Version control for reproducible science

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What version control software does

- Software that records changes you make to files over time
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  - Recover old files, keep track of file changes
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- **Put more intuitively**, version control takes a snapshot in time (called a '**commit**') of all the files in one of your folders (called '**repositories**')
  - Visualise changes to your files over time
  - Look at the differences between file versions
  - Record who changed files, and what they changed

Version control makes science easier

- Organise files and avoid having to 'save as' multiple versions
  - analysis_1.R
  - analysis_2.R
  - analysis_FINAL.R
  - analysis_FINAL_no_really_this_time.R

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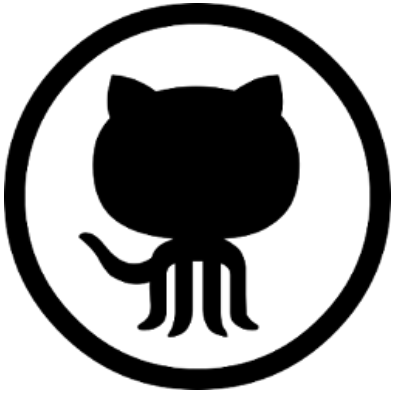
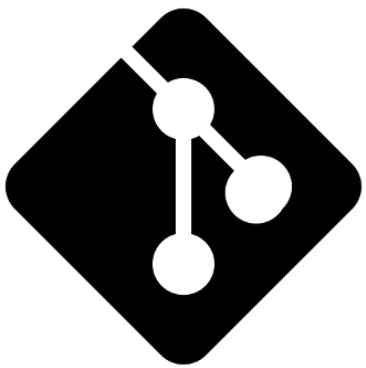
  - analysis_2.R
  - analysis_FINAL.R
  - analysis_FINAL_no_really_this_time.R
- Have a clear history of what you have done, when, and why (through commit comments)
- Never worry about losing your data, analysis, or writing when integrating with GitHub

Version control can help open science



- Transparent record of data collection, analysis, and writing
- Record publicly available on GitHub, Bitbucket, or GitLab
- GitHub repository can be copied, reproduced, and discussed
- git and GitHub can track individual contributions to a project

Most researchers use git (and GitHub)



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- Separate from GitHub

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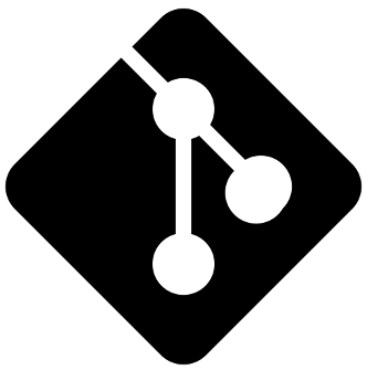

- Free and open-source
- Separate from GitHub
- Works across platforms
  - Windows
  - Linux
  - Mac
- Invented by Linus Torvalds

Objectives: using version control

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- Understand key concepts of version control
- Perform basic tasks in GitHub and GitKraken
  - Staging and committing files
  - Pushing to and pulling from GitHub
  - Branching, merging, & resolving merge conflicts

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Discuss, share, and get additional help by raising an issue in the version_control repository on the Stirling Coding Club GitHub organisation.

Why focus on using GitKraken?

- Free to download and use
- Easy GitHub integration
- Graphical user interface
- Visualisation of repository

Accompanying notes to these slides are available in the version_control repository, and include instructions for using the command line interface, and for editing directly in GitHub.