Version control is an essential tool for scientists

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Stimulus onset quenches neural variability: a widespread cortical phenomenon

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13 ‘local’ authors, 13 ‘non-local’ authors

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Mark M Churchland¹,²,¹⁶, Byron M Yu¹–³,¹⁶, John P Cunningham¹, Leo P Sugrue²,⁴, Marlene R Cohen²,⁴, Greg S Corrado²,⁴, William T Newsome²,⁴,⁵, Andrew M Clark⁶, Paymon Hosseini⁶, Benjamin B Scott⁶, David C Bradley⁶, Matthew A Smith⁷, Adam Kohn⁸,⁹, J Anthony Movshon⁹, Katherine M Armstrong²,⁵, Tirin Moore²,⁵, Steve W Chang¹⁰, Lawrence H Snyder¹⁰, Stephen G Lisberger¹¹, Nicholas J Priebe¹², Ian M Finn¹³, David Ferster¹³, Stephen I Ryu¹,¹⁴, Gopal Santhanam¹, Maneesh Sahani³ & Krishna V Shenoy¹,²,¹⁵
Record taking and reproducibility

- Hubert - Running version A of model with more stations
  - Did not finish to converge
  - `Sim Name: MPAQ-VA_News.mat`

- Kajfar - Running version B of the model with larger seed
  - `Sim Name: MPAQ-VA-Long.mat`
  - Running version B as above on
    - Speech: `Sim Name: MPAQ-VA-LongSpeech.mat`
    - Birdsong: `Sim Name: MPAQ-VA-LongBirdsong.mat`

- Harlow - Computing decoding performance of the following models:
  - `MPAQ-VA.mat`
  - `MPAQ-VA-News.mat`
  - `MPAQ-VA-Long.mat`
  - `MPAQ-VA-LongSpeech.mat`
  - `MPAQ-VA-LongBirdsong.mat`

- Check convergence & hack with VD VBC VC
- Dataset - Running VA of model with larger seed sizes ("size")
Releasing code
Desiderata

• **Synchronise:** between multiple machines

• **Share:**
  - between multiple local and non-local coauthors
  - make parts of the code public (development versus stable release)

• **Record:** simulation settings, changes an author has made, etc.

*Version control handles this and more*
Version control

AKA: revision control, source control, software configuration management

- analogue to **track changes** in word: for all files in a directory
- who changed what, where and when
- can roll back changes
- can share/synchronise all the files
Why Git?

- Regular version control
  - Centralised
  - Everything passes through server
  - Slow and cannot work off-line
Why Git?

• In **Git** everyone has a copy of the database - whole history
  – Everything is local
  – Very fast and can work offline
  – Distributed (backup)

• Branching is simple (refactoring)

• Open source and Free

• limitation: text files versus binaries
Demo
"Bringing industrial software-development practices into the lab cannot come too soon"

Greg Wilson
software-carpentry.org
Where to find out more information

- **Where’s the Real Bottleneck in Scientific Computing?**
  American Scientist [http://tinyurl.com/3bowoye](http://tinyurl.com/3bowoye)
  HPC Wire [http://tinyurl.com/3rz8kp8](http://tinyurl.com/3rz8kp8)

- **Intro to scientific computing (unit testing, version control etc.):**

- **Why Git’s popularity is on the up:**
  [http://tinyurl.com/3asbtlv](http://tinyurl.com/3asbtlv)

- **Git project home:**

- **Git online tutorial:**
• Git for scientific computing tutorial (part of python summer school)
  https://python.g-node.org/python-autumnschool-2010/schedule

• Git reference:
  http://gitref.org/

• Git Wiki:
  https://git.wiki.kernel.org/index.php/Main_Page

• UNISON:
  http://www.cis.upenn.edu/~bcpierce/unison/

• Version control is built into matlab: