alias yolo='git push --force'

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Applied Bioinformatics Discussion

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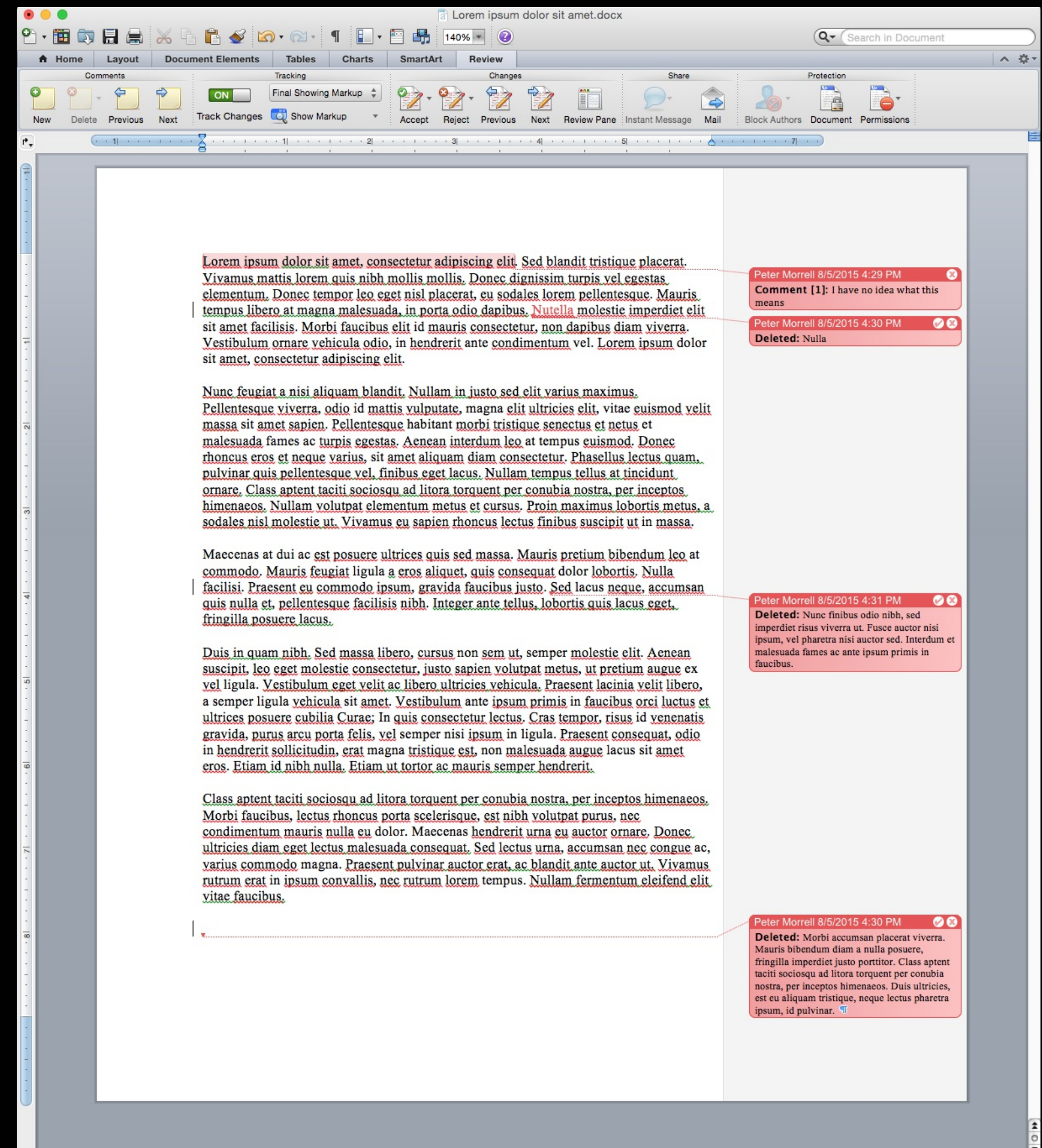
What is Git?

Version Control System
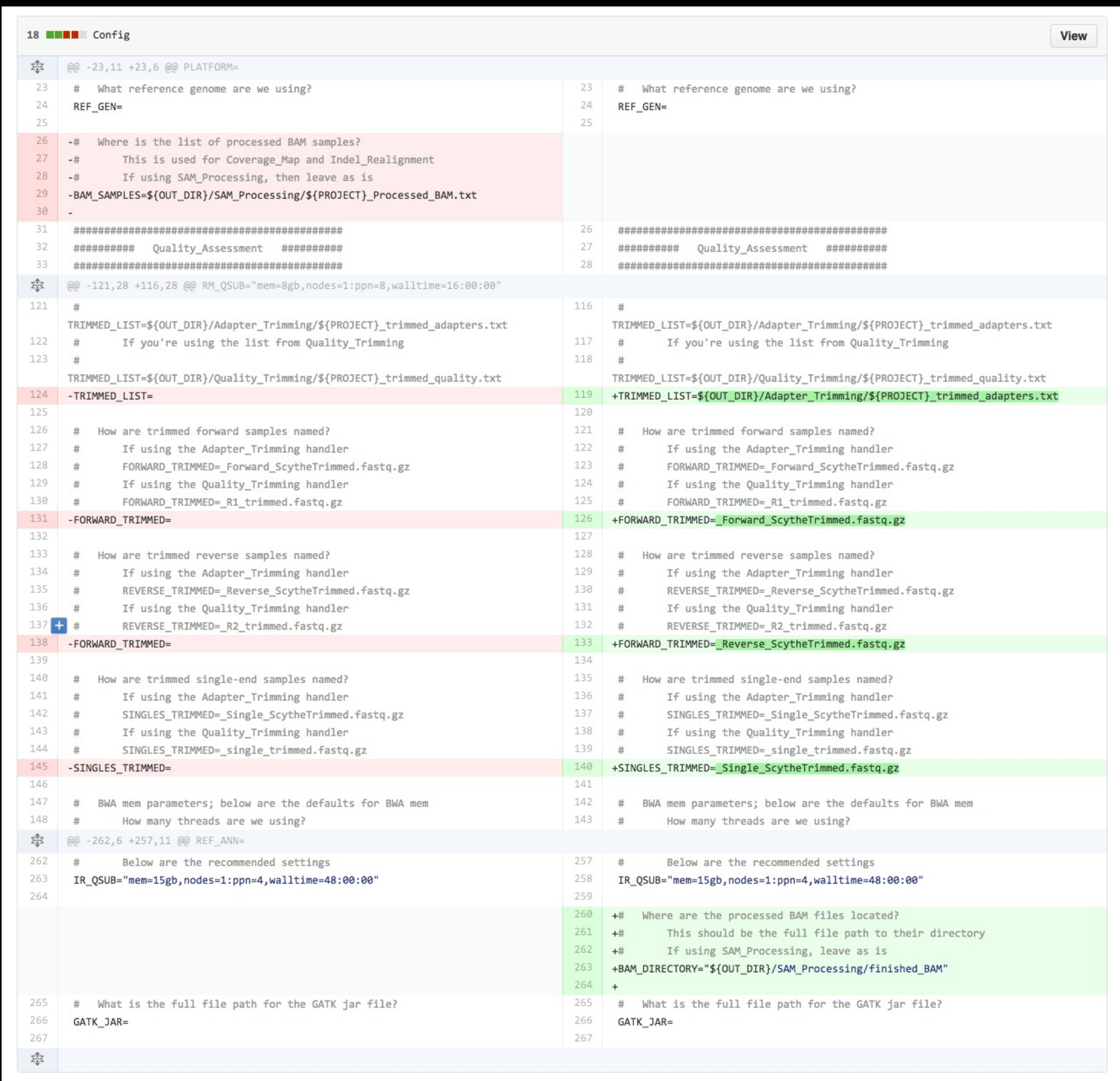
- Keep track of changes
- Use specific version of code
- Free software

Git Vs. MS Word

MS Word Track Changes

Git Track Changes

Git Basics

To create a new repository

```
git init [directory]
```

Check Git's status of files in repository.

```
git status
```

See commit history.

```
git log --graph
```

Git Basics

To move and rename files:

```
git mv fileName1 fileName2
git mv filepath1/fileName1 filepath3/fileName1
```

To remove files:

```
git rm filename
```

For more git commands, refer to Git Cheat Sheet

Git Basics

Add files to be tracked by Git

```
git add
```

Commit a file and it's changes to Git

```
git commit
```

.gitignore

Special file that tells Git to not track certain files

- Data files
- Temporary files
- Byte/compiled code

Git Remotes

Git Remotes

Git Remotes allow for a backup of your repository on some other devices

- Can be hosted service like BitBucket or GitHub
- Can be on private server

Git Remotes

Obtain a repository from an existing URL

```
git clone [url]
```

Git Remotes

Synchronize Changes

- Downloads history and updates changes
- You must be in the repository before you run this command

```
git pull
```

Git Remotes

- Uploads all local changes (use all three commands in order)
- You add the change, commit the change, and push the change

```
git add
git commit -m "commit message"
git push
```

Git Remotes

Common examples of Git Remotes are GitHub and BitBucket

Authenticating Git Remotes

Two methods

- SSH
- HTTPS

VINCE BUFFALO IS WRONG

Git Remotes

It is recommended to use *HTTPS* over *SSH* when working with Git, especially GitHub

- HTTPS is simpler to set up than SSH
- Git's credential.helper only works with HTTPS, not SSH
- HTTPS is an open port on all networks, SSH may be blocked
- HTTPS has the same, or better, level of security as SSH

  - Users unfamiliar with SSH best practices will find SSH less secure due to improper management of private keys

Intro to GitHub

Collaboration

- Review changes
- Comment on code
- Report issues

Sharing of code

- Get feedback

User friendliness

- Web-based graphical interface
- READMEs and Wiki pages

An account is not necessary to view and download public repositories.

Collaborating with GitHub

Working with Your Collaborators

Caution!

Always pull before you start editing a file!!

What (NOT) to Use GitHub For?

Using GitHub

GitHub is used to store code and documentation

GitHub can also be used for writing in Markdown/LaTeX

Website hosting through GitHub Pages is an acceptable use of GitHub

Abusing GitHub

GitHub is **not** used for data storage

- Example datasets are acceptable

GitHub is **not** used for compiled machine code or interpreted byte code

- Python .pyc files should **not** be uploaded

GitHub is **not** used for non-human readable files

- Binary files should **not** be uploaded

See Bryan J et al. (2016) Good enough practices for scientific computing.

Possibly Abusing GitHub

Figure sharing on GitHub should only be done if the figure is being used elsewhere on GitHub
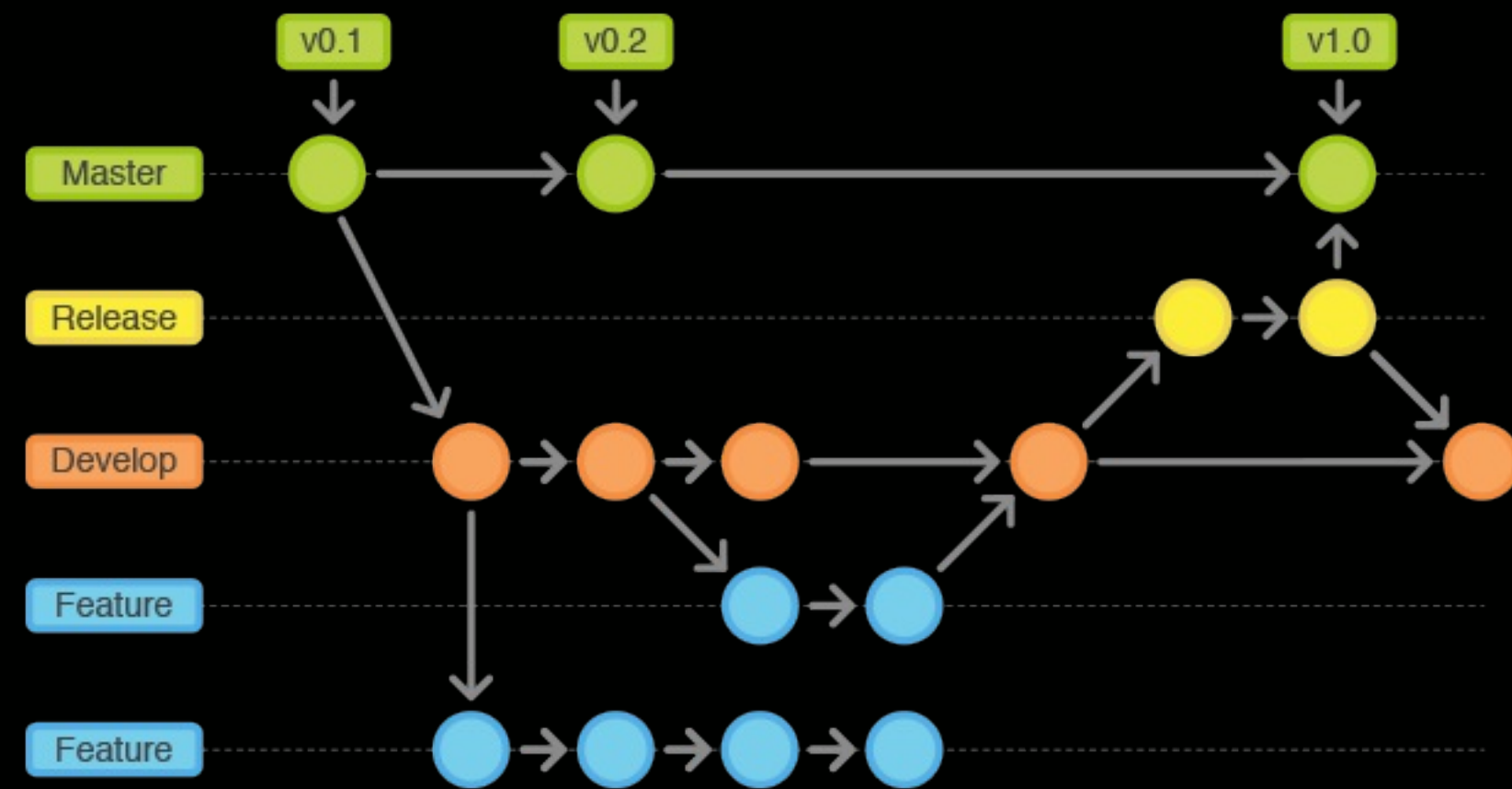
- Wiki pages/READMEs
- GitHub Pages
- Writings hosted on GitHub

  - Example: ANGSD-wrapper manuscript

Working with Past Commits

Undo and Edit Commits

```
git commit --amend
git reset --hard
git checkout --force
```

Git Branches, Forks, and Pull Requests

Merge Errors

Chaochih's Favorite!

More Advanced Git Topics

Submodules

Searching revisions with git grep

Rebasing git rebase

Exercise: Test the waters!

Get into groups of 3-5. Make sure **at least 1** person has a computer with Git installed on it.

If you need a reference for Git commands, take a look at GitHub's cheat sheet.