

Introduction of SciLab

FOSS:

Free and open-source software (FOSS) is software that can be classified as both free software and open-source software. That is, anyone is freely licensed to use, copy, study, and change the software in any way, and the source code is openly shared so that people are encouraged to voluntarily improve the design of the software. This is in contrast to proprietary software, where the software is under restrictive copyright licensing and the source code is usually hidden from the users.

FOSS maintains the software user's civil liberty rights. Other benefits of using FOSS can include decreased software costs, increased security and stability (especially in regard to malware), protecting privacy, education, and giving users more control over their own hardware. Free and open-source operating systems such as Linux and descendants of BSD are widely utilized today, powering millions of servers, desktops, smartphones (e.g., Android), and other devices. Free-software licenses and open-source licenses are used by many software packages. The free-software movement and the open-source software movement are online social movements behind widespread production and adoption of FOSS.

Lets look at one of the free and open source software, that is SciLa

SciLab:

Scilab is a programming language associated with a rich collection of numerical algorithms covering many aspects of scientific computing problems. From the software point of view, Scilab is an interpreted language. This generally allows to get faster development processes, because the user directly accesses to a high-level language, with a rich set of features provided by the library. The Scilab language is meant to be extended so that user-defined data types can be defined with possibly overloaded operations. Scilab users can develop their own module so that they can solve their particular problems. The Scilab language allows to dynamically compile and link other languages such as Fortran and C: this way, external libraries can be used as if they were a part of Scilab built-in features.



Fig.SciLab logo

From the license point of view, Scilab is a **free software** in the sense that the user does not pay for it and Scilab is an **open source software**, provided under the Cecill license. The software is distributed with source code, so that the user has an access to Scilab most internal aspects. Most of the time, the user downloads and installs, a binary version of Scilab since the Scilab consortium provides Windows, Linux and Mac OS executable versions. An online help is provided in many local languages. From a scientific point of view, Scilab comes with many features. At the very beginning of Scilab, features were focused on linear algebra. But, rapidly, the number of features extended to cover many areas of scientific computing.

The following is a short list of its capabilities:

- Linear algebra, sparse matrices,
- Polynomials and rational functions,
- Interpolation, approximation,
- Linear, quadratic and non linear optimization,
- Ordinary Differential Equation solver and Differential Algebraic Equations solver,
- Classic and robust control, Linear Matrix Inequality optimization,
- Differentiable and non-differentiable optimization,
- Signal processing,
- Statistics.

Scilab provides many graphics features, including a set of plotting functions, which allow to create 2D and 3D plots as well as user interfaces. The Xcos environment provides hybrid dynamic systems modeler and simulator.