A Very Very Short Introduction to Git

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Outline

Version-controlling: a comparison

Methods	Data Location	Pros	Cons
Manual Dating	L	SO EASY	What about merging?
Dropbox	L/R	Easy synchronizing	Only 1-way fallback
SVN	L/R	True VCS	Centralized
Git	L/R	Decentralized	Merging is verbose

Basic ideas of git

- Cache snapshots of file are stored, not the difference
- Local operations, mirroring remote source
  - A central server is actually not necessary
- Can revert to any state

States in git

- Not staged: changes are not recorded
- Staged (not committed): git knows your changes, but you haven't decided if you need to commit.
  - Normally it's easier to just stage and commit your changes
  - May be useful if you are doing a long fix
  - Unstage your changes does not revert the file.

- Committed: the changes are permanently recorded. You can either push your changes or continue working.

- Anything you committed is safe! (but the process can mess up)

Helpful utilities for git

- Command line (of course)
- The github client (good for visual branching)
- Magit-mode for emacs
- vim-fugitive for vim

Initialize a clean repository

#Initialize a clean git repo
```
git init
git status
```

Results:

```
Reinitialized existing Git repository in
/Users/tiantian/polybox/Studies-ETH/Computation-Seminar/.git/
On branch master

Initial commit

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        #Tian-git.org#
        .#Tian-git.org
        .DS_Store
        Tian-git.dvi
        Tian-git.org
        Tian-git.org~
        Tian-git.pdf
        Tian-git.tex
        Tian-git.tex~
        _minted-Tian-git/

nothing added to commit but untracked files present (use "git add" to track)
```

Clone from an existing remote repository

```
# Clone from a remote repo to local dir
git clone https://github.com/lovaulonze/.matplotlib.git some
ls -al some
```

Results

```
total 56
drwxr-xr-x   6 tiantian  staff     204  1  6 10:59 .
drwxr-xr-x  14 tiantian  staff     476  1  6 10:59 ..
drwxr-xr-x  12 tiantian  staff     408  1  6 10:59 .git
-rw-r--r--   1 tiantian  staff      61  1  6 10:59 .gitignore
-rw-r--r--   1 tiantian  staff   24528  1  6 10:59 matplotlibrc
drwxr-xr-x   4 tiantian  staff     136  1  6 10:59 stylelib
```

Remember to use the .gitignore file

```
# Git status w/o .gitignore rules
git status
```

Results

```
On branch master

Initial commit

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .#Tian-git.org
    .DS_Store
    Tian-git.dvi
    Tian-git.org
    Tian-git.org~
    Tian-git.pdf
    Tian-git.tex
    Tian-git.tex~
    _minted-Tian-git/
    some/

nothing added to commit but untracked files present (use "git add" to track)
```

.gitignore (II)

```
# Use .gitignore rules
cat .gitignore
echo ""
echo ""
git status
```

Results

```
*#*
*~
*.tex
_minted*
some/
*.dvi

On branch master

Initial commit

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .DS_Store
    .gitignore
    Tian-git.org
    Tian-git.pdf

nothing added to commit but untracked files present (use "git add" to track)
```

Stage the untracked files:

```
# Add some file to the staged area
# But we leave out some
git add Tian-* .gitignore
git status
```

Results

```
On branch master

Initial commit

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

    new file:   .gitignore
    new file:   Tian-git.org
    new file:   Tian-git.pdf

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .DS_Store
```

Finally the commit

```
# Commit the stated files
git commit -m "Commit. Presentation to the commit"
git status

[master (root-commit) 45f73d7] Commit. Presentation to the commit
 3 files changed, 203 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 Tian-git.org
 create mode 100644 Tian-git.pdf
On branch master

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .DS_Store

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

Now use a remote for pushing

```
# Must add a remote for pushing!
# origin is the default branch
git remote add origin https://github.com/lovaulonze/git-slides.git
# Push the changes to the master upstream
git push -u origin master
git status


Branch master set up to track remote branch master from origin.
On branch master
Your branch is up-to-date with 'origin/master'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    .DS_Store

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