NeuroFedora

Free Software for Free Neuroscience

Ankur Sinha
Ph.D. candidate: UH Biocomputation Group, UK,
Volunteer: Fedora Project.

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Free/Open (neuro) Science

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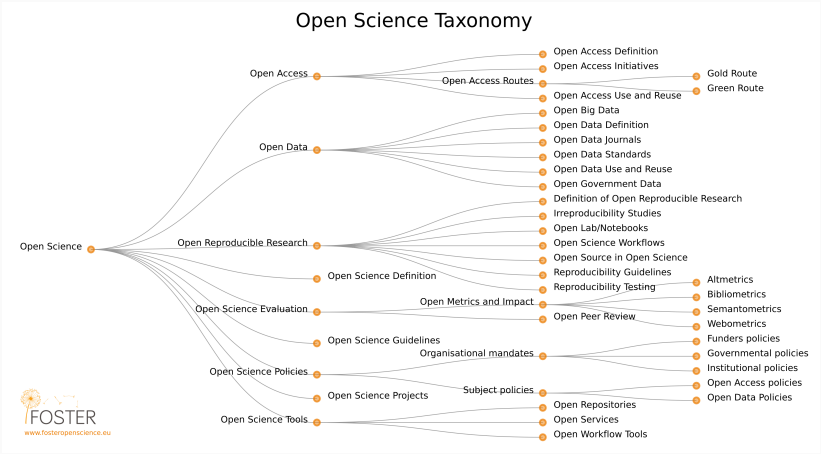
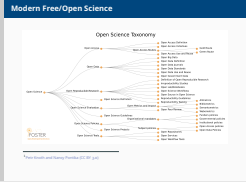
Modern Free/Open Science



[1] Petr Knoth and Nancy Pontika (CC BY 3.0)

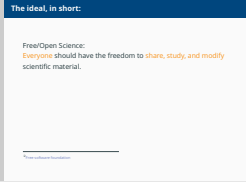


1. We know this, but it's always to remind ourselves how massive modern Open Science is.
2. It encompasses everything from data collection, to storage, to sharing, to processing, to dissemination of results.

The ideal, in short:

Free/Open Science:
Everyone should have the freedom to share, study, and modify scientific material.

[2] Free software foundation



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Free/Open Science includes and relies heavily on Free/Open Source Software (FOSS).

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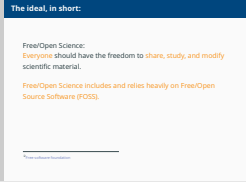

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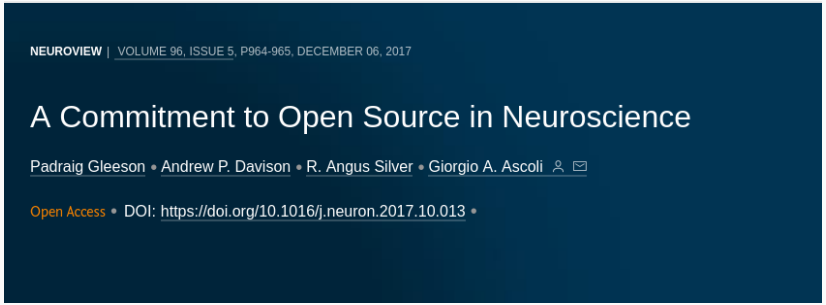
FOSS:
Everyone should have the freedom to share, study, and modify software[5].

[2] Free software foundation

So we strive to use more and more FOSS



[6] Open source for neuroscience

So we strive to use more and more FOSS

NeuroFedora: why, how, what?

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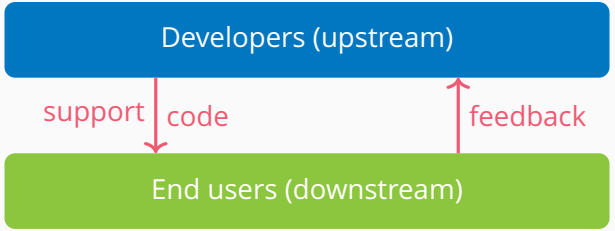
FOSS: Developers and users



FOSS: Developers and users
Developers (upstream)
support
code
feedback
End users (downstream)

Neuroscience community: highly multidisciplinary

- various specialities: biologists, mathematicians, physicists, chemists, psychologists, . . . ,

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(Anecdotal) notes on development of research software

- often single developer, or small development teams
- limited maintenance, short-lived projects
- limited access to hardware/resources
- limited code quality
- limited use of established best practices
- limited testing for correctness (!)
- complex dependency chains
- lack of documentation and support
- lack of community development know-how

1. Give how interdisciplinary neuroscience is, most researchers are NOT trained in development
2. This implies, and this is based on anecdotal evidence, that the software used in research is not of the best quality

(Anecdotal) notes on users of research software

- waste time and effort installing (and reinstalling) their software stacks
- rarely run test suites (!)
- rarely report bugs upstream
- rarely send improvements upstream
- are unaware of helpful development tools

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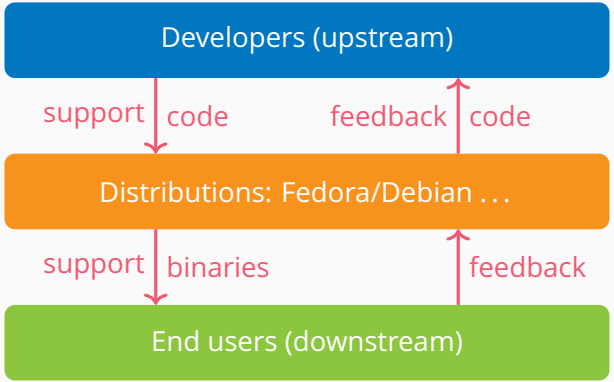
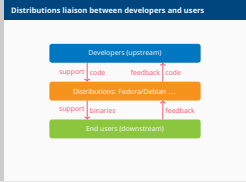
1. The other side of the bridge is the users
2. Because they aren't trained, they have a hard time setting up and using the software
3. If correctness of a tool cannot be verified, how can the correctness of the scientific result be claimed?

Distributions liaison between developers and users





Distributions, like Fedora, are in a unique position:

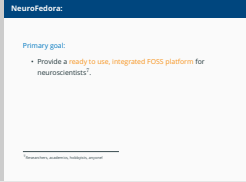
- liaison between upstream and users
- have the infrastructure
- follow best practices in software development
- constantly work on community development
- learn from one another—train while working
- disseminate information to end-users

NeuroFedora:

Primary goal:

- Provide a ready to use, integrated FOSS platform for neuroscientists[7].

[7] Researchers, academics, hobbyists, anyone!



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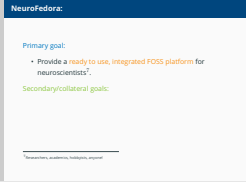


NeuroFedora:

Primary goal:

- Provide a ready to use, integrated FOSS platform for neuroscientists[7].

Secondary/collateral goals:

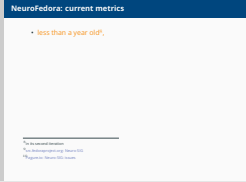
- help improve the standard and maintenance of tools
- help users develop software development skills
- make neuroscience accessible to non-specialists

[7] Researchers, academics, hobbyists, anyone!

NeuroFedora: current metrics

- less than a year old[8],

[8] in its second iteration
[9] src.fedoraproject.org: Neuro-SIG
[10] Pagure.io: Neuro-SIG: issues



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  - 15 package maintainers
  - 5 designers, newcomers
  - only 5 from a neuroscience background

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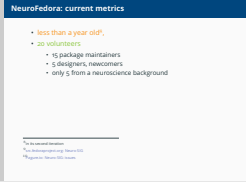

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- software:
  - 120 tools (packages) ready to install[9]:
    - Neuron, NEST, Genesis, Brian (v1 and v2), Moose, python-libNeuroML, PyLEMS, PyNWB, ...
  - ~170 in queue[10].
    - NeuroMLlite, pyNeuroML, NetPyNE, ...

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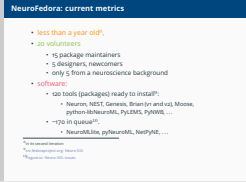

Search: “NeuroFedora”

Mailing list: neuro-sig@lists.fedoraproject.org
IRC: #fedora-neuro on Freenode
Telegram: t.me/NeuroFedora
Documentation neuro.fedoraproject.org
Blog: neuroblog.fedoraproject.org
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