



# NeuroFedora

Free Software for Free Neuroscience

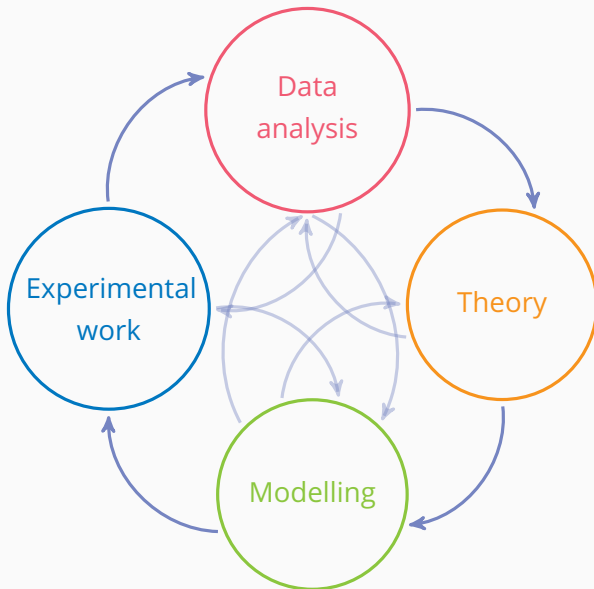
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NeuroFedora Contributors

## How: Research Pipeline

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# 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 knowledge<sup>4</sup>:

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

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<sup>4</sup>also to a non-specialist audience.

## Free/Open (neuro) Science

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## 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 software<sup>5</sup>.

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

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<sup>2</sup>Free 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> •



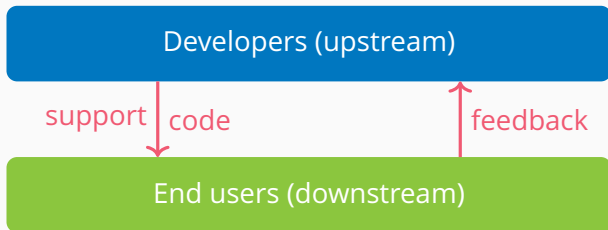
## NeuroFedora: why, how, what?

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## Neuroscience community: highly multidisciplinary

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

## FOSS: Developers and users



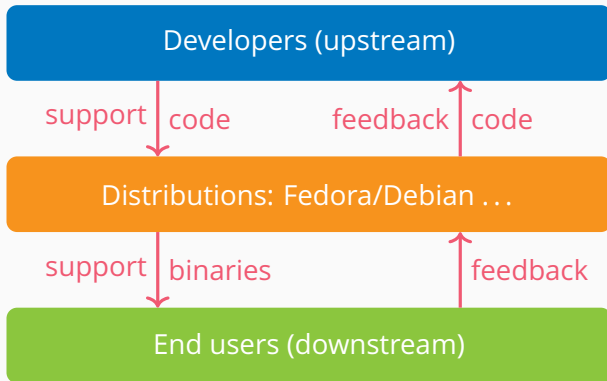
## (Anecdotal) notes on development of research software

- 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 neuroscientists<sup>7</sup>.

## Secondary/collateral goals:

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

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<sup>7</sup> Researchers, academics, hobbyists, anyone!



# NeuroFedora: current metrics

- Turned a year old, in September 2019<sup>8</sup>,
- 20 volunteers
  - 16 package maintainers
  - 5 designers, newcomers
  - only 5 from a neuroscience background
- software:
  - 135 tools (packages) ready to install<sup>9</sup>:
    - Neuron, InterViews, NEST, Genesis, Brian (v1 and v2), Moose, python-libNeuroML, PyLEMS, PyNWB, ...
  - ~180 in queue<sup>10</sup>.
    - NeuroMLlite, pyNeuroML, NetPyNE, ...

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<sup>8</sup> in its second iteration

<sup>9</sup> [src.fedoraproject.org](http://src.fedoraproject.org): Neuro-SIG

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

## Search: “NeuroFedora”



Mailing list: [neuro-sig@lists.fedoraproject.org](mailto:neuro-sig@lists.fedoraproject.org)

IRC: [#fedora-neuro](#) on Freenode

Telegram: [t.me/NeuroFedora](https://t.me/NeuroFedora)

Documentation [neuro.fedoraproject.org](https://neuro.fedoraproject.org)

Blog: [neuroblog.fedoraproject.org](https://neuroblog.fedoraproject.org)

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