Stellarium: Open-Source Planetarium Software

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About Stellarium

Purpose: Stellarium is a free, open-source planetarium software that renders realistic 3D skies in real-time, simulating what can be observed with the naked eye, binoculars, or a telescope.

License Type: GNU General Public License version 2 (GPLv2)

Initiated By: Fabien Chérea and his brother Guillaume

Initial Release: 2001

Programming Languages Used: C++ with Qt framework

Started as a personal project and has evolved with contributions from a global community of developers.

Size of Codebase: 9,315kloc

Features / Services

Major Features:

- Real-time rendering of the night sky with over 600,000 stars, planets, and deep-sky objects.
- Accurate depiction of celestial events such as solar and lunar eclipses, transits, and conjunctions.
- Ability to simulate the sky from any location on Earth at any given time.
- Extensive catalog of constellations from various cultures.

Unique Features:

- Fisheye projection mode for planetarium domes.
- Scripting support to create custom sky tours

Developer Base

Core Developers:

Led by Alexander Wolf, with significant contributions from developers like Georg Zotti, Marcos Cardinot, Guillaume Chéreau, Bogdan Marinov, Timothy Reaves, and Florian Schaukowitsch.

Major Contributors:

Primarily individual contributors; however, organizations like Digitalis Education Solutions have developed forks such as Nightshade for specific applications.

Contributor Evolution:

The project has seen a steady increase in contributors over the years, fostering a vibrant community of developers and enthusiasts.

User Base

Primary Users: Amateur and professional astronomers, educators, students, and astronomy enthusiasts.

User Growth: Since its inception, Stellarium has gained widespread popularity, becoming a go-to tool for astronomy education and observation. Its inclusion as a featured application in platforms like the Ubuntu Software Center in December 2011 highlights its broad acceptance.

Open Source User Base - Growth & Evolution

Downloads: While specific monthly download figures are not publicly disclosed, Stellarium has been used by more than 20 million users since its launch in 2000.

GitHub Stars: The project's GitHub repository has garnered approximately 7,760 stars, reflecting strong community interest and engagement.

Forum Users: Stellarium maintains an active user community through forums and mailing lists, though exact numbers of active users and new registrations per month are not specified.

Development Process

Development Management: Community-driven development with collaborative input from global contributors.

Issue Tracking: Utilizes GitHub for code repository management, issue tracking, and version control.

Release Cycle: Regular updates with the latest release being version 24.4, released on December 22, 2024.

Repository Hosting: The project's source code is hosted on GitHub, providing a centralized platform for version control and collaboration.

Version Control System and Issue Tracking: Git is used for version control, enabling efficient tracking of changes, branching, and merging.

Interesting Facts

Awards: In 2006, Stellarium won a gold award in the Education category of the Les Trophées du Libre free software competition.

Professional Use: A modified version of Stellarium has been utilized by the MeerKAT radio telescope project as a virtual sky display, demonstrating its applicability in professional astronomy.

Literary Mention: Eleanor Catton, author of the 2013 Booker Prize-winning novel "The Luminaries," used Stellarium to accurately depict the night sky corresponding to the time periods in her novel.

Usage Example