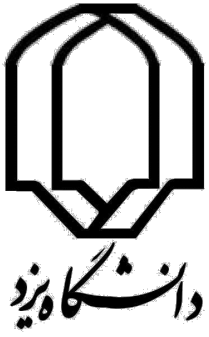


Department of Computer Science, Yazd University

SageMath

A.Rahiminasab

October9, 2015

SageMath(previously Sage or SAGE)

System for Algebra and Geometry Experimentation

☞ is mathematical software with features covering many aspects of mathematics, including algebra, combinatorics, numerical mathematics, number theory,and calculus.

History

- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

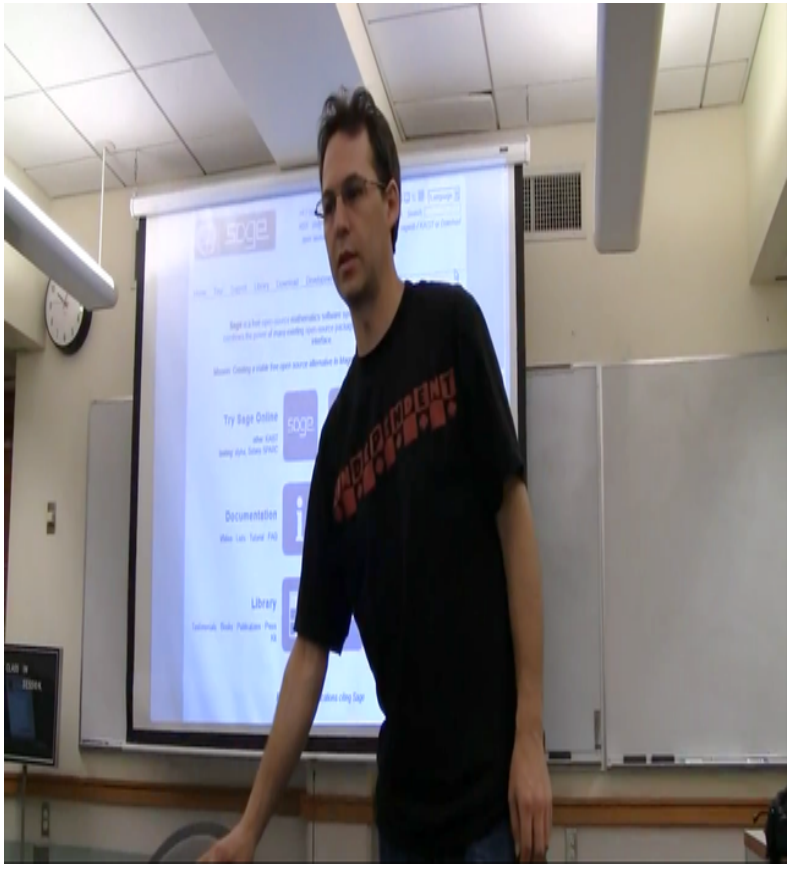
- Initial release:24 February 2005; 10 years ago,
- Stable release:6.8 / 26 July 2015; 3 months ago,
- initial goals : creating an "open source alternative to Magma, Maple, Mathematica, and MATLAB",
- Written in :Python, Cython,
- Operating system:Cross-platform
- License:GNU General Public License
- Website www.sagemath.org

History

The originator and leader of the SageMath project:

- Born:21 February 1974 (age 41)Santa Barbara, California
- Occupation:Professor of Mathematics
- Known for:lead developer of Sage
- Website:www.wstein.org

William A. Stein

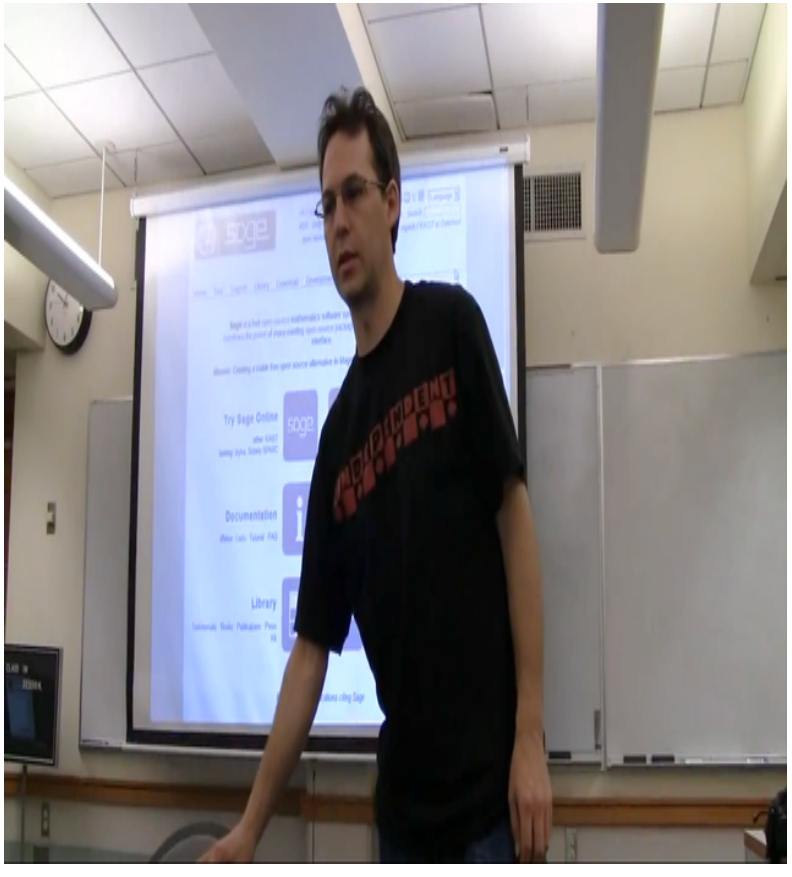


History

The originator and leader of the SageMath project:

- Born:21 February 1974 (age 41)Santa Barbara, California
- Occupation:Professor of Mathematics
- Known for:lead developer of Sage
- Website:www.wstein.org

William A. Stein

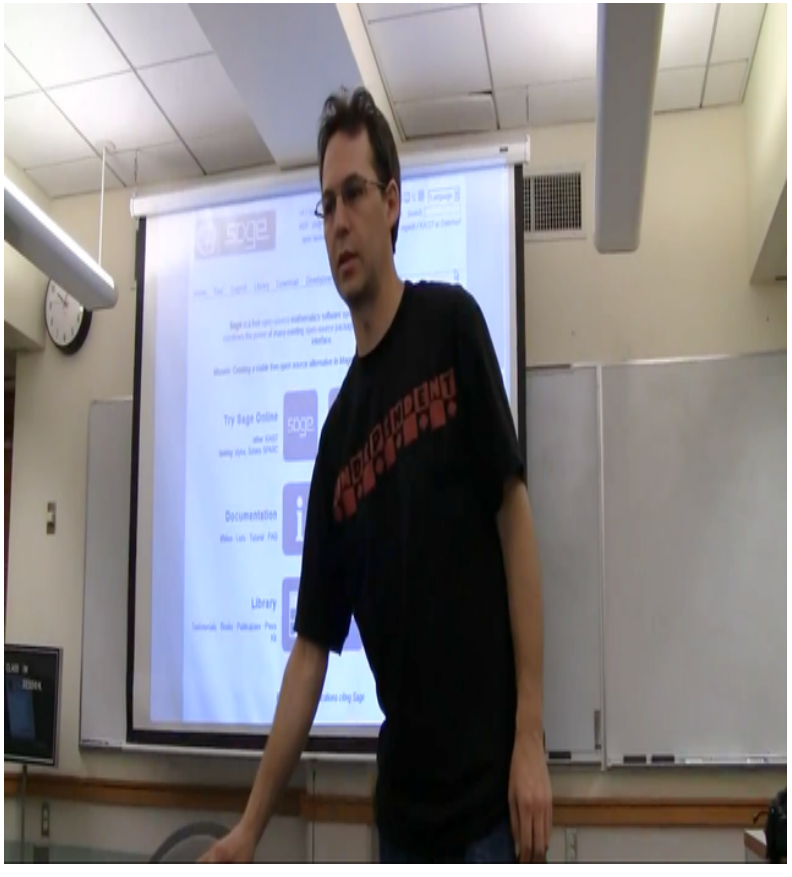


History

The originator and leader of the SageMath project:

- Born:21 February 1974 (age 41)Santa Barbara, California
- Occupation:Professor of Mathematics
- Known for:lead developer of Sage
- Website:www.wstein.org

William A. Stein

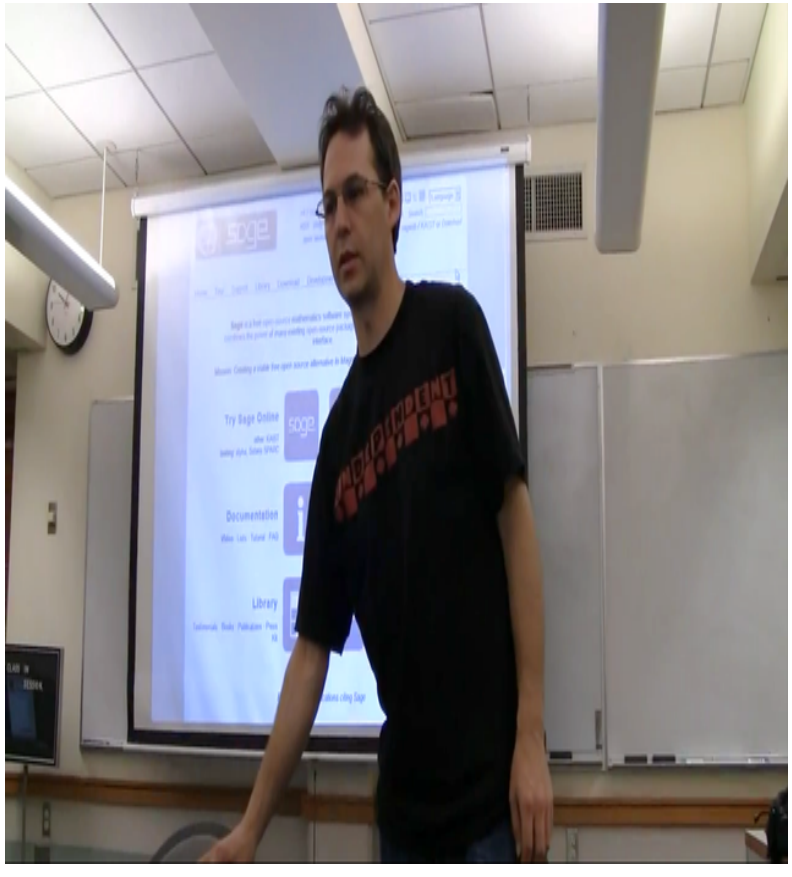


History

The originator and leader of the SageMath project:

- Born:21 February 1974 (age 41)Santa Barbara, California
- Occupation:Professor of Mathematics
- Known for:lead developer of Sage
- Website:www.wstein.org

William A. Stein

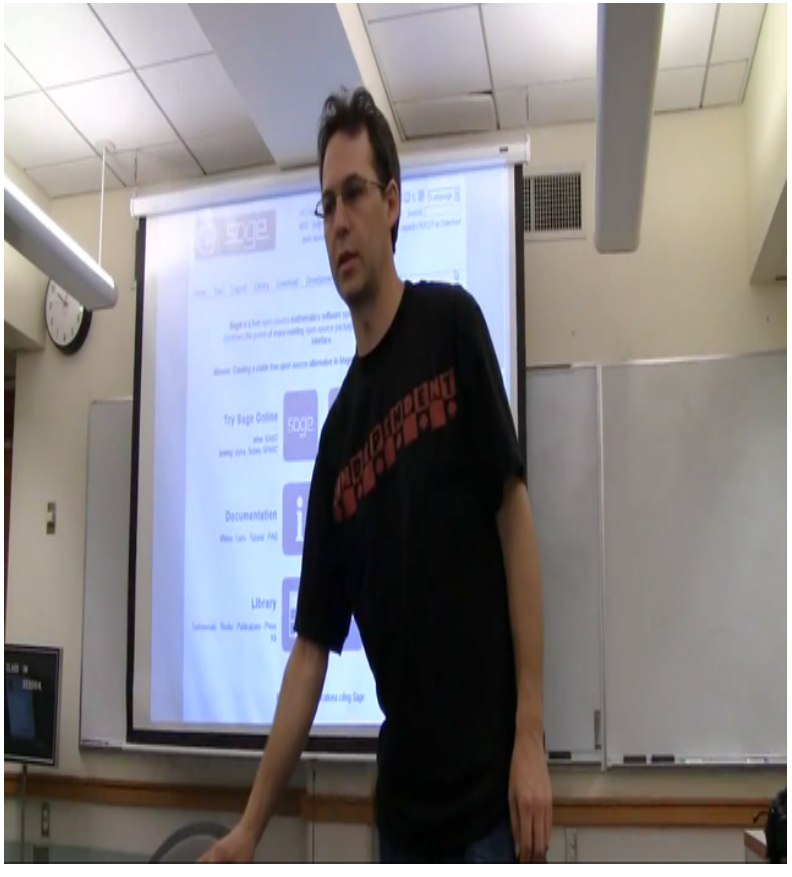


History

The originator and leader of the SageMath project:

- Born:21 February 1974 (age 41)Santa Barbara, California
- Occupation:Professor of Mathematics
- Known for:lead developer of Sage
- Website:www.wstein.org

William A. Stein



History

√

Stein is currently doing computational and theoretical research into the problem of computing with modular forms and the Birch and Swinnerton-Dyer conjecture.He is considered "a leading expert in the field of computational arithmetic".

Features

Features of SageMath include:

1. A browser-based notebook for review and re-use of previous inputs and outputs, including graphics and text annotations. Compatible with Firefox, Opera, Konqueror, Google Chrome and Safari. Notebooks can be accessed locally or remotely and the connection can be secured with HTTPS.
2. A text-based command-line interface using IPython
3. Support for parallel processing using multi-core processors, multiple processors, or distributed computing
4. Calculus using Maxima and SymPy
5. Numerical linear algebra using the GSL, SciPy and NumPy

Features

6. Libraries of elementary and special mathematical functions
7. 2D and 3D graphs of symbolic functions and numerical data
8. Matrix manipulation, including sparse arrays
9. Multivariate statistics libraries, using R and SciPy
10. A toolkit for adding user interfaces to calculations and applications
11. Graph theory visualization and analysis tools
12. Libraries of number theory functions
13. Support for complex numbers, arbitrary precision and symbolic computation

Features

14. Technical word processing including formula editing and embedding SageMath within LaTeX documents
15. The Python standard library, including tools for connecting to SQL, HTTP, HTTPS, NNTP, IMAP, SSH, IRC, FTP and others

Licensing and availability

SageMath is free software, distributed under the terms of the GNU General Public License version 2+. SageMath is available in many ways:

1. The source code can be downloaded from the downloads page . Although not recommended for end users, development releases of SageMath are also available.
2. Binaries can be downloaded for Linux, OS X and Solaris (both x86 and SPARC).
3. A live CD containing a bootable Linux operating system is also available. This allows usage of Sage without Linux installation.
4. Users could use an online version of SageMath at sagenb.org , but it has been discontinued in April 2015.

Licensing and availability

5. A new online SageMath notebook is available at cloud.sagemath.com

Licensing and availability

Although Microsoft was sponsoring a native version of Sage for the Windows operating system,as of 2012 there were no plans for a native port, and users of Windows currently have to use virtualization technology such as VirtualBox to run Sage.As of Sage 5.9, it mostly successfully builds on Cygwin. Linux distributions in which SageMath is available as a package are Mandriva, Fedora, and Arch Linux. It is also available as a dedicated Ubuntu PPA. In Gentoo, it's available via layman in the "sage-on-gentoo"overlay. However, SageMath can be installed to any Linux distribution. Gentoo prefix also provides Sage on other operating systems.

Related projects

- ☞ Sagemath Cloud:computational mathematics in the cloud
- ☞ Sage Math for Android:to access Sagemath Cloud from Android
- ☞ LMFDB:database of L-functions, modular forms, and related objects
- ☞ FindStat:database of combinatorial statistics

sdge

on Windows

play

sdge

on Linux

play2

sdge

on Linux Server

play3

Comparison of computer algebra systems:
https://en.wikipedia.org/wiki/List_of_computer_algebra_systems
Comparison of numerical analysis software:
https://en.wikipedia.org/wiki/Comparison_of_numerical_analysis_software