

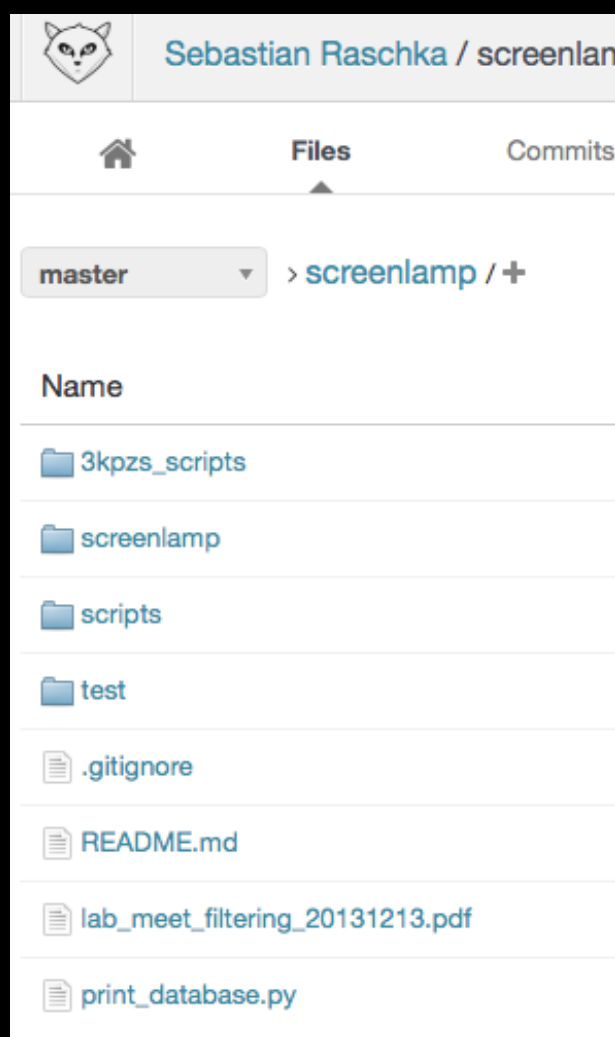
Git & MSU GitLab

Sebastian Raschka
January 8, 2014



What is Version Control?














data storage that keeps previous versions



05 Dec, 2013 2 commits	e1167e44d 3kpzs prefilter screening rasbt	Browse Code » about 1 month ago
	cfadca08a add mol2 strings rasbt	Browse Code » about 1 month ago
04 Dec, 2013 5 commits	03de252c4 print head rasbt	Browse Code » about 1 month ago
	eb04fdff6 removed old readme rasbt	Browse Code » about 1 month ago
	7d1c91896 doc update rasbt	Browse Code » about 1 month ago
	97cfc9834 refactoring: update_records rasbt	Browse Code » about 1 month ago
02 Dec, 2013 1 commit	54758891b unittests and build and query rasbt	Browse Code » about 1 month ago
	3ace72c79 create db Sebastian Raschka	Browse Code » about 1 month ago
22 Nov, 2013 1 commit	4e19df146 first commit rasbt	Browse Code » about 1 month ago

Benefits of Version Control

keep track of changes

 05 Dec, 2013 2 commits	e1167e44d 3kpzs prefilter screening  rasbt	Browse Code » about 1 month ago
	cfadca08a add mol2 strings  rasbt	Browse Code » about 1 month ago
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Benefits of Version Control

revert changes

Benefits of Version Control

share & collaborate

Git vs. other Version Control systems

free and open source distributed



<http://git-scm.com/>

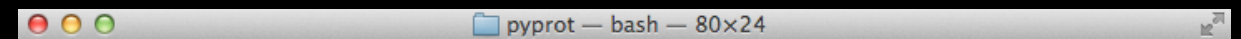
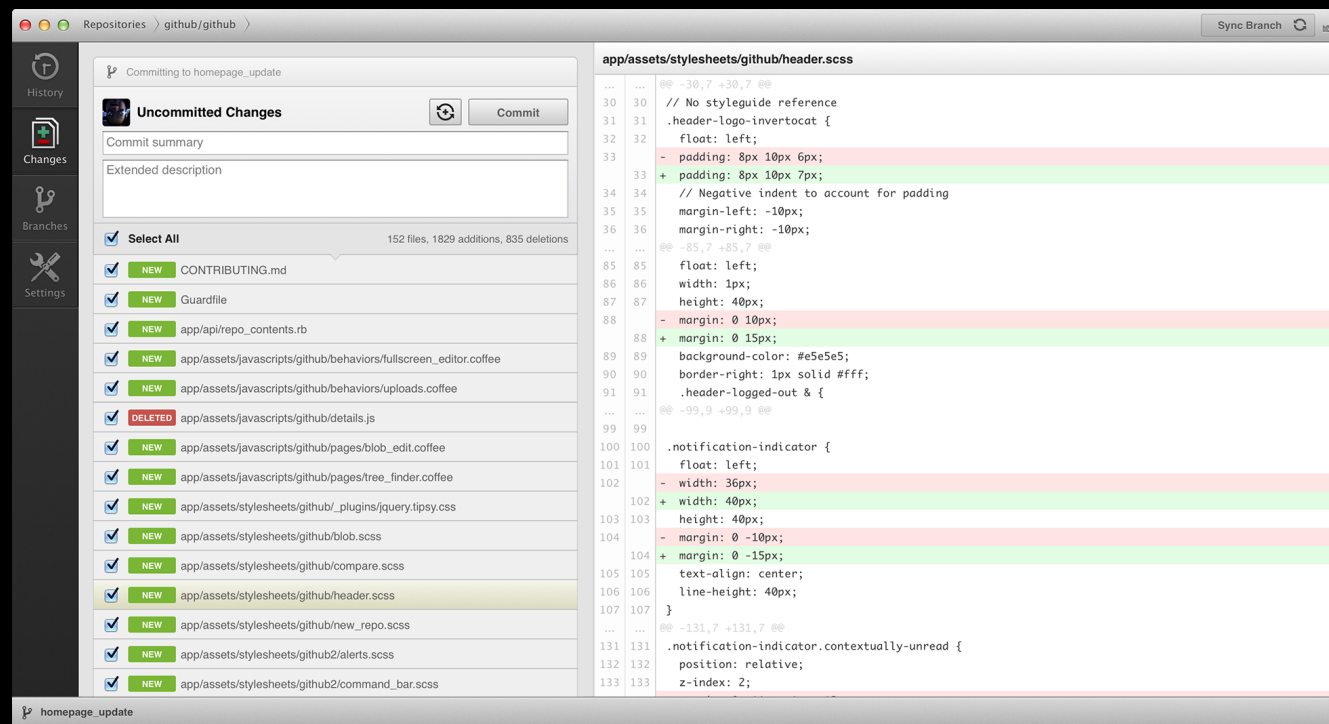
Git vs. other Version Control systems

all platforms



Git vs. other Version Control systems

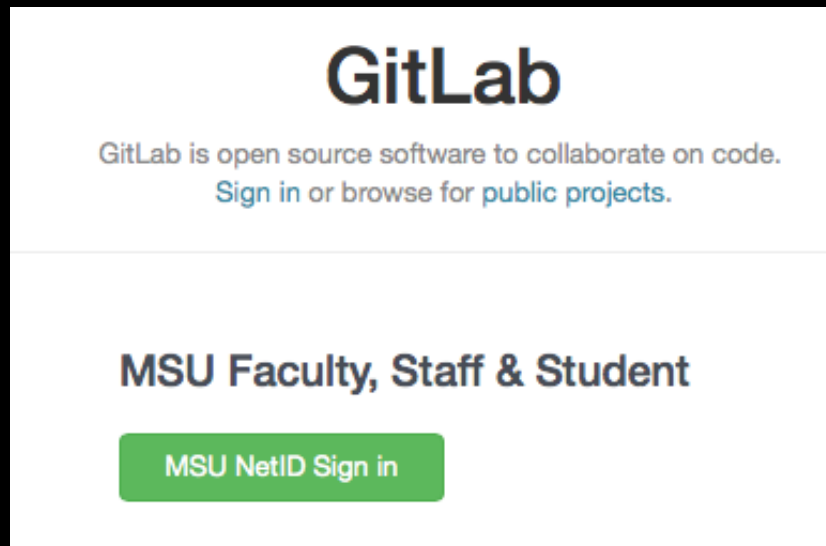
command line or GUI



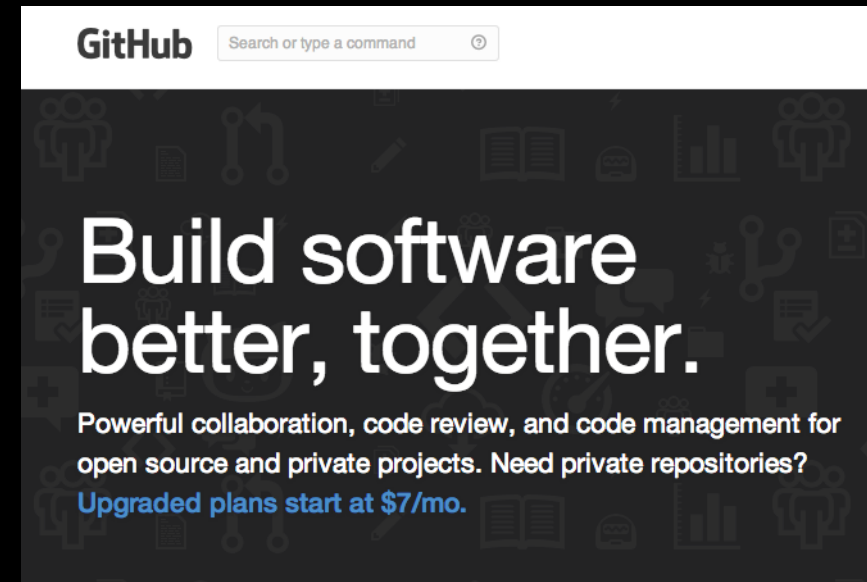
The most commonly used git commands are:

add	Add file contents to the index
bisect	Find by binary search the change that introduced a bug
branch	List, create, or delete branches
checkout	Checkout a branch or paths to the working tree
clone	Clone a repository into a new directory
commit	Record changes to the repository
diff	Show changes between commits, commit and working tree, etc
fetch	Download objects and refs from another repository
grep	Print lines matching a pattern
init	Create an empty Git repository or reinitialize an existing one
log	Show commit logs
merge	Join two or more development histories together
mv	Move or rename a file, a directory, or a symlink
pull	Fetch from and merge with another repository or a local branch
push	Update remote refs along with associated objects
rebase	Forward-port local commits to the updated upstream head

Server platforms



<https://gitlab.msu.edu/>



<https://github.com/>



<https://bitbucket.org>

make your own!

Git vs. other Version Control systems

offline editing

Git vs. other Version Control systems

popular (e.g., reddit, linux kernel ...)

The screenshot shows the GitHub interface for the 'torvalds / linux' repository. At the top, there's a navigation bar with the GitHub logo, a search bar, and links to 'Explore', 'Gist', 'Blog', and 'Help'. The repository name 'torvalds / linux' is prominently displayed, along with statistics: 2,116 watches, 11,760 stars, and 4,357 forks. Below this, a summary bar indicates '10,000+ commits', '1 branch', '354 releases', and '3,324 contributors'. The main content area shows a list of recent commits, with the most recent one by 'torvalds' titled 'Merge tag 'ext4_for_linus_stable'' of git://git.kernel.org/pub/scm/linux...'. To the right, there's a sidebar with links to 'Code', 'Pull Requests' (24), 'Pulse', 'Graphs', and 'Network'. At the bottom right, there's a section for cloning the repository, showing the HTTPS clone URL and buttons for 'Clone in Desktop' and 'Download ZIP'.

GitHub repository page for **torvalds / linux**.

Repository statistics:

- 10,000+ commits
- 1 branch
- 354 releases
- 3,324 contributors

Current branch: **master**

Recent commits:

- torvalds** authored a day ago: Merge tag 'ext4_for_linus_stable' of git://git.kernel.org/pub/scm/linux... (latest commit ef350bb7c5)
- Documentation**: Merge branch 'for-linus' of git://git.kernel.dk/linux-block (14 days ago)
- arch**: Merge branch 'fixes' of git://ftp.arm.linux.org.uk/~rmk/linux-arm (2 days ago)
- block**: block: fix memory leaks on unplugging block device (a month ago)
- crypto**: Merge git://git.kernel.org/pub/scm/linux/kernel/git/herbert/crypto-2.6 (a month ago)
- drivers**: Merge git://git.kernel.org/pub/scm/linux/kernel/git/davem/net (a day ago)
- firmware**: firmware,IB/qib: revert firmware file move (9 months ago)
- fs**: Merge tag 'ext4_for_linus_stable' of git://git.kernel.org/pub/scm/linux... (a day ago)

Clone options:

- HTTPS clone URL: `https://github.com/torvalds/linux.git`
- You can clone with [HTTPS](#), [SSH](#), or [Subversion](#).
- Buttons: Clone in Desktop, Download ZIP

Git vs. other Version Control systems

efficient: snapshots of whole repository
(unchanged files are links to previous snapshot)

Git vs. other Version Control systems

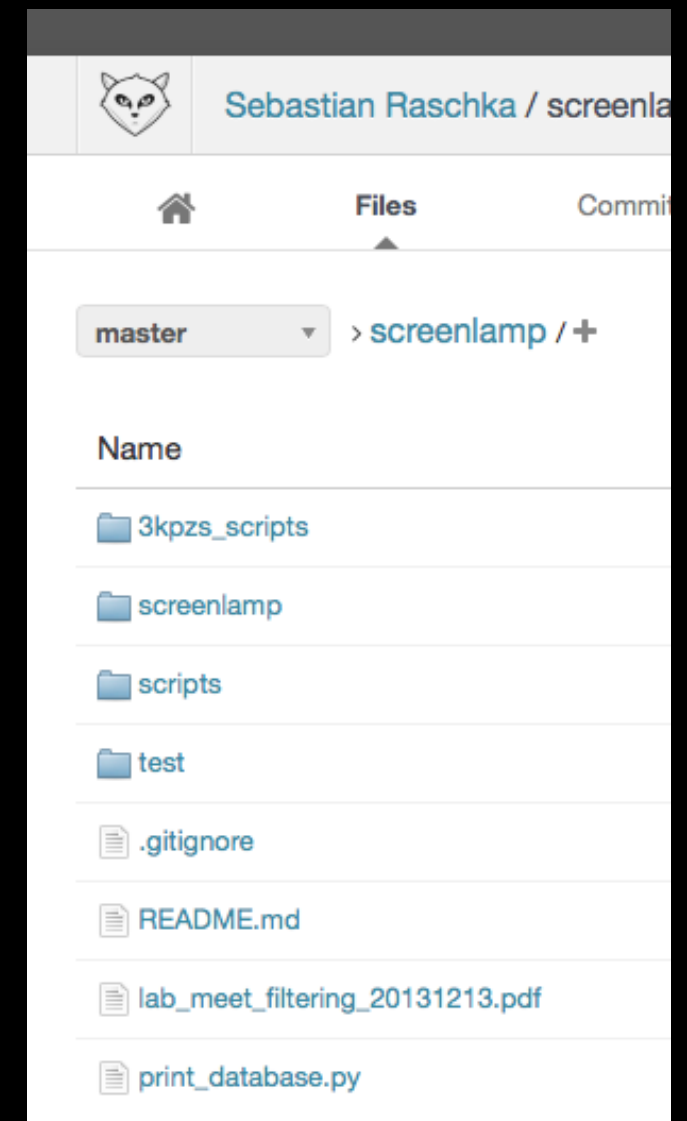
very clever about merging & conflicts
- never lose anything

Git vs. other Version Control systems

data is safe!

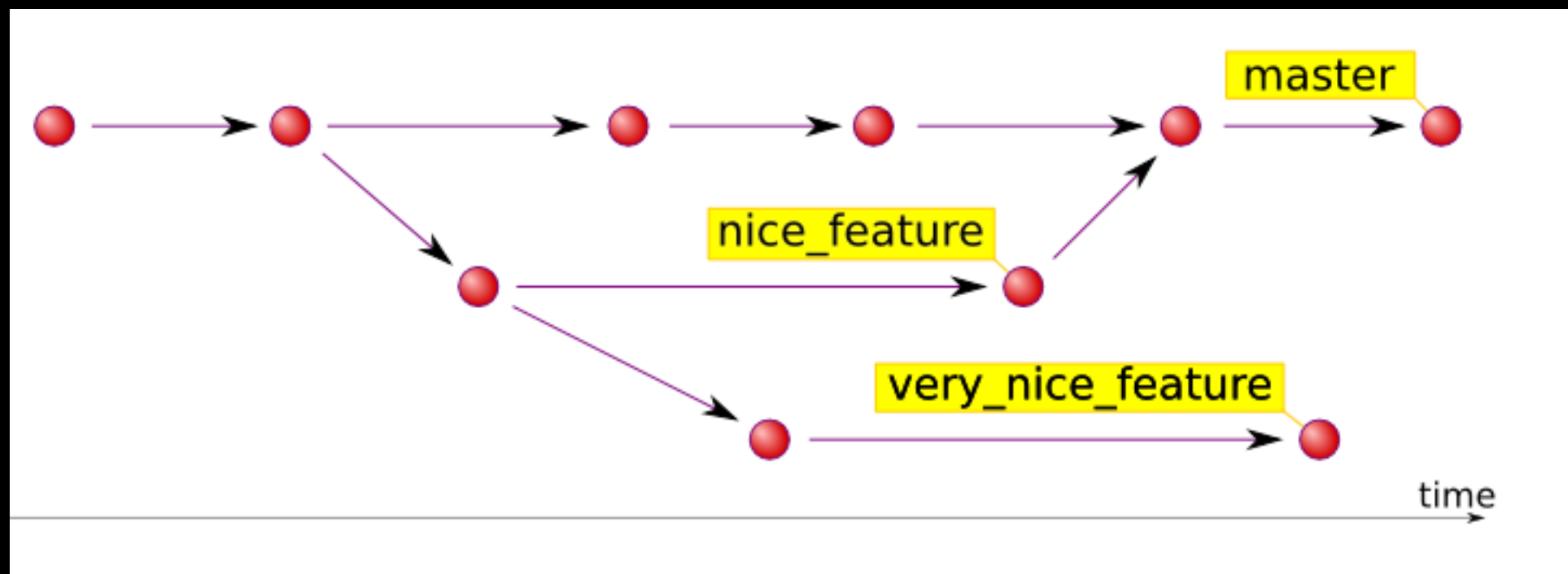
everyone has a full copy
+ copy on server

```
sebastian ~/Gitlab/screenlamp> git branch
  develop_mac
* master
sebastian ~/Gitlab/screenlamp> ls
3kpzs_scripts      print_database.py
README.md          screenlamp
docs              scripts
lab_meet_filtering_20131213.pdf test
sebastian ~/Gitlab/screenlamp> █
```



Git vs. other Version Control systems

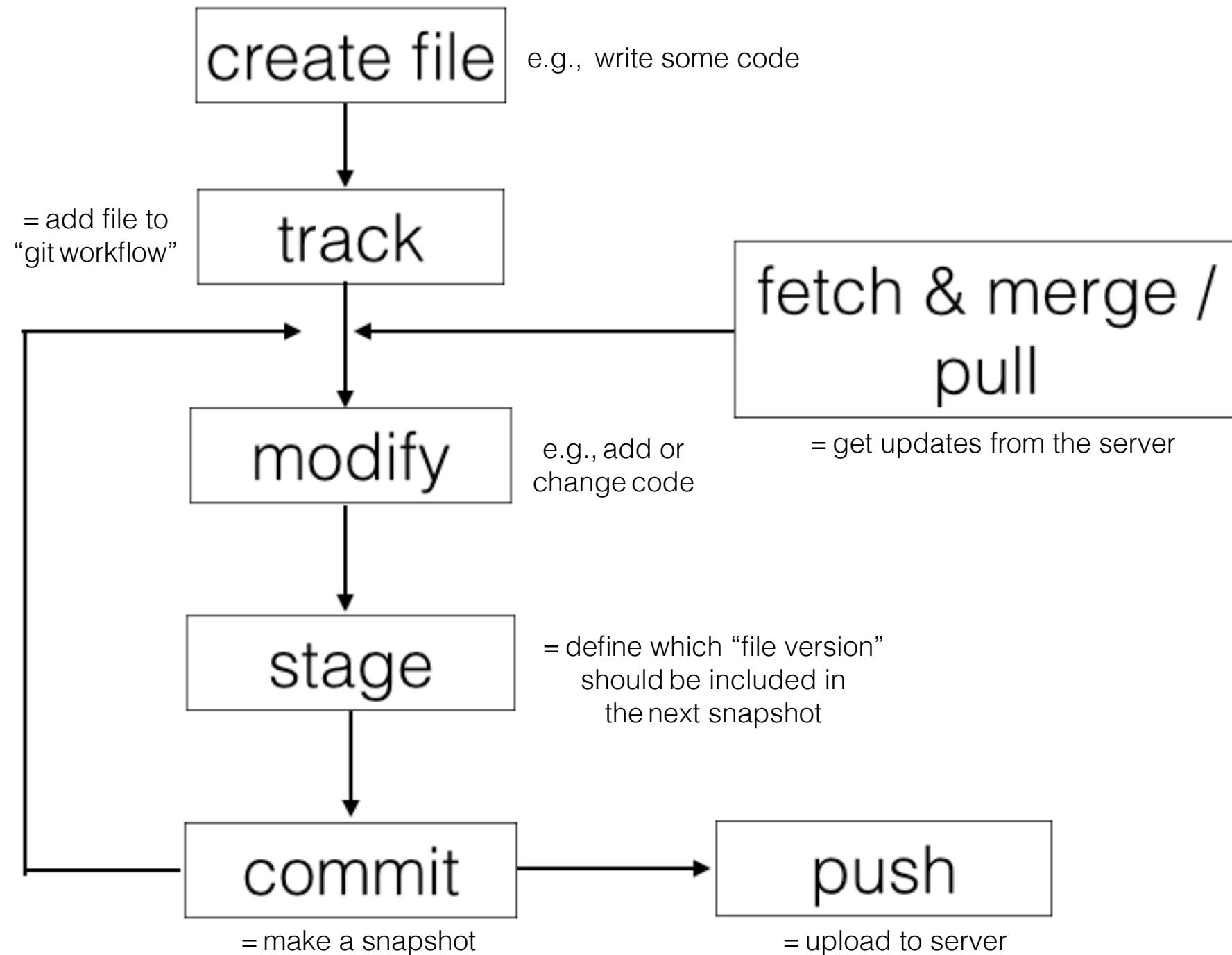
lightweight branching



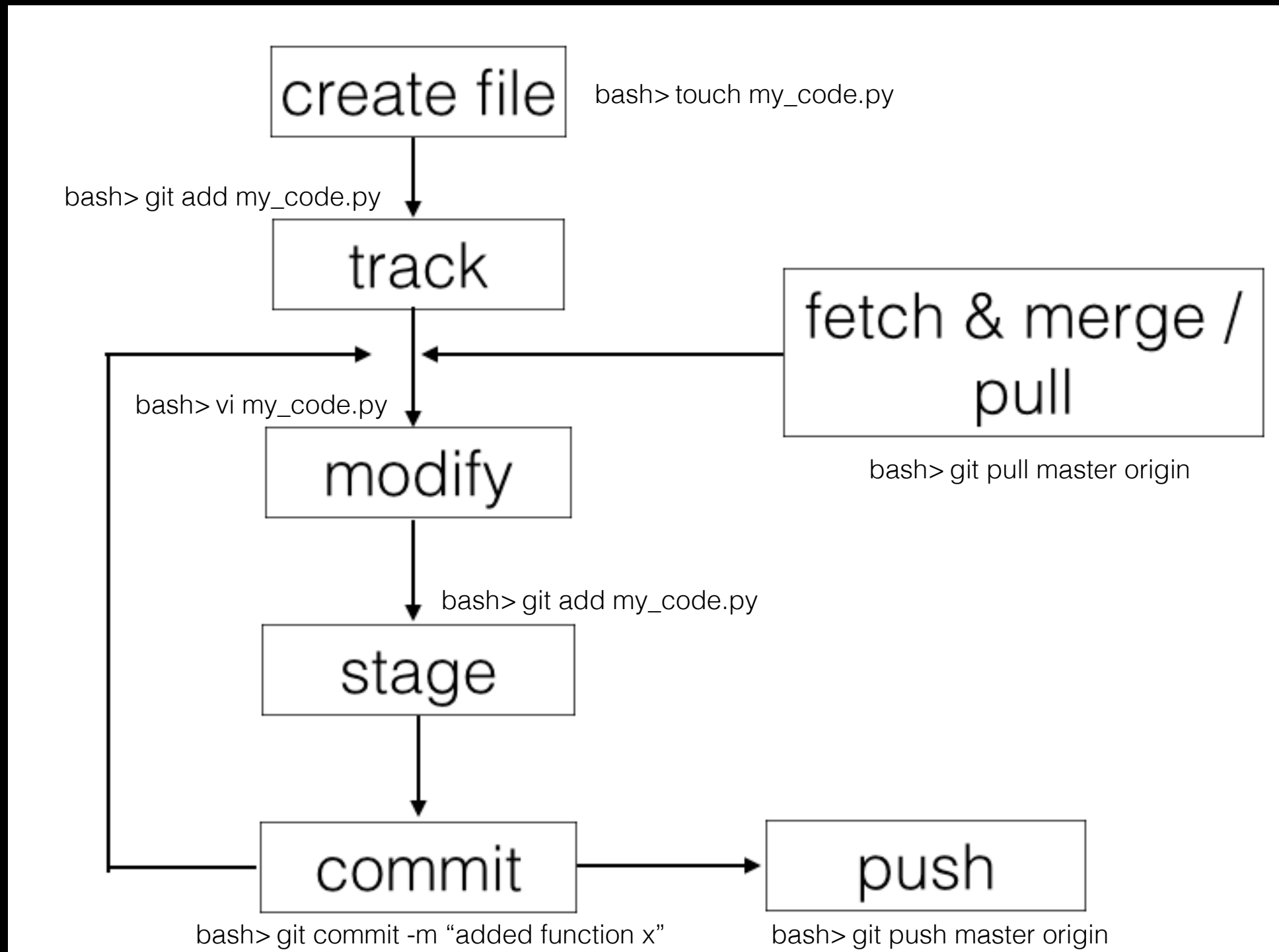
<http://img.hades.name/blog-media/git/git-history.png>

GitHub vs. MSU GitLab

Workflow overview



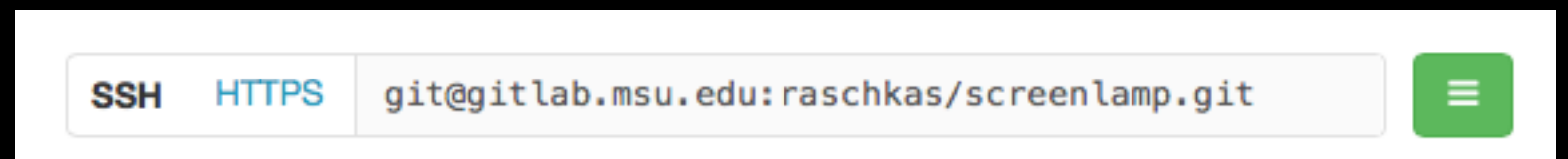
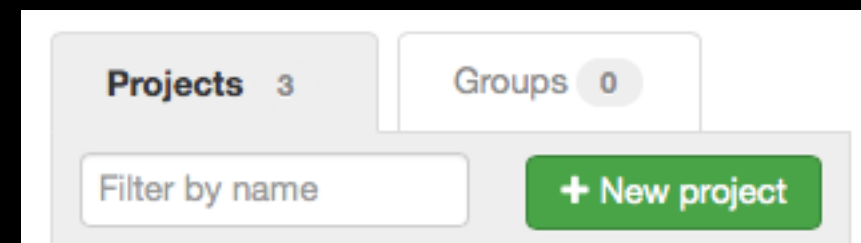
Syntax examples



Setting up a new Git repository (existing project)

```
cd my_proj      # go into the projects' folder
git init        # initialize a new git repository
```

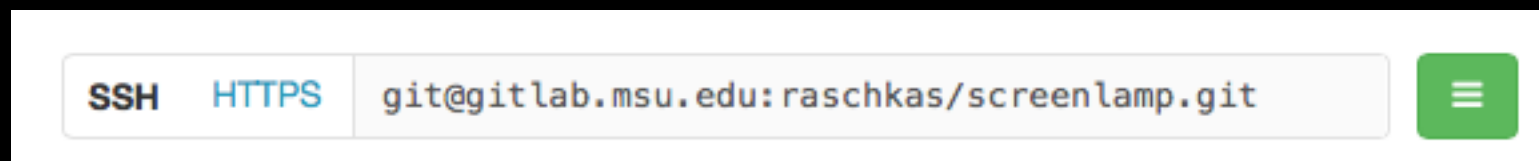
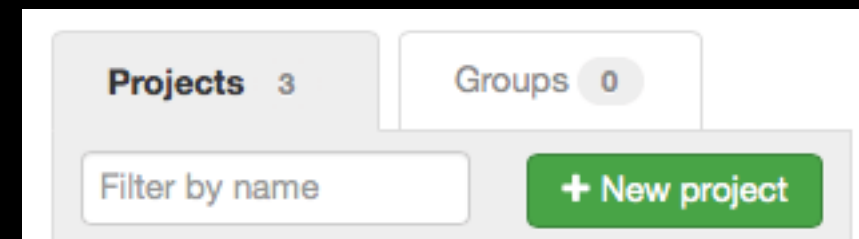
create a new “repo” on msu.gitlab



```
git remote add origin git@gitlab.msu.edu:raschkas/screenlamp.git
```

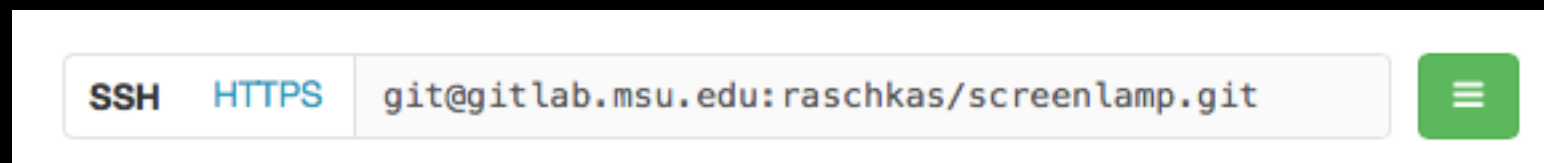
Setting up a new Git repository (new project)

create a new “repo” on msu.gitlab



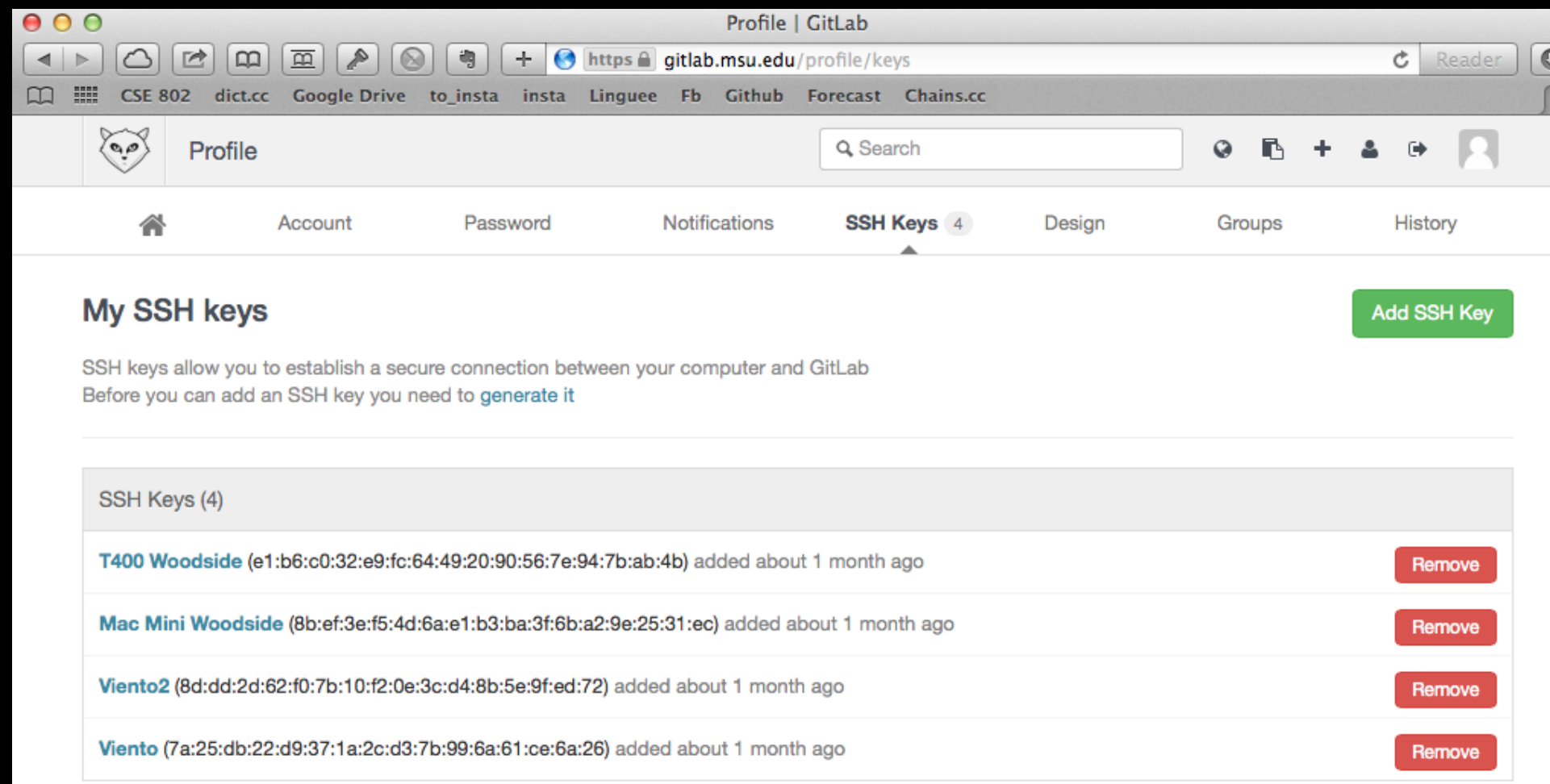
```
git clone git@gitlab.msu.edu:raschkas/screenlamp.git
```

Download an existing project



```
git clone git@gitlab.msu.edu:raschkas/screenlamp.git
```

SSH keys and Git



<https://help.github.com/articles/generating-ssh-keys>

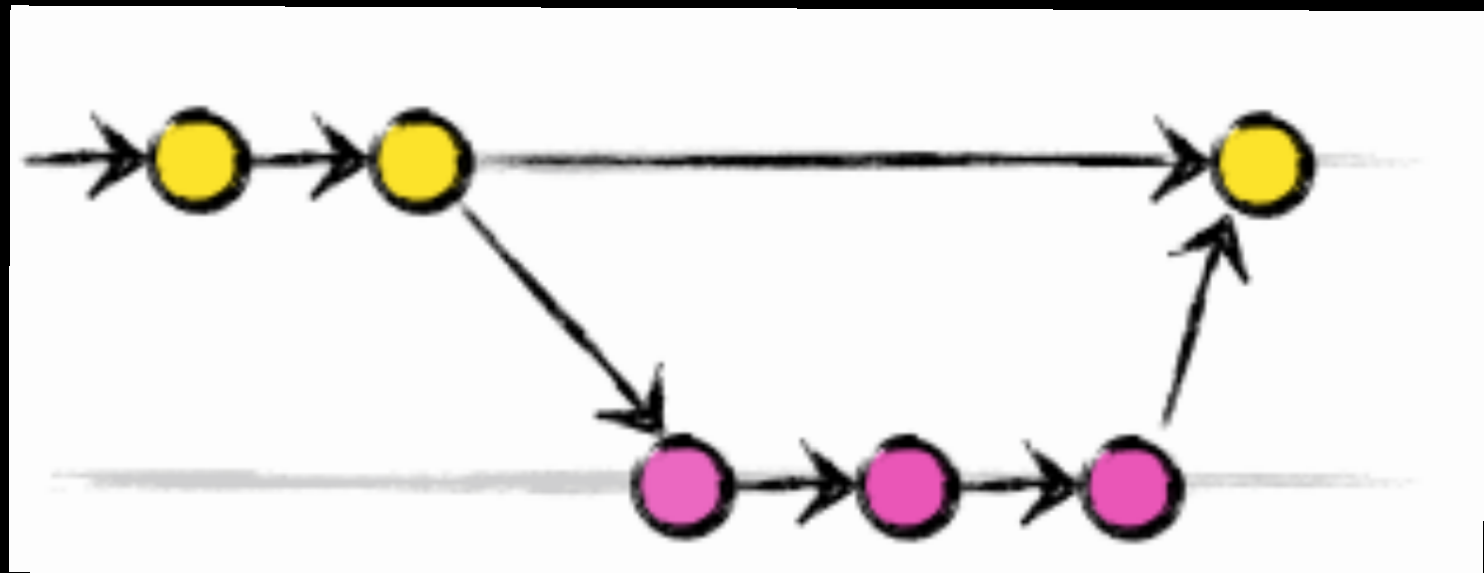
[https://sol.bch.msu.edu/mediawiki/index.php/
First_setup_instructions_for_gitlab.msu.edu](https://sol.bch.msu.edu/mediawiki/index.php/First_setup_instructions_for_gitlab.msu.edu)

Branching

```
git branch develop_feature_x    # create new branch
git checkout develop_feature_x  # switch to new branch
# ... (do some work)
git checkout master              # switch to master branch
git merge develop_feature_x      # merge changes into master branch
git branch -d develop_feature_x # delete other branch
```

master

develop_feature_x



<http://nvie.com/img/2010/01/merge-without-ff.png>

More Resources

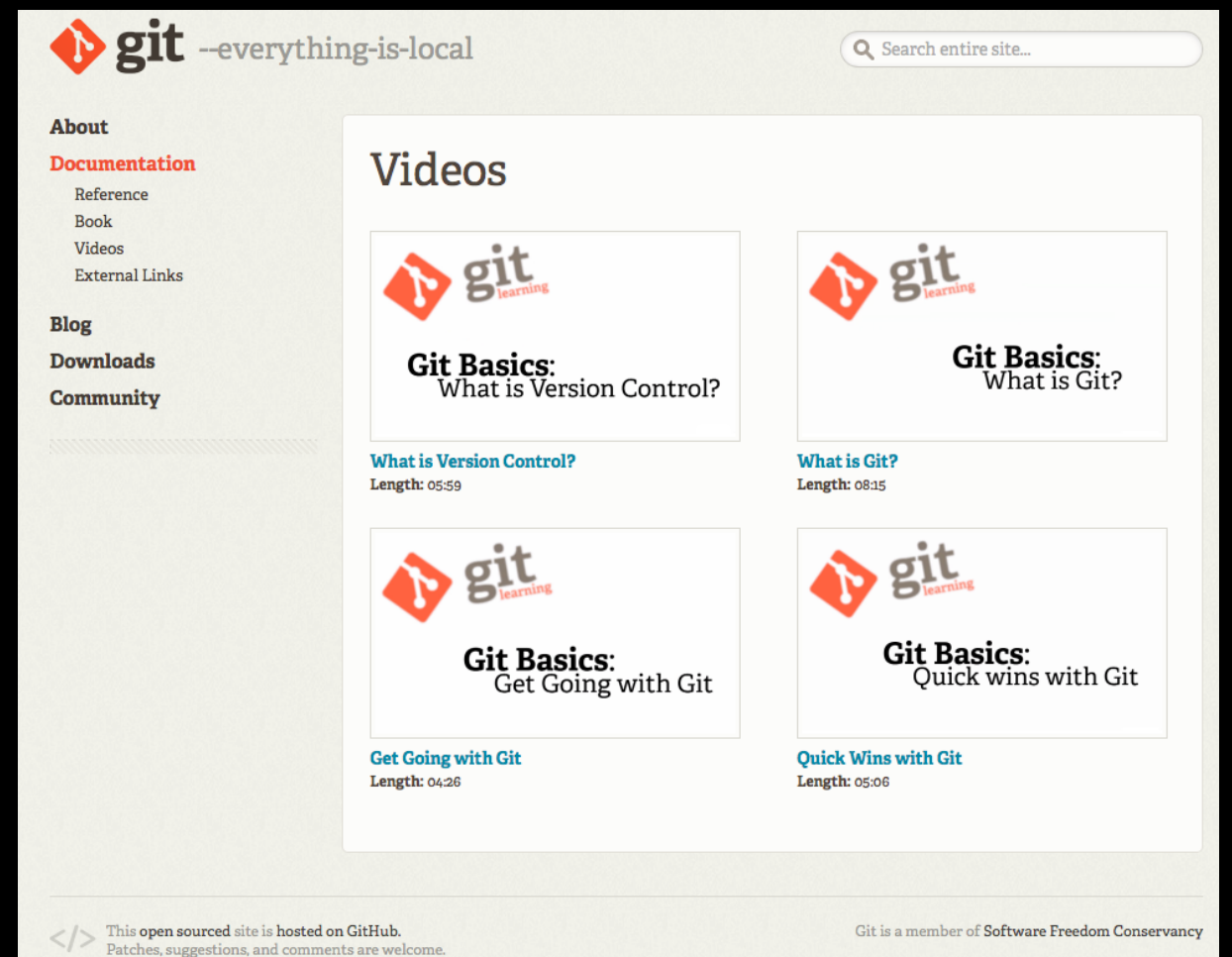
<https://gitlab.msu.edu>

<https://github.com>

<https://help.github.com>

<http://git-scm.com/book>

<http://git-scm.com/videos>



The screenshot shows the 'git --everything-is-local' website. The sidebar on the left contains the following links: **About**, **Documentation** (with sub-links: Reference, Book, Videos, External Links), **Blog**, **Downloads**, and **Community**. The main content area is titled 'Videos' and displays four video thumbnails, each featuring the 'git learning' logo. The videos are: 'Git Basics: What is Version Control?' (Length: 05:59), 'Git Basics: What is Git?' (Length: 08:15), 'Git Basics: Get Going with Git' (Length: 04:26), and 'Git Basics: Quick wins with Git' (Length: 05:06). At the bottom of the page, there is a footer with a GitHub logo and text stating 'This open sourced site is hosted on GitHub. Patches, suggestions, and comments are welcome.' and 'Git is a member of Software Freedom Conservancy'.