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A ready to use Free and Open source platform for neuroscientists

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A ready to use Free and Open source platform for neuroscientists

Ankur Sinha @ Fedora 7/12/2018

Philosophy

test Philosophy One of the control o

Philosophy



test 2019-03-28 □ Philosophy -Free software

Users should have the freedom to share, study, and modify

software¹.

Users should have the freedom to share, study, and modify

⁰

¹Free software foundation



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test □ Philosophy

-Free software

Users should have the freedom to share, study, and modify The user is free.

Users should have the freedom to share, study, and modify software¹.

The user is free.

¹Free software foundation



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

scientific material².

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-Free science

□ Philosophy

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



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test -Philosophy

-Free science

Everyone should have the freedom to share, study, and modify scientific material2. So, scientists, hobbyists, students ... should all have access to scientific material-irrespective of social status, location, age,

Everyone should have the freedom to share, study, and modify scientific material².

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

²Open source for neuroscience

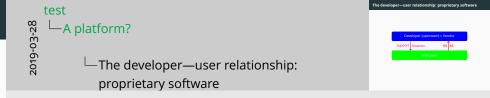
test A platform?

A platform?

A platform?

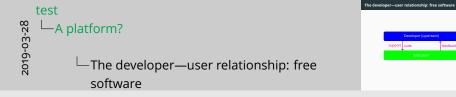
The developer—user relationship: proprietary software



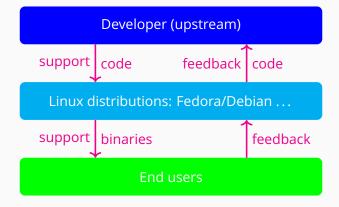


The developer—user relationship: free software





The developer—user relationship: distributions







- Build software:including all dependencies.



³Fedora project: staying close to upstream.

- & ⊢A platform?
 - -Distributions: package maintainers

Build software:
 Industry all appendinces:
 Check for correctness (I).

- Build software:
 - including all dependencies.
- Check for correctness (!).

³Fedora project: staying close to upstream.

- Build software:
 - including all dependencies.
- Check for correctness (!).
- Keep up with upstream: updates, security fixes



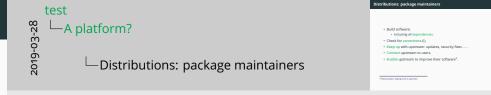
³Fedora project: staying close to upstream.

- Build software:
 - including all dependencies.
- Check for correctness (!).
- Keep up with upstream: updates, security fixes
- Connect upstream to users.



³Fedora project: staying close to upstream.

- Build software:
 - including all dependencies.
- Check for correctness (!).
- Keep up with upstream: updates, security fixes
- Connect upstream to users.
- Enable upstream to improve their software³.



³Fedora project: staying close to upstream.

NeuroFedora

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NeuroFedora



• Enable free science:

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└─NeuroFedora

└─Goals

Enable free science:

Goals

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-Goals



- Enable free science:
 - researchers (end-users):
 - ready to use tested tools.

Goals

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Goals

Enable free science:
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 *unione improvement.
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- Enable free science:
 - researchers (end-users):
 - ready to use tested tools.
 - upstreams:
 - feedback from users.
 - software improvements.
 - implement standards.

Goals

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Goals Badde free science

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Help make science "diffault to open";

- 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".

. Compulsory: Python+, Cython, GSL, Nourses, CMake, GCC.

NeuroFedora example I: NEST (★★★★)

- Build requires⁴:
 - Compulsory: Python+, Cython, GSL, Ncurses, CMake, GCC.

⁴Fedora project: nest SPEC file.

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NeuroFedora example I: NEST (★★★★)

Federa projenti nesi 1760 Ele.

- Build requires⁴:
 - Compulsory: Python+, Cython, GSL, Ncurses, CMake, GCC.
 - Optional: libneurosim (for PyNN), MUSIC, MPICH, OpenMPI.

⁴Fedora project: nest SPEC file.

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 I: NEST: usage

\$ sudo dnf install python3-nest \$ sudo dnf install python3-nest-mpich \$ sudo dnf install python3-nest-opermpi

NeuroFedora Example I: NEST: usage



• Build requires⁵:

⁵ Fedora project: PyNN SPEC file (WIP).



NeuroFedora example II: PyNN (★★★)

- Build requires⁵:
 - Compulsory: Python+, Ncurses, CMake, GCC.
 - At least one of: NEST, Brian, NEURON.

⁵ Fedora project: PyNN SPEC file (WIP).



NeuroFedora Example II: PyNN (WIP): usage

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NeuroFedora Example II: PyNN (WIP): usage

Installs PyNN and NEST, Brian⁶, NineML (and NEURON⁷)

NeuroFedora Example II: PyNN (WIP): usage

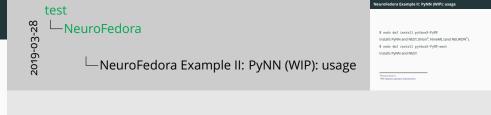
\$ sudo dnf install python3-PyNN Installs PyNN and NEST, Brian⁶, NineML (and NEURON⁷).

⁶Requires Brian v1

⁷WIP: Requires upstream improvements.

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.



⁶Requires Brian v1

⁷WIP: Requires upstream improvements.

NeuroFedora: package metrics

- 67 packages available in total⁸.
- ~130 in queue⁹.

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NeuroFedora: package metrics

NeuroFedora: package metrics

NeuroFedora: package metrics

⁹

⁸ src.fedoraproject.org: Neuro-SIG ⁹ Pagure.io: Neuro-SIG: issues

NeuroFedora: computational neuroscience

- Available: NEST, NineML, moose, Brian2, PyLEMS.
- In queue (26)¹⁰: NEURON, PyNN, Brian1, NetPyne, Genesis, NeuroMLlite, pyNeuroML, pype9, HNN, libSBML . . .

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- In quase polific MSERIOR, PyM. Bior., Nethyra. Gen
NeuroRedora: computational neuroscience

- NeuroRedora: computational neuroscience

¹Neuro-SIG: computational neuroscience

NeuroFedora: neuroimaging

- Available: biosig, dcm2niix, gifticlib, InsightToolKit, libminc, dipy, fsleyes, mne-bids, pydicom ...
- In queue (40)¹¹: Nistats, FEAT, TranctoR, FSL, SPM, connectomeviewer, nipype, itktools . . .

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Audidatic Biology domains, giffselds, length flouldes, libraries, dity, futures me both, grigation and proceedings of the control of the

¹ Neuro-SIG: neuroimaging

NeuroFedora: data analysis

nitime, patsy . . .

- Available: nilearn, scikit-learn, klusta, lazyarray, neo,
- In queue (25)¹²: spyke-viewer, stimfit, pyelectro, pyspike, pymc3...

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NeuroFedora: data analysis

 Available: nilearn, scikit-learn, klusta, lazyarray, neo, nitime, patsy...

nitime, patsy ...

• In queue (25)¹²: spyke-viewer, stimfit, pyelectro, pyspike

NeuroFedora: data analysis

¹Neuro-SIG: data analysis

· Available: texlive (full), duecredit, chaospy, PsychToolbox, tridesclous, uncertainpy, neuroshare

NeuroFedora: utilities

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

¹³Neuro-SIG: utilities

Continue package imports.

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NeuroFedora: plans

NeuroFedora: plans

¹Pagure.io: Neuro-SIG: Documentation
¹⁵registry.fedoraproject.org

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- Continue package imports.
- Update documentation¹⁴.

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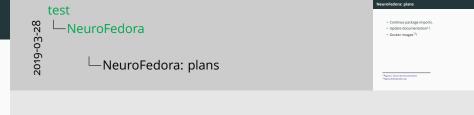
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NeuroFedora: plans

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¹‡agure.io: Neuro-SIG: Documentation
¹‡egistry.fedoraproject.org

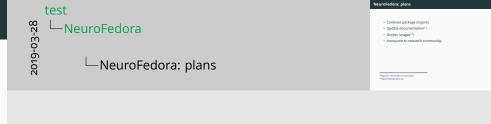
- Continue package imports.
- Update documentation¹⁴.
- Docker images¹⁵!



¹⁴ Pagure.io: Neuro-SIG: Documentation

¹Pagure.io: Neuro-SIG: Doci

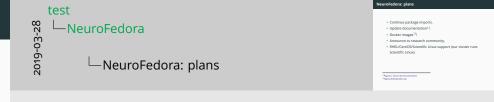
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- Docker images¹⁵!
- Announce to research community.



¹Pagure.io: Neuro-SIG: Documentation

¹⁵registry.fedoraproject.org

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- Announce to research community.
- RHEL/CentOS/Scientific Linux support (our cluster runs Scientific Linux).



¹‡agure.io: Neuro-SIG: Documentation

¹⁵registry.fedoraproject.org

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- BoFs/Hack sessions at scientific conferences (workshop at CNS 2019?)

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└─NeuroFedora: plans

NeuroFedora: plans

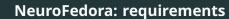
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¹ pagure.io: Neuro-SIG: Documentation

¹⁵registry.fedoraproject.org



• More package maintainers¹⁶.

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NeuroFedora: requirements

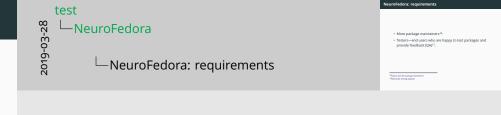
NeuroFedora: requirements

¹⁶Fedora: Join the package maintainers ¹Fedora QA: testing updates

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NeuroFedora: requirements

- More package maintainers¹⁶.
- Testers—end users who are happy to test packages and provide feedback (QA)¹⁷.



¹Fedora: Join the package maintainers

¹Fedora QA: testing updates

NeuroFedora: requirements

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 - └─NeuroFedora: requirements

More package maintainers¹⁶.
 Testers—end users who are happy to test packages and provide feedback (QA)¹⁷.
 Documentation writers/proofreaders.

NeuroFedora: requirements

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- Testers—end users who are happy to test packages and provide feedback $(QA)^{17}$.
- Documentation writers/proofreaders.

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¹⁶Fedora: Join the package maintainers

¹Fedora QA: testing updates

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

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