

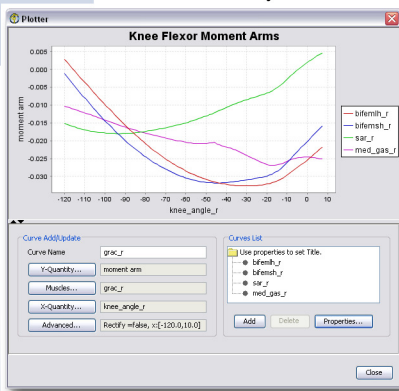


1.1

OpenSim

OpenSim is a freely available software system that allows you to build, exchange, and analyze **musculoskeletal models** and **dynamic simulations** of movement.

Plot Results of Analyses

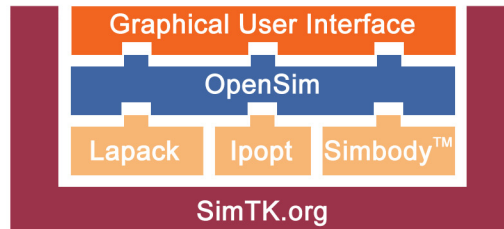


What is OpenSim?

OpenSim is an interactive graphical software system for developing and analyzing simulations of the musculoskeletal system. The software is created from SimTK, a simulation toolkit developed to create mathematical models of biological dynamics. OpenSim can be used for biomechanics research, treatment planning, surgical simulation, computer animation, and ergonomics.

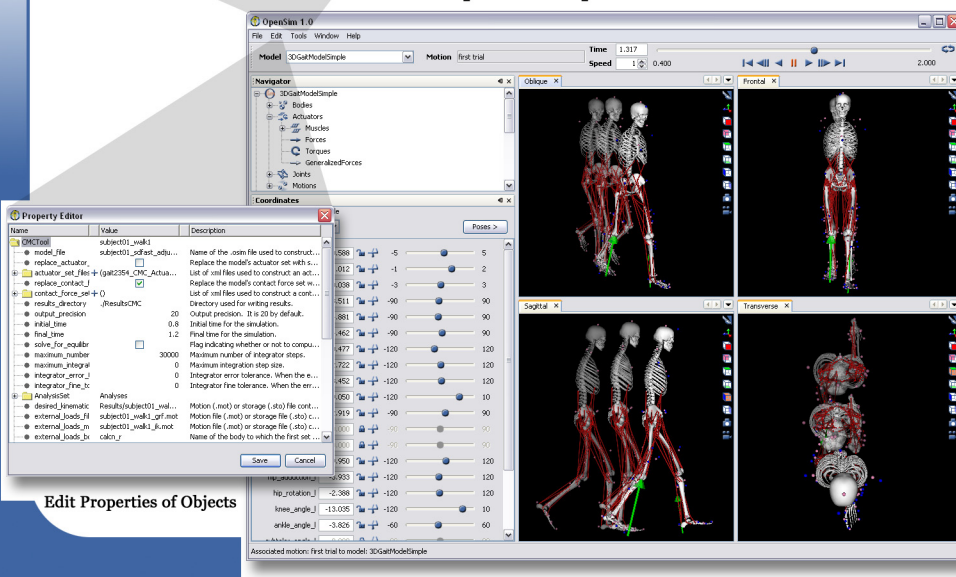
Relation to SimTK

SimTK (Simulation Toolkit) is being developed by Simbios, a NIH National Center for Biomedical Computation based at Stanford University. The purpose of SimTK is to enable groundbreaking biomedical research by providing open access to high-quality tools for modeling and simulating biological structures. The tools are available at SimTK.org. The source code for SimTK is freely available and distributable under the MIT License.



OpenSim Relation to SimTK

OpenSim Graphical User Interface



Edit Properties of Objects

OpenSim is built from computational tools available on SimTK.org, including Lapack linear algebra library, Ipopt optimizer, and the Simbody™ multibody dynamics engine. The OpenSim application and documentation are available on SimTK.org.

Compatibility with SIMM

SIMM (Software for Interactive Musculoskeletal Modeling) from Motion Analysis Corp. is a widely used software application for biomechanical analysis, surgical planning, and ergonomics. The joint (*.jnt) and muscle (*.msl) files used by SIMM to describe models of the musculoskeletal system can be converted into OpenSim models (*.osim) and brought into the OpenSim framework.

OpenSim augments the functionality of SIMM and the SIMM Dynamics Pipeline by providing advanced simulation and control capabilities. In addition, the object-oriented, modular design of OpenSim allows users to extend its functionality and share functionality with other OpenSim users.

OpenSim is a self-contained modeling and simulation environment that does not require additional software components or licenses (such as SD/FAST) to generate dynamic simulations.

Supported by NIH Roadmap Grant U54 GM072970



Visualization Toolkit

Computed Muscle Control

Simbody™

Simmatrix™

Simmath™



Ipopt



Lapack