such content is marked with the property STATE='UNTRACKED' in the command results.

The following types of changes are distinguished and reported via the STATE result property:

- added
- copied
- deleted
- modified
- renamed
- typechange
- unmerged
- untracked

Whenever applicable, source and/or destination revisions are reported to indicate when exactly within the requested revision range a particular component changed its status.

Optionally, the reported changes can be limited to a subset of paths within a dataset.

Options

PATH

path to be evaluated. Constraints: value must be a string [Default: None]

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

specify the dataset to query. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–revision [REVISION EXPRESSION]

comparison reference specification. Three modes are supported: 1) <revision> changes you have in your working tree relative to the named revision (this can also be a branch name, tag, commit or any label Git can understand). 2) <revision>..<revision> changes between two arbitrary revisions. 3) <revision>...<revision> changes on the branch containing and up to the second <revision>, starting at a common ancestor of both revisions. [Default: None]

–staged

get the changes already staged for a commit relative to an optionally given revision (by default the most recent one). [Default: False]

–ignore-subdatasets *IGNORE_SUBDATASETS*

speed up execution by (partially) not evaluating the state of subdatasets in a parent dataset. With "none" a subdataset is considered modified when it either contains untracked or modified content or its last saved state differs from that recorded in the parent dataset. When "untracked" is used subdatasets are not considered modified when they only contain untracked content (but they are still scanned for modified content). Using "dirty" ignores all changes to the work tree of subdatasets, only changes to the revisions stored in the parent dataset are shown. Using "all" hides all changes to subdatasets. Note, even with "all" recursive execution will still report other changes in any existing subdataset, only the subdataset record in a parent dataset is not evaluated. Constraints: value must be one of ('none', 'untracked', 'dirty', 'all') [Default: 'none']

–report-untracked *REPORT_UNTRACKED*

If and how untracked content is reported when comparing a revision to the state of the work tree. 'no': no untracked files are reported; 'normal': untracked files and entire untracked directories are reported as such; 'all': report individual files even in fully untracked directories. Constraints: value must be one of ('no', 'normal', 'all') [Default: 'normal']

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad sshrun

Synopsis

```
datalad sshrun [-h] [-p PORT] [-n] login cmd
```

Description

Run command on remote machines via SSH.

This is a replacement for a small part of the functionality of SSH. In addition to SSH alone, this command can make use of datalad's SSH connection management. Its primary use case is to be used with Git as 'core.sshCommand' or via "GIT_SSH_COMMAND".

Options

login

[user@]hostname.

cmd

command for remote execution.

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-p *PORT*, –port *PORT*

port to connect to on the remote host. [Default: None]

-n

Redirect stdin from /dev/null. [Default: False]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad siblings

Synopsis

```
datalad siblings [-h] [-d DATASET] [-s NAME] [--url [URL]] [--pushurl PUSHURL] [-D␣
↪DESCRIPTION] [--fetch] [--as-common-datasrc NAME] [--publish-depends SIBLINGNAME] [-
↪-publish-by-default REFSPEC] [--annex-wanted EXPR] [--annex-required EXPR] [--annex-
↪group EXPR] [--annex-groupwanted EXPR] [--inherit] [--no-annex-info] [-r] [--
↪recursion-limit LEVELS] [ACTION]
```

Description

Manage sibling configuration

This command offers four different actions: 'query', 'add', 'remove', 'configure', 'enable'. 'query' is the default action and can be used to obtain information about (all) known siblings. 'add' and 'configure' are highly similar actions, the only difference being that adding a sibling with a name that is already registered will fail, whereas reconfiguring a (different) sibling under a known name will not be considered an error. 'enable' can be used to complete access configuration for non-Git sibling (aka git-annex special remotes). Lastly, the 'remove' action allows for the removal (or de-configuration) of a registered sibling.

For each sibling (added, configured, or queried) all known sibling properties are reported. This includes:

"name" Name of the sibling

"path" Absolute path of the dataset

"url" For regular siblings at minimum a "fetch" URL, possibly also a "pushurl"

Additionally, any further configuration will also be reported using a key that matches that in the Git configuration.

By default, sibling information is rendered as one line per sibling following this scheme:

```
<dataset_path>: <sibling_name>(<+|->) [<access_specification]
```

where the + and - labels indicate the presence or absence of a remote data annex at a particular remote, and ACCESS_SPECIFICATION contains either a URL and/or a type label for the sibling.

Options

ACTION

command action selection (see general documentation). Constraints: value must be one of ('query', 'add', 'remove', 'configure', 'enable') [Default: 'query']

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

specify the dataset to configure. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

-s NAME, –name NAME

name of the sibling. For sibling removal this option is mandatory, otherwise the hostname part of a given URL is used as a default. This option can be used to limit 'query' to a specific sibling. Constraints: value must be a string [Default: None]

–url [*URL*]

the URL of or path to the dataset sibling named by NAME. For recursive operation it is required that a template string for building subdataset sibling URLs is given. List of currently available placeholders: %NAME the name of the dataset, where slashes are replaced by dashes. Constraints: value must be a string [Default: None]

–pushurl *PUSHURL*

in case the URL cannot be used to publish to the dataset sibling, this option specifies a URL to be used instead. If no URL is given, PUSHURL serves as URL as well. Constraints: value must be a string [Default: None]

-D *DESCRIPTION*, –description *DESCRIPTION*

short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. Constraints: value must be a string [Default: None]

–fetch

fetch the sibling after configuration. [Default: False]

–as-common-datasrc NAME

configure the created sibling as a common data source of the dataset that can be automatically used by all consumers of the dataset (technical: git-annex auto- enabled special remote). [Default: None]

–publish-depends SIBLINGNAME

add a dependency such that the given existing sibling is always published prior to the new sibling. This equals setting a configuration item 'remote.SIBLINGNAME .datalad-publish-depends'. This option can be given more than once to configure multiple dependencies. Constraints: value must be a string [Default: None]

–publish-by-default REFSPEC

add a refspec to be published to this sibling by default if nothing specified. Constraints: value must be a string [Default: None]

–annex-wanted EXPR

expression to specify 'wanted' content for the repository/sibling. See https ://git-annex.branchable.com/git-annex-wanted/ for more information. Constraints: value must be a string [Default: None]

–annex-required EXPR

expression to specify 'required' content for the repository/sibling. See https ://git-annex.branchable.com/git-annex-required/ for more information. Constraints: value must be a string [Default: None]

–annex-group EXPR

expression to specify a group for the repository. See https://git- annex.branchable.com/git-annex-group/ for more information. Constraints: value must be a string [Default: None]

–annex-groupwanted EXPR

expression for the groupwanted. Makes sense only if –annex-wanted="groupwanted" and annex-group is given too. See https://git-annex.branchable.com/git-annex- groupwanted/ for more information. Constraints: value must be a string [Default: None]

–inherit

if sibling is missing, inherit settings (git config, git annex wanted/group/groupwanted) from its super-dataset. [Default: False]

–no-annex-info

Whether to query all information about the annex configurations of siblings. Can be disabled if speed is a concern. [Default: True]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

datalad subdatasets

Synopsis

```
datalad subdatasets [-h] [-d DATASET] [--fulfilled FULFILLED] [-r] [--recursion-limit␣
↪LEVELS] [--contains PATH] [--bottomup] [--set-property NAME VALUE] [--delete-
↪property NAME]
```

Description

Report subdatasets and their properties.

The following properties are reported (if possible) for each matching subdataset record.

"name" Name of the subdataset in the parent (often identical with the relative path in the parent dataset)

"path" Absolute path to the subdataset

"parentds" Absolute path to the parent dataset

"revision" SHA1 of the subdataset commit recorded in the parent dataset

"state" Condition of the subdataset: 'clean', 'modified', 'absent', 'conflict' as reported by *git submodule*

"revision_descr" Output of *git describe* for the subdataset

"gitmodule_url" URL of the subdataset recorded in the parent

"gitmodule_<label>" Any additional configuration property on record.

Performance note: Property modification, requesting BOTTOMUP reporting order, or a particular numerical RECURSION_LIMIT implies an internal switch to an alternative query implementation for recursive query that is more flexible, but also notably slower (performs one call to Git per dataset versus a single call for all combined).

The following properties for subdatasets are recognized by DataLad (without the 'gitmodule_' prefix that is used in the query results):

"datalad-recursiveinstall" If set to 'skip', the respective subdataset is skipped when DataLad is recursively installing its superdataset. However, the subdataset remains installable when explicitly requested, and no other features are impaired.

Options

-h, –help, –help-np

show this help message. –help-np forcefully disables the use of a pager for displaying the help message

-d *DATASET*, –dataset *DATASET*

specify the dataset to query. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. Constraints: Value must be a Dataset or a valid identifier of a Dataset (e.g. a path) [Default: None]

–fulfilled *FULFILLED*

if given, must be a boolean flag indicating whether to report either only locally present or absent datasets. By default subdatasets are reported regardless of their status. Constraints: value must be convertible to type bool [Default: None]

-r, –recursive

if set, recurse into potential subdataset. [Default: False]

–recursion-limit LEVELS

limit recursion into subdataset to the given number of levels. Constraints: value must be convertible to type 'int' [Default: None]

–contains PATH

limit report to the subdatasets containing the given path. If a root path of a subdataset is given the last reported dataset will be the subdataset itself. Constraints: value must be a string [Default: None]

–bottomup

whether to report subdatasets in bottom-up order along each branch in the dataset tree, and not top-down. [Default: False]

–set-property NAME VALUE

Name and value of one or more subdataset properties to be set in the parent dataset's .gitmodules file. The property name is case-insensitive, must start with a letter, and consist only of alphanumeric characters. The value can be a Python format() template string wrapped in '<>' (e.g. '<{gitmodule_name}>'). Supported keywords are any item reported in the result properties of this command, plus 'refds_relpath' and 'refds_relname': the relative path of a subdataset with respect to the base dataset of the command call, and, in the latter case, the same string with all directory separators replaced by dashes. This option can be given multiple times. Constraints: value must be a string [Default: None]

–delete-property NAME

Name of one or more subdataset properties to be removed from the parent dataset's .gitmodules file. This option can be given multiple times. Constraints: value must be a string [Default: None]

Authors

datalad is developed by The DataLad Team and Contributors <team@datalad.org>.

5.2 Python module reference

This module reference extends the manual with a comprehensive overview of the available functionality built into datalad. Each module in the package is documented by a general summary of its purpose and the list of classes and functions it provides.

5.2.1 High-level user interface

Dataset operations

api.Dataset(path)	Representation of a DataLad dataset/repository
api.add([path, dataset, to_git, save, ...])	Add files/directories to an existing dataset.
api.create([path, force, description, ...])	Create a new dataset from scratch.
api.create_sibling(sshurl[, name, ...])	Create a dataset sibling on a UNIX-like SSH-accessible machine
api.create_sibling_github(reponame[, ...])	Create dataset sibling on Github.
api.drop([path, dataset, recursive, ...])	Drop file content from datasets
api.get([path, source, dataset, recursive, ...])	Get any dataset content (files/directories/subdatasets).
api.install([path, source, dataset, ...])	Install a dataset from a (remote) source.
api.publish([path, dataset, to, since, ...])	Publish a dataset to a known *sibling*.
api.remove([path, dataset, recursive, ...])	Remove components from datasets
api.save([message, path, dataset, ...])	Save the current state of a dataset
api.update([path, sibling, merge, dataset, ...])	Update a dataset from a sibling.
api.uninstall([path, dataset, recursive, ...])	Uninstall subdatasets
api.unlock([path, dataset, recursive, ...])	Unlock file(s) of a dataset

datalad.api.Dataset

class datalad.api.**Dataset**(*path*)

Representation of a DataLad dataset/repository

This is the core data type of DataLad: a representation of a dataset. At its core, datasets are (git-annex enabled) Git repositories. This class provides all operations that can be performed on a dataset.

Creating a dataset instance is cheap, all actual operations are delayed until they are actually needed. Creating multiple *Dataset* class instances for the same Dataset location will automatically yield references to the same object.

A dataset instance comprises of two major components: a *repo* attribute, and a *config* attribute. The former offers access to low-level functionality of the Git or git-annex repository. The latter gives access to a dataset's configuration manager.

Most functionality is available via methods of this class, but also as stand-alone functions with the same name in *datalad.api*.

__init__(*path*)

Parameters **path** (*str*) – Path to the dataset location. This location may or may not exist yet.

Methods

`__init__`(path)	**param path** Path to the dataset location. This location may or may not exist
`add`([dataset, to_git, save, message, ...])	Add files/directories to an existing dataset.
`add_readme`([filename, existing])	Add basic information about DataLad datasets to a README file
`addurls`(urlfile, urlformat, filenameformat)	Create and update a dataset from a list of URLs.
`aggregate_metadata`([dataset, recursive, ...])	Aggregate metadata of one or more datasets for later query.
`annotate_paths`([dataset, recursive, ...])	Analyze and act upon input paths
`clean`([what, recursive, recursion_limit])	Clean up after DataLad (possible temporary files etc.)
`clone`([path, dataset, description, ...])	Obtain a dataset copy from a URL or local source (path)
`close`()	Perform operations which would close any possible process using this Dataset
`create`([force, description, dataset, ...])	Create a new dataset from scratch.
`create_sibling`([name, target_dir, ...])	Create a dataset sibling on a UNIX-like SSH-accessible machine
`create_sibling_github`([dataset, recursive, ...])	Create dataset sibling on Github.
`diff`([dataset, revision, staged, ...])	Report changes of dataset components.
`download_url`([dataset, path, overwrite, ...])	Download content
`drop`([dataset, recursive, recursion_limit, ...])	Drop file content from datasets
`export_archive`([filename, archivetype, ...])	Export the content of a dataset as a TAR/ZIP archive.
`export_to_figshare`([filename, ...])	Export the content of a dataset as a ZIP archive to figshare
`extract_metadata`([files, dataset])	Run one or more of DataLad's metadata extractors on a dataset or file.
`get`([source, dataset, recursive, ...])	Get any dataset content (files/directories/subdatasets).
`get_subdatasets`([pattern, fulfilled, ...])	DEPRECATED: use *subdatasets()*
`get_superdataset`([datalad_only, topmost, ...])	Get the dataset's superdataset
`install`([source, dataset, get_data, ...])	Install a dataset from a (remote) source.
`is_installed`()	Returns whether a dataset is installed.
`metadata`([dataset, get_aggregates, ...])	Metadata reporting for files and entire datasets
`no_annex`(pattern[, ref_dir, makedirs])	Configure a dataset to never put some content into the dataset's annex
`publish`([dataset, to, since, missing, ...])	Publish a dataset to a known *sibling*.
`recall_state`(whereto)	Something that can be used to checkout a particular state (tag, commit) to "undo" a change or switch to a otherwise desired previous state.
`remove`([dataset, recursive, check, save, ...])	Remove components from datasets
`rerun`([since, dataset, branch, message, ...])	Re-execute previous *datalad run* commands.
`run`([dataset, inputs, outputs, expand, ...])	Run an arbitrary shell command and record its impact on a dataset.

Continued on next page

Table 2 – continued from previous page

run_procedure([dataset, discover, help_proc])	Run prepared procedures (DataLad scripts) on a dataset
save([path, dataset, all_updated, ...])	Save the current state of a dataset
search([dataset, force_reindex, ...])	Search dataset metadata
siblings([dataset, name, url, pushurl, ...])	Manage sibling configuration
subdatasets([fulfilled, recursive, ...])	Report subdatasets and their properties.
uninstall([dataset, recursive, check, if_dirty])	Uninstall subdatasets
unlock([dataset, recursive, recursion_limit])	Unlock file(s) of a dataset
update([sibling, merge, dataset, recursive, ...])	Update a dataset from a sibling.
wtf([sensitive, clipboard])	Generate a report about the DataLad installation and configuration

Attributes

config	Get an instance of the parser for the persistent dataset configuration.
id	Identifier of the dataset.
path	path to the dataset
repo	Get an instance of the version control system/repo for this dataset, or None if there is none yet (or none anymore).

datalad.api.add

datalad.api.**add**(*path=None*, *dataset=None*, *to_git=None*, *save=True*, *message=None*, *recursive=False*, *recursion_limit=None*, *ds2super=False*, *git_opts=None*, *annex_opts=None*, *annex_add_opts=None*, *jobs=None*)

Add files/directories to an existing dataset.

Typically, files and directories to be added to a dataset would be placed into a directory of a dataset, and subsequently this command can be used to register this new content with the dataset. With recursion enabled, files will be added to their respective subdatasets as well.

By default all files are added to the dataset's *annex*, i.e. only their content identity and availability information is tracked with Git. This results in lightweight datasets. If desired, the *to_git* flag can be used to tell datalad to inject files directly into Git. While this is not recommended for binary data or large files, it can be used for source code and meta-data to be able to benefit from Git's track and merge capabilities. Files checked directly into Git are always and unconditionally available immediately after installation of a dataset.

Note: Power-user info: This command uses **git annex add** or **git add** to incorporate new dataset content.

Parameters

- **path** (*non-empty sequence of str or None, optional*) – path/name of the component to be added. The component must exist on the filesystem already. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the add operation on. If no dataset is given, an attempt is made to identify the dataset based on the current working directory and/or the *path* given. [Default: None]

- **to_git** (*bool, optional*) – flag whether to add data directly to Git, instead of tracking data identity only. Usually this is not desired, as it inflates dataset sizes and impacts flexibility of data transport. If not specified - it will be up to git-annex to decide, possibly on .gitattributes options. [Default: None]
- **save** (*bool, optional*) – by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]
- **message** (*str or None, optional*) – a description of the state or the changes made to a dataset. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **ds2super** (*bool, optional*) – given paths of dataset (toplevel) locations will cause these datasets to be added to their respective superdatasets underneath a given base *dataset* (instead of all their content to themselves). If no base *dataset* is provided, this flag has no effect. Regular files and directories are always added to their respective datasets, regardless of this setting. [Default: False]
- **git_opts** (*str or None, optional*) – option string to be passed to **git** calls. [Default: None]
- **annex_opts** (*str or None, optional*) – option string to be passed to **git annex** calls. [Default: None]
- **annex_add_opts** (*str or None, optional*) – option string to be passed to **git annex add** calls. [Default: None]
- **jobs** (*int or None or {'auto'}, optional*) – how many parallel jobs (where possible) to use. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]

- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.create

datalad.api.**create**(*path=None*, *force=False*, *description=None*, *dataset=None*, *no_annex=False*, *save=True*, *annex_version=None*, *annex_backend='MD5E'*, *native_metadata_type=None*, *shared_access=None*, *git_opts=None*, *annex_opts=None*, *annex_init_opts=None*, *text_no_annex=None*, *fake_dates=False*)

Create a new dataset from scratch.

This command initializes a new *dataset* at a given location, or the current directory. The new dataset can optionally be registered in an existing *superdataset* (the new dataset's path needs to be located within the superdataset for that, and the superdataset needs to be given explicitly). It is recommended to provide a brief description to label the dataset's nature *and* location, e.g. "Michael's music on black laptop". This helps humans to identify data locations in distributed scenarios. By default an identifier comprised of user and machine name, plus path will be generated.

This command only creates a new dataset, it does not add any content to it, even if the target directory already contains additional files or directories.

Plain Git repositories can be created via the *no_annex* flag. However, the result will not be a full dataset, and, consequently, not all features are supported (e.g. a description).

To create a local version of a remote dataset use the *install()* command instead.

Note: Power-user info: This command uses **git init** and **git annex init** to prepare the new dataset. Registering to a superdataset is performed via a **git submodule add** operation in the discovered superdataset.

Parameters

- **path** (*str or Dataset or None, optional*) – path where the dataset shall be created, directories will be created as necessary. If no location is provided, a dataset will be created in the current working directory. Either way the command will error if the target directory is not empty. Use *force* to create a dataset in a non-empty directory. [Default: None]
- **force** (*bool, optional*) – enforce creation of a dataset in a non-empty directory. [Default: False]
- **description** (*str or None, optional*) – short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. [Default: None]

- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the create operation on. If a dataset is given, a new subdataset will be created in it. [Default: None]
- **no_annex** (*bool, optional*) – if set, a plain Git repository will be created without any annex. [Default: False]
- **save** (*bool, optional*) – by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]
- **annex_version** (*int or None, optional*) – select a particular annex repository version. The list of supported versions depends on the available git-annex version. This should be left untouched, unless you know what you are doing. [Default: None]
- **annex_backend** (*str or None, optional*) – set default hashing backend used by the new dataset. For a list of supported backends see the git-annex documentation. The default is optimized for maximum compatibility of datasets across platforms (especially those with limited path lengths). [Default: 'MD5E']
- **native_metadata_type** (*list of str or None, optional*) – Metadata type label. Must match the name of the respective parser implementation in DataLad (e.g. "xmp"). [Default: None]
- **shared_access** – configure shared access to a dataset, see *git init –shared* documentation for complete details on the supported scenarios. Possible values include: 'false', 'true', 'group', and 'all'. [Default: None]
- **git_opts** (*str or None, optional*) – option string to be passed to **git** calls. [Default: None]
- **annex_opts** (*str or None, optional*) – option string to be passed to **git annex** calls. [Default: None]
- **annex_init_opts** (*str or None, optional*) – option string to be passed to **git annex init** calls. [Default: None]
- **text_no_annex** (*bool, optional*) – if set, all text files in the future would be added to Git, not annex. Achieved by adding an entry to *.gitattributes* file. See http://git-annex.branchable.com/tips/largefiles/ and *no_annex* DataLad plugin to establish even more detailed control over which files are placed under annex control. [Default: None]
- **fake_dates** (*bool, optional*) – Configure the repository to use fake dates. The date for a new commit will be set to one second later than the latest commit in the repository. This can be used to anonymize dates. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]

- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.create_sibling

datalad.api.**create_sibling**(*sshurl*, *name=None*, *target_dir=None*, *target_url=None*, *target_pushurl=None*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *existing='error'*, *shared=None*, *ui=False*, *as_common_datasrc=None*, *publish_by_default=None*, *publish_depends=None*, *annex_wanted=None*, *annex_group=None*, *annex_groupwanted=None*, *inherit=False*, *since=None*)

Create a dataset sibling on a UNIX-like SSH-accessible machine

Given a local dataset, and SSH login information this command creates a remote dataset repository and configures it as a dataset sibling to be used as a publication target (see *publish* command).

Various properties of the remote sibling can be configured (e.g. name location on the server, read and write access URLs, and access permissions.

Optionally, a basic web-viewer for DataLad datasets can be installed at the remote location.

This command supports recursive processing of dataset hierarchies, creating a remote sibling for each dataset in the hierarchy. By default, remote siblings are created in hierarchical structure that reflects the organization on the local file system. However, a simple templating mechanism is provided to produce a flat list of datasets (see –target-dir).

Parameters

- **sshurl** (*str*) – Login information for the target server. This can be given as a URL (ssh://host/path) or SSH-style (user@host:path). Unless overridden, this also serves the future dataset's access URL and path on the server.
- **name** (*str or None, optional*) – sibling name to create for this publication target. If *recursive* is set, the same name will be used to label all the subdatasets' siblings. When creating a target dataset fails, no sibling is added. [Default: None]
- **target_dir** (*str or None, optional*) – path to the directory *on the server* where the dataset shall be created. By default the SSH access URL is used to identify this directory. If a relative path is provided here, it is interpreted as being relative to the user's home directory on the server. Additional features are relevant for recursive processing of datasets

with subdatasets. By default, the local dataset structure is replicated on the server. However, it is possible to provide a template for generating different target directory names for all (sub)datasets. Templates can contain certain placeholder that are substituted for each (sub)dataset. For example: "/mydirectory/dataset%%RELNAME". Supported placeholders: %%RELNAME - the name of the datasets, with any slashes replaced by dashes. [Default: None]

- **target_url** (*str or None, optional*) – "public" access URL of the to-be-created target dataset(s) (default: *sshurl*). Accessibility of this URL determines the access permissions of potential consumers of the dataset. As with *target_dir*, templates (same set of placeholders) are supported. Also, if specified, it is provided as the annex description. [Default: None]
- **target_pushurl** (*str or None, optional*) – In case the *target_url* cannot be used to publish to the dataset, this option specifies an alternative URL for this purpose. As with *target_url*, templates (same set of placeholders) are supported. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to create the publication target for. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **existing** (*{'skip', 'replace', 'error', 'reconfigure'}, optional*) – action to perform, if a sibling is already configured under the given name and/or a target directory already exists. In this case, a dataset can be skipped ('skip'), an existing target directory be forcefully re-initialized, and the sibling (re-)configured ('replace', implies 'reconfigure'), the sibling configuration be updated only ('reconfigure'), or to error ('error'). [Default: 'error']
- **shared** (*str or bool or None, optional*) – if given, configures the access permissions on the server for multi- users (this could include access by a webserver!). Possible values for this option are identical to those of *git init –shared* and are described in its documentation. [Default: None]
- **ui** (*bool or str, optional*) – publish a web interface for the dataset with an optional user- specified name for the html at publication target. defaults to *index.html* at dataset root. [Default: False]
- **as_common_datasrc** – configure the created sibling as a common data source of the dataset that can be automatically used by all consumers of the dataset (technical: git-annex auto-enabled special remote). [Default: None]
- **publish_by_default** (*list of str or None, optional*) – add a refspec to be published to this sibling by default if nothing specified. [Default: None]
- **publish_depends** (*list of str or None, optional*) – add a dependency such that the given existing sibling is always published prior to the new sibling. This equals setting a configuration item 'remote.SIBLINGNAME.datalad-publish-depends'. Multiple dependencies can be given as a list of sibling names. [Default: None]
- **annex_wanted** (*str or None, optional*) – expression to specify 'wanted' content for the repository/sibling. See https://git-annex.branchable.com/git-annex-wanted/ for more information. [Default: None]

- **annex_group** (*str or None, optional*) – expression to specify a group for the repository. See https://git- annex.branchable.com/git-annex-group/ for more information. [Default: None]
- **annex_groupwanted** (*str or None, optional*) – expression for the groupwanted. Makes sense only if annex_wanted="groupwanted" and annex-group is given too. See https ://git-annex.branchable.com/git-annex-groupwanted/ for more information. [Default: None]
- **inherit** (*bool, optional*) – if sibling is missing, inherit settings (git config, git annex wanted/group/groupwanted) from its super-dataset. [Default: False]
- **since** (*str or None, optional*) – limit processing to datasets that have been changed since a given state (by tag, branch, commit, etc). This can be used to create siblings for recently added subdatasets. [Default: None]

datalad.api.create_sibling_github

datalad.api.**create_sibling_github**(*reponame*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *name='github'*, *existing='error'*, *github_login=None*, *github_passwd=None*, *github_organization=None*, *access_protocol='https'*, *publish_depends=None*, *dryrun=False*)

Create dataset sibling on Github.

A repository can be created under a user's Github account, or any organization a user is a member of (given appropriate permissions).

Recursive sibling creation for subdatasets is supported. A dataset hierarchy is represented as a flat list of Github repositories.

Github cannot host dataset content. However, in combination with other data sources (and siblings), publishing a dataset to Github can facilitate distribution and exchange, while still allowing any dataset consumer to obtain actual data content from alternative sources.

For Github authentication user credentials can be given as arguments. Alternatively, they are obtained interactively or queried from the systems credential store. Lastly, an *oauth* token stored in the Git configuration under variable *hub.oauthtoken* will be used automatically. Such a token can be obtained, for example, using the commandline Github interface (https://github.com/sociomantic/git-hub) by running: `git hub setup`.

Parameters

- **reponame** (*str*) – Github repository name. When operating recursively, a suffix will be appended to this name for each subdataset.
- **dataset** (*Dataset or None, optional*) – specify the dataset to create the publication target for. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **name** (*str, optional*) – name to represent the Github repository in the local dataset installation. [Default: 'github']
- **existing** (*{'skip', 'error', 'reconfigure'}, optional*) – desired behavior when already existing or configured siblings are discovered. 'skip': ignore; 'error':

fail immediately; 'reconfigure': use the existing repository and reconfigure the local dataset to use it as a sibling. [Default: 'error']

- **github_login** (*str or None, optional*) – Github user name or access token. [Default: None]
- **github_passwd** (*str or None, optional*) – Github user password. [Default: None]
- **github_organization** (*str or None, optional*) – If provided, the repository will be created under this Github organization. The respective Github user needs appropriate permissions. [Default: None]
- **access_protocol** (*{'https', 'ssh'}, optional*) – Which access protocol/URL to configure for the sibling. [Default: 'https']
- **publish_depends** (*list of str or None, optional*) – add a dependency such that the given existing sibling is always published prior to the new sibling. This equals setting a configuration item 'remote.SIBLINGNAME.datalad-publish-depends'. Multiple dependencies can be given as a list of sibling names. [Default: None]
- **dryrun** (*bool, optional*) – If this flag is set, no communication with Github is performed, and no repositories will be created. Instead would-be repository names are reported for all relevant datasets. [Default: False]

datalad.api.drop

datalad.api.**drop**(*path=None*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *check=True*, *if_dirty='save-before'*)

Drop file content from datasets

This command takes any number of paths of files and/or directories. If a common (super)dataset is given explicitly, the given paths are interpreted relative to this dataset.

Recursion into subdatasets needs to be explicitly enabled, while recursion into subdirectories within a dataset is done automatically. An optional recursion limit is applied relative to each given input path.

By default, the availability of at least one remote copy is verified before file content is dropped. As these checks could lead to slow operation (network latencies, etc), they can be disabled.

Examples

Drop all file content in a dataset:

```
~/some/dataset$ datalad drop
```

Drop all file content in a dataset and all its subdatasets:

```
~/some/dataset$ datalad drop --recursive
```

Parameters

- **path** (*sequence of str or None, optional*) – path/name of the component to be dropped. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the operation on. If no dataset is given, an attempt is made to identify a dataset based on the *path* given. [Default: None]

- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **check** (*bool, optional*) – whether to perform checks to assure the configured minimum number (remote) source for data. [Default: True]
- **if_dirty** – desired behavior if a dataset with unsaved changes is discovered: 'fail' will trigger an error and further processing is aborted; 'save-before' will save all changes prior any further action; 'ignore' let's datalad proceed as if the dataset would not have unsaved changes. [Default: 'save-before']
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.get

datalad.api.**get**(*path=None*, *source=None*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *get_data=True*, *description=None*, *reckless=False*, *jobs='auto'*, *verbose=False*)

Get any dataset content (files/directories/subdatasets).

This command only operates on dataset content. To obtain a new independent dataset from some source use the *install* command.

By default this command operates recursively within a dataset, but not across potential subdatasets, i.e. if a directory is provided, all files in the directory are obtained. Recursion into subdatasets is supported too. If enabled, relevant subdatasets are detected and installed in order to fulfill a request.

Known data locations for each requested file are evaluated and data are obtained from some available location (according to git-annex configuration and possibly assigned remote priorities), unless a specific source is specified.

Note: Power-user info: This command uses **`git annex get`** to fulfill file handles.

Parameters

- **`path`** (*sequence of str or None, optional*) – path/name of the requested dataset component. The component must already be known to a dataset. To add new components to a dataset use the *add* command. [Default: None]
- **`source`** (*str or None, optional*) – label of the data source to be used to fulfill requests. This can be the name of a dataset *sibling* or another known source. [Default: None]
- **`dataset`** (*Dataset or None, optional*) – specify the dataset to perform the add operation on, in which case *path* arguments are interpreted as being relative to this dataset. If no dataset is given, an attempt is made to identify a dataset for each input *path*. [Default: None]
- **`recursive`** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **`recursion_limit`** (*int or {'existing'} or None, optional*) – limit recursion into subdataset to the given number of levels. Alternatively, 'existing' will limit recursion to subdatasets that already existed on the filesystem at the start of processing, and prevent new subdatasets from being obtained recursively. [Default: None]
- **`get_data`** (*bool, optional*) – whether to obtain data for all file handles. If disabled, *get* operations are limited to dataset handles. [Default: True]
- **`description`** (*str or None, optional*) – short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. [Default: None]
- **`reckless`** (*bool, optional*) – Set up the dataset to be able to obtain content in the cheapest/fastest possible way, even if this poses a potential risk the data integrity (e.g. hardlink files from a local clone of the dataset). Use with care, and limit to "read-only" use cases. With this flag the installed dataset will be marked as untrusted. [Default: False]
- **`jobs`** (*int or None or {'auto'}, optional*) – how many parallel jobs (where possible) to use. [Default: 'auto']
- **`verbose`** (*bool, optional*) – print out more detailed information while executing a command. [Default: False]
- **`on_failure`** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions

will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']

- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.install

datalad.api.**install**(*path=None*, *source=None*, *dataset=None*, *get_data=False*, *description=None*, *recursive=False*, *recursion_limit=None*, *save=True*, *reckless=False*, *jobs='auto'*)

Install a dataset from a (remote) source.

This command creates a local *sibling* of an existing dataset from a (remote) location identified via a URL or path. Optional recursion into potential subdatasets, and download of all referenced data is supported. The new dataset can be optionally registered in an existing *superdataset* by identifying it via the *dataset* argument (the new dataset's path needs to be located within the superdataset for that).

It is recommended to provide a brief description to label the dataset's nature *and* location, e.g. "Michael's music on black laptop". This helps humans to identify data locations in distributed scenarios. By default an identifier comprised of user and machine name, plus path will be generated.

When only partial dataset content shall be obtained, it is recommended to use this command without the *get-data* flag, followed by a `get()` operation to obtain the desired data.

Note: Power-user info: This command uses **git clone**, and **git annex init** to prepare the dataset.

Registering to a superdataset is performed via a **git submodule add** operation in the discovered superdataset.

Parameters

- **path** – path/name of the installation target. If no *path* is provided a destination path will be derived from a source URL similar to **git clone**. [Default: None]
- **source** (*str or None, optional*) – URL or local path of the installation source. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the install operation on. If no dataset is given, an attempt is made to identify the dataset in a parent directory of the current working directory and/or the *path* given. [Default: None]
- **get_data** (*bool, optional*) – if given, obtain all data content too. [Default: False]
- **description** (*str or None, optional*) – short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **save** (*bool, optional*) – by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]
- **reckless** (*bool, optional*) – Set up the dataset to be able to obtain content in the cheapest/fastest possible way, even if this poses a potential risk the data integrity (e.g. hardlink files from a local clone of the dataset). Use with care, and limit to "read-only" use cases. With this flag the installed dataset will be marked as untrusted. [Default: False]
- **jobs** (*int or None or {'auto'}, optional*) – how many parallel jobs (where possible) to use. [Default: 'auto']
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]

- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.publish

datalad.api.**publish**(*path=None*, *dataset=None*, *to=None*, *since=None*, *missing='fail'*, *force=False*, *transfer_data='auto'*, *recursive=False*, *recursion_limit=None*, *git_opts=None*, *annex_opts=None*, *annex_copy_opts=None*, *jobs=None*)

Publish a dataset to a known *sibling*.

This makes the last saved state of a dataset available to a sibling or special remote data store of a dataset. Any target sibling must already exist and be known to the dataset.

Optionally, it is possible to limit publication to change sets relative to a particular point in the version history of a dataset (e.g. a release tag). By default, the state of the local dataset is evaluated against the last known state of the target sibling. Actual publication is only attempted if there was a change compared to the reference state, in order to speed up processing of large collections of datasets. Evaluation with respect to a particular "historic" state is only supported in conjunction with a specified reference dataset. Change sets are also evaluated recursively, i.e. only those subdatasets are published where a change was recorded that is reflected in to current state of the top-level reference dataset. See "since" option for more information.

Only publication of saved changes is supported. Any unsaved changes in a dataset (hierarchy) have to be saved before publication.

Note: Power-user info: This command uses **git push**, and **git annex copy** to publish a dataset. Publication targets are either configured remote Git repositories, or git-annex special remotes (if they support data upload).

Parameters

- **path** (*sequence of str or None, optional*) – path(s), that may point to file handle(s) to publish including their actual content or to subdataset(s) to be published. If a file handle is published with its data, this implicitly means to also publish the (sub)dataset it belongs to. '.' as a path is treated in a special way in the sense, that it is passed to subdatasets in case *recursive* is also given. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the (top-level) dataset to be published. If no dataset is given, the datasets are determined based on the input arguments. [Default: None]
- **to** (*str or None, optional*) – name of the target sibling. If no name is given an attempt is made to identify the target based on the dataset's configuration (i.e. a configured tracking branch, or a single sibling that is configured for publication). [Default: None]

- **since** (*str or None, optional*) – When publishing dataset(s), specifies commit (treeish, tag, etc) from which to look for changes to decide whether updated publishing is necessary for this and which children. If empty argument is provided, then we would take from the previously published to that remote/sibling state (for the current branch). [Default: None]
- **missing** (*{'fail', 'inherit', 'skip'}, optional*) – action to perform, if a sibling does not exist in a given dataset. By default it would fail the run ('fail' setting). With 'inherit' a 'create-sibling' with '–inherit-settings' will be used to create sibling on the remote. With 'skip' - it simply will be skipped. [Default: 'fail']
- **force** (*bool, optional*) – enforce doing publish activities (git push etc) regardless of the analysis if they seemed needed. [Default: False]
- **transfer_data** (*{'auto', 'none', 'all'}, optional*) – ADDME. [Default: 'auto']
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **git_opts** (*str or None, optional*) – option string to be passed to **git** calls. [Default: None]
- **annex_opts** (*str or None, optional*) – option string to be passed to **git annex** calls. [Default: None]
- **annex_copy_opts** (*str or None, optional*) – option string to be passed to **git annex copy** calls. [Default: None]
- **jobs** (*int or None or {'auto'}, optional*) – how many parallel jobs (where possible) to use. [Default: None]

datalad.api.remove

datalad.api.**remove**(*path=None*, *dataset=None*, *recursive=False*, *check=True*, *save=True*, *message=None*, *if_dirty='save-before'*)

Remove components from datasets

This command can remove subdatasets and paths, including non-empty directories, from datasets. Removing a component implies dropping present content and uninstalling associated subdatasets. Subsequently, the component is "unregistered" from the respective dataset. This means that the component is no longer present on the file system.

By default, the availability of at least one remote copy is verified before file content is dropped. As these checks could lead to slow operation (network latencies, etc), they can be disabled.

Examples

Permanently remove a subdataset from a dataset and wipe out the subdataset association too:

```
~/some/dataset$ datalad remove somesubdataset1
```

Parameters

- **path** (*sequence of str or None, optional*) – path/name of the component to be removed. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the operation on. If no dataset is given, an attempt is made to identify a dataset based on the *path* given. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **check** (*bool, optional*) – whether to perform checks to assure the configured minimum number (remote) source for data. [Default: True]
- **save** (*bool, optional*) – by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]
- **message** (*str or None, optional*) – a description of the state or the changes made to a dataset. [Default: None]
- **if_dirty** – desired behavior if a dataset with unsaved changes is discovered: 'fail' will trigger an error and further processing is aborted; 'save-before' will save all changes prior any further action; 'ignore' let's datalad proceed as if the dataset would not have unsaved changes. [Default: 'save-before']
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item

return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.save

datalad.api.**save**(*message=None*, *path=None*, *dataset=None*, *all_updated=True*, *version_tag=None*, *recursive=False*, *recursion_limit=None*, *super_datasets=False*, *message_file=None*)

Save the current state of a dataset

Saving the state of a dataset records changes that have been made to it. This change record is annotated with a user-provided description. Optionally, an additional tag, such as a version, can be assigned to the saved state. Such tag enables straightforward retrieval of past versions at a later point in time.

Examples

Save any content underneath the current directory, without altering any potential subdataset (use –recursive for that):

```
% datalad save .
```

Save any modification of known dataset content, but leave untracked files (e.g. temporary files) untouched:

```
% dataset save -d <path_to_dataset>
```

Tag the most recent saved state of a dataset:

```
% dataset save -d <path_to_dataset> --version-tag bestyet
```

Parameters

- **message** (*str or None, optional*) – a description of the state or the changes made to a dataset. [Default: None]
- **path** (*sequence of str or None, optional*) – path/name of the dataset component to save. If given, only changes made to those components are recorded in the new state. [Default: None]
- **dataset** (*Dataset or None, optional*) – "specify the dataset to save. [Default: None]
- **all_updated** (*bool, optional*) – if no explicit paths are given, save changes of all known components in a datasets. [Default: True]
- **version_tag** (*str or None, optional*) – an additional marker for that state. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **super_datasets** (*bool, optional*) – if set, save a change in a dataset also in its superdataset. [Default: False]
- **message_file** (*str or None, optional*) – take the commit message from this file. This flag is mutually exclusive with -m. [Default: None]

- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.update

datalad.api.**update**(*path=None*, *sibling=None*, *merge=False*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *fetch_all=None*, *reobtain_data=False*)

Update a dataset from a sibling.

Parameters

- **path** (*sequence of str or None, optional*) – path to a dataset that shall be updated. [Default: None]
- **sibling** (*str or None, optional*) – name of the sibling to update from. If no sibling is given, updates from all siblings are obtained. [Default: None]
- **merge** (*bool, optional*) – merge obtained changes from the given or the default sibling. [Default: False]
- **dataset** (*Dataset or None, optional*) – "specify the dataset to update. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. [Default: None]

- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **fetch_all** (*bool, optional*) – this option has no effect and will be removed in a future version. When no siblings are given, an all-sibling update will be performed. [Default: None]
- **reobtain_data** (*bool, optional*) – if enabled, file content that was present before an update will be re-obtained in case a file was changed by the update. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.uninstall

datalad.api.**uninstall**(*path=None*, *dataset=None*, *recursive=False*, *check=True*, *if_dirty='save-before'*)

Uninstall subdatasets

This command can be used to uninstall any number of installed subdatasets. This command will error if individual files or non-dataset directories are given as input (use the drop or remove command depending on the

desired goal), nor will it uninstall top-level datasets (i.e. datasets that are not a subdataset in another dataset; use the remove command for this purpose).

By default, the availability of at least one remote copy for each currently available file in any dataset is verified. As these checks could lead to slow operation (network latencies, etc), they can be disabled.

Any number of paths to process can be given as input. Recursion into subdatasets needs to be explicitly enabled, while recursion into subdirectories within a dataset is done automatically. An optional recursion limit is applied relative to each given input path.

Examples

Uninstall a subdataset (undo installation):

```
~/some/dataset$ datalad uninstall somesubdataset1
```

Parameters

- **path** (*sequence of str or None, optional*) – path/name of the component to be uninstalled. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the operation on. If no dataset is given, an attempt is made to identify a dataset based on the *path* given. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **check** (*bool, optional*) – whether to perform checks to assure the configured minimum number (remote) source for data. [Default: True]
- **if_dirty** – desired behavior if a dataset with unsaved changes is discovered: 'fail' will trigger an error and further processing is aborted; 'save-before' will save all changes prior any further action; 'ignore' let's datalad proceed as if the dataset would not have unsaved changes. [Default: 'save-before']
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]

- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.unlock

datalad.api.**unlock**(*path=None*, *dataset=None*, *recursive=False*, *recursion_limit=None*)

Unlock file(s) of a dataset

Unlock files of a dataset in order to be able to edit the actual content

Parameters

- **path** (*sequence of str or None, optional*) – file(s) to unlock. [Default: None]
- **dataset** (*Dataset or None, optional*) – "specify the dataset to unlock files in. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. If the latter fails, an attempt is made to identify the dataset based on *path*. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports

**kwargs it will additionally be passed the keyword arguments of the original API call. [Default: None]

- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

Metadata handling

api.search([query, dataset, force_reindex, ...])	Search dataset metadata
api.metadata([path, dataset, ...])	Metadata reporting for files and entire datasets
api.aggregate_metadata([path, dataset, ...])	Aggregate metadata of one or more datasets for later query.
api.extract_metadata(types[, files, dataset])	Run one or more of DataLad's metadata extractors on a dataset or file.

datalad.api.search

datalad.api.**search**(*query=None*, *dataset=None*, *force_reindex=False*, *max_nresults=None*, *mode=None*, *full_record=False*, *show_keys=None*, *show_query=False*)

Search dataset metadata

DataLad can search metadata extracted from a dataset and/or aggregated into a superdataset (see the *aggregate-metadata* command). This makes it possible to discover datasets, or individual files in a dataset even when they are not available locally.

Ultimately DataLad metadata are a graph of linked data structures. However, this command does not (yet) support queries that can exploit all information stored in the metadata. At the moment the following search modes are implemented that represent different trade-offs between the expressiveness of a query and the computational and storage resources required to execute a query.

- egrep (default)
- egrepcs [case-sensitive egrep]
- textblob
- autofield

An alternative default mode can be configured by tuning the configuration variable 'datalad.search.default-mode':

```
[datalad "search"]
  default-mode = egrepcs
```

Each search mode has its own default configuration for what kind of documents to query. The respective default can be changed via configuration variables:

```
[datalad "search"]
  index-<mode_name>-documenttype = (all|datasets|files)
```

Mode: egrep/egrepcs

These search modes are largely ignorant of the metadata structure, and simply perform matching of a search pattern against a flat string-representation of metadata. This is advantageous when the query is simple and the metadata structure is irrelevant, or precisely known. Moreover, it does not require a search index, hence results can be reported without an initial latency for building a search index when the underlying metadata has changed (e.g. due to a dataset update). By default, these search modes only consider datasets and do not investigate records for individual files for speed reasons. Search results are reported in the order in which they were discovered.

Queries can make use of Python regular expression syntax (https://docs.python.org/3/library/re.html). In *egrep* mode, matching is case-insensitive when the query does not contain upper case characters, but is case-sensitive when it does. In *egrepcs* mode, matching is always case-sensitive. Expressions will match anywhere in a metadata string, not only at the start.

When multiple queries are given, all queries have to match for a search hit (AND behavior).

It is possible to search individual metadata key/value items by prefixing the query with a metadata key name, separated by a colon (':'). The key name can also be a regular expression to match multiple keys. A query match happens when any value of an item with a matching key name matches the query (OR behavior). See examples for more information.

Examples

Query for (what happens to be) an author:

```
% datalad search haxby
```

Queries are case-INsensitive when the query contains no upper case characters, and can be regular expressions. Use *egrepcs* mode when it is desired to perform a case-sensitive lowercase match:

```
% datalad search --mode egrepcs halchenko.*haxby
```

This search mode performs NO analysis of the metadata content. Therefore queries can easily fail to match. For example, the above query implicitly assumes that authors are listed in alphabetical order. If that is the case (which may or may not be true), the following query would yield NO hits:

```
% datalad search Haxby.*Halchenko
```

The `textblob` search mode represents an alternative that is more robust in such cases.

For more complex queries multiple query expressions can be provided that all have to match to be considered a hit (AND behavior). This query discovers all files (non-default behavior) that match 'bids.type=T1w' AND 'nifti1.qform_code=scanner':

```
% datalad -c datalad.search.index-egrep-documenttype=all search bids.type:T1w␣
↪nifti1.qform_code:scanner
```

Key name selectors can also be expressions, which can be used to select multiple keys or construct "fuzzy" queries. In such cases a query matches when any item with a matching key matches the query (OR behavior).

However, multiple queries are always evaluated using an AND conjunction. The following query extends the example above to match any files that have either 'nifti1.qform_code=scanner' or 'nifti1.sform_code=scanner':

```
% datalad -c datalad.search.index-egrep-documenttype=all search bids.type:T1w␣
↪nifti1.(q|s)form_code:scanner
```

Mode: textblob

This search mode is very similar to the `egrep` mode, but with a few key differences. A search index is built from the string-representation of metadata records. By default, only datasets are included in this index, hence the indexing is usually completed within a few seconds, even for hundreds of datasets. This mode uses its own query language (not regular expressions) that is similar to other search engines. It supports logical conjunctions and fuzzy search terms. More information on this is available from the Whoosh project (search engine implementation):

- Description of the Whoosh query language: http://whoosh.readthedocs.io/en/latest/querylang.html)
- Description of a number of query language customizations that are enabled in DataLad, such as, fuzzy term matching: http://whoosh.readthedocs.io/en/latest/parsing.html#common-customizations

Importantly, search hits are scored and reported in order of descending relevance, hence limiting the number of search results is more meaningful than in the 'egrep' mode and can also reduce the query duration.

Examples

Search for (what happens to be) two authors, regardless of the order in which those names appear in the metadata:

```
% datalad search --mode textblob halchenko haxby
```

Fuzzy search when you only have an approximate idea what you are looking for or how it is spelled:

```
% datalad search --mode textblob haxbi~
```

Very fuzzy search, when you are basically only confident about the first two characters and how it sounds approximately (or more precisely: allow for three edits and require matching of the first two characters):

```
% datalad search --mode textblob haksbi~3/2
```

Combine fuzzy search with logical constructs:

```
% datalad search --mode textblob 'haxbi~ AND (hanke OR halchenko)'
```

Mode: autofield

This mode is similar to the 'textblob' mode, but builds a vastly more detailed search index that represents individual metadata variables as individual fields. By default, this search index includes records for datasets and individual fields, hence it can grow very quickly into a huge structure that can easily take an hour or more to build and require more than a GB of storage. However, limiting it to documents on datasets (see above) retains the enhanced expressiveness of queries while dramatically reducing the resource demands.

Examples

List names of search index fields (auto-discovered from the set of indexed datasets):

```
% datalad search --mode autofield --show-keys name
```

Fuzzy search for datasets with an author that is specified in a particular metadata field:

```
% datalad search --mode autofield bids.author:haxbi~ type:dataset
```

Search for individual files that carry a particular description prefix in their 'nifti1' metadata:

```
% datalad search --mode autofield nifti1.description:FSL* type:file
```

Reporting

Search hits are returned as standard DataLad results. On the command line the '–output-format' (or '-f') option can be used to tweak results for further processing.

Examples

Format search hits as a JSON stream (one hit per line):

```
% datalad -f json search haxby
```

Custom formatting: which terms matched the query of particular results. Useful for investigating fuzzy search results:

```
$ datalad -f '{path}: {query_matched}' search --mode autofield bids.author:haxbi~
```

Parameters

- **query** – query string, supported syntax and features depends on the selected search mode (see documentation). [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the query operation on. If no dataset is given, an attempt is made to identify the dataset based on the current working directory and/or the *path* given. [Default: None]
- **force_reindex** (*bool, optional*) – force rebuilding the search index, even if no change in the dataset's state has been detected, for example, when the index documenttype configuration has changed. [Default: False]
- **max_nresults** (*int or None, optional*) – maxmimum number of search results to report. Setting this to 0 will report all search matches. Depending on the mode this can search substantially slower. If not specified, a mode-specific default setting will be used. [Default: None]
- **mode** – Mode of search index structure and content. See section SEARCH MODES for details. [Default: None]
- **full_record** (*bool, optional*) – If set, return the full metadata record for each search hit. Depending on the search mode this might require additional queries. By default, only data that is available to the respective search modes is returned. This always includes essential information, such as the path and the type. [Default: False]
- **show_keys** – if given, a list of known search keys is shown. If 'name' - only the name is printed one per line. If 'short' or 'full', statistics (in how many datasets, and how many unique values) are printed. 'short' truncates the listing of unique values. No other action is performed (except for reindexing), even if other arguments are given. Each key is accompanied by a term definition in parenthesis (TODO). In most cases a definition is given in the form of a URL. If an ontology definition for a term is known, this URL can resolve to a webpage that provides a comprehensive definition of the term. However, for speed reasons

term resolution is solely done on information contained in a local dataset's metadata, and definition URLs might be outdated or point to no longer existing resources. [Default: None]

- **show_query** (*bool, optional*) – if given, the formal query that was generated from the given query string is shown, but not actually executed. This is mostly useful for debugging purposes. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.metadata

datalad.api.**metadata**(*path=None*, *dataset=None*, *get_aggregates=False*, *reporton='all'*, *recursive=False*)

Metadata reporting for files and entire datasets

Two types of metadata are supported:

1. metadata describing a dataset as a whole (dataset-global metadata), and
2. metadata for files in a dataset (content metadata).

Both types can be accessed with this command.

Examples

Report the metadata of a single file, as aggregated into the closest locally available dataset, containing the query path:

```
% datalad metadata somedir/subdir/thisfile.dat
```

Sometimes it is helpful to get metadata records formatted in a more accessible form, here as pretty-printed JSON:

```
% datalad -f json_pp metadata somedir/subdir/thisfile.dat
```

Same query as above, but specify which dataset to query (must be containing the query path):

```
% datalad metadata -d . somedir/subdir/thisfile.dat
```

Report any metadata record of any dataset known to the queried dataset:

```
% datalad metadata --recursive --reporton datasets
```

Get a JSON-formatted report of aggregated metadata in a dataset, incl. information on enabled metadata extractors, dataset versions, dataset IDs, and dataset paths:

```
% datalad -f json metadata --get-aggregates
```

Parameters

- **path** (*sequence of str or None, optional*) – path(s) to query metadata for. [Default: None]
- **dataset** (*Dataset or None, optional*) – dataset to query. If given, metadata will be reported as stored in this dataset. Otherwise, the closest available dataset containing a query path will be consulted. [Default: None]
- **get_aggregates** (*bool, optional*) – if set, yields all (sub)datasets for which aggregate metadata are available in the dataset. No other action is performed, even if other arguments are given. The reported results contain a datasets's ID, the commit hash at which metadata aggregation was performed, and the location of the object file(s) containing the aggregated metadata. [Default: False]
- **reporton** (*{'all', 'datasets', 'files', 'none'}, optional*) – choose on what type result to report on: 'datasets', 'files', 'all' (both datasets and files), or 'none' (no report). [Default: 'all']
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]

- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.aggregate_metadata

datalad.api.**aggregate_metadata**(*path=None*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *update_mode='target'*, *incremental=False*, *force_extraction=False*, *save=True*)

Aggregate metadata of one or more datasets for later query.

Metadata aggregation refers to a procedure that extracts metadata present in a dataset into a portable representation that is stored a single standardized format. Moreover, metadata aggregation can also extract metadata in this format from one dataset and store it in another (super)dataset. Based on such collections of aggregated metadata it is possible to discover particular datasets and specific parts of their content, without having to obtain the target datasets first (see the DataLad 'search' command).

To enable aggregation of metadata that are contained in files of a dataset, one has to enable one or more metadata extractor for a dataset. DataLad supports a number of common metadata standards, such as the Exchangeable Image File Format (EXIF), Adobe's Extensible Metadata Platform (XMP), and various audio file metadata systems like ID3. DataLad extension packages can provide metadata data extractors for additional metadata sources. For example, the neuroimaging extension provides extractors for scientific (meta)data standards like BIDS, DICOM, and NIfTI1. Some metadata extractors depend on particular 3rd-party software. The list of metadata extractors available to a particular DataLad installation is reported by the 'wtf' command ('datalad wtf').

Enabling a metadata extractor for a dataset is done by adding its name to the 'datalad.metadata.nativetype' configuration variable – typically in the dataset's configuration file (.datalad/config), e.g.:

```
[datalad "metadata"]
  nativetype = exif
  nativetype = xmp
```

If an enabled metadata extractor is not available in a particular DataLad installation, metadata extraction will not succeed in order to avoid inconsistent aggregation results.

Enabling multiple extractors is supported. In this case, metadata are extracted by each extractor individually, and stored alongside each other. Metadata aggregation will also extract DataLad's own metadata (extractors 'datalad_core', and 'annex').

Metadata aggregation can be performed recursively, in order to aggregate all metadata across all subdatasets, for example, to be able to search across any content in any dataset of a collection. Aggregation can also be performed for subdatasets that are not available locally. In this case, pre-aggregated metadata from the closest available superdataset will be considered instead.

Depending on the versatility of the present metadata and the number of dataset or files, aggregated metadata can grow prohibitively large. A number of configuration switches are provided to mitigate such issues.

datalad.metadata.aggregate-content-<extractor-name> If set to false, content metadata aggregation will not be performed for the named metadata extractor (a potential underscore '_' in the extractor name must be replaced by a dash '-'). This can substantially reduce the runtime for metadata extraction, and also reduce the size of the generated metadata aggregate. Note, however, that some extractors may not produce any metadata when this is disabled, because their metadata might come from individual file headers only. 'datalad.metadata.store-aggregate-content' might be a more appropriate setting in such cases.

datalad.metadata.aggregate-ignore-fields Any metadata key matching any regular expression in this configuration setting is removed prior to generating the dataset-level metadata summary (keys and their unique values across all dataset content), and from the dataset metadata itself. This switch can also be used to filter out sensitive information prior aggregation.

datalad.metadata.generate-unique-<extractor-name> If set to false, DataLad will not auto-generate a summary of unique content metadata values for a particular extractor as part of the dataset-global metadata (a potential underscore '_' in the extractor name must be replaced by a dash '-'). This can be useful if such a summary is bloated due to minor uninformative (e.g. numerical) differences, or when a particular extractor already provides a carefully designed content metadata summary.

datalad.metadata.maxfieldsize Any metadata value that exceeds the size threshold given by this configuration setting (in bytes/characters) is removed.

datalad.metadata.store-aggregate-content If set, extracted content metadata are still used to generate a dataset-level summary of present metadata (all keys and their unique values across all files in a dataset are determined and stored as part of the dataset-level metadata aggregate, see datalad.metadata.generate-unique-<extractor-name>), but metadata on individual files are not stored. This switch can be used to avoid prohibitively large metadata files. Discovery of datasets containing content matching particular metadata properties will still be possible, but such datasets would have to be obtained first in order to discover which particular files in them match these properties.

Parameters

- **path** (*sequence of str or None, optional*) – path to datasets that shall be aggregated. When a given path is pointing into a dataset, the metadata of the containing dataset will be aggregated. [Default: None]
- **dataset** (*Dataset or None, optional*) – topmost dataset metadata will be aggregated into. All dataset between this dataset and any given path will receive updated aggregated metadata from all given paths. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]

- **update_mode** (*{'all', 'target'}, optional*) – which datasets to update with newly aggregated metadata: all datasets from any leaf dataset to the top-level target dataset including all intermediate datasets (all), or just the top-level target dataset (target). [Default: 'target']
- **incremental** (*bool, optional*) – If set, all information on metadata records of subdatasets that have not been (re-)aggregated in this run will be kept unchanged. This is useful when (re-)aggregation only a subset of a dataset hierarchy, for example, because not all subdatasets are locally available. [Default: False]
- **force_extraction** (*bool, optional*) – If set, all enabled extractors will be engaged regardless of whether change detection indicates that metadata has already been extracted for a given dataset state. [Default: False]
- **save** (*bool, optional*) – by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.extract_metadata

datalad.api.**extract_metadata**(*types*, *files=None*, *dataset=None*)

Run one or more of DataLad's metadata extractors on a dataset or file.

The result(s) are structured like the metadata DataLad would extract during metadata aggregation. There is one result per dataset/file.

Examples

Extract metadata with two extractors from a dataset in the current directory and also from all its files:

```
$ datalad extract-metadata -d . --type frictionless_datapackage --type datalad_
↪core
```

Extract XMP metadata from a single PDF that is not part of any dataset:

```
$ datalad extract-metadata --type xmp Downloads/freshfromtheweb.pdf
```

Parameters

- **types** – Name of a metadata extractor to be executed.
- **files** (*sequence of str or None, optional*) – Path of a file to extract metadata from. [Default: None]
- **dataset** (*Dataset or None, optional*) – "Dataset to extract metadata from. If no *file* is given, metadata is extracted from all files of the dataset. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can

perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]

- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

Reproducible execution

api.run([cmd, dataset, inputs, outputs, ...])	Run an arbitrary shell command and record its impact on a dataset.
api.rerun([revision, since, dataset, ...])	Re-execute previous *datalad run* commands.
api.run_procedure([spec, dataset, discover, ...])	Run prepared procedures (DataLad scripts) on a dataset

datalad.api.run

datalad.api.**run**(*cmd=None*, *dataset=None*, *inputs=None*, *outputs=None*, *expand=None*, *explicit=False*, *message=None*, *sidecar=None*, *rerun=False*)

Run an arbitrary shell command and record its impact on a dataset.

It is recommended to craft the command such that it can run in the root directory of the dataset that the command will be recorded in. However, as long as the command is executed somewhere underneath the dataset root, the exact location will be recorded relative to the dataset root.

If the executed command did not alter the dataset in any way, no record of the command execution is made.

If the given command errors, a *CommandError* exception with the same exit code will be raised, and no modifications will be saved.

Command format

A few placeholders are supported in the command via Python format specification. "{pwd}" will be replaced with the full path of the current working directory. "{dspath}" will be replaced with the full path of the dataset that run is invoked on. "{inputs}" and "{outputs}" represent the values specified by *inputs* and *outputs*. If multiple values are specified, the values will be joined by a space. The order of the values will match that order from the command line, with any globs expanded in alphabetical order (like bash). Individual values can be accessed with an integer index (e.g., "{inputs[0]}").

Note that the representation of the inputs or outputs in the formatted command string depends on whether the command is given as a list of arguments or as a string. The concatenated list of inputs or outputs will be surrounded by quotes when the command is given as a list but not when it is given as a string. This means that the string form is required if you need to pass each input as a separate argument to a preceding script (i.e., write the command as "./script {inputs}", quotes included). The string form should also be used if the input or output paths contain spaces or other characters that need to be escaped.

To escape a brace character, double it (i.e., "{{" or "}}").

Custom placeholders can be added as configuration variables under "datalad.run.substitutions". As an example:

Add a placeholder "name" with the value "joe":

```
% git config --file=.datalad/config datalad.run.substitutions.name joe
% datalad add -m "Configure name placeholder" .datalad/config
```

Access the new placeholder in a command:

```
% datalad run "echo my name is {name} >me"
```

Parameters

- **cmd** – command for execution. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to record the command results in. An attempt is made to identify the dataset based on the current working directory. If a dataset is given, the command will be executed in the root directory of this dataset. [Default: None]
- **inputs** – A dependency for the run. Before running the command, the content of this file will be retrieved. A value of "." means "run **datalad get .**". The value can also be a glob. [Default: None]
- **outputs** – Prepare this file to be an output file of the command. A value of "." means "run **datalad unlock .**" (and will fail if some content isn't present). For any other value, if the content of this file is present, unlock the file. Otherwise, remove it. The value can also be a glob. [Default: None]
- **expand** (*None or {'inputs', 'outputs', 'both'}, optional*) – Expand globs when storing inputs and/or outputs in the commit message. [Default: None]
- **explicit** (*bool, optional*) – Consider the specification of inputs and outputs to be explicit. Don't warn if the repository is dirty, and only save modifications to the listed outputs. [Default: False]
- **message** (*str or None, optional*) – a description of the state or the changes made to a dataset. [Default: None]
- **sidecar** (*None or bool, optional*) – By default, the configuration variable 'datalad.run.record-sidecar' determines whether a record with information on a command's execution is placed into a separate record file instead of the commit message (default: off). This option can be used to override the configured behavior on a case-by-case basis. Sidecar files are placed into the dataset's '.datalad/runinfo' directory (customizable via the 'datalad.run.record-directory' configuration variable). [Default: None]
- **rerun** (*bool, optional*) – re-run the command recorded in the last saved change (if any). Note: This option is deprecated since version 0.9.2 and will be removed in a later release. Use *datalad rerun* instead. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value

does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]

- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.rerun

datalad.api.**rerun**(*revision='HEAD'*, *since=None*, *dataset=None*, *branch=None*, *message=None*, *onto=None*, *script=None*, *report=False*)

Re-execute previous *datalad run* commands.

This will unlock any dataset content that is on record to have been modified by the command in the specified revision. It will then re-execute the command in the recorded path (if it was inside the dataset). Afterwards, all modifications will be saved.

Report mode

When called with report=True, this command reports information about what would be re-executed as a series of records. There will be a record for each revision in the specified revision range. Each of these will have one of the following "rerun_action" values:

- run: the revision has a recorded command that would be re-executed
- skip: the revision does not have a recorded command and would be skipped
- pick: the revision does not have a recorded command and would be cherry picked

The decision to skip rather than cherry pick a revision is based on whether the revision would be reachable from HEAD at the time of execution.

In addition, when a starting point other than HEAD is specified, there is a rerun_action value "checkout", in which case the record includes information about the revision the would be checked out before rerunning any commands.

Examples

Re-execute the command from the previous commit:

```
% datalad rerun
```

Re-execute any commands in the last five commits:

```
% datalad rerun --since=HEAD~5
```

Do the same as above, but re-execute the commands on top of HEAD~5 in a detached state:

```
% datalad rerun --onto= --since=HEAD~5
```

Re-execute all previous commands and compare the old and new results:

```
% # on master branch
% datalad rerun --branch=verify --since=
% # now on verify branch
% datalad diff --revision=master..
% git log --oneline --left-right --cherry-pick master...
```

Note: Currently the "onto" feature only sets the working tree of the current dataset to a previous state. The working trees of any subdatasets remain unchanged.

Parameters

- **revision** (*str, optional*) – rerun command(s) in *revision*. By default, the command from this commit will be executed, but *since* can be used to construct a revision range. [Default: 'HEAD']
- **since** (*str or None, optional*) – If *since* is a commit-ish, the commands from all commits that are reachable from *revision* but not *since* will be re-executed (in other words, the commands in **git log SINCE..REVISION**). If SINCE is an empty string, it is set to the parent of the first commit that contains a recorded command (i.e., all commands in **git log REVISION** will be re-executed). [Default: None]
- **dataset** (Dataset *or None, optional*) – specify the dataset from which to rerun a recorded command. If no dataset is given, an attempt is made to identify the dataset based on the current working directory. If a dataset is given, the command will be executed in the root directory of this dataset. [Default: None]
- **branch** (*str or None, optional*) – create and checkout this branch before rerunning the commands. [Default: None]
- **message** (*str or None, optional*) – use MESSAGE for the reran commit rather than the recorded commit message. In the case of a multi-commit rerun, all the reran commits will have this message. [Default: None]
- **onto** (*str or None, optional*) – start point for rerunning the commands. If not specified, commands are executed at HEAD. This option can be used to specify an alternative start point, which will be checked out with the branch name specified by *branch* or in a detached state otherwise. As a special case, an empty value for this option means to use the commit specified by *since*. [Default: None]
- **script** (*str or None, optional*) – extract the commands into this file rather than rerunning. Use - to write to stdout instead. [Default: None]
- **report** (*bool, optional*) – Don't actually re-execute anything, just display what would be done. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions

will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']

- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.run_procedure

datalad.api.**run_procedure**(*spec=None*, *dataset=None*, *discover=False*, *help_proc=False*)

Run prepared procedures (DataLad scripts) on a dataset

Concept

A "procedure" is an algorithm with the purpose to process a dataset in a particular way. Procedures can be useful in a wide range of scenarios, like adjusting dataset configuration in a uniform fashion, populating a dataset with particular content, or automating other routine tasks, such as synchronizing dataset content with certain siblings.

Implementations of some procedures are shipped together with DataLad, but additional procedures can be provided by 1) any DataLad extension, 2) any (sub-)dataset, 3) a local user, or 4) a local system administrator. DataLad will look for procedures in the following locations and order:

Directories identified by the configuration settings

- 'datalad.locations.user-procedures' (determined by appdirs.user_config_dir; defaults to '$HOME/.config/datalad/procedures' on GNU/Linux systems)
- 'datalad.locations.system-procedures' (determined by appdirs.site_config_dir; defaults to '/etc/xdg/datalad/procedures' on GNU/Linux systems)
- 'datalad.locations.dataset-procedures'

and subsequently in the 'resources/procedures/' directories of any installed extension, and, lastly, of the DataLad installation itself.

Please note that a dataset that defines 'datalad.locations.dataset-procedures' provides its procedures to any dataset it is a subdataset of. That way you can have a collection of such procedures in a dedicated dataset and install it as a subdataset into any dataset you want to use those procedures with. In case of a naming conflict with such a dataset hierarchy, the dataset you're calling run-procedures on will take precedence over its subdatasets and so on.

Each configuration setting can occur multiple times to indicate multiple directories to be searched. If a procedure matching a given name is found (filename without a possible extension), the search is aborted and this implementation will be executed. This makes it possible for individual datasets, users, or machines to override externally provided procedures (enabling the implementation of customizable processing "hooks").

Procedure implementation

A procedure can be any executable. Executables must have the appropriate permissions and, in the case of a script, must contain an appropriate "shebang" line. If a procedure is not executable, but its filename ends with '.py', it is automatically executed by the 'python' interpreter (whichever version is available in the present environment). Likewise, procedure implementations ending on '.sh' are executed via 'bash'.

Procedures can implement any argument handling, but must be capable of taking at least one positional argument (the absolute path to the dataset they shall operate on).

For further customization there are two configuration settings per procedure available:

- 'datalad.procedures.<NAME>.call-format' fully customizable format string to determine how to execute procedure NAME (see also datalad-run). It currently requires to include the following placeholders:
  - '{script}': will be replaced by the path to the procedure
  - '{ds}': will be replaced by the absolute path to the dataset the procedure shall operate on
  - '{args}': (not actually required) will be replaced by

    all but the first element of *spec* if *spec* is a list or tuple As an example the default format string for a call to a python script is: "python {script} {ds} {args}"
- 'datalad.procedures.<NAME>.help' will be shown on *datalad run-procedure –help-proc NAME* to provide a description and/or usage info for procedure NAME

Customize other commands with procedures

On execution of any commands, DataLad inspects two additional configuration settings:

- 'datalad.<name>.proc-pre'
- 'datalad.<name>.proc-post'

where '<name>' is the name of a DataLad command. Using this mechanism DataLad can be instructed to run one or more procedures before or after the execution of a given command. For example, configuring a set of metadata types in any newly created dataset can be achieved via:

% datalad -c 'datalad.create.proc-post=cfg_metadatatypes xmp image' create -d myds

As procedures run on datasets, it is necessary to explicitly identify the target dataset via the -d (–dataset) option.

Parameters

- **spec** – Name and possibly additional arguments of the to-be-executed procedure. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to run the procedure on. An attempt is made to identify the dataset based on the current working directory. [Default: None]

- **discover** (*bool, optional*) – if given, all configured paths are searched for procedures and one result record per discovered procedure is yielded, but no procedure is executed. [Default: False]
- **help_proc** (*bool, optional*) – if given, get a help message for procedure NAME from config setting datalad.procedures.NAME.help. [Default: False]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

Plumbing commands

api.annotate_paths([path, dataset, ...])	Analyze and act upon input paths
api.clean([dataset, what, recursive, ...])	Clean up after DataLad (possible temporary files etc.)
api.clone(source[, path, dataset, ...])	Obtain a dataset copy from a URL or local source (path)
api.create_test_dataset([path, spec, seed])	Create test (meta-)dataset.
api.diff([path, dataset, revision, staged, ...])	Report changes of dataset components.
api.download_url(urls[, dataset, path, ...])	Download content
api.ls(loc[, recursive, fast, all_, long_, ...])	List summary information about URLs and dataset(s)
api.sshrun(login, cmd[, port, no_stdin])	Run command on remote machines via SSH.

Continued on next page

Table 6 – continued from previous page

api.siblings([action, dataset, name, url, ...])	Manage sibling configuration
api.subdatasets([dataset, fulfilled, ...])	Report subdatasets and their properties.

datalad.api.annotate_paths

datalad.api.**annotate_paths**(*path=None*, *dataset=None*, *recursive=False*, *recursion_limit=None*, *action=None*, *unavailable_path_status=''*, *unavailable_path_msg=None*, *nondataset_path_status='error'*, *force_parentds_discovery=True*, *force_subds_discovery=True*, *force_no_revision_change_discovery=True*, *force_untracked_discovery=True*, *modified=None*)

Analyze and act upon input paths

Given paths (or more generally location requests) are inspected and annotated with a number of properties. A list of recognized properties is provided below.

Input *paths* for this command can either be un-annotated (raw) path strings, or already (partially) annotated paths. In the latter case, further annotation is limited to yet-unknown properties, and is potentially faster than initial annotation.

Recognized path properties

"action" label of the action that triggered the path annotation

"annexkey" annex key for the content of a file

"logger" logger for reporting a message

"message" message (plus possible tsring expansion arguments)

"orig_request" original input by which a path was determined

"parentds" path of dataset containing the annotated path (superdataset for subdatasets)

"path" absolute path that is annotated

"process_content" flag that content underneath the path is to be processed

"process_updated_only" flag that only known dataset components are to be processed

"raw_input" flag whether this path was given as raw (non-annotated) input

"refds" path of a reference/base dataset the annotated path is part of

"registered_subds" flag whether a dataset is known to be a true subdataset of *parentds*

"revision" the recorded commit for a subdataset in a superdataset

"revision_descr" a human-readable description of *revision*

"source_url" URL a dataset was installed from

"staged" flag whether a path is known to be "staged" in its containing dataset

"state" state indicator for a path in its containing dataset (clean, modified, absent (also for files), conflict)

"status" action result status (ok, notneeded, impossible, error)

"type" nature of the path (file, directory, dataset)

"url" registered URL for a subdataset in a superdataset

In the case of enabled modification detection the results may contain additional properties regarding the nature of the modification. See the documentation of the *diff* command for details.

Parameters

- **path** (*sequence of str or None, optional*) – path to be annotated. [Default: None]
- **dataset** (*Dataset or None, optional*) – an optional reference/base dataset for the paths. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **action** (*str or None, optional*) – an "action" property value to include in the path annotation. [Default: None]
- **unavailable_path_status** (*str or None, optional*) – a "status" property value to include in the annotation for paths that are underneath a dataset, but do not exist on the filesystem. [Default: ''']
- **unavailable_path_msg** (*str or None, optional*) – a "message" property value to include in the annotation for paths that are underneath a dataset, but do not exist on the filesystem. [Default: None]
- **nondataset_path_status** (*str or None, optional*) – a "status" property value to include in the annotation for paths that are not underneath any dataset. [Default: 'error']
- **force_parentds_discovery** (*bool, optional*) – Flag to disable reports of parent dataset information for any path, in particular dataset root paths. Disabling saves on command run time, if this information is not needed. [Default: True]
- **force_subds_discovery** (*bool, optional*) – Flag to disable reporting type='dataset' for subdatasets, even when they are not installed, or their mount point directory doesn't exist. Disabling saves on command run time, if this information is not needed. [Default: True]
- **force_no_revision_change_discovery** (*bool, optional*) – Flag to disable discovery of changes which were not yet committed. Disabling saves on command run time, if this information is not needed. [Default: True]
- **force_untracked_discovery** (*bool, optional*) – Flag to disable discovery of untracked changes. Disabling saves on command run time, if this information is not needed. [Default: True]
- **modified** (*str or bool or None, optional*) – comparison reference specification for modification detection. This can be (mostly) anything that *git diff* understands (commit, treeish, tag, etc). See the documentation of *datalad diff –revision* for details. Unmodified paths will not be annotated. If a requested path was not modified but some content underneath it was, then the request is replaced by the modified paths and those are annotated instead. This option can be used with *True* as an argument to test against changes that have been made, but have not yet been staged for a commit. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']

- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.clean

datalad.api.**clean**(*dataset=None*, *what=None*, *recursive=False*, *recursion_limit=None*)

Clean up after DataLad (possible temporary files etc.)

Removes extracted temporary archives, etc.

Examples

$ datalad clean

Parameters

- **dataset** (*Dataset or None, optional*) – specify the dataset to perform the clean operation on. If no dataset is given, an attempt is made to identify the dataset in current working directory. [Default: None]
- **what** – What to clean. If none specified – all known targets are cleaned. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions

will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']

- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.clone

datalad.api.**clone**(*source*, *path=None*, *dataset=None*, *description=None*, *reckless=False*, *alt_sources=None*)

Obtain a dataset copy from a URL or local source (path)

The purpose of this command is to obtain a new clone (copy) of a dataset and place it into a not-yet-existing or empty directory. As such *clone* provides a strict subset of the functionality offered by *install*. Only a single dataset can be obtained, recursion is not supported. However, once installed, arbitrary dataset components can be obtained via a subsequent *get* command.

Primary differences over a direct *git clone* call are 1) the automatic initialization of a dataset annex (pure Git repositories are equally supported); 2) automatic registration of the newly obtained dataset as a subdataset (submodule), if a parent dataset is specified; 3) support for datalad's resource identifiers and automatic generation of alternative access URL for common cases (such as appending '.git' to the URL in case the accessing the base URL failed); and 4) ability to take additional alternative source locations as an argument.

Parameters

- **source** (*str or None*) – URL, DataLad resource identifier, local path or instance of dataset to be cloned.
- **path** – path to clone into. If no *path* is provided a destination path will be derived from a source URL similar to **git clone**. [Default: None]

- **dataset** (*Dataset or None, optional*) – (parent) dataset to clone into. If given, the newly cloned dataset is registered as a subdataset of the parent. Also, if given, relative paths are interpreted as being relative to the parent dataset, and not relative to the working directory. [Default: None]
- **description** (*str or None, optional*) – short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. [Default: None]
- **reckless** (*bool, optional*) – Set up the dataset to be able to obtain content in the cheapest/fastest possible way, even if this poses a potential risk the data integrity (e.g. hardlink files from a local clone of the dataset). Use with care, and limit to "read-only" use cases. With this flag the installed dataset will be marked as untrusted. [Default: False]
- **alt_sources** (*non-empty sequence of str or None, optional*) – Alternative sources to be tried if a dataset cannot be obtained from the main *source*. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.create_test_dataset

datalad.api.**create_test_dataset**(*path=None*, *spec=None*, *seed=None*)

Create test (meta-)dataset.

Parameters

- **path** (*str or None, optional*) – path/name where to create (if specified, must not exist). [Default: None]
- **spec** (*str or None, optional*) – spec for hierarchy, defined as a min-max (min could be omitted to assume 0) defining how many (random number from min to max) of sub- datasets to generate at any given level of the hierarchy. Each level separated from each other with /. Example: 1-3/-2 would generate from 1 to 3 subdatasets at the top level, and up to two within those at the 2nd level. [Default: None]
- **seed** (*int or None, optional*) – seed for rng. [Default: None]

datalad.api.diff

datalad.api.**diff**(*path=None*, *dataset=None*, *revision=None*, *staged=False*, *ignore_subdatasets='none'*, *report_untracked='normal'*, *recursive=False*, *recursion_limit=None*)

Report changes of dataset components.

Reports can be generated for changes between recorded revisions, or between a revision and the state of a dataset's work tree.

Unlike 'git diff', this command also reports untracked content when comparing a revision to the state of the work tree. Such content is marked with the property *state='untracked'* in the command results.

The following types of changes are distinguished and reported via the *state* result property:

- added
- copied
- deleted
- modified
- renamed
- typechange
- unmerged
- untracked

Whenever applicable, source and/or destination revisions are reported to indicate when exactly within the requested revision range a particular component changed its status.

Optionally, the reported changes can be limited to a subset of paths within a dataset.

Parameters

- **path** (*sequence of str or None, optional*) – path to be evaluated. [Default: None]
- **dataset** (*Dataset or None, optional*) – specify the dataset to query. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. [Default: None]

- **revision** – comparison reference specification. Three modes are supported: 1) <revision> changes you have in your working tree relative to the named revision (this can also be a branch name, tag, commit or any label Git can understand). 2) <revision>..<revision> changes between two arbitrary revisions. 3) <revision>...<revision> changes on the branch containing and up to the second <revision>, starting at a common ancestor of both revisions. [Default: None]
- **staged** (*bool, optional*) – get the changes already staged for a commit relative to an optionally given revision (by default the most recent one). [Default: False]
- **ignore_subdatasets** (*{'none', 'untracked', 'dirty', 'all'}, optional*) – speed up execution by (partially) not evaluating the state of subdatasets in a parent dataset. With "none" a subdataset is considered modified when it either contains untracked or modified content or its last saved state differs from that recorded in the parent dataset. When "untracked" is used subdatasets are not considered modified when they only contain untracked content (but they are still scanned for modified content). Using "dirty" ignores all changes to the work tree of subdatasets, only changes to the revisions stored in the parent dataset are shown. Using "all" hides all changes to subdatasets. Note, even with "all" recursive execution will still report other changes in any existing subdataset, only the subdataset record in a parent dataset is not evaluated. [Default: 'none']
- **report_untracked** (*{'no', 'normal', 'all'}, optional*) – If and how untracked content is reported when comparing a revision to the state of the work tree. 'no': no untracked files are reported; 'normal': untracked files and entire untracked directories are reported as such; 'all': report individual files even in fully untracked directories. [Default: 'normal']
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets',*

'successdatasets-or-none', 'metadata'} or callable or None, optional) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]

- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.download_url

datalad.api.**download_url**(*urls*, *dataset=None*, *path=None*, *overwrite=False*, *archive=False*, *save=True*, *message=None*)

Download content

It allows for a uniform download interface to various supported URL schemes, re-using or asking for authentication details maintained by datalad.

Examples

$ datalad download-url http://example.com/file.dat s3://bucket/file2.dat

Parameters

- **urls** (*non-empty sequence of str*) – URL(s) to be downloaded.
- **dataset** (*Dataset or None, optional*) – specify the dataset to add files to. If no dataset is given, an attempt is made to identify the dataset based on the current working directory and/or the *path* given. Use save=False to prevent adding files to the dataset. [Default: None]
- **path** (*str or None, optional*) – path (filename or directory path) where to store downloaded file(s). In case of multiple URLs provided, must point to a directory. Otherwise current directory is used. [Default: None]
- **overwrite** (*bool, optional*) – flag to overwrite it if target file exists. [Default: False]
- **archive** (*bool, optional*) – pass the downloaded files to add_archive_content(. . . , delete=True). [Default: False]
- **save** (*bool, optional*) – by default all modifications to a dataset are immediately saved. Giving this option will disable this behavior. [Default: True]
- **message** (*str or None, optional*) – a description of the state or the changes made to a dataset. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']

- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.ls

datalad.api.**ls**(*loc*, *recursive=False*, *fast=False*, *all_=False*, *long_=False*, *config_file=None*, *list_content=False*, *json=None*)

List summary information about URLs and dataset(s)

ATM only s3:// URLs and datasets are supported

Examples

$ datalad ls s3://openfmri/tarballs/ds202 # to list S3 bucket $ datalad ls # to list current dataset

Parameters

- **loc** (*sequence of str or None*) – URL or path to list, e.g. s3://...
- **recursive** (*bool, optional*) – recurse into subdirectories. [Default: False]
- **fast** (*bool, optional*) – only perform fast operations. Would be overridden by –all. [Default: False]
- **all** (*bool, optional*) – list all (versions of) entries, not e.g. only latest entries in case of S3. [Default: False]
- **long** (*bool, optional*) – list more information on entries (e.g. acl, urls in s3, annex sizes etc). [Default: False]

- **config_file** (*str or None, optional*) – path to config file which could help the 'ls'. E.g. for s3:// URLs could be some ~/.s3cfg file which would provide credentials. [Default: None]
- **list_content** – list also the content or only first 10 bytes (first10), or md5 checksum of an entry. Might require expensive transfer and dump binary output to your screen. Do not enable unless you know what you are after. [Default: False]
- **json** – metadata json of dataset for creating web user interface. display: prints jsons to stdout or file: writes each subdir metadata to json file in subdir of dataset or delete: deletes all metadata json files in dataset. [Default: None]

datalad.api.sshrun

datalad.api.**sshrun**(*login*, *cmd*, *port=None*, *no_stdin=False*)

Run command on remote machines via SSH.

This is a replacement for a small part of the functionality of SSH. In addition to SSH alone, this command can make use of datalad's SSH connection management. Its primary use case is to be used with Git as 'core.sshCommand' or via "GIT_SSH_COMMAND".

Parameters

- **login** – [user@]hostname.
- **cmd** – command for remote execution.
- **port** – port to connect to on the remote host. [Default: None]
- **no_stdin** (*bool, optional*) – Redirect stdin from /dev/null. [Default: False]

datalad.api.siblings

datalad.api.**siblings**(*action='query'*, *dataset=None*, *name=None*, *url=None*, *pushurl=None*, *description=None*, *fetch=False*, *as_common_datasrc=None*, *publish_depends=None*, *publish_by_default=None*, *annex_wanted=None*, *annex_required=None*, *annex_group=None*, *annex_groupwanted=None*, *inherit=False*, *get_annex_info=True*, *recursive=False*, *recursion_limit=None*)

Manage sibling configuration

This command offers four different actions: 'query', 'add', 'remove', 'configure', 'enable'. 'query' is the default action and can be used to obtain information about (all) known siblings. 'add' and 'configure' are highly similar actions, the only difference being that adding a sibling with a name that is already registered will fail, whereas re-configuring a (different) sibling under a known name will not be considered an error. 'enable' can be used to complete access configuration for non-Git sibling (aka git-annex special remotes). Lastly, the 'remove' action allows for the removal (or de-configuration) of a registered sibling.

For each sibling (added, configured, or queried) all known sibling properties are reported. This includes:

"name" Name of the sibling

"path" Absolute path of the dataset

"url" For regular siblings at minimum a "fetch" URL, possibly also a "pushurl"

Additionally, any further configuration will also be reported using a key that matches that in the Git configuration.

By default, sibling information is rendered as one line per sibling following this scheme:

```
<dataset_path>: <sibling_name>(<+|->) [<access_specification]
```

where the + and - labels indicate the presence or absence of a remote data annex at a particular remote, and *access_specification* contains either a URL and/or a type label for the sibling.

Parameters

- **action** (*{'query', 'add', 'remove', 'configure', 'enable'} or None, optional*) – command action selection (see general documentation). [Default: 'query']
- **dataset** (*Dataset or None, optional*) – specify the dataset to configure. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. [Default: None]
- **name** (*str or None, optional*) – name of the sibling. For sibling removal this option is mandatory, otherwise the hostname part of a given URL is used as a default. This option can be used to limit 'query' to a specific sibling. [Default: None]
- **url** (*str or None, optional*) – the URL of or path to the dataset sibling named by *name*. For recursive operation it is required that a template string for building subdataset sibling URLs is given. List of currently available placeholders: %%NAME the name of the dataset, where slashes are replaced by dashes. [Default: None]
- **pushurl** (*str or None, optional*) – in case the *url* cannot be used to publish to the dataset sibling, this option specifies a URL to be used instead. If no *url* is given, *pushurl* serves as *url* as well. [Default: None]
- **description** (*str or None, optional*) – short description to use for a dataset location. Its primary purpose is to help humans to identify a dataset copy (e.g., "mike's dataset on lab server"). Note that when a dataset is published, this information becomes available on the remote side. [Default: None]
- **fetch** (*bool, optional*) – fetch the sibling after configuration. [Default: False]
- **as_common_datasrc** – configure the created sibling as a common data source of the dataset that can be automatically used by all consumers of the dataset (technical: git-annex auto-enabled special remote). [Default: None]
- **publish_depends** (*list of str or None, optional*) – add a dependency such that the given existing sibling is always published prior to the new sibling. This equals setting a configuration item 'remote.SIBLINGNAME.datalad-publish-depends'. Multiple dependencies can be given as a list of sibling names. [Default: None]
- **publish_by_default** (*list of str or None, optional*) – add a refspec to be published to this sibling by default if nothing specified. [Default: None]
- **annex_wanted** (*str or None, optional*) – expression to specify 'wanted' content for the repository/sibling. See https://git-annex.branchable.com/git-annex-wanted/ for more information. [Default: None]
- **annex_required** (*str or None, optional*) – expression to specify 'required' content for the repository/sibling. See https://git-annex.branchable.com/git-annex-required/ for more information. [Default: None]
- **annex_group** (*str or None, optional*) – expression to specify a group for the repository. See https://git- annex.branchable.com/git-annex-group/ for more information. [Default: None]
- **annex_groupwanted** (*str or None, optional*) – expression for the groupwanted. Makes sense only if annex_wanted="groupwanted" and annex-group is given too.

See https ://git-annex.branchable.com/git-annex-groupwanted/ for more information. [Default: None]

- **inherit** (*bool, optional*) – if sibling is missing, inherit settings (git config, git annex wanted/group/groupwanted) from its super-dataset. [Default: False]
- **get_annex_info** (*bool, optional*) – Whether to query all information about the annex configurations of siblings. Can be disabled if speed is a concern. [Default: True]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

datalad.api.subdatasets

datalad.api.**subdatasets**(*dataset=None*, *fulfilled=None*, *recursive=False*, *recursion_limit=None*, *contains=None*, *bottomup=False*, *set_property=None*, *delete_property=None*)

Report subdatasets and their properties.

The following properties are reported (if possible) for each matching subdataset record.

"name" Name of the subdataset in the parent (often identical with the relative path in the parent dataset)

"path" Absolute path to the subdataset

"parentds" Absolute path to the parent dataset

"revision" SHA1 of the subdataset commit recorded in the parent dataset

"state" Condition of the subdataset: 'clean', 'modified', 'absent', 'conflict' as reported by *git submodule*

"revision_descr" Output of *git describe* for the subdataset

"gitmodule_url" URL of the subdataset recorded in the parent

"gitmodule_<label>" Any additional configuration property on record.

Performance note: Property modification, requesting *bottomup* reporting order, or a particular numerical *recursion_limit* implies an internal switch to an alternative query implementation for recursive query that is more flexible, but also notably slower (performs one call to Git per dataset versus a single call for all combined).

The following properties for subdatasets are recognized by DataLad (without the 'gitmodule_' prefix that is used in the query results):

"datalad-recursiveinstall" If set to 'skip', the respective subdataset is skipped when DataLad is recursively installing its superdataset. However, the subdataset remains installable when explicitly requested, and no other features are impaired.

Parameters

- **dataset** (*Dataset or None, optional*) – specify the dataset to query. If no dataset is given, an attempt is made to identify the dataset based on the input and/or the current working directory. [Default: None]
- **fulfilled** (*bool or None, optional*) – if given, must be a boolean flag indicating whether to report either only locally present or absent datasets. By default subdatasets are reported regardless of their status. [Default: None]
- **recursive** (*bool, optional*) – if set, recurse into potential subdataset. [Default: False]
- **recursion_limit** (*int or None, optional*) – limit recursion into subdataset to the given number of levels. [Default: None]
- **contains** (*str or None, optional*) – limit report to the subdatasets containing the given path. If a root path of a subdataset is given the last reported dataset will be the subdataset itself. [Default: None]
- **bottomup** (*bool, optional*) – whether to report subdatasets in bottom-up order along each branch in the dataset tree, and not top-down. [Default: False]
- **set_property** (*list of 2-item sequence of str or None, optional*) – Name and value of one or more subdataset properties to be set in the parent dataset's .gitmodules file. The property name is case- insensitive, must start with a letter, and consist only of alphanumeric characters. The value can be a Python format() template string wrapped in '<>' (e.g. '<{gitmodule_name}>'). Supported keywords are any item reported in the result properties of this command, plus 'refds_relpath' and 'refds_relname': the relative path of a subdataset with respect to the base dataset of the command call, and, in the latter case, the same string with all directory separators replaced by dashes. [Default: None]

- **delete_property** (*list of str or None, optional*) – Name of one or more subdataset properties to be removed from the parent dataset's .gitmodules file. [Default: None]
- **on_failure** (*{'ignore', 'continue', 'stop'}, optional*) – behavior to perform on failure: 'ignore' any failure is reported, but does not cause an exception; 'continue' if any failure occurs an exception will be raised at the end, but processing other actions will continue for as long as possible; 'stop': processing will stop on first failure and an exception is raised. A failure is any result with status 'impossible' or 'error'. Raised exception is an IncompleteResultsError that carries the result dictionaries of the failures in its *failed* attribute. [Default: 'continue']
- **proc_post** – Like *proc_pre*, but procedures are executed after the main command has finished. [Default: None]
- **proc_pre** – DataLad procedure to run prior to the main command. The argument a list of lists with procedure names and optional arguments. Procedures are called in the order their are given in this list. It is important to provide the respective target dataset to run a procedure on as the *dataset* argument of the main command. [Default: None]
- **result_filter** (*callable or None, optional*) – if given, each to-be-returned status dictionary is passed to this callable, and is only returned if the callable's return value does not evaluate to False or a ValueError exception is raised. If the given callable supports ***kwargs* it will additionally be passed the keyword arguments of the original API call. [Default: None]
- **result_renderer** (*{'default', 'json', 'json_pp', 'tailored'} or None, optional*) – format of return value rendering on stdout. [Default: None]
- **result_xfm** (*{'paths', 'relpaths', 'datasets', 'successdatasets-or-none', 'metadata'} or callable or None, optional*) – if given, each to-be-returned result status dictionary is passed to this callable, and its return value becomes the result instead. This is different from *result_filter*, as it can perform arbitrary transformation of the result value. This is mostly useful for top- level command invocations that need to provide the results in a particular format. Instead of a callable, a label for a pre-crafted result transformation can be given. [Default: None]
- **return_type** (*{'generator', 'list', 'item-or-list'}, optional*) – return value behavior switch. If 'item-or-list' a single value is returned instead of a one-item return value list, or a list in case of multiple return values. *None* is return in case of an empty list. [Default: 'list']

Miscellaneous commands

api.add_archive_content(archive[, annex, ...])	Add content of an archive under git annex control.
api.test([module, verbose, nocapture, pdb, stop])	Run internal DataLad (unit)tests.

datalad.api.add_archive_content

datalad.api.**add_archive_content**(*archive*, *annex=None*, *add_archive_leading_dir=False*, *strip_leading_dirs=False*, *leading_dirs_depth=None*, *leading_dirs_consider=None*, *use_current_dir=False*, *delete=False*, *key=False*, *exclude=None*, *rename=None*, *existing='fail'*, *annex_options=None*, *copy=False*, *commit=True*, *allow_dirty=False*, *stats=None*, *drop_after=False*, *delete_after=False*)

Add content of an archive under git annex control.

This results in the files within archive (which must be already under annex control itself) added under annex referencing original archive via custom special remotes mechanism

Example

annex-repo$ datalad add-archive-content my_big_tarball.tar.gz

Parameters

- **archive** (*str*) – archive file or a key (if *key=True* specified).
- **annex** – annex instance to use. [Default: None]
- **add_archive_leading_dir** (*bool, optional*) – flag to place extracted content under a directory which would correspond to archive name with suffix stripped. E.g. for archive *example.zip* its content will be extracted under a directory *example/*. [Default: False]
- **strip_leading_dirs** (*bool, optional*) – flag to move all files directories up, from how they were stored in an archive, if that one contained a number (possibly more than 1 down) single leading directories. [Default: False]
- **leading_dirs_depth** – maximal depth to strip leading directories to. If not specified (None), no limit. [Default: None]
- **leading_dirs_consider** (*list of str or None, optional*) – regular expression(s) for directories to consider to strip away. [Default: None]
- **use_current_dir** (*bool, optional*) – flag to extract archive under the current directory, not the directory where archive is located. Note that it will be of no effect if *key=True* is given. [Default: False]
- **delete** (*bool, optional*) – flag to delete original archive from the filesystem/git in current tree. Note that it will be of no effect if *key=True* is given. [Default: False]
- **key** (*bool, optional*) – flag to signal if provided archive is not actually a filename on its own but an annex key. [Default: False]
- **exclude** (*list of str or None, optional*) – regular expressions for filenames which to exclude from being added to annex. Applied after –rename if that one is specified. For exact matching, use anchoring. [Default: None]
- **rename** (*list of str or None, optional*) – regular expressions to rename files before being added under git. First letter defines how to split provided string into two parts: Python regular expression (with groups), and replacement string. [Default: None]
- **existing** – what operation to perform a file from archive tries to overwrite an existing file with the same name. 'fail' (default) leads to RuntimeError exception. 'overwrite' silently replaces existing file. 'archive-suffix' instructs to add a suffix (prefixed with a '-') matching archive name from which file gets extracted, and if that one present, 'numeric-suffix' is in

effect in addition, when incremental numeric suffix (prefixed with a '.') is added until no name collision is longer detected. [Default: 'fail']

- **annex_options** (*str or None, optional*) – additional options to pass to git-annex. [Default: None]
- **copy** (*bool, optional*) – flag to copy the content of the archive instead of moving. [Default: False]
- **commit** (*bool, optional*) – flag to not commit upon completion. [Default: True]
- **allow_dirty** (*bool, optional*) – flag that operating on a dirty repository (uncommitted or untracked content) is ok. [Default: False]
- **stats** – ActivityStats instance for global tracking. [Default: None]
- **drop_after** (*bool, optional*) – drop extracted files after adding to annex. [Default: False]
- **delete_after** (*bool, optional*) – extract under a temporary directory, git-annex add, and delete after. To be used to "index" files within annex without actually creating corresponding files under git. Note that *annex dropunused* would later remove that load. [Default: False]

Returns

Return type annex

datalad.api.test

datalad.api.**test**(*module=None*, *verbose=False*, *nocapture=False*, *pdb=False*, *stop=False*)

Run internal DataLad (unit)tests.

This can be used to verify correct operation on the system. It is just a thin wrapper around a call to nose, so number of exposed options is minimal

Parameters

- **module** – test name(s), by default all tests of DataLad core and any installed extensions are executed. [Default: None]
- **verbose** (*bool, optional*) – be verbose - list test names. [Default: False]
- **nocapture** (*bool, optional*) – do not capture stdout. [Default: False]
- **pdb** (*bool, optional*) – drop into debugger on failures or errors. [Default: False]
- **stop** (*bool, optional*) – stop running tests after the first error or failure. [Default: False]

Plugins

DataLad can be customized by plugins. The following plugins are shipped with DataLad.

add_readme	add a README file to a dataset
addurls	Create and update a dataset from a list of URLs.
check_dates	Extension for checking dates within repositories.
export_archive	export a dataset as a compressed TAR/ZIP archive
export_to_figshare	export a dataset as a TAR/ZIP archive to figshare

Continued on next page

Table 8 – continued from previous page

no_annex	configure which dataset parts to never put in the annex
wtf	provide information about this DataLad installation

5.2.2 Support functionality

auto	Proxy basic file operations (e.g.
cmd	Wrapper for command and function calls, allowing for dry runs and output handling
consts	constants for datalad
log	
utils	
version	Defines version to be imported in the module and obtained from setup.py
support.annexrepo	Interface to git-annex by Joey Hess.
support.archives	Various handlers/functionality for different types of files (e.g.
support.configparserinc	
customremotes.main	
customremotes.base	Base classes to custom git-annex remotes (e.g.
customremotes.archives	Custom remote to support getting the load from archives present under annex

datalad.auto

Proxy basic file operations (e.g. open) to auto-obtain files upon I/O

class datalad.auto.**AutomagicIO**(*autoget=True*, *activate=False*, *check_once=False*)

Bases: object

Class to proxy commonly used API for accessing files so they get automatically fetched

Currently supports builtin open() and h5py.File when those are read

activate()

active

autoget

deactivate()

datalad.cmd

Wrapper for command and function calls, allowing for dry runs and output handling

class datalad.cmd.**GitRunner**(**args*, ***kwargs*)

Bases: *datalad.cmd.Runner*

Runner to be used to run git and git annex commands

Overloads the runner class to check & update GIT_DIR and GIT_WORK_TREE environment variables set to the absolute path if is defined and is relative path

static get_git_environ_adjusted(*env=None*)

Replaces GIT_DIR and GIT_WORK_TREE with absolute paths if relative path and defined

run(*cmd*, *env=None*, **args*, ***kwargs*)
Runs the command *cmd* using shell.

In case of dry-mode *cmd* is just added to *commands* and it is actually executed otherwise. Allows for separately logging stdout and stderr or streaming it to system's stdout or stderr respectively.

Note: Using a string as *cmd* and shell=True allows for piping, multiple commands, etc., but that implies shlex.split() is not used. This is considered to be a security hazard. So be careful with input.

Parameters

- **cmd** (*str, list*) – String (or list) defining the command call. No shell is used if cmd is specified as a list
- **log_stdout** (*bool, optional*) – If True, stdout is logged. Goes to sys.stdout otherwise.
- **log_stderr** (*bool, optional*) – If True, stderr is logged. Goes to sys.stderr otherwise.
- **log_online** (*bool, optional*) – Whether to log as output comes in. Setting to True is preferable for running user-invoked actions to provide timely output
- **expect_stderr** (*bool, optional*) – Normally, having stderr output is a signal of a problem and thus it gets logged at level 11. But some utilities, e.g. wget, use stderr for their progress output. Whenever such output is expected, set it to True and output will be logged at level 9 unless exit status is non-0 (in non-online mode only, in online – would log at 9)
- **expect_fail** (*bool, optional*) – Normally, if command exits with non-0 status, it is considered an error and logged at level 11 (above DEBUG). But if the call intended for checking routine, such messages are usually not needed, thus it will be logged at level 9.
- **cwd** (*string, optional*) – Directory under which run the command (passed to Popen)
- **env** (*string, optional*) – Custom environment to pass
- **shell** (*bool, optional*) – Run command in a shell. If not specified, then it runs in a shell only if command is specified as a string (not a list)
- **stdin** (*file descriptor*) – input stream to connect to stdin of the process.

Returns

Return type (stdout, stderr) - bytes!

Raises CommandError – if command's exitcode wasn't 0 or None. exitcode is passed to CommandError's *code*-field. Command's stdout and stderr are stored in CommandError's *stdout* and *stderr* fields respectively.

class datalad.cmd.**Runner**(*cwd=None*, *env=None*, *protocol=None*, *log_outputs=None*)
Bases: object

Provides a wrapper for calling functions and commands.

An object of this class provides a methods that calls shell commands or python functions, allowing for protocolling the calls and output handling.

Outputs (stdout and stderr) can be either logged or streamed to system's stdout/stderr during execution. This can be enabled or disabled for both of them independently. Additionally, a protocol object can be a used with

the Runner. Such a protocol has to implement datalad.support.protocol.ProtocolInterface, is able to record calls and allows for dry runs.

call (*f*, **args*, ***kwargs*)
Helper to unify collection of logging all "dry" actions.

Calls *f* if *Runner*-object is not in dry-mode. Adds *f* along with its arguments to *commands* otherwise.

Parameters **f** (*callable*) –

commands

cwd

dry

env

log (*msg*, **args*, ***kwargs*)
log helper

Logs at level 9 by default and adds "Protocol:"-prefix in order to log the used protocol.

log_cwd

log_env

log_outputs

log_stdin

protocol

run (*cmd*, *log_stdout=True*, *log_stderr=True*, *log_online=False*, *expect_stderr=False*, *expect_fail=False*, *cwd=None*, *env=None*, *shell=None*, *stdin=None*)
Runs the command *cmd* using shell.

In case of dry-mode *cmd* is just added to *commands* and it is actually executed otherwise. Allows for separately logging stdout and stderr or streaming it to system's stdout or stderr respectively.

Note: Using a string as *cmd* and shell=True allows for piping, multiple commands, etc., but that implies shlex.split() is not used. This is considered to be a security hazard. So be careful with input.

Parameters

- **cmd** (*str, list*) – String (or list) defining the command call. No shell is used if cmd is specified as a list
- **log_stdout** (*bool, optional*) – If True, stdout is logged. Goes to sys.stdout otherwise.
- **log_stderr** (*bool, optional*) – If True, stderr is logged. Goes to sys.stderr otherwise.
- **log_online** (*bool, optional*) – Whether to log as output comes in. Setting to True is preferable for running user-invoked actions to provide timely output
- **expect_stderr** (*bool, optional*) – Normally, having stderr output is a signal of a problem and thus it gets logged at level 11. But some utilities, e.g. wget, use stderr for their progress output. Whenever such output is expected, set it to True and output will be logged at level 9 unless exit status is non-0 (in non-online mode only, in online – would log at 9)
- **expect_fail** (*bool, optional*) – Normally, if command exits with non-0 status, it is considered an error and logged at level 11 (above DEBUG). But if the call intended

for checking routine, such messages are usually not needed, thus it will be logged at level 9.

- **cwd** (*string, optional*) – Directory under which run the command (passed to Popen)
- **env** (*string, optional*) – Custom environment to pass
- **shell** (*bool, optional*) – Run command in a shell. If not specified, then it runs in a shell only if command is specified as a string (not a list)
- **stdin** (*file descriptor*) – input stream to connect to stdin of the process.

Returns

Return type (stdout, stderr) - bytes!

Raises CommandError – if command's exitcode wasn't 0 or None. exitcode is passed to CommandError's *code*-field. Command's stdout and stderr are stored in CommandError's *stdout* and *stderr* fields respectively.

datalad.cmd.**get_runner**(**args*, ***kwargs*)

datalad.cmd.**link_file_load**(*src*, *dst*, *dry_run=False*)
Just a little helper to hardlink files's load

datalad.consts

constants for datalad

datalad.log

class datalad.log.**ColorFormatter**(*use_color=None*, *log_name=False*, *log_pid=False*)
Bases: logging.Formatter

format(*record*)
Format the specified record as text.

The record's attribute dictionary is used as the operand to a string formatting operation which yields the returned string. Before formatting the dictionary, a couple of preparatory steps are carried out. The message attribute of the record is computed using LogRecord.getMessage(). If the formatting string uses the time (as determined by a call to usesTime(), formatTime() is called to format the event time. If there is exception information, it is formatted using formatException() and appended to the message.

datalad.utils

class datalad.utils.**File**(*name*, *executable=False*)
Bases: object

Helper for a file entry in the create_tree/@with_tree

It allows to define additional settings for entries

class datalad.utils.**SequenceFormatter**(*separator=' '*, *element_formatter=<string.Formatter object>*, **args*, ***kwargs*)
Bases: string.Formatter

string.Formatter subclass with special behavior for sequences.

This class delegates formatting of individual elements to another formatter object. Non-list objects are formatted by calling the delegate formatter's "format_field" method. List-like objects (list, tuple, set, frozenset) are formatted by formatting each element of the list according to the specified format spec using the delegate formatter and then joining the resulting strings with a separator (space by default).

format_element(*elem*, *format_spec*)
Format a single element

For sequences, this is called once for each element in a sequence. For anything else, it is called on the entire object. It is intended to be overridden in subclases.

format_field(*value*, *format_spec*)

datalad.utils.**any_re_search**(*regexes*, *value*)
Return if any of regexes (list or str) searches succesfully for value

datalad.utils.**as_unicode**(*val*, *cast_types=<type 'object'>*)
Given an arbitrary value, would try to obtain unicode value of it

For unicode it would return original value, for python2 str or python3 bytes it would use assure_unicode, for None - an empty (unicode) string, and for any other type (see *cast_types*) - would apply the unicode constructor. If value is not an instance of *cast_types*, TypeError is thrown

Parameters **cast_types** (*type*) – Which types to cast to unicode by providing to constructor

datalad.utils.**assert_no_open_files**(**args*, ***kwargs*)

datalad.utils.**assure_bool**(*s*)
Convert value into boolean following convention for strings

to recognize on,True,yes as True, off,False,no as False

datalad.utils.**assure_bytes**(*s*, *encoding='utf-8'*)
Convert/encode unicode to str (PY2) or bytes (PY3) if of 'text_type'

Parameters **encoding** (*str, optional*) – Encoding to use. "utf-8" is the default

datalad.utils.**assure_dict_from_str**(*s*, ***kwargs*)
Given a multiline string with key=value items convert it to a dictionary

Parameters

- **s** (*str or dict*) –
- **None if input s is empty** (*Returns*) –

datalad.utils.**assure_dir**(**args*)
Make sure directory exists.

Joins the list of arguments to an os-specific path to the desired directory and creates it, if it not exists yet.

datalad.utils.**assure_iter**(*s*, *cls*, *copy=False*, *iterate=True*)
Given not a list, would place it into a list. If None - empty list is returned

Parameters

- **s** (*list or anything*) –
- **cls** (*class*) – Which iterable class to assure
- **copy** (*bool, optional*) – If correct iterable is passed, it would generate its shallow copy
- **iterate** (*bool, optional*) – If it is not a list, but something iterable (but not a text_type) iterate over it.

datalad.utils.**assure_list**(*s*, *copy=False*, *iterate=True*)
Given not a list, would place it into a list. If None - empty list is returned

Parameters

- **s** (*list or anything*) –
- **copy** (*bool, optional*) – If list is passed, it would generate a shallow copy of the list
- **iterate** (*bool, optional*) – If it is not a list, but something iterable (but not a text_type) iterate over it.

datalad.utils.**assure_list_from_str**(*s*, *sep='\n'*)
Given a multiline string convert it to a list of return None if empty

Parameters **s** (*str or list*) –

datalad.utils.**assure_tuple_or_list**(*obj*)
Given an object, wrap into a tuple if not list or tuple

datalad.utils.**assure_unicode**(*s*, *encoding=None*, *confidence=None*)
Convert/decode to unicode (PY2) or str (PY3) if of 'binary_type'

Parameters

- **encoding** (*str, optional*) – Encoding to use. If None, "utf-8" is tried, and then if not a valid UTF-8, encoding will be guessed
- **confidence** (*float, optional*) – A value between 0 and 1, so if guessing of encoding is of lower than specified confidence, ValueError is raised

datalad.utils.**auto_repr**(*cls*)
Decorator for a class to assign it an automagic quick and dirty __repr__

It uses public class attributes to prepare repr of a class

Original idea: http://stackoverflow.com/a/27799004/1265472

datalad.utils.**better_wraps**(*to_be_wrapped*)
Decorator to replace *functools.wraps*

This is based on *wrapt* instead of *functools* and in opposition to *wraps* preserves the correct signature of the decorated function. It is written with the intention to replace the use of *wraps* without any need to rewrite the actual decorators.

class datalad.utils.**chpwd**(*path*, *mkdir=False*, *logsuffix=''*)
Bases: object

Wrapper around os.chdir which also adjusts environ['PWD']

The reason is that otherwise PWD is simply inherited from the shell and we have no ability to assess directory path without dereferencing symlinks.

If used as a context manager it allows to temporarily change directory to the given path

datalad.utils.**create_tree**(*path*, *tree*, *archives_leading_dir=True*)
Given a list of tuples (name, load) create such a tree

if load is a tuple itself – that would create either a subtree or an archive with that content and place it into the tree if name ends with .tar.gz

datalad.utils.**create_tree_archive**(*path*, *name*, *load*, *overwrite=False*, *archives_leading_dir=True*)
Given an archive *name*, create under *path* with specified *load* tree

datalad.utils.**decode_input**(*s*)
Given input string/bytes, decode according to stdin codepage (or UTF-8) if not defined

If fails – issue warning and decode allowing for errors being replaced

datalad.utils.**disable_logger**(**args*, ***kwds*)
context manager to temporarily disable logging

This is to provide one of swallow_logs' purposes without unnecessarily creating temp files (see gh-1865)

Parameters **logger** (*Logger*) – Logger whose handlers will be ordered to not log anything. Default: datalad's topmost Logger ('datalad')

datalad.utils.**dlabspath**(*path*, *norm=False*)
Symlinks-in-the-cwd aware abspath

os.path.abspath relies on os.getcwd() which would not know about symlinks in the path

TODO: we might want to norm=True by default to match behavior of os .path.abspath?

datalad.utils.**encode_filename**(*filename*)
Encode unicode filename

datalad.utils.**escape_filename**(*filename*)
Surround filename in "" and escape " in the filename

datalad.utils.**expandpath**(*path*, *force_absolute=True*)
Expand all variables and user handles in a path.

By default return an absolute path

datalad.utils.**file_basename**(*name*, *return_ext=False*)
Strips up to 2 extensions of length up to 4 characters and starting with alpha not a digit, so we could get rid of .tar.gz etc

datalad.utils.**find_files**(*regex*, *topdir='.'*, *exclude=None*, *exclude_vcs=True*, *exclude_datalad=False*, *dirs=False*)
Generator to find files matching regex

Parameters

- **regex** (*basestring*) –
- **exclude** (*basestring, optional*) – Matches to exclude
- **exclude_vcs** – If True, excludes commonly known VCS subdirectories. If string, used as regex to exclude those files (regex: *'/(?:git|gitattributes|svn|bzr|hg)(?:/|$)'*)
- **exclude_datalad** – If True, excludes files known to be datalad meta-data files (e.g. under .datalad/ subdirectory) (regex: *'/(?:datalad)(?:/|$)'*)
- **topdir** (*basestring, optional*) – Directory where to search
- **dirs** (*bool, optional*) – Whether to match directories as well as files

datalad.utils.**generate_chunks**(*container*, *size*)
Given a container, generate chunks from it with size up to *size*

datalad.utils.**get_dataset_pwds**(*dataset*)
Return the current directory for the dataset.

Parameters **dataset** (Dataset) –

Returns

- *A tuple, where the first item is the absolute path of the pwd and the*

- *second is the pwd relative to the dataset's path.*

datalad.utils.**get_dataset_root**(*path*)
Return the root of an existent dataset containing a given path

The root path is returned in the same absolute or relative form as the input argument. If no associated dataset exists, or the input path doesn't exist, None is returned.

datalad.utils.**get_encoding_info**()
Return a dictionary with various encoding/locale information

datalad.utils.**get_envvars_info**()

datalad.utils.**get_func_kwargs_doc**(*func*)
Provides args for a function

Parameters **func** (*str*) – name of the function from which args are being requested

Returns of the args that a function takes in

Return type list

datalad.utils.**get_ipython_shell**()
Detect if running within IPython and returns its *ip* (shell) object

Returns None if not under ipython (no *get_ipython* function)

datalad.utils.**get_logfilename**(*dspath*, *cmd='datalad'*)
Return a filename to use for logging under a dataset/repository

directory would be created if doesn't exist, but dspath must exist and be a directory

datalad.utils.**get_open_files**(*path*, *log_open=False*)
Get open files under a path

Parameters

- **path** (*str*) – File or directory to check for open files under
- **log_open** (*bool or int*) – If set - logger level to use

Returns path : pid

Return type dict

datalad.utils.**get_path_prefix**(*path*, *pwd=None*)
Get path prefix (for current directory)

Returns relative path to the topdir, if we are under topdir, and if not absolute path to topdir. If *pwd* is not specified - current directory assumed

datalad.utils.**get_tempfile_kwargs**(*tkwargs=None*, *prefix=''*, *wrapped=None*)
Updates kwargs to be passed to tempfile. calls depending on env vars

datalad.utils.**get_timestamp_suffix**(*time_=None*, *prefix='-'*)
Return a time stamp (full date and time up to second)

primarily to be used for generation of log files names

datalad.utils.**get_trace**(*edges*, *start*, *end*, *trace=None*)
Return the trace/path to reach a node in a tree.

Parameters

- **edges** (*sequence(2-tuple)*) – The tree given by a sequence of edges (parent, child) tuples. The nodes can be identified by any value and data type that supports the '==' operation.

- **start** – Identifier of the start node. Must be present as a value in the parent location of an edge tuple in order to be found.
- **end** – Identifier of the target/end node. Must be present as a value in the child location of an edge tuple in order to be found.
- **trace** (*list*) – Mostly useful for recursive calls, and used internally.

Returns Returns a list with the trace to the target (the starts and the target are not included in the trace, hence if start and end are directly connected an empty list is returned), or None when no trace to the target can be found, or start and end are identical.

Return type None or list

datalad.utils.**getpwd**()
Try to return a CWD without dereferencing possible symlinks

This function will try to use PWD environment variable to provide a current working directory, possibly with some directories along the path being symlinks to other directories. Unfortunately, PWD is used/set only by the shell and such functions as *os.chdir* and *os.getcwd* nohow use or modify it, thus *os.getcwd()* returns path with links dereferenced.

While returning current working directory based on PWD env variable we verify that the directory is the same as *os.getcwd()* after resolving all symlinks. If that verification fails, we fall back to always use *os.getcwd()*.

Initial decision to either use PWD env variable or os.getcwd() is done upon the first call of this function.

datalad.utils.**import_module_from_file**(*modpath*, *pkg=None*, *log=<bound method Logger.debug of <logging.Logger object>>*)
Import provided module given a path

TODO: - RF/make use of it in pipeline.py which has similar logic - join with import_modules above?

Parameters **pkg** (*module, optional*) – If provided, and modpath is under pkg.__path__, relative import will be used

datalad.utils.**import_modules**(*modnames*, *pkg*, *msg='Failed to import {module}'*, *log=<bound method Logger.debug of <logging.Logger object>>*)
Helper to import a list of modules without failing if N/A

Parameters

- **modnames** (*list of str*) – List of module names to import
- **pkg** (*str*) – Package under which to import
- **msg** (*str, optional*) – Message template for .format() to log at DEBUG level if import fails. Keys {module} and {package} will be provided and ': {exception}' appended
- **log** (*callable, optional*) – Logger call to use for logging messages

datalad.utils.**is_explicit_path**(*path*)
Return whether a path explicitly points to a location

Any absolute path, or relative path starting with either '../' or './' is assumed to indicate a location on the filesystem. Any other path format is not considered explicit.

datalad.utils.**is_interactive**()
Return True if all in/outs are tty

datalad.utils.**knows_annex**(*path*)
Returns whether at a given path there is information about an annex

It is just a thin wrapper around GitRepo.is_with_annex() classmethod which also checks for *path* to exist first.

This includes actually present annexes, but also uninitialized ones, or even the presence of a remote annex branch.

datalad.utils.**line_profile**(*func*)

datalad.utils.**lmtime**(*filepath*, *mtime*)
Set mtime for files, while not de-referencing symlinks.

To overcome absence of os.lutime

Works only on linux and OSX ATM

datalad.utils.**make_tempfile**(**args*, ***kwds*)
Helper class to provide a temporary file name and remove it at the end (context manager)

Parameters

- **mkdir** (*bool, optional (default: False)*) – If True, temporary directory created using tempfile.mkdtemp()
- **content** (*str or bytes, optional*) – Content to be stored in the file created
- **wrapped** (*function, optional*) – If set, function name used to prefix temporary file name
- ****tkwargs** – All other arguments are passed into the call to tempfile.mk{,d}temp(), and resultant temporary filename is passed as the first argument into the function t. If no 'prefix' argument is provided, it will be constructed using module and function names ('.' replaced with '_').
- **change the used directory without providing keyword argument 'dir' set** (*To*) –
- **DATALAD_TESTS_TEMP_DIR.** –

Examples

```
>>> from os.path import exists
>>> from datalad.utils import make_tempfile
>>> with make_tempfile() as fname:
...     k = open(fname, 'w').write('silly test')
>>> assert not exists(fname)  # was removed
```

```
>>> with make_tempfile(content="blah") as fname:
...     assert open(fname).read() == "blah"
```

datalad.utils.**map_items**(*func*, *v*)
A helper to apply *func* to all elements (keys and values) within dict

No type checking of values passed to func is done, so *func* should be resilient to values which it should not handle

Initial usecase - apply_recursive(url_fragment, assure_unicode)

datalad.utils.**md5sum**(*filename*)

datalad.utils.**not_supported_on_windows**(*msg=None*)
A little helper to be invoked to consistently fail whenever functionality is not supported (yet) on Windows

datalad.utils.**nothing_cm**(**args*, ***kwds*)
Just a dummy cm to programmically switch context managers

datalad.utils.**open_r_encdetect**(*fname*, *readahead=1000*)
Return a file object in read mode with auto-detected encoding

This is helpful when dealing with files of unknown encoding.

Parameters **readahead** (*int, optional*) – How many bytes to read for guessing the encoding type. If negative - full file will be read

datalad.utils.**optional_args**(*decorator*)
allows a decorator to take optional positional and keyword arguments. Assumes that taking a single, callable, positional argument means that it is decorating a function, i.e. something like this:

```
@my_decorator
def function(): pass
```

Calls decorator with decorator(f, **args*, ***kwargs*)

datalad.utils.**partition**(*items*, *predicate=<type 'bool'>*)
Partition *items* by *predicate*.

Parameters

- **items** (*iterable*) –
- **predicate** (*callable*) – A function that will be mapped over each element in *items*. The elements will partitioned based on whether the return value is false or true.

Returns

- *A tuple with two generators, the first for 'false' items and the second for*
- *'true' ones.*

Notes

Taken from Peter Otten's snippet posted at https://nedbatchelder.com/blog/201306/filter_a_list_into_two_parts.html

datalad.utils.**path_is_subpath**(*path*, *prefix*)
Return True if path is a subpath of prefix

It will return False if path == prefix.

Parameters

- **path** (*str*) –
- **prefix** (*str*) –

datalad.utils.**path_startswith**(*path*, *prefix*)
Return True if path starts with prefix path

Parameters

- **path** (*str*) –
- **prefix** (*str*) –

datalad.utils.**posix_relpath**(*path*, *start=None*)
Behave like os.path.relpath, but always return POSIX paths...

on any platform.

datalad.utils.**read_csv_lines**(*fname*, *dialect=None*, *readahead=16384*, ***kwargs*)
A generator of dict records from a CSV/TSV

Automatically guesses the encoding for each record to convert to UTF-8

Parameters

- **fname** (*str*) – Filename
- **dialect** (*str, optional*) – Dialect to specify to csv.reader. If not specified – guessed from the file, if fails to guess, "excel-tab" is assumed
- **readahead** (*int, optional*) – How many bytes to read from the file to guess the type
- ****kwargs** – Passed to *csv.reader*

datalad.utils.**rmdir**(*path*, **args*, ***kwargs*)
os.rmdir with our optional checking for open files

datalad.utils.**rmtemp**(*f*, **args*, ***kwargs*)
Wrapper to centralize removing of temp files so we could keep them around

It will not remove the temporary file/directory if DATALAD_TESTS_TEMP_KEEP environment variable is defined

datalad.utils.**rmtree**(*path*, *chmod_files='auto'*, *children_only=False*, **args*, ***kwargs*)
To remove git-annex .git it is needed to make all files and directories writable again first

Parameters

- **chmod_files** (*string or bool, optional*) – Whether to make files writable also before removal. Usually it is just a matter of directories to have write permissions. If 'auto' it would chmod files on windows by default
- **children_only** (*bool, optional*) – If set, all files and subdirectories would be removed while the path itself (must be a directory) would be preserved
- ***args** –
- ****kwargs** – Passed into shutil.rmtree call

datalad.utils.**rotree**(*path*, *ro=True*, *chmod_files=True*)
To make tree read-only or writable

Parameters

- **path** (*string*) – Path to the tree/directory to chmod
- **ro** (*bool, optional*) – Whether to make it R/O (default) or RW
- **chmod_files** (*bool, optional*) – Whether to operate also on files (not just directories)

datalad.utils.**safe_print**(*s*)
Print with protection against UTF-8 encoding errors

datalad.utils.**saved_generator**(*gen*)
Given a generator returns two generators, where 2nd one just replays

So the first one would be going through the generated items and 2nd one would be yielding saved items

datalad.utils.**setup_exceptionhook**(*ipython=False*)
Overloads default sys.excepthook with our exceptionhook handler.

If interactive, our exceptionhook handler will invoke pdb.post_mortem; if not interactive, then invokes default handler.

datalad.utils.**shortened_repr**(*value*, *l=30*)

datalad.utils.**slash_join**(*base*, *extension*)
Join two strings with a '/', avoiding duplicate slashes

If any of the strings is None the other is returned as is.

datalad.utils.**sorted_files**(*dout*)
Return a (sorted) list of files under dout

datalad.utils.**swallow_logs**(**args*, ***kwds*)
Context manager to consume all logs.

datalad.utils.**swallow_outputs**(**args*, ***kwds*)
Context manager to help consuming both stdout and stderr, and print()

stdout is available as cm.out and stderr as cm.err whenever cm is the yielded context manager. Internally uses temporary files to guarantee absent side-effects of swallowing into StringIO which lacks .fileno.

print mocking is necessary for some uses where sys.stdout was already bound to original sys.stdout, thus mocking it later had no effect. Overriding print function had desired effect

datalad.utils.**try_multiple**(*ntrials*, *exception*, *base*, *f*, **args*, ***kwargs*)
Call f multiple times making exponentially growing delay between the calls

datalad.utils.**try_multiple_dec**(*f*, *ntrials=None*, *duration=0.1*, *exceptions=None*, *increment_type=None*)

datalad.utils.**unique**(*seq*, *key=None*)
Given a sequence return a list only with unique elements while maintaining order

This is the fastest solution. See https://www.peterbe.com/plog/uniqifiers-benchmark and http://stackoverflow.com/a/480227/1265472 for more information. Enhancement – added ability to compare for uniqueness using a key function

Parameters

- **seq** – Sequence to analyze
- **key** (*callable, optional*) – Function to call on each element so we could decide not on a full element, but on its member etc

datalad.utils.**unlink**(**args*, ***kwargs*)
'Robust' unlink. Would try multiple times

On windows boxes there is evidence for a latency of more than a second until a file is considered no longer "in-use". WindowsError is not known on Linux, and if IOError or any other exception is thrown then if except statement has WindowsError in it – NameError also see gh-2533

datalad.utils.**updated**(*d*, *update*)
Return a copy of the input with the 'update'

Primarily for updating dictionaries

datalad.utils.**with_pathsep**(*path*)
Little helper to guarantee that path ends with /

datalad.version

Defines version to be imported in the module and obtained from setup.py

datalad.support.annexrepo

Interface to git-annex by Joey Hess.

For further information on git-annex see https://git-annex.branchable.com/.

class datalad.support.annexrepo.**AnnexRepo**(*path*, *url=None*, *runner=None*, *direct=None*, *backend=None*, *always_commit=True*, *create=True*, *init=False*, *batch_size=None*, *version=None*, *description=None*, *git_opts=None*, *annex_opts=None*, *annex_init_opts=None*, *repo=None*, *fake_dates=False*)

Bases: datalad.support.gitrepo.GitRepo, datalad.support.repo.RepoInterface

Representation of an git-annex repository.

Paths given to any of the class methods will be interpreted as relative to PWD, in case this is currently beneath AnnexRepo's base dir (*self.path*). If PWD is outside of the repository, relative paths will be interpreted as relative to *self.path*. Absolute paths will be accepted either way.

GIT_ANNEX_MIN_VERSION = '6.20180913'

WEB_UUID = '00000000-0000-0000-0000-000000000001'

add(*files*, **args*, ***kwargs*)

Add file(s) to the repository.

Parameters

- **files** (*list of str*) – list of paths to add to the annex
- **git** (*bool*) – if True, add to git instead of annex.
- **backend** –
- **options** –
- **update** (*bool*) –

  –update option for git-add. From git's manpage: Update the index just where it already has an entry matching <pathspec>. This removes as well as modifies index entries to match the working tree, but adds no new files.

  If no <pathspec> is given when –update option is used, all tracked files in the entire working tree are updated (old versions of Git used to limit the update to the current directory and its subdirectories).

  Note: Used only, if a call to git-add instead of git-annex-add is performed

Returns

Return type list of dict

add_(*files*, *git=None*, *backend=None*, *options=None*, *jobs=None*, *git_options=None*, *annex_options=None*, *update=False*)

Like *add*, but returns a generator

add_remote(*name*, *url*, *options=None*)

Overrides method from GitRepo in order to set remote.<name>.annex-ssh-options in case of a SSH remote.

add_url_to_file(*file_*, **args*, ***kwargs*)

Add file from url to the annex.

Downloads *file* from *url* and add it to the annex. If annex knows *file* already, records that it can be downloaded from *url*.

Note: Consider using the higher-level *download_url* instead.

Parameters

- **file** (*str*) –
- **url** (*str*) –
- **options** (*list*) – options to the annex command
- **batch** (*bool, optional*) – initiate or continue with a batched run of annex addurl, instead of just calling a single git annex addurl command
- **unlink_existing** (*bool, optional*) – by default crashes if file already exists and is under git. With this flag set to True would first remove it.

Returns In batch mode only ATM returns dict representation of json output returned by annex

Return type dict

add_urls(*urls*, *options=None*, *backend=None*, *cwd=None*, *jobs=None*, *git_options=None*, *annex_options=None*)

Downloads each url to its own file, which is added to the annex.

Parameters

- **urls** (*list of str*) –
- **options** (*list, optional*) – options to the annex command
- **cwd** (*string, optional*) – working directory from within which to invoke git-annex

adjust(*options=None*)

enter an adjusted branch

This command is only available in a v6+ git-annex repository.

Parameters **options** (*list of str*) – currently requires '–unlock' or '–fix'; default: –unlock

commit(*msg=None*, *options=None*, *_datalad_msg=False*, *careless=True*, *files=None*, *proxy=False*)

Commit changes to git.

Parameters

- **msg** (*str, optional*) – commit-message
- **options** (*list of str, optional*) – cmdline options for git-commit
- **_datalad_msg** (*bool, optional*) – To signal that commit is automated commit by datalad, so it would carry the [DATALAD] prefix
- **careless** (*bool, optional*) – if False, raise when there's nothing actually committed; if True, don't care
- **files** (*list of str, optional*) – path(s) to commit
- **date** (*str, optional*) – Date in one of the formats git understands
- **index_file** (*str, optional*) – An alternative index to use

copy_to(*files*, **args*, ***kwargs*)

Copy the actual content of *files* to *remote*

Parameters

- **files** (*str or list of str*) – path(s) to copy
- **remote** (*str*) – name of remote to copy *files* to

Returns files successfully copied

Return type list of str

default_backends

drop(*files*, **args*, ***kwargs*)
Drops the content of annexed files from this repository.

Drops only if possible with respect to required minimal number of available copies.

Parameters

- **files** (*list of str*) – paths to drop
- **options** (*list of str, optional*) – commandline options for the git annex drop command
- **jobs** (*int, optional*) – how many jobs to run in parallel (passed to git-annex call)

Returns 'success' item in each object indicates failure/success per file path.

Return type list(JSON objects)

drop_key(*keys*, *options=None*, *batch=False*)
Drops the content of annexed files from this repository referenced by keys

Dangerous: it drops without checking for required minimal number of available copies.

Parameters

- **keys** (*list of str, str*) –
- **batch** (*bool, optional*) – initiate or continue with a batched run of annex dropkey, instead of just calling a single git annex dropkey command

enable_remote(*name*, *env=None*)
Enables use of an existing special remote

Parameters **name** (*str*) – name, the special remote was created with

file_has_content(*files*, **args*, ***kwargs*)
Check whether files have their content present under annex.

Parameters

- **files** (*list of str*) – file(s) to check for being actually present.
- **allow_quick** (*bool, optional*) – allow quick check, based on having a symlink into .git/annex/objects. Works only in non-direct mode (TODO: thin mode)

Returns For each input file states whether file has content locally

Return type list of bool

find(*files*, **args*, ***kwargs*)
Run *git annex find* on file(s).

Parameters

- **files** (*list of str*) – files to find under annex
- **batch** (*bool, optional*) – initiate or continue with a batched run of annex find, instead of just calling a single git annex find command. If any items in *files* are directories, this value is treated as False.

Returns

- A dictionary the maps each item in *files* to its *git annex find*
- *result. Items without a successful result will be an empty string, and*
- multi-item results (which can occur for if *files* includes a
- *directory) will be returned as a list.*

fsck()

get(*files*, **args*, ***kwargs*)
Get the actual content of files

Parameters

- **files** (*list of str*) – paths to get
- **remote** (*str, optional*) – from which remote to fetch content
- **options** (*list of str, optional*) – commandline options for the git annex get command
- **jobs** (*int or None, optional*) – how many jobs to run in parallel (passed to git-annex call). If not specified (None), then
- **key** (*bool, optional*) – If provided file value is actually a key

Returns **files**

Return type list of dict

get_annexed_files(*with_content_only=False*, *patterns=None*)
Get a list of files in annex

Parameters

- **with_content_only** (*bool, optional*) – Only list files whose content is present.
- **patterns** (*list, optional*) – Globs to pass to annex's *–include=*. Files that match any of these will be returned (i.e., they'll be separated by *–or*).

Returns

Return type A list of file names

get_contentlocation(*key*, *batch=False*)
Get location of the key content

Normally under .git/annex objects in indirect mode and within file tree in direct mode.

Unfortunately there is no (easy) way to discriminate situations when given key is simply incorrect (not known to annex) or its content not currently present – in both cases annex just silently exits with -1

Parameters

- **key** (*str*) – key
- **batch** (*bool, optional*) – initiate or continue with a batched run of annex contentlocation

Returns path relative to the top directory of the repository. If no content is present, empty string is returned

Return type str

get_corresponding_branch(*branch=None*)
In case of a managed branch, get the corresponding one.

If *branch* is not a managed branch, return that branch without any changes.

Note: Since default for *branch* is the active branch, *get_corresponding_branch()* is equivalent to *get_active_branch()* if the active branch is not a managed branch.

Parameters **branch** (*str*) – name of the branch; defaults to active branch

Returns name of the corresponding branch if there is any, name of the queried branch otherwise.

Return type str

get_description(*uuid=None*)
Get annex repository description

Parameters **uuid** (*str, optional*) – For which remote (based on uuid) to report description for

Returns None returned if not found

Return type str or None

get_file_backend(*files*, **args*, ***kwargs*)
Get the backend currently used for file(s).

Parameters **files** (*list of str*) –

Returns For each file in input list indicates the used backend by a str like "SHA256E" or "MD5".

Return type list of str

get_file_key(*files*, **args*, ***kwargs*)
Get key of an annexed file.

Parameters

- **files** (*str or list*) – file(s) to look up
- **batch** (*None or bool, optional*) – If True, *lookupkey –batch* process will be used, which would not crash even if provided file is not under annex (but directly under git), but rather just return an empty string. If False, invokes without –batch. If None, use batch mode if more than a single file is provided.

Returns keys used by git-annex for each of the files; in case of a list an empty string is returned if there was no key for that file

Return type str or list

Raises

- FileInGitError – If running in non-batch mode and a file is under git, not annex
- FileNotInAnnexError – If running in non-batch mode and a file is not under git at all

get_file_size(*file_*, **args*, ***kwargs*)

get_groupwanted(*name*)
Get *groupwanted* expression for a group *name*

Parameters **name** (*str*) – Name of the groupwanted group

get_metadata(*files*, *timestamps=False*)
Query git-annex file metadata

Parameters

- **files** (*str or list(str)*) – One or more paths for which metadata is to be queried.
- **timestamps** (*bool, optional*) – If True, the output contains a '<metadatakey>-lastchanged' key for every metadata item, reflecting the modification time, as well as a 'lastchanged' key with the most recent modification time of any metadata item.

Returns One tuple per file (could be more items than input arguments when directories are given). First tuple item is the filename, second item is a dictionary with metadata key/value pairs. Note that annex metadata tags are stored under the key 'tag', which is a regular metadata item that can be manipulated like any other.

Return type generator

get_preferred_content(*property*, *remote=None*)
Get preferred content configuration of a repository or remote

Parameters

- **property** (*{'wanted', 'required', 'group'}*) – Type of property to query
- **remote** (*str, optional*) – If not specified (None), returns the property for the local repository.

Returns Whether the setting is returned, or an empty string if there is none.

Return type str

Raises

- ValueError – If an unknown property label is given.
- CommandError – If the annex call errors.

get_remotes(*with_urls_only=False*, *exclude_special_remotes=False*)
Get known (special-) remotes of the repository

Parameters

- **exclude_special_remotes** (*bool, optional*) – if True, don't return annex special remotes
- **with_urls_only** (*bool, optional*) – return only remotes which have urls

Returns **remotes** – List of names of the remotes

Return type list of str

static get_size_from_key(*key*)
A little helper to obtain size encoded in a key

get_special_remotes()
Get info about all known (not just enabled) special remotes.

Returns Keys are special remore UUIDs, values are dicts with arguments for *git-annex enableremote*. This includes at least the 'type' and 'name' of a special remote. Each type of special remote may require addition arguments that will be available in the respective dictionary.

Return type dict

get_status(*untracked=True*, *deleted=True*, *modified=True*, *added=True*, *type_changed=True*, *submodules=True*, *path=None*)
Return various aspects of the status of the annex repository

Note: Under certain circumstances newly added submodules might be reported as 'modified' rather tha 'added'. See *AnnexRepo._submodules_dirty_direct_mode* for details.

Parameters

- **untracked** –
- **deleted** –
- **modified** –
- **added** –
- **type_changed** –
- **submodules** –
- **path** –

classmethod get_toppath(*path*, *follow_up=True*, *git_options=None*)
Return top-level of a repository given the path.

Parameters

- **follow_up** (*bool*) – If path has symlinks – they get resolved by git. If follow_up is True, we will follow original path up until we hit the same resolved path. If no such path found, resolved one would be returned.
- **git_options** (*list of str*) – options to be passed to the git rev-parse call
- **None if no parent directory contains a git repository.** (*Return*) –

get_tracking_branch(*branch=None*, *corresponding=True*)
Get the tracking branch for *branch* if there is any.

By default returns the tracking branch of the corresponding branch if *branch* is a managed branch.

Parameters

- **branch** (*str*) – local branch to look up. If none is given, active branch is used.
- **corresponding** (*bool*) – If True actually look up the corresponding branch of *branch* (also if *branch* isn't explicitly given)

Returns (remote or None, refspec or None) of the tracking branch

Return type tuple

get_urls(*file_*, **args*, ***kwargs*)
Get URLs for a file/key

Parameters

- **file** (*str*) –
- **key** (*bool, optional*) – Whether provided files are actually annex keys

Returns

Return type A list of URLs

git_annex_version = None

info(*files*, **args*, ***kwargs*)
Provide annex info for file(s).

Parameters **files** (*list of str*) – files to look for

Returns Info for each file

Return type dict

init_remote(*name*, *options*)
Creates a new special remote

Parameters **name** (*str*) – name of the special remote

is_available(*files*, **args*, ***kwargs*)
Check if file or key is available (from a remote)

In case if key or remote is misspecified, it wouldn't fail but just keep returning False, although possibly also complaining out loud ;)

Parameters

- **file** (*str*) – Filename or a key
- **remote** (*str, optional*) – Remote which to check. If None, possibly multiple remotes are checked before positive result is reported
- **key** (*bool, optional*) – Whether provided files are actually annex keys
- **batch** (*bool, optional*) – Initiate or continue with a batched run of annex checkpresentkey

Returns with True indicating that file/key is available from (the) remote

Return type bool

is_crippled_fs()
Return True if git-annex considers current filesystem 'crippled'.

Returns

Return type True if on crippled filesystem, False otherwise

is_direct_mode()
Return True if annex is in direct mode

Returns

Return type True if in direct mode, False otherwise.

is_dirty(*index=True*, *working_tree=False*, *untracked_files=True*, *submodules=True*, *path=None*)
Returns true if the repo is considered to be dirty

Parameters

- **index** (*bool*) – if True, consider changes to the index
- **working_tree** (*bool*) – if True, consider changes to the working tree
- **untracked_files** (*bool*) – if True, consider untracked files
- **submodules** (*bool*) – if True, consider submodules
- **path** (*str or list of str*) – path(s) to consider only

Returns

Return type bool

is_managed_branch(*branch=None*)
Whether *branch* is managed by git-annex.

ATM this returns true in direct mode (branch 'annex/direct/my_branch') and if on an adjusted branch (annex v6+ repository: either 'adjusted/my_branch(unlocked)' or 'adjusted/my_branch(fixed)'

Note: The term 'managed branch' is used to make clear it's meant to be more general than the v6+ 'adjusted branch'.

Parameters **branch** (*str*) – name of the branch; default: active branch

Returns True if on a managed branch, False otherwise

Return type bool

is_remote_annex_ignored(*remote*)
Return True if remote is explicitly ignored

is_special_annex_remote(*remote*, *check_if_known=True*)
Return whether remote is a special annex remote

Decides based on the presence of diagnostic annex- options for the remote

is_under_annex(*files*, **args*, ***kwargs*)
Check whether files are under annex control

Parameters

- **files** (*list of str*) – file(s) to check for being under annex
- **allow_quick** (*bool, optional*) – allow quick check, based on having a symlink into .git/annex/objects. Works only in non-direct mode (TODO: thin mode)

Returns For each input file states whether file is under annex

Return type list of bool

classmethod is_valid_repo(*path*, *allow_noninitialized=False*)
Return True if given path points to an annex repository

lock(*files*, **args*, ***kwargs*)
undo unlock

Use this to undo an unlock command if you don't want to modify the files any longer, or have made modifications you want to discard.

Parameters

- **files** (*list of str*) –
- **options** (*list of str*) –

merge_annex(*remote=None*)
Merge git-annex branch

Merely calls *sync* with the appropriate arguments.

Parameters **remote** (*str, optional*) – Name of a remote to be "merged".

migrate_backend(*files*, **args*, ***kwargs*)
Changes the backend used for *file*.

The backend used for the key-value of *files*. Only files currently present are migrated. Note: There will be no notification if migrating fails due to the absence of a file's content!

Parameters

- **files** (*list*) – files to migrate.
- **backend** (*str*) – specify the backend to migrate to. If none is given, the default backend of this instance will be used.

precommit()
Perform pre-commit maintenance tasks, such as closing all batched annexes since they might still need to flush their changes into index

proxy (*git_cmd*, ***kwargs*)
Use git-annex as a proxy to git

This is needed in case we are in direct mode, since there's no git working tree, that git can handle.

Parameters

- **git_cmd** (*list of str*) – the actual git command
- ****kwargs** (*dict, optional*) – passed to _run_annex_command

Returns output of the command call

Return type (stdout, stderr)

remove (*files*, **args*, ***kwargs*)
Remove files from git/annex (works in direct mode as well)

Parameters

- **files** –
- **force** (*bool, optional*) –

repo_info (*fast=False*)
Provide annex info for the entire repository.

Returns Info for the repository, with keys matching the ones returned by annex

Return type dict

rm_url (*file_*, **args*, ***kwargs*)
Record that the file is no longer available at the url.

Parameters

- **file** (*str*) –
- **url** (*str*) –

set_default_backend (*backend*, *persistent=True*, *commit=True*)
Set default backend

Parameters

- **backend** (*str*) –
- **persistent** (*bool, optional*) – If persistent, would add/commit to .gitattributes. If not – would set within .git/config

set_direct_mode (*enable_direct_mode=True*)
Switch to direct or indirect mode

Parameters **enable_direct_mode** (*bool*) – True means switch to direct mode, False switches to indirect mode

Raises CommandNotAvailableError – in case you try to switch to indirect mode on a crippled filesystem

set_groupwanted (*name*, *expr*)
Set *expr* for the *name* groupwanted

set_metadata (*files*, *reset=None*, *add=None*, *init=None*, *remove=None*, *purge=None*, *recursive=False*)
Manipulate git-annex file-metadata

Parameters

- **files** (*str or list(str)*) – One or more paths for which metadata is to be manipulated. The changes applied to each file item are uniform. However, the result may not be uniform across files, depending on the actual operation.
- **reset** (*dict, optional*) – Metadata items matching keys in the given dict are (re)set to the respective values.
- **add** (*dict, optional*) – The values of matching keys in the given dict appended to any possibly existing values. The metadata keys need not necessarily exist before.
- **init** (*dict, optional*) – Metadata items for the keys in the given dict are set to the respective values, if the key is not yet present in a file's metadata.
- **remove** (*dict, optional*) – Values in the given dict are removed from the metadata items matching the respective key, if they exist in a file's metadata. Non-existing values, or keys do not lead to failure.
- **purge** (*list, optional*) – Any metadata item with a key matching an entry in the given list is removed from the metadata.
- **recursive** (*bool, optional*) – If False, fail (with CommandError) when directory paths are given as *files*.

Returns JSON obj per modified file

Return type generator

set_preferred_content(*property*, *expr*, *remote=None*)
Set preferred content configuration of a repository or remote

Parameters

- **property** (*{'wanted', 'required', 'group'}*) – Type of property to query
- **expr** (*str*) – Any expression or label supported by git-annex for the given property.
- **remote** (*str, optional*) – If not specified (None), sets the property for the local repository.

Returns Raw git-annex output in response to the set command.

Return type str

Raises

- ValueError – If an unknown property label is given.
- CommandError – If the annex call errors.

set_remote_dead(*name*)
Announce to annex that remote is "dead"

set_remote_url(*name*, *url*, *push=False*)
Set the URL a remote is pointing to

Sets the URL of the remote *name*. Requires the remote to already exist.

Parameters

- **name** (*str*) – name of the remote
- **url** (*str*) –
- **push** (*bool*) – if True, set the push URL, otherwise the fetch URL; if True, additionally set annexurl to *url*, to make sure annex uses it to talk to the remote, since access via fetch URL might be restricted.

supports_unlocked_pointers
Return True if repository version supports unlocked pointers.

sync(*remotes=None*, *push=True*, *pull=True*, *commit=True*, *content=False*, *all=False*, *fast=False*)
Synchronize local repository with remotes

Use this command when you want to synchronize the local repository with one or more of its remotes. You can specify the remotes (or remote groups) to sync with by name; the default if none are specified is to sync with all remotes.

Parameters

- **remotes** (*str, list(str), optional*) – Name of one or more remotes to be sync'ed.
- **push** (*bool*) – By default, git pushes to remotes.
- **pull** (*bool*) – By default, git pulls from remotes
- **commit** (*bool*) – A commit is done by default. Disable to avoid committing local changes.
- **content** (*bool*) – Normally, syncing does not transfer the contents of annexed files. This option causes the content of files in the work tree to also be uploaded and downloaded as necessary.
- **all** (*bool*) – This option, when combined with *content*, makes all available versions of all files be synced, when preferred content settings allow
- **fast** (*bool*) – Only sync with the remotes with the lowest annex-cost value configured

unannex(*files*, **args*, ***kwargs*)
undo accidental add command

Use this to undo an accidental git annex add command. Note that for safety, the content of the file remains in the annex, until you use git annex unused and git annex dropunused.

Parameters

- **files** (*list of str*) –
- **options** (*list of str*) –

Returns successfully unannexed files

Return type list of str

unlock(*files*, **args*, ***kwargs*)
unlock files for modification

Parameters

- **files** (*list of str*) –
- **options** (*list of str*) –

Returns successfully unlocked files

Return type list of str

untracked_files
Get a list of untracked files

uuid
Annex UUID

Returns Returns a the annex UUID, if there is any, or *None* otherwise.

Return type str

whereis (*files*, **args*, ***kwargs*)
Lists repositories that have actual content of file(s).

Parameters

- **files** (*list of str*) – files to look for
- **output** (*{'descriptions', 'uuids', 'full'}, optional*) – If 'descriptions', a list of remotes descriptions returned is per each file. If 'full', for each file a dictionary of all fields is returned as returned by annex
- **key** (*bool, optional*) – Whether provided files are actually annex keys
- **options** (*list, optional*) – Options to pass into git-annex call

Returns

if output == 'descriptions', contains a list of descriptions of remotes for each input file, describing the remote for each remote, which was found by git-annex whereis, like:

```
u'me@mycomputer:~/where/my/repo/is [origin]' or
u'web' or
u'me@mycomputer:~/some/other/clone'
```

if output == 'uuids', returns a list of uuids. if output == 'full', returns a dictionary with filenames as keys and values a detailed record, e.g.:

```
{'00000000-0000-0000-0000-000000000001': {
  'description': 'web',
  'here': False,
  'urls': ['http://127.0.0.1:43442/about.txt', 'http://example.com/
↪someurl']
}}
```

Return type list of list of unicode or dict

class datalad.support.annexrepo.**BatchedAnnex**(*annex_cmd*, *git_options=None*, *annex_options=None*, *path=None*, *json=False*, *output_proc=None*)
Bases: object

Container for an annex process which would allow for persistent communication

close(*return_stderr=False*)
Close communication and wait for process to terminate

Returns stderr output if return_stderr and stderr file was there. None otherwise

Return type str

class datalad.support.annexrepo.**BatchedAnnexes**(*batch_size=0*, *git_options=None*)
Bases: dict

Class to contain the registry of active batch'ed instances of annex for a repository

clear()
Override just to make sure we don't rely on __del__ to close all the pipes

close()
Close communication to all the batched annexes

It does not remove them from the dictionary though

get(*k*[, *d*]) → D[k] if k in D, else d. d defaults to None.

class datalad.support.annexrepo.**ProcessAnnexProgressIndicators**(*expected=None*)
Bases: object

'Filter' for annex –json output to react to progress indicators

Instance of this beast should be passed into log_stdout option for git-annex commands runner

finish()

start()

datalad.support.annexrepo.**readline_json**(*stdout*)

datalad.support.annexrepo.**readline_rstripped**(*stdout*)

datalad.support.annexrepo.**readlines_until_ok_or_failed**(*stdout*, *maxlines=100*)
Read stdout until line ends with ok or failed

datalad.support.archives

Various handlers/functionality for different types of files (e.g. for archives)

class datalad.support.archives.**ArchivesCache**(*toppath=None*, *persistent=False*)
Bases: object

Cache to maintain extracted archives

Parameters

- **toppath** (*str*) – Top directory under .git/ of which temp directory would be created. If not provided – random tempdir is used
- **persistent** (*bool, optional*) – Passed over into generated ExtractedArchives

clean(*force=False*)

get_archive(*archive*)

path

class datalad.support.archives.**ExtractedArchive**(*archive*, *path=None*, *persistent=False*)
Bases: object

Container for the extracted archive

STAMP_SUFFIX = '.stamp'

assure_extracted()
Return path to the extracted *archive*. Extract archive if necessary

clean(*force=False*)

get_extracted_file(*afile*)

get_extracted_filename(*afile*)
Return full path to the *afile* within extracted *archive*

It does not actually extract any archive

get_extracted_files()
Generator to provide filenames which are available under extracted archive

get_leading_directory(*depth=None*, *consider=None*, *exclude=None*)
Return leading directory of the content within archive

Parameters

- **depth** (*int or None, optional*) – Maximal depth of leading directories to consider. If None - no upper limit
- **consider** (*list of str, optional*) – Regular expressions for file/directory names to be considered (before exclude). Applied to the entire relative path to the file as in the archive
- **exclude** (*list of str, optional*) – Regular expressions for file/directory names to be excluded from consideration. Applied to the entire relative path to the file as in the archive

Returns If there is no single leading directory – None returned

Return type str or None

is_extracted

path
Given an archive – return full path to it within cache (extracted)

stamp_path

datalad.support.archives.**compress_files**(*files*, *archive*, *path=None*, *overwrite=True*)
Compress *files* into an *archive* file

Parameters

- **files** (*list of str*) –
- **archive** (*str*) –
- **path** (*str*) – Alternative directory under which compressor will be invoked, to e.g. take into account relative paths of files and/or archive
- **overwrite** (*bool*) – Whether to allow overwriting the target archive file if one already exists

datalad.support.archives.**decompress_file**(*archive*, *dir_*, *leading_directories='strip'*)
Decompress *archive* into a directory *dir_*

Parameters

- **archive** (*str*) –
- **dir** (*str*) –
- **leading_directories** (*{'strip', None}*) – If *strip*, and archive contains a single leading directory under which all content is stored, all the content will be moved one directory up and that leading directory will be removed.

datalad.support.archives.**unixify_path**(*path*)
On windows convert paths from drive:d ile to /drive/d/file

This overcomes problems with various cmdline tools we are to use, such as tar etc

datalad.support.configparserinc

class datalad.support.configparserinc.**SafeConfigParserWithIncludes**(*defaults=None*, *dict_type=<class 'collections.OrderedDict'>*, *allow_no_value=False*)

Bases: ConfigParser.SafeConfigParser

Class adds functionality to SafeConfigParser to handle included other configuration files (or may be urls, whatever in the future)

File should have section [includes] and only 2 options implemented are 'files_before' and 'files_after' where files are listed 1 per line.

Example:

```
[INCLUDES]
before = 1.conf
         3.conf

after = 1.conf
```

It is a simple implementation, so just basic care is taken about recursion. Includes preserve right order, ie new files are inserted to the list of read configs before original, and their includes correspondingly so the list should follow the leaves of the tree.

I wasn't sure what would be the right way to implement generic (aka c++ template) so we could base at any **configparser* class... so I will leave it for the future

SECTION_NAME = 'INCLUDES'

static getIncludes(*resource*, *seen=[]*)

Given 1 config resource returns list of included files (recursively) with the original one as well Simple loops are taken care about

read(*filenames*)

datalad.customremotes.main

datalad.customremotes.main.**main**(*args=None*, *backend=None*)

datalad.customremotes.main.**setup_parser**(*backend*)

datalad.customremotes.base

Base classes to custom git-annex remotes (e.g. extraction from archives)

class datalad.customremotes.base.**AnnexCustomRemote**(*path=None*, *cost=None*, *fin=None*, *fout=None*)

Bases: object

Base class to provide custom special remotes for git-annex

Implements git-annex special custom remotes protocol described at http://git-annex.branchable.com/design/external_special_remote_protocol/

AVAILABILITY = 'LOCAL'

COST = 100

CUSTOM_REMOTE_NAME = None

SUPPORTED_SCHEMES = ()

debug(*msg*)

error(*msg*, *annex_err='ERROR'*)

get_DIRHASH(*key*, *full=False*)
Gets a two level hash associated with a Key.

Parameters

- **full** (*bool, optional*) – If True, would spit out full DIRHASH path, i.e. with a KEY/ directory
- **like "abc/def". This is always the same for any given Key, so** (*Something*) –
- **be used for eg, creating hash directory structures to store Keys in.** (*can*) –

get_URLS(*key*)
Gets URL(s) associated with a Key.

get_contentlocation(*key*, *absolute=False*, *verify_exists=True*)
Return (relative to top or absolute) path to the file containing the key

This is a wrapper around AnnexRepo.get_contentlocation which provides caching of the result (we are asking the location for the same archive key often)

heavydebug(*msg*, **args*, ***kwargs*)

info(*msg*)

main()
Interface to the command line tool

progress(*bytes*)

read(*req=None*, *n=1*)
Read a message from git-annex

Parameters

- **req** (*string, optional*) – Expected request - first msg of the response
- **n** (*int*) – Number of response elements after first msg

req_CHECKPRESENT(*key*)

CHECKPRESENT-SUCCESS Key Indicates that a key has been positively verified to be present in the remote.

CHECKPRESENT-FAILURE Key Indicates that a key has been positively verified to not be present in the remote.

CHECKPRESENT-UNKNOWN Key ErrorMsg Indicates that it is not currently possible to verify if the key is present in the remote. (Perhaps the remote cannot be contacted.)

req_CHECKURL(*url*)
The remote replies with one of CHECKURL-FAILURE, CHECKURL-CONTENTS, or CHECKURL-MULTI.

CHECKURL-CONTENTS Size|UNKNOWN Filename Indicates that the requested url has been verified to exist. The Size is the size in bytes, or use "UNKNOWN" if the size could not be determined. The Filename can be empty (in which case a default is used), or can specify a filename that is suggested to be used for this url.

CHECKURL-MULTI Url Size|UNKNOWN Filename ... Indicates that the requested url has been verified to exist, and contains multiple files, which can each be accessed using their own url. Note that since a list is returned, neither the Url nor the Filename can contain spaces.

CHECKURL-FAILURE Indicates that the requested url could not be accessed.

req_CLAIMURL(*url*)

req_EXPORTSUPPORTED()

req_GETAVAILABILITY()

req_GETCOST()

req_INITREMOTE(**args*)
Initialize this remote. Provides high level abstraction.

Specific implementation should go to _initialize

req_PREPARE(**args*)
Prepare "to deliver". Provides high level abstraction

Specific implementation should go to _prepare

req_REMOVE(*key*)

REMOVE-SUCCESS Key Indicates the key has been removed from the remote. May be returned if the remote didn't have the key at the point removal was requested.

REMOVE-FAILURE Key ErrorMsg Indicates that the key was unable to be removed from the remote.

req_TRANSFER(*cmd*, *key*, *file*)

req_WHEREIS(*key*)
Added in 5.20150812-17-g6bc46e3

provide any information about ways to access the content of a key stored in it, such as eg, public urls. This will be displayed to the user by eg, git annex whereis. The remote replies with WHEREIS-SUCCESS or WHEREIS-FAILURE. Note that users expect git annex whereis to run fast, without eg, network access. This is not needed when SETURIPRESENT is used, since such uris are automatically displayed by git annex whereis.

WHEREIS-SUCCESS String Indicates a location of a key. Typically an url, the string can be anything that it makes sense to display to the user about content stored in the special remote.

WHEREIS-FAILURE Indicates that no location is known for a key.

send(**args*)
Send a message to git-annex

Parameters ***args** (*list of strings*) – arguments to be joined by a space and passed to git-annex

send_unsupported(*msg=None*)
Send UNSUPPORTED-REQUEST to annex and log optional message in our log

stop(*msg=None*)

class datalad.customremotes.base.**AnnexExchangeProtocol**(*repopath*, *custom_remote_name=None*)
Bases: datalad.support.protocol.ProtocolInterface

A little helper to protocol interactions of custom remote with annex

HEADER = '#!/bin/bash\n\nset -e\n\n# Gets a VALUE response and stores it in $RET\nrepo

add_section(*cmd*, *exception*)
Adds a section to the protocol.

This is an alternative to the use of start_section() and end_section(). In opposition to start_section, this one can be called anytime.

Parameters

- **cmd** (*list*) – The actual command and its options/arguments as a list
- **exception** (*Exception*) – The exception raised by the command if any or None otherwise.

do_execute_callables

do_execute_ext_commands

end_section(*id_*, *exception*)
Ends the section *id*.

To call after the command call to be recorded. This ends the section defined by *id* as returned by start_section().

Parameters

- **id** (*int*) –
- **exception** (*Exception*) – The exception raised by the command if any or None otherwise.
- **Raises** –
- **-------** –
- **IndexError** – in case *id* is invalid.

initiate()

records_callables

records_ext_commands

start_section(*cmd*)
Starts a new section of the protocol.

To call before the command call to be recorded. To be used with a corresponding call of end_section().

Parameters **cmd** (*list*) – The actual command and its options/arguments as a list

Returns An id of the started section to be used as argument of the corresponding call of end_section().

Return type int

write_entries(*entries*)

write_section(*cmd*)

exception datalad.customremotes.base.**AnnexRemoteQuit**
Bases: exceptions.Exception

datalad.customremotes.base.**generate_uuids**()
Generate UUIDs for our remotes. Even though quick, for consistency pre-generated and recorded in consts.py

datalad.customremotes.base.**get_function_nargs**(*f*)

datalad.customremotes.base.**init_datalad_remote**(*repo*, *remote*, *encryption=None*, *autoenable=False*, *opts=[]*)

Initialize datalad special remote

datalad.customremotes.archives

Custom remote to support getting the load from archives present under annex

class datalad.customremotes.archives.**ArchiveAnnexCustomRemote**(*persistent_cache=True*, ***kwargs*)

Bases: *datalad.customremotes.base.AnnexCustomRemote*

Special custom remote allowing to obtain files from archives

Archives should also be under annex control.

AVAILABILITY = 'local'

COST = 500

CUSTOM_REMOTE_NAME = 'archive'

SUPPORTED_SCHEMES = ('dl+archive',)

URL_PREFIX = 'dl+archive:'

URL_SCHEME = 'dl+archive'

cache

get_file_url(*archive_file=None*, *archive_key=None*, *file=None*, *size=None*)

Given archive (file or a key) and a file – compose URL for access

Examples

dl+archive:SHA256E-s176–69...3e.tar.gz#path=1/d2/2d&size=123 when size of file within archive was known to be 123

dl+archive:SHA256E-s176–69...3e.tar.gz#path=1/d2/2d when size of file within archive was not provided

Parameters **size** (*int, optional*) – Size of the file. If not provided, will simply be empty

req_CHECKPRESENT(*key*)

Check if copy is available

TODO: just proxy the call to annex for underlying tarball

Replies

CHECKPRESENT-SUCCESS Key Indicates that a key has been positively verified to be present in the remote.

CHECKPRESENT-FAILURE Key Indicates that a key has been positively verified to not be present in the remote.

CHECKPRESENT-UNKNOWN Key ErrorMsg Indicates that it is not currently possible to verify if the key is present in the remote. (Perhaps the remote cannot be contacted.)

req_CHECKURL(*url*)
Replies

CHECKURL-CONTENTS Size|UNKNOWN Filename Indicates that the requested url has been verified to exist. The Size is the size in bytes, or use "UNKNOWN" if the size could not be determined. The Filename can be empty (in which case a default is used), or can specify a filename that is suggested to be used for this url.

CHECKURL-MULTI Url Size|UNKNOWN Filename ... Indicates that the requested url has been verified to exist, and contains multiple files, which can each be accessed using their own url. Note that since a list is returned, neither the Url nor the Filename can contain spaces.

CHECKURL-FAILURE Indicates that the requested url could not be accessed.

req_REMOVE(*key*)

REMOVE-SUCCESS Key Indicates the key has been removed from the remote. May be returned if the remote didn't have the key at the point removal was requested

REMOVE-FAILURE Key ErrorMsg Indicates that the key was unable to be removed from the remote.

req_WHEREIS(*key*)

WHEREIS-SUCCESS String Indicates a location of a key. Typically an url, the string can be anything that it makes sense to display to the user about content stored in the special remote.

WHEREIS-FAILURE Indicates that no location is known for a key.

stop(**args*)
Stop communication with annex

datalad.customremotes.archives.**main**()
cmdline entry point

5.2.3 Configuration management

config

datalad.config

class datalad.config.**ConfigManager**(*dataset=None*, *dataset_only=False*, *overrides=None*)
Bases: object

Thin wrapper around *git-config* with support for a dataset configuration.

The general idea is to have an object that is primarily used to read/query configuration option. Upon creation, current configuration is read via one (or max two, in the case of the presence of dataset-specific configuration) calls to *git config*. If this class is initialized with a Dataset instance, it supports reading and writing configuration from `.datalad/config` inside a dataset too. This file is committed to Git and hence useful to ship certain configuration items with a dataset.

The API aims to provide the most significant read-access API of a dictionary, the Python ConfigParser, and GitPython's config parser implementations.

This class is presently not capable of efficiently writing multiple configurations items at once. Instead, each modification results in a dedicated call to *git config*. This author thinks this is OK, as he cannot think of a situation where a large number of items need to be written during normal operation. If such need arises, various solutions are possible (via GitPython, or an independent writer).

Each instance carries a public *overrides* attribute. This dictionary contains variables that override any setting

read from a file. The overrides are persistent across reloads, and are not modified by any of the manipulation methods, such as *set* or *unset*.

Any DATALAD_* environment variable is also presented as a configuration item. Settings read from environment variables are not stored in any of the configuration file, but are read dynamically from the environment at each *reload()* call. Their values take precedence over any specification in configuration files, and even overrides.

Parameters

- **dataset** (*Dataset, optional*) – If provided, all *git config* calls are executed in this dataset's directory. Moreover, any modifications are, by default, directed to this dataset's configuration file (which will be created on demand)
- **dataset_only** (*bool*) – If True, configuration items are only read from a datasets persistent configuration file, if any present (the one in `.datalad/config`, not `.git/config`).
- **overrides** (*dict, optional*) – Variable overrides, see general class documentation for details.

add(*var*, *value*, *where='dataset'*, *reload=True*)
Add a configuration variable and value

Parameters

- **var** (*str*) – Variable name including any section like *git config* expects them, e.g. 'core.editor'
- **value** (*str*) – Variable value
- **where** (*{'dataset', 'local', 'global'}, optional*) – Indicator which configuration file to modify. 'dataset' indicates the persistent configuration in .datalad/config of a dataset; 'local' the configuration of a dataset's Git repository in .git/config; 'global' refers to the general configuration that is not specific to a single repository (usually in $USER/.gitconfig).
- **reload** (*bool*) – Flag whether to reload the configuration from file(s) after modification. This can be disable to make multiple sequential modifications slightly more efficient.

get(*k*[, *d*]) → D[k] if k in D, else d. d defaults to None.

get_value(*section*, *option*, *default=None*)
Like *get()*, but with an optional default value

If the default is not None, the given default value will be returned in case the option did not exist. This behavior imitates GitPython's config parser.

getbool(*section*, *option*, *default=None*)
A convenience method which coerces the option value to a bool

Values "on", "yes", "true" and any int!=0 are considered True Values which evaluate to bool False, "off", "no", "false" are considered False TypeError is raised for other values.

getfloat(*section*, *option*)
A convenience method which coerces the option value to a float

getint(*section*, *option*)
A convenience method which coerces the option value to an integer

has_option(*section*, *option*)
If the given section exists, and contains the given option

has_section(*section*)
Indicates whether a section is present in the configuration

items(*section=None*)
Return a list of (name, value) pairs for each option

Optionally limited to a given section.

keys()
Returns list of configuration item names

obtain(*var*, *default=None*, *dialog_type=None*, *valtype=None*, *store=False*, *where=None*, *reload=True*, ***kwargs*)
Convenience method to obtain settings interactively, if needed

A UI will be used to ask for user input in interactive sessions. Questions to ask, and additional explanations can be passed directly as arguments, or retrieved from a list of pre-configured items.

Additionally, this method allows for type conversion and storage of obtained settings. Both aspects can also be pre-configured.

Parameters

- **var** (*str*) – Variable name including any section like *git config* expects them, e.g. 'core.editor'
- **default** (*any type*) – In interactive sessions and if *store* is True, this default value will be presented to the user for confirmation (or modification). In all other cases, this value will be silently assigned unless there is an existing configuration setting.
- **dialog_type** (*{'question', 'yesno', None}*) – Which dialog type to use in interactive sessions. If *None*, pre-configured UI options are used.
- **store** (*bool*) – Whether to store the obtained value (or default)
- **where** (*{'dataset', 'local', 'global'}, optional*) – Indicator which configuration file to modify. 'dataset' indicates the persistent configuration in .datalad/config of a dataset; 'local' the configuration of a dataset's Git repository in .git/config; 'global' refers to the general configuration that is not specific to a single repository (usually in $USER/.gitconfig).
- **reload** (*bool*) – Flag whether to reload the configuration from file(s) after modification. This can be disable to make multiple sequential modifications slightly more efficient.
- ****kwargs** – Additional arguments for the UI function call, such as a question *text*.

options(*section*)
Returns a list of options available in the specified section.

reload(*force=False*)
Reload all configuration items from the configured sources

If *force* is False, all files configuration was previously read from are checked for differences in the modification times. If no difference is found for any file no reload is performed. This mechanism will not detect newly created global configuration files, use *force* in this case.

remove_section(*sec*, *where='dataset'*, *reload=True*)
Rename a configuration section

Parameters

- **sec** (*str*) – Name of the section to remove.
- **where** (*{'dataset', 'local', 'global'}, optional*) – Indicator which configuration file to modify. 'dataset' indicates the persistent configuration in .datalad/config of a dataset; 'local' the configuration of a dataset's Git repository in .git/config;

'global' refers to the general configuration that is not specific to a single repository (usually in $USER/.gitconfig).

- **reload** (*bool*) – Flag whether to reload the configuration from file(s) after modification. This can be disable to make multiple sequential modifications slightly more efficient.

rename_section(*old*, *new*, *where='dataset'*, *reload=True*)
Rename a configuration section

Parameters

- **old** (*str*) – Name of the section to rename.
- **new** (*str*) – Name of the section to rename to.
- **where** (*{'dataset', 'local', 'global'}, optional*) – Indicator which configuration file to modify. 'dataset' indicates the persistent configuration in .datalad/config of a dataset; 'local' the configuration of a dataset's Git repository in .git/config; 'global' refers to the general configuration that is not specific to a single repository (usually in $USER/.gitconfig).
- **reload** (*bool*) – Flag whether to reload the configuration from file(s) after modification. This can be disable to make multiple sequential modifications slightly more efficient.

sections()
Returns a list of the sections available

set(*var*, *value*, *where='dataset'*, *reload=True*, *force=False*)
Set a variable to a value.

In opposition to *add*, this replaces the value of *var* if there is one already.

Parameters

- **var** (*str*) – Variable name including any section like *git config* expects them, e.g. 'core.editor'
- **value** (*str*) – Variable value
- **force** (*bool*) – if set, replaces all occurrences of *var* by a single one with the given *value*. Otherwise raise if multiple entries for *var* exist already
- **where** (*{'dataset', 'local', 'global'}, optional*) – Indicator which configuration file to modify. 'dataset' indicates the persistent configuration in .datalad/config of a dataset; 'local' the configuration of a dataset's Git repository in .git/config; 'global' refers to the general configuration that is not specific to a single repository (usually in $USER/.gitconfig).
- **reload** (*bool*) – Flag whether to reload the configuration from file(s) after modification. This can be disable to make multiple sequential modifications slightly more efficient.

unset(*var*, *where='dataset'*, *reload=True*)
Remove all occurrences of a variable

Parameters

- **var** (*str*) – Name of the variable to remove
- **where** (*{'dataset', 'local', 'global'}, optional*) – Indicator which configuration file to modify. 'dataset' indicates the persistent configuration in .datalad/config of a dataset; 'local' the configuration of a dataset's Git repository in .git/config; 'global' refers to the general configuration that is not specific to a single repository (usually in $USER/.gitconfig).

- **reload** (*bool*) – Flag whether to reload the configuration from file(s) after modification. This can be disable to make multiple sequential modifications slightly more efficient.

datalad.config.**anything2bool**(*val*)

datalad.config.**get_git_version**(*runner*)
Return version of available git

5.2.4 Test infrastructure

tests.utils	Miscellaneous utilities to assist with testing
tests.utils_testrepos	
tests.heavyoutput	Helper to provide heavy load on stdout and stderr

datalad.tests.utils

Miscellaneous utilities to assist with testing

class datalad.tests.utils.**HTTPPath**(*path*)
Bases: object

Serve the content of a path via an HTTP URL.

This class can be used as a context manager, in which case it returns the URL.

Alternatively, the *start* and *stop* methods can be called directly.

Parameters **path** (*str*) – Directory with content to serve.

start()
Start serving *path* via HTTP.

stop()
Stop serving *path*.

class datalad.tests.utils.**SilentHTTPHandler**(**args*, ***kwargs*)
Bases: SimpleHTTPServer.SimpleHTTPRequestHandler

A little adapter to silence the handler

log_message(*format*, **args*)

datalad.tests.utils.**assert_dict_equal**(*d1*, *d2*)

datalad.tests.utils.**assert_in_results**(*results*, ***kwargs*)
Verify that the particular combination of keys and values is found in one of the results

datalad.tests.utils.**assert_is_generator**(*gen*)

datalad.tests.utils.**assert_message**(*message*, *results*)
Verify that each status dict in the results has a message

This only tests the message template string, and not a formatted message with args expanded.

datalad.tests.utils.**assert_no_errors_logged**(*func*, *skip_re=None*)
Decorator around function to assert that no errors logged during its execution

datalad.tests.utils.**assert_not_in_results**(*results*, ***kwargs*)
Verify that the particular combination of keys and values is not in any of the results

datalad.tests.utils.**assert_re_in**(*regex*, *c*, *flags=0*, *match=True*, *msg=None*)
Assert that container (list, str, etc) contains entry matching the regex

datalad.tests.utils.**assert_result_count**(*results*, *n*, ***kwargs*)
Verify specific number of results (matching criteria, if any)

datalad.tests.utils.**assert_result_values_cond**(*results*, *prop*, *cond*)
Verify that the values of all results for a given key in the status dicts fullfill condition *cond*.

Parameters

- **results** –
- **prop** (*str*) –
- **cond** (*callable*) –

datalad.tests.utils.**assert_result_values_equal**(*results*, *prop*, *values*)
Verify that the values of all results for a given key in the status dicts match the given sequence

datalad.tests.utils.**assert_status**(*label*, *results*)
Verify that each status dict in the results has a given status label

label can be a sequence, in which case status must be one of the items in this sequence.

datalad.tests.utils.**assert_str_equal**(*s1*, *s2*)
Helper to compare two lines

datalad.tests.utils.**clone_url**(*url*)

datalad.tests.utils.**get_datasets_topdir**()
Delayed parsing so it could be monkey patched etc

datalad.tests.utils.**get_most_obscure_supported_name**(**arg*, ***kw*)
Return the most obscure filename that the filesystem would support under TEMPDIR

TODO: we might want to use it as a function where we would provide tdir

datalad.tests.utils.**get_mtimes_and_digests**(*target_path*)
Return digests (md5) and mtimes for all the files under target_path

datalad.tests.utils.**ignore_nose_capturing_stdout**(*func*)
Decorator workaround for nose's behaviour with redirecting sys.stdout

Needed for tests involving the runner and nose redirecting stdout. Counter-intuitively, that means it needed for nosetests without '-s'. See issue reported here: https://code.google.com/p/python-nose/issues/detail?id=243&can=1&sort=-id&colspec=ID%20Type%20Status%20Priority%20Stars%20Milestone%20Owner%20Summary

datalad.tests.utils.**integration**(*f*)
Mark test as an "integration" test which generally is not needed to be run

Generally tend to be slower

datalad.tests.utils.**known_failure**(*func*)
Test decorator marking a test as known to fail

This combines *probe_known_failure* and *skip_known_failure* giving the skipping precedence over the probing.

datalad.tests.utils.**known_failure_direct_mode**(*func*)
Test decorator marking a test as known to fail in a direct mode test run

If datalad.repo.direct is set to True behaves like *known_failure*. Otherwise the original (undecorated) function is returned.

datalad.tests.utils.**known_failure_v6**(*func*)
Test decorator marking a test as known to fail in a v6+ test run

If datalad.repo.version is set to 6 or later behaves like *known_failure*. Otherwise the original (undecorated) function is returned.

datalad.tests.utils.**known_failure_v6_or_later**(*func*)
Test decorator marking a test as known to fail in a v6+ test run

If datalad.repo.version is set to 6 or later behaves like *known_failure*. Otherwise the original (undecorated) function is returned.

datalad.tests.utils.**known_failure_windows**(*func*)
Test decorator marking a test as known to fail on windows

On Windows behaves like *known_failure*. Otherwise the original (undecorated) function is returned.

datalad.tests.utils.**nok_startswith**(*s*, *prefix*)

datalad.tests.utils.**ok_annex_get**(*ar*, *files*, *network=True*)
Helper to run .get decorated checking for correct operation

get passes through stderr from the ar to the user, which pollutes screen while running tests

Note: Currently not true anymore, since usage of –json disables progressbars

datalad.tests.utils.**ok_archives_caches**(*repopath*, *n=1*, *persistent=None*)
Given a path to repository verify number of archives

Parameters

- **repopath** (*str*) – Path to the repository
- **n** (*int, optional*) – Number of archives directories to expect
- **persistent** (*bool or None, optional*) – If None – both persistent and not count.

datalad.tests.utils.**ok_broken_symlink**(*path*)

datalad.tests.utils.**ok_clean_git**(*path*, *annex=None*, *head_modified=[]*, *index_modified=[]*, *untracked=[]*, *ignore_submodules=False*)
Verify that under given path there is a clean git repository

it exists, .git exists, nothing is uncommitted/dirty/staged

Note: Parameters head_modified and index_modified currently work in pure git or indirect mode annex only. If they are given, no test of modification of known repo content is performed.

Parameters

- **path** (*str or Repo*) – in case of a str: path to the repository's base dir; Note, that passing a Repo instance prevents detecting annex. This might be useful in case of a non-initialized annex, a GitRepo is pointing to.
- **annex** (*bool or None*) – explicitly set to True or False to indicate, that an annex is (not) expected; set to None to autodetect, whether there is an annex. Default: None.
- **ignore_submodules** (*bool*) – if True, submodules are not inspected

datalad.tests.utils.**ok_endswith**(*s*, *suffix*)

datalad.tests.utils.**ok_exists**(*path*)

datalad.tests.utils.**ok_file_has_content**(*path*, *content*, *strip=False*, *re_=False*, ***kwargs*)
Verify that file exists and has expected content

datalad.tests.utils.**ok_file_under_git**(*path*, *filename=None*, *annexed=False*)
Test if file is present and under git/annex control

If relative path provided, then test from current directory

datalad.tests.utils.**ok_generator**(*gen*)

datalad.tests.utils.**ok_git_config_not_empty**(*ar*)
Helper to verify that nothing rewritten the config file

datalad.tests.utils.**ok_good_symlink**(*path*)

datalad.tests.utils.**ok_startswith**(*s*, *prefix*)

datalad.tests.utils.**ok_symlink**(*path*)
Checks whether path is either a working or broken symlink

datalad.tests.utils.**patch_config**(*vars*)
Patch our config with custom settings. Returns mock.patch cm

datalad.tests.utils.**probe_known_failure**(*func*)
Test decorator allowing the test to pass when it fails and vice versa

Setting config datalad.tests.knownfailures.probe to True tests, whether or not the test is still failing. If it's not, an AssertionError is raised in order to indicate that the reason for failure seems to be gone.

datalad.tests.utils.**put_file_under_git**(*path*, *filename=None*, *content=None*, *annexed=False*)
Place file under git/annex and return used Repo

datalad.tests.utils.**set_date**(**args*, ***kwds*)
Temporarily override environment variables for git/git-annex dates.

Parameters **timestamp** (*int*) – Unix timestamp.

datalad.tests.utils.**skip_httpretty_on_problematic_pythons**(*func*)
As discovered some httpretty bug causes a side-effect on other tests on some Pythons. So we skip the test if such problematic combination detected

References https://travis-ci.org/datalad/datalad/jobs/94464988 http://stackoverflow.com/a/29603206/1265472

datalad.tests.utils.**skip_if_no_module**(*module*)

datalad.tests.utils.**skip_if_no_network**(*func=None*)
Skip test completely in NONETWORK settings

If not used as a decorator, and just a function, could be used at the module level

datalad.tests.utils.**skip_if_on_windows**(*func*)
Skip test completely under Windows

datalad.tests.utils.**skip_if_scrapy_without_selector**()
A little helper to skip some tests which require recent scrapy

datalad.tests.utils.**skip_if_url_is_not_available**(*url*, *regex=None*)

datalad.tests.utils.**skip_ssh**(*func*)
Skips SSH tests if on windows or if environment variable DATALAD_TESTS_SSH was not set

datalad.tests.utils.**slow**(*f*)
Mark test as a slow, although not necessarily integration or usecase test

datalad.tests.utils.**usecase**(*f*)
Mark test as a usecase user ran into and which (typically) caused bug report to be filed/troubleshooted

datalad.tests.utils_testrepos

class datalad.tests.utils_testrepos.**BasicAnnexTestRepo**(*path=None*, *puke_if_exists=True*)

Bases: *datalad.tests.utils_testrepos.TestRepo*

Creates a basic test git-annex repository

REPO_CLASS
alias of *datalad.support.annexrepo.AnnexRepo*

create_info_file()

populate()

class datalad.tests.utils_testrepos.**BasicGitTestRepo**(*path=None*, *puke_if_exists=True*)

Bases: *datalad.tests.utils_testrepos.TestRepo*

Creates a basic test git repository.

REPO_CLASS
alias of datalad.support.gitrepo.GitRepo

create_info_file()

populate()

class datalad.tests.utils_testrepos.**InnerSubmodule**

Bases: object

create()

path

url

class datalad.tests.utils_testrepos.**NestedDataset**(*path=None*, *puke_if_exists=True*)

Bases: *datalad.tests.utils_testrepos.BasicAnnexTestRepo*

populate()

class datalad.tests.utils_testrepos.**SubmoduleDataset**(*path=None*, *puke_if_exists=True*)

Bases: *datalad.tests.utils_testrepos.BasicAnnexTestRepo*

populate()

class datalad.tests.utils_testrepos.**TestRepo**(*path=None*, *puke_if_exists=True*)

Bases: object

REPO_CLASS = None

create()

create_file(*name*, *content*, *add=True*, *annex=False*)

path

populate()

url

datalad.tests.heavyoutput

Helper to provide heavy load on stdout and stderr

5.2.5 Command line interface infrastructure

cmdline.main
cmdline.helpers
cmdline.common_args

datalad.cmdline.main

class datalad.cmdline.main.**ArgumentParserDisableAbbrev**(*prog=None*, *usage=None*, *description=None*, *epilog=None*, *version=None*, *parents=[]*, *formatter_class=<class 'argparse.HelpFormatter'>*, *prefix_chars='-'*, *fromfile_prefix_chars=None*, *argument_default=None*, *conflict_handler='error'*, *add_help=True*)

Bases: argparse.ArgumentParser

datalad.cmdline.main.**add_entrypoints_to_interface_groups**(*interface_groups*)

datalad.cmdline.main.**fail_with_short_help**(*parser=None*, *msg=None*, *known=None*, *provided=None*, *hint=None*, *exit_code=1*, *what='command'*, *out=None*)

Generic helper to fail with short help possibly hinting on what was intended if *known* were provided

datalad.cmdline.main.**get_commands_from_groups**(*groups*)

Get a dictionary of command: interface_spec

datalad.cmdline.main.**get_description_with_cmd_summary**(*grp_short_descriptions*, *interface_groups*, *parser_description*)

datalad.cmdline.main.**main**(*args=None*)

datalad.cmdline.main.**setup_parser**(*cmdlineargs*, *formatter_class=<class 'argparse.RawDescriptionHelpFormatter'>*, *return_subparsers=False*)

datalad.cmdline.helpers

class datalad.cmdline.helpers.**HelpAction**(*option_strings*, *dest*, *nargs=None*, *const=None*, *default=None*, *type=None*, *choices=None*, *required=False*, *help=None*, *metavar=None*)

Bases: argparse.Action

class datalad.cmdline.helpers.**LogLevelAction**(*option_strings*, *dest*, *nargs=None*, *const=None*, *default=None*, *type=None*, *choices=None*, *required=False*, *help=None*, *metavar=None*)

Bases: argparse.Action

datalad.cmdline.helpers.**get_repo_instance**(*path='.'*, *class_=None*)

Returns an instance of appropriate datalad repository for path. Check whether a certain path is inside a known

type of repository and returns an instance representing it. May also check for a certain type instead of detecting the type of repository.

Parameters

- **path** (*str*) – path to check; default: current working directory
- **class** (*class*) – if given, check whether path is inside a repository, that can be represented as an instance of the passed class.

Raises RuntimeError, in case cwd is not inside a known repository.

datalad.cmdline.helpers.**parser_add_common_opt**(*parser*, *opt*, *names=None*, ***kwargs*)

datalad.cmdline.helpers.**run_via_pbs**(*args*, *pbs*)

datalad.cmdline.helpers.**strip_arg_from_argv**(*args*, *value*, *opt_names*)
Strip an originally listed option (with its value) from the list cmdline args

datalad.cmdline.common_args

5.3 Configuration

DataLad uses the same configuration mechanism and syntax as Git itself. Consequently, datalad can be configured using the **git config** command. Both a *global* user configuration (typically at `~/.gitconfig`), and a *local* repository-specific configuration (`.git/config`) are inspected.

In addition, datalad supports a persistent dataset-specific configuration. This configuration is stored at `.datalad/config` in any dataset. As it is part of a dataset, settings stored there will also be in effect for any consumer of such a dataset. Both *global* and *local* settings on a particular machine always override configuration shipped with a dataset.

All datalad-specific configuration variables are prefixed with `datalad.`.

It is possible to override or amend the configuration using environment variables. Any variable with a name that starts with `DATALAD_` will be available as the corresponding `datalad.` configuration variable, replacing any `__` (two underscores) with a hyphen, then any `_` (single underscore) with a dot, and finally converting all letters to lower case. Values from environment variables take precedence over configuration file settings.

The following sections provide a (non-exhaustive) list of settings honored by datalad. They are categorized according to the scope they are typically associated with.

5.3.1 Global user configuration

datalad.externals.nda.dbserver NDA database server: Hostname of the database server

datalad.locations.cache Cache directory: Where should datalad cache files? Default: ~/.cache/datalad

datalad.locations.default-dataset Default dataset path: Where should datalad should look for (or install) a default dataset? Default: ~/datalad

datalad.locations.system-plugins System plugin directory: Where should datalad search for system plugins? Default: /etc/xdg/datalad/plugins

datalad.locations.system-procedures System procedure directory: Where should datalad search for system procedures? Default: /etc/xdg/datalad/procedures

datalad.locations.user-plugins User plugin directory: Where should datalad search for user plugins? Default: ~/.config/datalad/plugins

datalad.locations.user-procedures User procedure directory: Where should datalad search for user procedures? Default: ~/.config/datalad/procedures

5.3.2 Local repository configuration

datalad.crawl.cache Crawler download caching: Should the crawler cache downloaded files?

[bool]

datalad.fake-dates Fake (anonymize) dates: Should the dates in the logs be faked? Default: False

[value must be convertible to type bool]

5.3.3 Sticky dataset configuration

datalad.locations.dataset-procedures Dataset procedure directory: Where should datalad search for dataset procedures (relative to a dataset root)? Default: .datalad/procedures

5.3.4 Miscellaneous configuration

datalad.cmd.protocol Specifies the protocol number used by the Runner to note shell command or python function call times and allows for dry runs. "externals-time" for ExecutionTimeExternalsProtocol, "time" for ExecutionTimeProtocol and "null" for NullProtocol. Any new DATALAD_CMD_PROTOCOL has to implement datalad.support.protocol.ProtocolInterface:

datalad.cmd.protocol.prefix Sets a prefix to add before the command call times are noted by DATALAD_CMD_PROTOCOL.:

datalad.exc.str.tblimit This flag is used by the datalad extract_tb function which extracts and formats stack-traces. It caps the number of lines to DATALAD_EXC_STR_TBLIMIT of pre-processed entries from traceback.:

datalad.fake-dates-start Initial fake date: When faking dates and there are no commits in any local branches, generate the date by adding one second to this value (Unix epoch time). The value must be positive. Default: 1112911993

[value must be convertible to type 'int']

datalad.log.level Used for control the verbosity of logs printed to stdout while running datalad commands/debugging:

datalad.log.name Include name of the log target in the log line:

datalad.log.names Which names (,-separated) to print log lines for:

datalad.log.namesre Regular expression for which names to print log lines for:

datalad.log.outputs Used to control whether both stdout and stderr of external commands execution are logged in detail (at DEBUG level):

datalad.log.timestamp Used to add timestamp to datalad logs: Default: False

[value must be convertible to type bool]

datalad.log.traceback Runs TraceBack function with collide set to True, if this flag is set to "collide". This replaces any common prefix between current traceback log and previous invocation with "...":

datalad.metadata.create-aggregate-annex-limit Limit configuration annexing aggregated metadata in new dataset: Git-annex large files expression (see https://git-annex.branchable.com/tips/largefiles; given expression will be wrapped in parentheses) Default: largerthan=20kb

datalad.metadata.maxfieldsize Maximum metadata field size: Metadata fields exceeding this size (in bytes/chars) are excluded from metadata extractio Default: 100000

[value must be convertible to type 'int']

datalad.metadata.nativetype Native dataset metadata scheme: Set this label to engage a particular metadata extraction parser

datalad.metadata.store-aggregate-content Aggregated content metadata storage: If this flag is enabled, content metadata is aggregated into superdataset to allow for discovery of individual files. If disable unique content metadata values are still aggregated to enable dataset discovery Default: True

[value must be convertible to type bool]

datalad.repo.direct Direct Mode for git-annex repositories: Set this flag to create annex repositories in direct mode by default Default: False

[value must be convertible to type bool]

datalad.repo.version git-annex repository version: Specifies the repository version for git-annex to be used by default Default: 5

[value must be convertible to type 'int']

datalad.runtime.raiseonerror Error behavior: Set this flag to cause DataLad to raise an exception on errors that would have otherwise just get logged Default: False

[value must be convertible to type bool]

datalad.runtime.report-status Command line result reporting behavior: If set (to other than 'all'), constrains command result report to records matching the given status. 'success' is a synonym for 'ok' OR 'notneeded', 'failure' stands for 'impossible' OR 'error' Default: None

[value must be one of ('all', 'success', 'failure', 'ok', 'notneeded', 'impossible', 'error')]

datalad.search.default-mode Default search mode: Label of the mode to be used by default Default: egrep

[value must be one of ('egrep', 'textblob', 'autofield')]

datalad.search.index-default-documenttype Type of search index documents: Labels of document types to include in a default search index Default: datasets

[value must be one of ('all', 'datasets', 'files')]

datalad.search.indexercachesize Maximum cache size for search index (per process): Actual memory consumption can be twice as high as this value in MB (one process per CPU is used) Default: 256

[value must be convertible to type 'int']

datalad.tests.dataladremote Binary flag to specify whether each annex repository should get datalad special remote in every test repository:

[value must be convertible to type bool]

datalad.tests.knownfailures.probe Probes tests that are known to fail on whether or not they are actually still failing: Default: False

[value must be convertible to type bool]

datalad.tests.knownfailures.skip Skips tests that are known to currently fail: Default: True

[value must be convertible to type bool]

datalad.tests.nonetwork Skips network tests completely if this flag is set Examples include test for s3, git_repositories, openfmri etc:

[value must be convertible to type bool]

datalad.tests.nonlo Specifies network interfaces to bring down/up for testing. Currently used by travis.:

datalad.tests.noteardown Does not execute teardown_package which cleans up temp files and directories created by tests if this flag is set:

[value must be convertible to type bool]

datalad.tests.protocolremote Binary flag to specify whether to test protocol interactions of custom remote with annex:

[value must be convertible to type bool]

datalad.tests.runcmdline Binary flag to specify if shell testing using shunit2 to be carried out:

[value must be convertible to type bool]

datalad.tests.ssh Skips SSH tests if this flag is **not** set:

[value must be convertible to type bool]

datalad.tests.temp.dir Create a temporary directory at location specified by this flag. It is used by tests to create a temporary git directory while testing git annex archives etc:

datalad.tests.temp.fs Specify the temporary file system to use as loop device for testing DATALAD_TESTS_TEMP_DIR creation:

datalad.tests.temp.fssize Specify the size of temporary file system to use as loop device for testing DATALAD_TESTS_TEMP_DIR creation:

datalad.tests.temp.keep Function rmtemp will not remove temporary file/directory created for testing if this flag is set:

[value must be convertible to type bool]

datalad.tests.ui.backend Tests UI backend: Which UI backend to use Default: tests-noninteractive

datalad.tests.usecassette Specifies the location of the file to record network transactions by the VCR module. Currently used by when testing custom special remotes:

CHAPTER 6

Extension packages

DataLad can be customized and additional functionality can be integrated via extensions. Each extension provides its own documentation:

- Crawling web resources and automated data distributions
- Neuroimaging data and workflows
- Containerized computational environments
- Alternative set of basic commands with improved cross-platform support

CHAPTER 7

Indices and tables

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