



## NeuroFedora

FOSS and open (neuro) science

NeuroFedora contributors

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## FOSS and Free/Open Science

### Free/Open Source Software

Ideal: users should have the freedom to **share, study, and modify** software<sup>1</sup>.

The **user** is **free**.

<sup>1</sup>Free software foundation

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### Free/Open Source Science?

Ideal: **Everyone** should have the freedom to **share, study, and modify** scientific material<sup>2</sup>.

So, scientists, hobbyists, students ... should all have access to scientific material—irrespective of social status, location, age, nationality ...

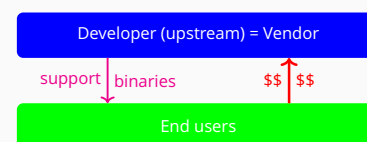
Especially given that **social policy must be evidence based**.

<sup>2</sup>Open source for neuroscience

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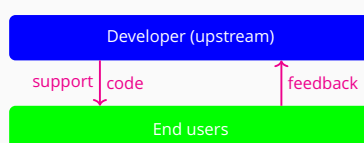
## A platform?

### The developer—user relationship: proprietary software



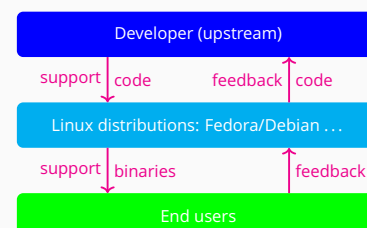
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### The developer—user relationship: free software



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### The developer—user relationship: distributions



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## Distributions: package maintainers

- Build software:
  - including all **dependencies**.
- Check for **correctness** (!).
- **Keep up** with upstream: updates, security fixes ....
- **Connect** upstream to users.
- **Enable** upstream to improve their software<sup>3</sup>.

<sup>3</sup>Fedora project: staying close to upstream.

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## NeuroFedora

## Goals

- Enable **free science**:
  - researchers (end-users):
    - ready to use **tested** tools.
  - upstreams:
    - feedback from users.
    - software improvements.
    - implement standards.
- Help make science “**default to open**”.

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## NeuroFedora example I: NEST (★★★★★)

- Build requires<sup>4</sup>:
  - **Compulsory**: Python+, Cython, GSL, Ncurses, CMake, GCC.
  - **Optional**: libneurosim (for PyNN), MUSIC, MPICH, OpenMPI.

<sup>4</sup>Fedora project: nest SPEC file.

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## NeuroFedora Example I: NEST: usage

```
$ sudo dnf install python3-nest
$ sudo dnf install python3-nest-mpich
$ sudo dnf install python3-nest-openmpi
```

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## NeuroFedora example II: PyNN (★★★)

- Build requires<sup>5</sup>:
  - **Compulsory**: Python+, Ncurses, CMake, GCC.
  - **At least one of**: NEST, Brian, NEURON.

<sup>5</sup>Fedora project: PyNN SPEC file (WIP).

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## NeuroFedora Example II: PyNN (WIP): usage

```
$ sudo dnf install python3-PyNN
Installs PyNN and NEST, Brian6, NineML (and NEURON7).
$ sudo dnf install python3-PyNN-nest
Installs PyNN and NEST.
```

<sup>6</sup>Requires Brian v1

<sup>7</sup>WIP: Requires upstream improvements.

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## NeuroFedora: package metrics

- 67 packages available in total<sup>8</sup>.
- ~130 in queue<sup>9</sup>.

<sup>8</sup>src.fedoraproject.org: Neuro-SIG

<sup>9</sup>pagure.io: Neuro-SIG: issues

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## NeuroFedora: computational neuroscience

- Available: NEST, NineML, moose, Brian2, PyLEMS.
- In queue (26)<sup>10</sup>: NEURON, PyNN, Brian1, NetPyne, Genesis, NeuroMLlite, pyNeuroML, pypeg, HNN, libSBML ...

<sup>10</sup>Neuro-SIG: computational neuroscience

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## NeuroFedora: neuroimaging

- Available: biosig, dcm2nii, gifticlib, InsightToolKit, libminc, dipy, fsleyes, mne-bids, pydicom ...
- In queue (40)<sup>11</sup>: Nistats, FEAT, TrancToR, FSL, SPM, connectomeviewer, nipy, itktools ...

<sup>11</sup>Neuro-SIG: neuroimaging

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## NeuroFedora: data analysis

- Available: nilearn, scikit-learn, klusta, lazyarray, neo, nitime, patsy ...
- In queue (25)<sup>12</sup>: spyke-viewer, stimfit, pyelectro, pypspike, pymc3 ...

<sup>12</sup>Neuro-SIG: data analysis

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## NeuroFedora: utilities

- Available: texlive (full), duecredit, chaospy, ...
- In queue (37)<sup>13</sup>: spiking-circus, pingouin, spykeutils, PsychToolbox, tridesclous, uncertainpy, neuroshare, Btmorph ...

<sup>13</sup>Neuro-SIG: utilities

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## NeuroFedora: plans

- Continue package imports.
- Update documentation<sup>14</sup>.
- Docker images<sup>15</sup>!
- Announce to research community.
- RHEL/CentOS/Scientific Linux support (our cluster runs Scientific Linux).
- BoFs/Hack sessions at scientific conferences (workshop at CNS 2019?)

<sup>14</sup>Figure.io: Neuro-SIG: Documentation

<sup>15</sup>Registry.fedoraproject.org

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## NeuroFedora: requirements











- More package maintainers<sup>16</sup>.
- Testers—end users who are happy to test packages and provide feedback (QA)<sup>17</sup>.
- Documentation writers/proofreaders.

<sup>16</sup>Fedora: join the package maintainers

<sup>17</sup>Fedora QA: testing updates

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## NeuroFedora: current team

10 Members	
	ankursinha
	jbysek
	ignatenkobrain
	ligrad
	pac23
	ibazan
	sergiopr
	mrough
	linuxmodder
	blackflie

<sup>0</sup>Fedora Infrastructure

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## NeuroFedora: get in touch

- Landing page (until a website/docs are set up) on Fedora wiki<sup>18</sup>.
- IRC channel: #fedora-neuro on Freenode.net<sup>19</sup>.
- Telegram channel: @NeuroFedora<sup>20</sup>.
- Mailing list on lists.fedoraproject.org<sup>21</sup>.
- Software suggestion form<sup>22</sup>.

<sup>18</sup>Fedora wiki: NeuroFedora

<sup>19</sup>#fedora-neuro on Freenode

<sup>20</sup>@NeuroFedora on Telegram

<sup>21</sup>lists.fedoraproject.org

<sup>22</sup>NeuroFedora: suggest software for inclusion

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<https://fedoraproject.org/wiki/SIGs/NeuroFedora>

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