



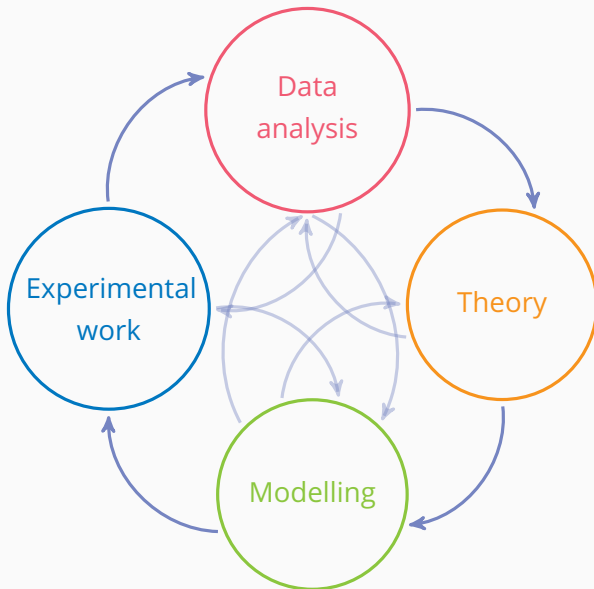
NeuroFedora

Free Software for Free Neuroscience

NeuroFedora Contributors

How: Research Pipeline

General workflow



Tools of the trade

Experimental:

- EEG, ECoG, intracellular and extracellular single and multi neuron recording,
- CT, DOI, MRI, f-MRI, MEG, PET,

Data analysis:

- Statistics,
- Machine Learning, Big Data, Deep learning,

Theory and modelling:

- Simulators of all kinds,

Tools for the dissemination of knowledge⁴:

- visualisation,
- academic writing,
- non academic writing: blogging . . . ,
- pod-casting,
- video making,
- creating teaching materials,
- collaborative tools and utilities

⁴also to a non-specialist audience.

Free/Open (neuro) Science

The ideal, in short:

Free/Open Science:

Everyone should have the freedom to share, study, and modify scientific material.

FOSS:

Everyone should have the freedom to share, study, and modify software⁵.

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

²Free software foundation

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A Commitment to Open Source in Neuroscience

Padraig Gleeson • Andrew P. Davison • R. Angus Silver • Giorgio A. Ascoli  

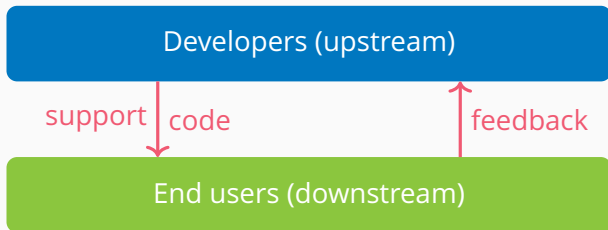
Open Access • DOI: <https://doi.org/10.1016/j.neuron.2017.10.013> •

NeuroFedora: why, how, what?

Neuroscience community: highly multidisciplinary

- **various specialities:** biologists, mathematicians, physicists, chemists, psychologists, ... ,
- **small proportion of trained software developers**

FOSS: Developers and users



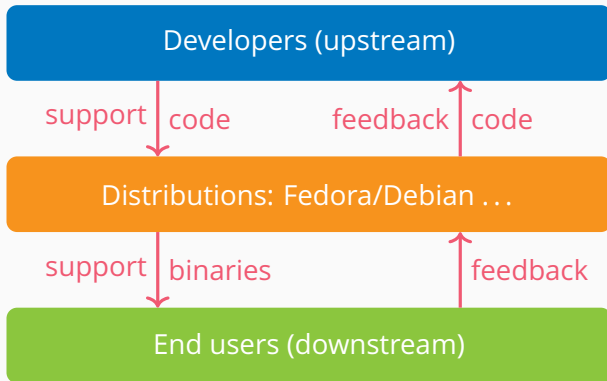
(Anecdotal) notes on development of research software

- 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**

(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

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

Primary goal:

- Provide a ready to use, integrated FOSS platform for neuroscientists⁷.

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

- Turned a year old, in September 2019⁸,
- 20 volunteers
 - 15 package maintainers
 - 5 designers, newcomers
 - only 5 from a neuroscience background
- software:
 - 120 tools (packages) ready to install⁹:
 - Neuron, InterViews, NEST, Genesis, Brian (v1 and v2), Moose, python-libNeuroML, PyLEMS, PyNWB, ...
 - ~180 in queue¹⁰.
 - NeuroMLlite, pyNeuroML, NetPyNE, ...

⁸ in its second iteration

⁹ src.fedoraproject.org: Neuro-SIG

¹⁰ [Pagure.io](https://pagure.io): Neuro-SIG: issues

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

Pagure.io (FOSS Git forge): [neuro-sig/NeuroFedora](https://pagure.io/neuro-sig/NeuroFedora)