NeuroDebian - a computing platform for neuro- (and open) science

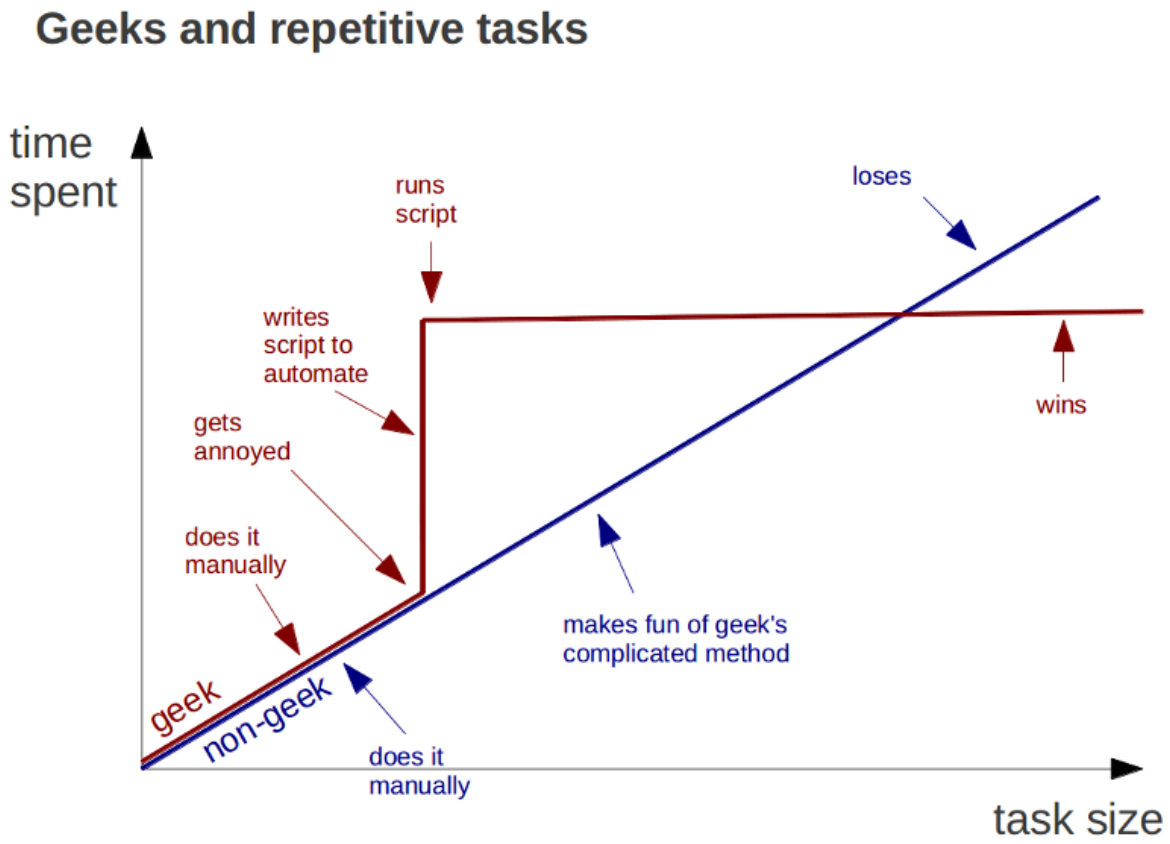
Part 1: Software Virtualization

March 2, 2017, 1.30 - 2.00 pm

Speaker: Jessica Oschwald

PhD student University Research Priority Program (URPP) Dynamics of Healthy Aging

Let's be geeks!



credit: Bruno Oliveira

Common problems with research software

- Many different platforms
- Complicated to install and maintain
- Small workforce
- Insufficient quality testing
- Developers leave

Why don't we share the same **open platform** that is **easy** to **access**, **install** and **maintain**?

NeuroDebian developers

Yaroslav Halchenko, Center for Cognitive Neuroscience, Dartmouth

Michael Hanke, University of Magdeburg, Germany

Their vision

"Together we can create an **integrated computing platform** that we all **freely share**, to exchange data and ideas, implemented as software, that we all **maintain collaboratively**"

(Halchenko & Hanke, 2012, p. 3)

Find all the details here....

frontiers in NEUROINFORMATICS

OPINION ARTICLE
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Open is not enough. Let's take the next step: an integrated, community-driven computing platform for neuroscience

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http://journal.frontiersin.org/article/10.3389/fninf.2012.00022/full

NeuroDebian

Integrated, community-driven computing platform for neuroscience

- Originally small project to provide software for neuroscientists
- Today: packages for many disciplines (e.g. electrophysiology, neural modeling, psychophysics, distributed computing)
- Uses Debian operating system (OS)

Strategy:

Help scientists and developers integrate their software into Debian OS and make use of its advantages!

Debian: a flavor of Linux

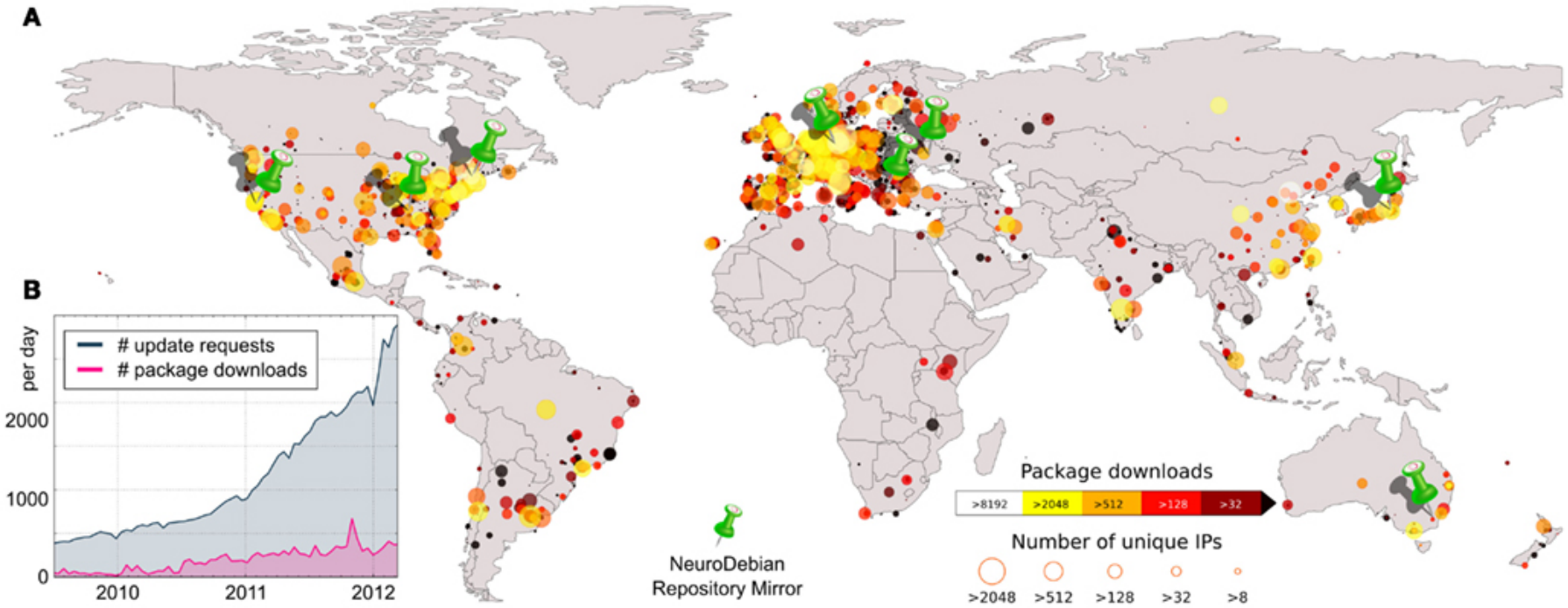
Advantages of using Debian OS

- Free and open to anyone (‚do-ocracy')
- Easy and fast installing (takes only minutes!)
- Strict open standards
- Largest software archive (>29'000 pieces)
- Standardization of binary and source distributions → reproducibility
- Runs on any hardware relevant for neuroscience research

In a nutshell: **open, accessible and reproducible**

NeuroDebian users worldwide

- used by thousands of researchers (20 new downloads / day)



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NeuroDebian packages

By field

- *Packages for Distributed Computing*
- *Packages for Electrophysiology*
- *Packages for Magnetic Reasonance Imaging*
- *Packages for Modeling of neural systems*
- *Packages for Neuroscience Datasets*
- *Packages for Neuroscience Education*
- *Packages for Psychophysics*

e.g. AFNI, FSL, PyMVPA, Nipype

Besides individual packages: NeuroDebian offers a complete **Virtual Machine (VM)** that can be used on any major operating system

How can you benefit from NeuroDebian?

- Free ✓
- Install it on any hardware✓
- Save your time ✓
- Platform for teaching (‘take away environment’) ✓
- Efficient collaboration ✓
- Multi-modal / multidisciplinary projects ✓
- Longitudinal studies ✓
- Contribute to open science and reproducibility ✓

Practical demonstration

Install NeuroDebian http://neuro.debian.net

Update the whole system

```
sudo apt-get update && apt-get upgrade
```

Install Packages

PyMVPA `sudo apt-get install python-mvpa2`

FSL `sudo apt-get install fsl-complete`

Get support

`neurodebian-users@lists.alioth.debian.org`

References

Halchenko, Y. O., & Hanke, M. (2012). Open is not enough. Let's take the next step: an integrated, community-driven computing platform for neuroscience. *Frontiers in Neuroinformatics*, *6*, 1–4. doi: 10.3389/fninf.2012.00022

http://neuro.debian.net

https://wiki.debian.org/NeuroDebian