The Universal Operating System

http://www.debian.org

Debian

was founded by Ian Murdock in August 1993 with the goal to create an easy to install and maintain non-commercial GNU/Linux operating system that would be able to compete in the commercial market. Since then, Debian established itself as an independent and unique project driven by more than 3000 enthusiastic contributors all around the globe. Principles of *do-ocracy* and democracy backed up by evolving transparent standards allowed Debian to deliver the most comprehensive operating system – not only by amount of integrated software, but also by number of the supported hardware architectures. The high quality and openness of Debian made it the foundation of choice for more than 120 derivative GNU/Linux distributions, such as Ubuntu and Mint.

Debian is

Versatile http://packages.debian.org
Over 15000 software packages maintained by experts to provide a stable system for *any* field of application.

Secure http://www.debian.org/security
Security updates guarantee safe operation.

Open http://www.debian.org/social_contract
All software is free and open-source (FOSS).
Debian is governed by public democratic processes.

Popular http://www.debian.org/users
Used by governments, companies, educational institutions.

Three Debian suites

Development *Unstable* (always *sid*)
Never *released*, constantly evolving platform to integrate new versions of software into Debian.
Despite its name, *Unstable* is a good platform for those requiring the most recent versions of software.

"Always-ready-to-release" *Testing* (now *stretch*)
Software versions known to be secure and of good quality. *Testing* provides a good balance between stability and recency of software.

Official release *Stable* (now 8.1, *jessie*)
Stable is released "when it is ready", *i.e.* when *Testing* is assured to be robust. Complementary updates keep the system secure.
Stable is the best choice where reliability and security are of primary importance.

Three Debian components

Free as in freedom *main*
All software in *main* is distributed under FOSS licenses compliant with Debian Free Software Guidelines (DFSG) to assure complete freedom to use, modify, and (re-)distribute.

Wanna-be free *contrib*
FOSS depending on *non-free* 3rd party software.

Somewhat free *non-free*
Software under restrictive licenses available at no charge.

Who is Debian

Debian is the only major operating system developed solely by volunteer individuals who collaborate via the Internet. Debian developers, teams or individual contributors improve the operating system not by writing new applications (in most cases) but by

- integrating existing software into Debian
- fixing and communicating bug reports to original developers
- assuring overall quality of the distribution
- improving documentation and translations
- providing user support

Packaged software in Debian have individual maintainers who are often also users of a particular software, and who are therefore interested in its reliable operation. Certain fields of applications have dedicated maintainer teams, such as Debian-Science or Debian-Med.

How to get Debian

Install on a hard-drive
http://www.debian.org/distrib/

Live CD/DVD
http://www.debian.org/CD/live/

Run in a Virtual Machine
http://neuro.debian.net/vm.html

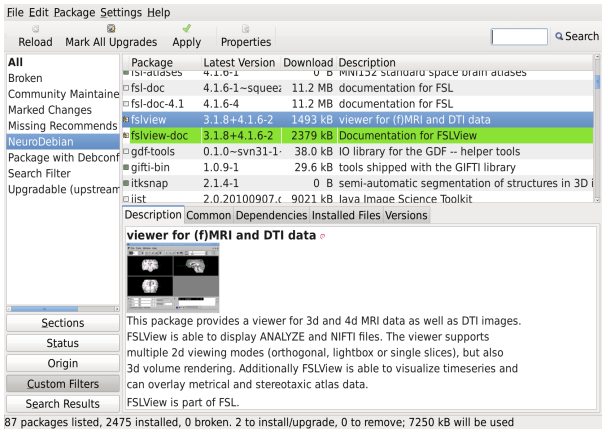
Development version
http://www.debian.org/devel/debian-installer

Use in a cloud
https://wiki.debian.org/Cloud

Docker: `docker pull debian`

How to install software

GUI (Synaptic): *Select and click "Apply"*



Command line: `apt-get install <packagename>`

How to upgrade the entire system

GUI (Synaptic):
Click "Mark All Upgrades", "Apply"
Command line:

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

How to get support

http://www.debian.org/support

Software bug
`reportbug <packagename>`

Community support
http://www.debian.org/MailingLists
http://forums.debian.net, ask.debian.net
irc://irc.debian.org/debian

Commercial support
http://www.debian.org/consultants

The Universal Research Platform

http://neuro.debian.net

NeuroDebian is

a Debian project that provides the Neuroscience community with a stable and versatile research platform – the Debian operating system. Since 2005, NeuroDebian integrates neuroscience software into Debian to allow neuroscientists to benefit from the advantages of the universal operating system in their day-to-day research activities. The NeuroDebian repository (http://neuro.debian.net) offers the latest research software for all Debian suites (and various releases of Ubuntu). The combination of a stable generic operating system, Debian, and a variety of conveniently accessible research software creates a versatile research platform for neuroscience that offers the latest methodologies of the field to everyone, for free. These advantages make NeuroDebian increasingly popular among neuroscientists and scientific software developers.

NeuroDebian is NOT

yet another Debian GNU/Linux derivative distribution. All work done by the NeuroDebian project targets the official Debian operating system. This approach helps to increase the longevity of the project by relying on the efforts of thousands of Debian contributors.

Software at your fingertips

http://neuro.debian.net/pkgs.html

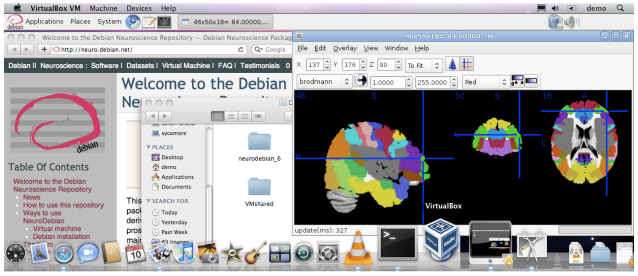
Distributed computing: Condor, DMTCP, IPython, ...
Electrophysiology: BioSig, Neo, Sigviewer, ...
Machine Learning: MDP, PyMVPA, sklearn, ...
Neural Modeling: Brian, CNrun, PyNN, XPPAUT ...
Imaging: AFNI, CMTK, FSL, Mricron, NiPy ...
Psychophysics: PsychoPy, Psychtoolbox-3, PyEPL ...

Benefits from Debian integration

- Debian standards and policies guarantee quality.
- Debian's centralized bug tracking system provides a unified single-point of entry for bug reporting and troubleshooting for any software in Debian.
- Debian makes software available through a worldwide distribution network, thus offloading bandwidth demands.
- Other Debian contributors handle large-scale aspects of deployment, quality assurance, porting and integration at the level of the entire distribution:
  Porting Software sources get built for 11 hardware architectures and 3 kernels (Linux, HURD, kFreeBSD). Porter teams maintain build infrastructure and help make the code platform-agnostic.
  QA Whole-archive rebuilds assure robustness of packaging and warn about upcoming problems (core libraries upgrades) beforehand.
  Internationalization (I18n) Translator teams help localize software for more than 60 languages.
- Neuroscience software becomes a 1st-class citizen within the Debian project, which guarantees its longevity, smooth installation and upgrades.

How to get NeuroDebian

Debian/Ubuntu: neuro.debian.net repository
Others: NeuroDebian Virtual Machine



Work-in-progress

Increased coverage
Electrophysiology: Fieldtrip
Neural Modeling: NEURON, (NEST), LFPy
Imaging: DTI-TK, Freesurfer, XNAT, ...
Improved quality assurance
Extended integration and regression testing
http://testkraut.readthedocs.org
Available snapshotting service
All versions of packages readily available
Data as the 1st-class citizen
http://datalad.org data distribution
Community knowledge exchange portal
http://neurostars.org/t/neurodebian

Testimonials

http://neuro.debian.net/testimonials.html

The approach taken with NeuroDebian is plainly the most appropriate approach to software distribution for the dominant platform in brain image analysis, and I have great confidence that this project will be a major asset to the neuroscience community in facilitating the distribution of stable software, improving the reliability and replicability of analyses, and in helping to improve software development practices.

– Prof. Daniel Y. Kimberg
Director, Data Processing Facility, Center for Functional Neuroimaging, University of Pennsylvania, Philadelphia, USA

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References

Halchenko, Y. O. & Hanke, M. (2012). Open is not enough. Lets take the next step: An integrated, community-driven computing platform for neuroscience. Frontiers in Neuroinformatics, 6:22. http://neuro.debian.net/#publications