Resource Summary Report

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OpenSim

RRID:SCR_002683
Type: Tool

Proper Citation

OpenSim (RRID:SCR_002683)

Resource Information

URL: http://opensim.stanford.edu

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Description: OpenSim is an open-source software system that lets users develop models of musculoskeletal structures and create dynamic simulations of movement. The software provides a platform on which the biomechanics community can build a library of simulations that can be exchanged, tested, analyzed, and improved through multi-institutional collaboration. The underlying software is written in ANSI C++, and the graphical user interface (GUI) is written in Java. OpenSim technology makes it possible to develop customized controllers, analyses, contact models, and muscle models among other things. These plugins can be shared without the need to alter or compile source code. Users can analyze existing models and simulations and develop new models and simulations from within the GUI.

Resource Type: simulation software, software resource, software application

Keywords: muscle-driven simulation, musculoskeletal biomechanics, neuromuscular simulation, modeling software, simulation software

Funding: Simbios ;
NIGMS U54 GM072970;
DARPA

Availability: Public, Free, Acknowledgement requested

Resource Name: OpenSim

Resource ID: SCR_002683

Alternate IDs: nif-0000-23308

Alternate URLs: https://simtk.org/home/opensim, http://opensim.stanford.edu/support/index.html

Record Creation Time: 20220129T080214+0000

Record Last Update: 20250429T054753+0000

Ratings and Alerts

No rating or validation information has been found for OpenSim.

No alerts have been found for OpenSim.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 455 mentions in open access literature.

Listed below are recent publications. The full list is available at ASWG.

Funaro A, et al. (2025) Subject-specific biomechanics influences tendon strains in patients with Achilles tendinopathy. Scientific reports, 15(1), 1084.

Ahn J, et al. (2025) A comprehensive assessment of a passive back support exoskeleton for load handling assistance. Scientific reports, 15(1), 3926.

Bruel A, et al. (2025) Role and modulation of various spinal pathways for human upper limb control in different gravity conditions. PLoS computational biology, 21(1), e1012069.

Chen D, et al. (2025) Identifying the Primary Kinetic Factors Influencing the Anterior-Posterior Center of Mass Displacement in Barbell Squats: A Factor Regression Analysis. Sensors (Basel, Switzerland), 25(2).

Fang Y, et al. (2025) Effect of Adapted Ergometer Setup and Rowing Speed on Lower Extremity Loading in People with and Without Spinal Cord Injury. Bioengineering (Basel, Switzerland), 12(1).

von Baczko MB, et al. (2025) Biomechanical modeling of musculoskeletal function related to the terrestrial locomotion of Riojasuchus tenuisceps (Archosauria: Ornithosuchidae). Anatomical record (Hoboken, N.J. : 2007), 308(2), 369.

Anderson DE, et al. (2025) Metastatic spine disease alters spinal load-to-strength ratios in patients compared to healthy individuals. medRxiv : the preprint server for health sciences.

Taitano RI, et al. (2024) Muscle anatomy is reflected in the spatial organization of the spinal motoneuron pools. Communications biology, 7(1), 97.

Kearney KM, et al. (2024) From Simulation to Reality: Predicting Torque With Fatigue Onset via Transfer Learning. IEEE transactions on neural systems and rehabilitation engineering : a publication of the IEEE Engineering in Medicine and Biology Society, 32, 3669.

Zhang Z, et al. (2024) Construction and validation of a nomogram model for predicting different sites of ankle pain in runners with chronic ankle instability. Scientific reports, 14(1), 22337.

Zhang Z, et al. (2024) The Effect of Different Degrees of Ankle Dorsiflexion Restriction on the Biomechanics of the Lower Extremity in Stop-Jumping. Applied bionics and biomechanics, 2024, 9079982.

Min YS, et al. (2024) Biomechanical Gait Analysis Using a Smartphone-Based Motion Capture System (OpenCap) in Patients with Neurological Disorders. Bioengineering (Basel, Switzerland), 11(9).

Luis I, et al. (2024) Insights into muscle metabolic energetics: Modelling muscle-tendon mechanics and metabolic rates during walking across speeds. PLoS computational biology, 20(9), e1012411.

Simonetti D, et al. (2024) A wearable gait lab powered by sensor-driven digital twins for quantitative biomechanical analysis post-stroke. Wearable technologies, 5, e13.

Anderson CP, et al. (2024) Effects of Supervised Exercise Therapy on Muscle Function During Walking in Patients with Peripheral Artery Disease. Bioengineering (Basel, Switzerland), 11(11).

Du H, et al. (2024) Experimental research based on robot-assisted surgery: Lower limb fracture reduction surgery planning navigation system. Health science reports, 7(4), e2033.

Bruel A, et al. (2024) The spinal cord facilitates cerebellar upper limb motor learning and control; inputs from neuromusculoskeletal simulation. PLoS computational biology, 20(1), e1011008.

Zhang Z, et al. (2024) Analysis of lumbar spine loading during walking in patients with chronic low back pain and healthy controls: An OpenSim-Based study. Frontiers in bioengineering and biotechnology, 12, 1377767.

Cornish BM, et al. (2024) Sagittal plane knee kinematics can be measured during activities of daily living following total knee arthroplasty with two IMU. PloS one, 19(2), e0297899.

Kainz H, et al. (2024) A framework based on subject-specific musculoskeletal models and Monte Carlo simulations to personalize muscle coordination retraining. Scientific reports, 14(1), 3567.