

Source Code Version Control Using Git

PART I: USING GIT AT YOUR OWN

Why?

- You back up your code.
- You can experiment with new ideas without being afraid that you will forget how to get back to a working solution.
- You track your progress.
- You can collaborate with other researchers.

Lingo

- Commit - a snapshot of your files.
- Repository - a local or remote set of commits.

Typical workflow

1. Make changes, simulate, generate figures etc.
2. Reach a significant stage (working solution, end of the day etc.)
3. Commit! (make a snapshot of your code)
4. Go to 1. until receiving a degree.

How to get started

- `cd dir/with/sources`
- `git init`
- `git add .`

Checking in changes

- `git add <files>`
- `git commit`

or

- `git commit -a`

Checking history and reverting changes

- `git log`
- `git log -p`
- `git log -stat`

- `git checkout <commit SHA>`

Correcting mistakes

- Reverting a commit:
git revert <commit SHA>
- Discarding uncommitted changes:
 - everything:
git reset --hard HEAD
 - one file:
git checkout HEAD filename

Branching and merging

- `git branch`
- `git branch <name>`
- `git checkout <name>`

or

`git checkout -b <name>`

Branching and merging

- `git checkout master`
- `git merge my_experimental_branch`

To see differences between branches:

`git diff <branch1> <branch2>`

Setting up your own remote repository

- `git clone --bare .git /tmp/myrepo.git`
- `scp /tmp/myrepo.git
s0786898@jupiter1:~/myrepo.git`
- `git remote add origin
s0786898@jupiter1:~/myrepo.git`
- `git pull origin master`
- `git push origin master`

GitHub

- `www.github.com`
- `git remote add github`
`git@github.com:username/repo_name.git`
- `git push github`

PART II: COLLABORATING WITH OTHERS

Typical workflow

- One main repository with write access limited to selected developers.
- Every dev has his own copy of the repository.
- Every feature or bugfix is developed in a separate branch.
- When the work is done the developer ask one of others to "pull" his branch.
- His branch is then evaluated and after optional changes merged into the main repository.

Nipyte example

Useful links

- www.progit.org
- www.syntevo.com/smartgit/index.html
- [hoth.entp.com/output/git for designers.html](http://hoth.entp.com/output/git_for_designers.html)