Improving efficiency in cognitive neuroscience research with NeuroDebian

http://www.debian.org
http://neuro.debian.net

Michael Hanke[1,2], Yaroslav O. Halchenko[1], James V. Haxby[1], Stefan Pollmann[2]

1) Dept. of Psychological and Brain Sciences, Dartmouth College, NH, USA
2) Dept. of Experimental Psychology, University of Magdeburg, Germany

THE BUGS YOU'LL SEE ARE NOT PROBLEMS

DOCTORS RECOMMEND

Scientific Users

A Plain Operating System Is Not Enough...

A complete research environment consists of many software tools. Each of them has its own requirements, release cycles, mailing lists and *bugs.*

A scientist's efficiency depends on local administrators to integrate all tools into a functional environment and provide them with timely updates and bugfixes.

Inappropriate or outdated environments disconnect a lab from latests developments in the field, frustrates researchers, and slows them down.

Why Debian?

Huge integrated environment providing about 30000 fully-supported, prebuilt, and preconfigured software packages covering a vast range of applications

Known for stability and smooth upgrades that become available when they are *ready*, not enforced by political or commercial considerations

Packages have *individual* maintainers that are familiar with a particular software

Active communities for medical and scientific software

What Is Readily Available?

What Do I Get?

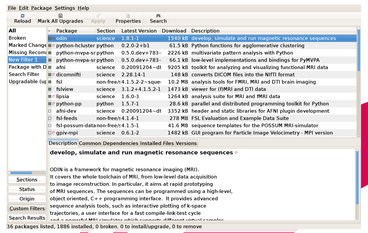
For example, installing FSL takes only one command and a few seconds:

```
apt-get install fsl
```

Performing system updates also takes care of updating research software

```
apt-get update; apt-get upgrade
```

Convenient graphical frontends are available



What Is NeuroDebian ?

NeuroDebian is Debian — with some additional software packages that are on their way to become a part of Debian. A supplemental repository with neuroscience software for Debian (and Ubuntu) systems is also provided.

Debian Facts

Independent, international non-profit volunteer organization of several thousand developers and contributors

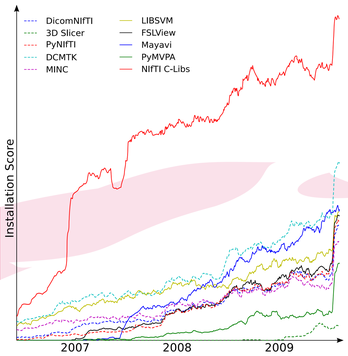
Continously developed since 1993

Origin of dozens of derived distributions (e.g. Ubuntu pulls from Debian)

GNU-based operating system ported for three different kernels: Linux, FreeBSD, Hurd

Supports the majority of available hardware platforms (e.g. Intel/AMD 32/64 bit, ARM, PowerPC, Itanium, IBM S/390)

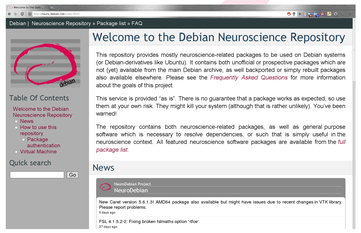
Increasingly Popular



How To Obtain It?

CD/DVD/USB-disk/Floppy installer images: ***http://www.debian.org***

Virtual machine image (with pre-installed neuroscience software): ***http://neuro.debian.net***



Software Developers

A Couple Of People Are Not Enough...

Impossible to build and tests software in all environments where users want to have it (hardware, library/compiler versions) -- many projects restrict the "supported environment" to limit necessary support effort

Ivory tower development imposes deployment burden onto users who have to face incompatible "supported environments" across different projects

Most projects have a mailing list, but only few offer a public bug-tracker

Why Debian?

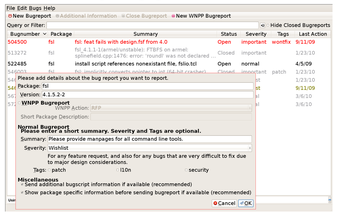
Many scientific development tools/libraries in a versatile integrated ecosystem

Debian-wide QA efforts make bug and security fixes available to developers (often before they actually become a problem, e.g. new compiler versions)

Each package has a dedicated maintainer providing frontline bugfixing and coordinates patches, as well as interactions between users and developers

What Is Readily Available?

What Do I Get?



Uniform bug-tracker interface for all packages

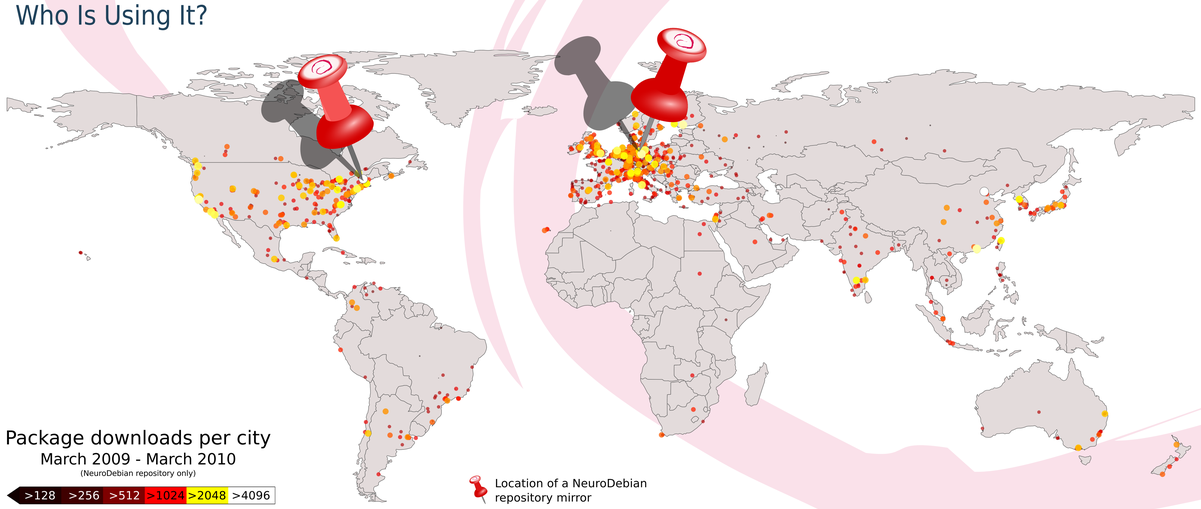
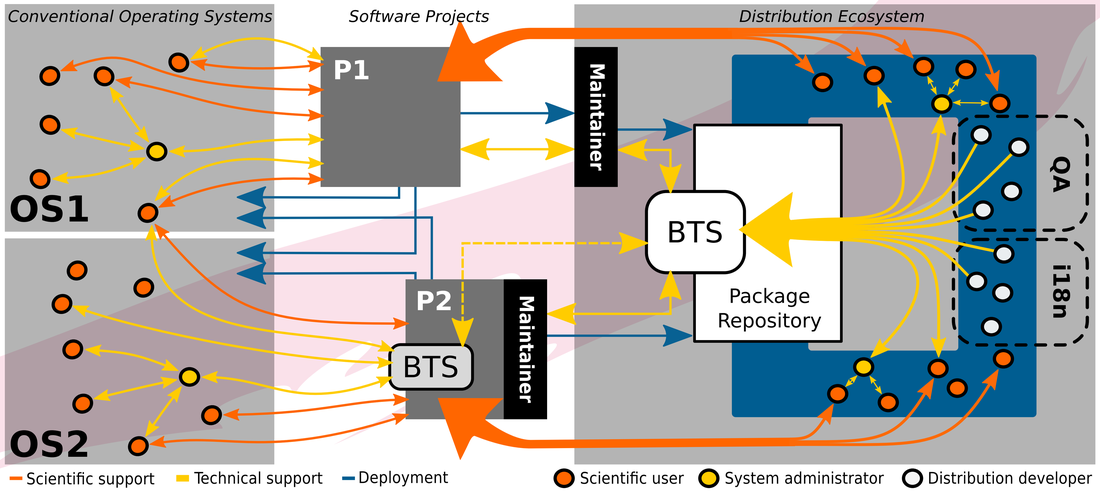
```
reportbug python-nifti
```

Publicly available build-logs for all Debian platforms

Package tests run on machines that are otherwise not available to upstream developers

Everybody can subscribe to package-related messages (e.g. bugs reports)

Who Is Using It?



Distribution Ecosystem: Improved Efficiency Through Coordination