Institut für Systemische Neurowissenschaften

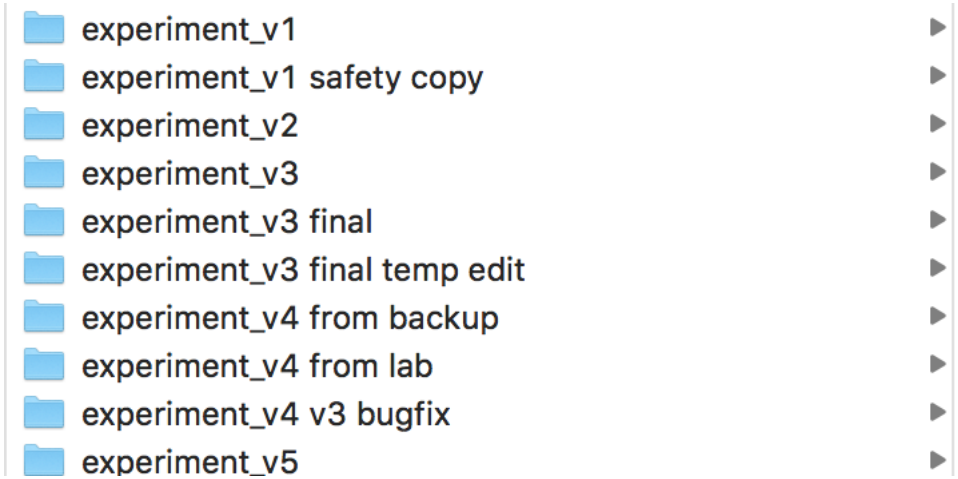
Methods Meeting

Version control and collaboration with git and GitHub

Julius Krumbiegel | 26.04.2021

Universitätsklinikum Hamburg-Eppendorf

Who needs git?



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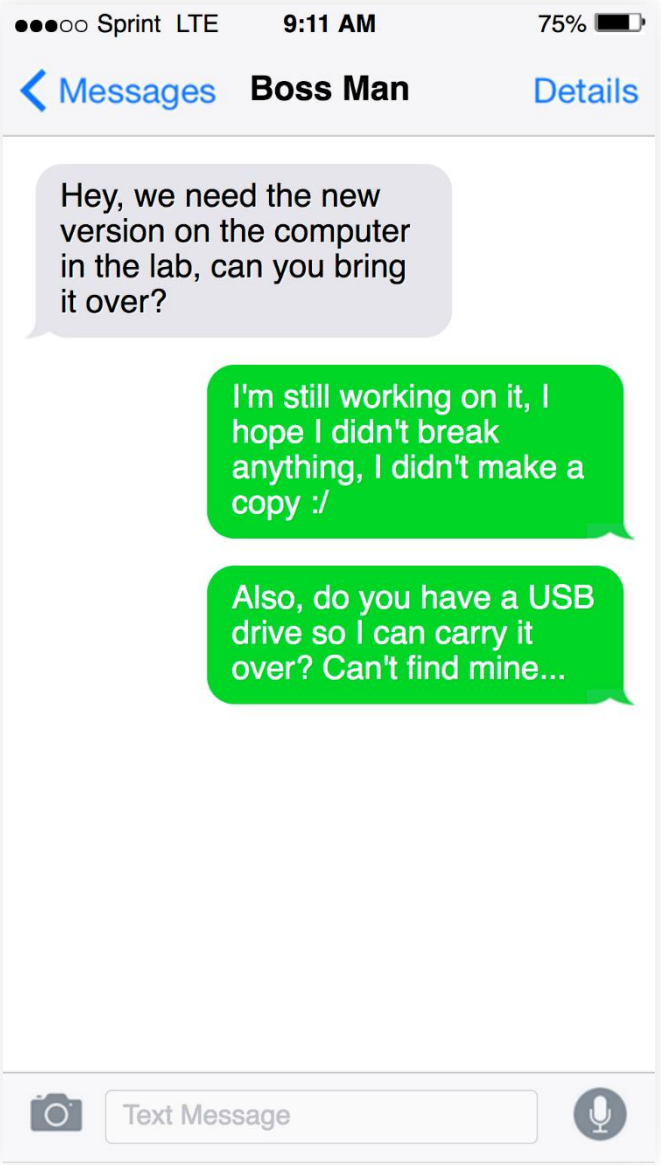

Who needs git?

```
 5 -    n_radial = ini.n_radial_positions;
 6 -    n_blocks = ini.n_blocks;
 7 -    n_trials = n_radial * n_blocks;
 8 -    trial_numbers = 1 : (n_trials);
 9
10 -    radial_positions = repmat(...
11          2 * pi * linspace(...
12              0,...
13              1 - 1 / n_radial,...
14              n_radial),...
15          [1 n_blocks]);
16
17 -    grey = 128;
18 -    black = 0;
19 -    oval_size = [-10, -10, 10, 10];
```

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13              1 + 1 / n_radial,...
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What is git?

git tracks how your code changed whenever you take a “snapshot”

You can…

…reverse changes and try out different approaches in branches

…store and share your code in the cloud, for example on GitHub

…collaborate on code bases with other researchers

How does git work?

git compares code versions line-by-line

It stores only the changes from one **commit** (“snapshot”) to the next

Separate **branches** can diverge from each other and merge together again

This results in an efficient graph structure over time

Using git is like walking back and forth along this graph

Important words

commit	a snapshot of code changes
branch	a named sequence of commits
repo (repository)	the folder with all your stuff including git's own files
fork	a copy of someone else's repo on GitHub in your own account
clone	a copy of an online repo on your own computer
push / pull	uploading / downloading changes
merge	bringing all changes from one branch into another branch
remote	a server with a copy of the repository (often on GitHub)
PR (pull request)	asking someone to merge your branch into their repo

Basic workflow

Clone or init repo	git init git clone
Pull changes from remote	git pull
Switch to / create branch	git checkout
Change some files	
Stage and commit changes	git add / git commit
Push changes to remote	git push

Real example…

Interactive Example

We’re going to:

- Explore a repository on GitHub
- File an issue
- Fork the repository
- Clone the fork
- Commit changes
- Push changes to fork
- Create a pull request

Things we skipped

Merge conflicts

Stashing

Detached HEAD state

.gitignore

Binary files

and more…