Version Control and Reproducible Research with GitHub

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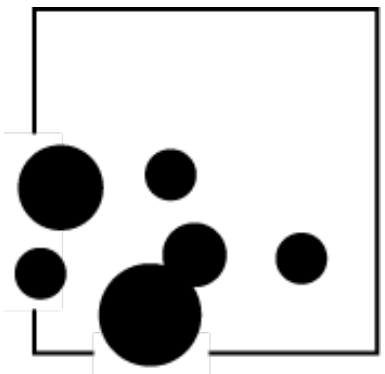

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Code sharing, publishing and development service for collaborative projects

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- Version control
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Under the hood

- Git is the version control language that GitHub is the GUI for
- Created by Linus Torvalds, a central developer of the Linux OS
- Command-line, but really straight-forward

A couple quick definitions

- **Repository**: Storage space where your projects reside
- **Commit**: Takes 'snapshot' of your repository, so you can log a new change, or revert to a previous state (Common command)
- **Branch**: Think of a folder within a repository, but cooler. More on this later
- **Fork**: What it sounds like. You're taking someone's project and making a copy of it for your own use (either to collaborate and to merge later or to use as a template for a different project)
- **Push**: The act of updating your project files (you will "push" your **commits**)
- **Pull**: Gets commits from a repository to your machine
- **Fetch**: A better version of **pull** that doesn't merge **commits**

How to begin

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2. Open a terminal window

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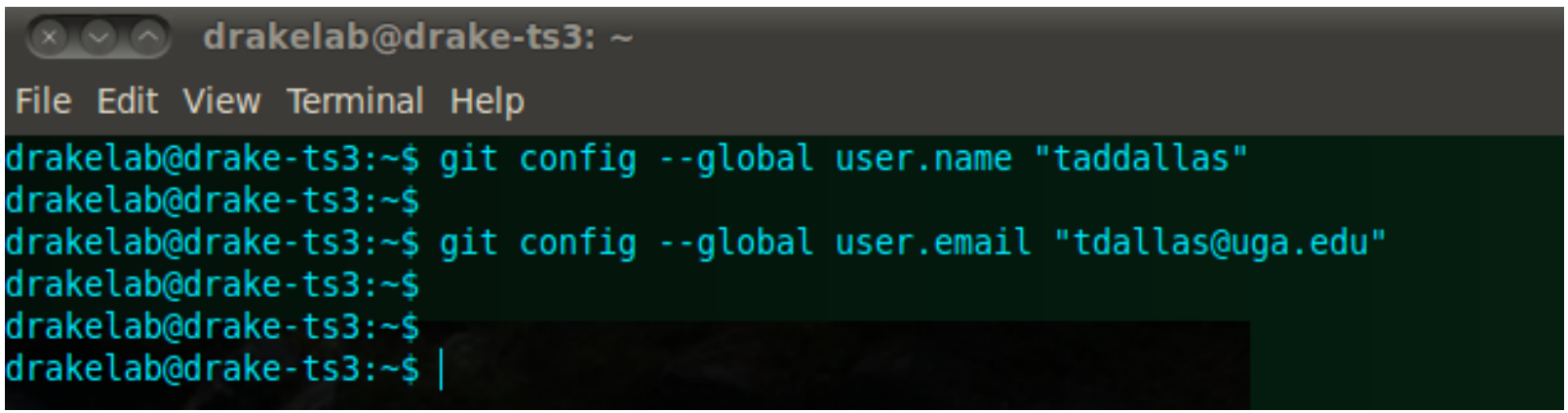

Okay. Now we have Git on our machines and GitHub accounts.

The GitHub framework

Getting your files on GitHub

- Do work in a local directory
- Create a Git repo in this local directory
- **Add** and **commit** your files ('put stones in the catapult')
- **Push** your files to Github ('catapult those stones')

Make your directory

Sets up local directory

$ cd folder you want your directory in
$ mkdir directory name
$ cd your project directory

Initializes git in that directory

$ git init

Do some stuff in the directory!

Committing changes

From within your local directory

$ git remote add origin
https://github.com/yourname/yourproject.git
$ git commit -a -m "message associated with your commit"

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Only need to do the **git remote add** command once. You can check to see what your remote locations are by typing

git remote -v

from within your local directory.

Push it!

$ git push origin master

General framework for edits thereafter

1. Edit your files locally
2. $ git commit -a -m “message about this commit”
3. $ git push origin master

How to collaborate using GitHub

Up to this point, it's been a solitary experience of **making** and **pushing**

Methods of collaboration

Two ways:

- **'Fork and Pull' model** : better
- **'Shared Repository' model** : easier

Pulling files from GitHub

- cd to local repository
- $ git remote -v outputs the .git repos you can push/pull to/from. Use $ git remote add 'http://github.com/name/project.git' if necessary
- $ git pull . fetches and merges files

Forking from command-line

$ git clone git://github.com/somename/someproject.git someproject

#This initializes a new local directory on your machine in a folder called 'someproject'

Some useful commands

Check status :
$ git status

See your remote locations :
$ git remote -v

View commit history :
$ git log

Revert to previous version since last commit:
$ git checkout – *filename*
See a log of all changes:
$git log

Questions?

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Let's now look at the user interface of GitHub and play around a bit