

MapleSim

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Modeling and Simulation with MapleSim

<u>Developer(s)</u>	Maplesoft
Initial release	December 15, 2008; 11 years ago ^[1]
<u>Stable release</u>	2019.1
<u>Operating system</u>	<ul style="list-style-type: none">• Windows 7 or later• macOS 10.12 or later• Red Hat Enterprise Linux 7 or later• SUSE Linux Enterprise 15 or later• Ubuntu 18.04 or later
<u>Platform</u>	<ul style="list-style-type: none">• Intel x86 32-bit, x86-64• Maple (software)
Available in	English, French and Japanese
<u>Type</u>	Mathematical modeling and Computer Simulation
<u>License</u>	Proprietary commercial software
Website	www.maplesoft.com/products/maplesim/index.aspx

MapleSim is a [Modelica](#)-based, multi-domain [modeling](#) and [simulation](#) tool developed by [Maplesoft](#). MapleSim generates model equations, runs simulations, and performs analyses using the symbolic and numeric mathematical engine of [Maple](#). Models are created by [dragging-and-dropping](#) components from a library into a central workspace, resulting in a model that represents the physical system in a graphical form. Maplesoft began development of MapleSim partly in response to a request from [Toyota](#) to produce physical modeling tools to aid in their new model-based development process.^{[2][3]}

The MapleSim library includes many components that can be connected together to model a system. These components are from areas of science and engineering such as [electrical](#), [mechanical](#),^[4] and [thermal](#) engineering fields. MapleSim also includes traditional signal flow

components that can be combined with other physical components in the workspace. Thus, MapleSim is able to combine [causal](#) modeling methods with [acausal](#) techniques that do not require specification of signal flow direction between all components.^[5]

The use of Maple underneath MapleSim allows all of the system equations to be generated and simplified automatically. The user can explore their system in various ways, such as viewing the equations behind their model and performing parameter optimization.^{[6][7]} The use of the Maple mathematics engine also allows for MapleSim to incorporate such features as units management and solving of high-order [DAEs](#) that are typically encountered in complex acausal models.^[8]



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Release history

Name/Version	Date
MapleSim 1.0	December 2008
MapleSim 2.0	April 2009
MapleSim 3.0	October 2009
MapleSim 4.0	April 2010
MapleSim 4.5	October 2010
MapleSim 5.0	June 2011
MapleSim 5.01	October 2011
MapleSim 5.02	January 2012
MapleSim 6.0	September 2012
MapleSim 6.1	April 2013
MapleSim 6.2	September 2013
MapleSim 6.3	December 2013
MapleSim 6.4	March 2014
MapleSim 7	December 2014
MapleSim 2015	May 2015
MapleSim 2016	April 2016
MapleSim 2016.2	January 2017
MapleSim 2017.0	May 2017
MapleSim 2017.1	June 2017

MapleSim 2017.2 August 2017

MapleSim 2017.3 September 2017

MapleSim 2018.1 June 2018

MapleSim 2019.1 May 2019

Add-on Libraries & Tools

- *MapleSim Connector*
 - ANSI C base [Simulink](#) S-function code generation
- *MapleSim Connector for FMI*
 - FMU generation based on [FMI](#) Standard
- *B&R MapleSim Connector*
 - Integration tool for [B&R](#) Automation Studio and MapleSim models
- *MapleSim Connector for LabVIEW and NI Veristand*
 - Code generation for NI [LabVIEW](#) Software
- *MapleSim Connector for JMAG-RT*
 - Import [JMAG](#)-RT file into MapleSim model
- *MapleSim CAD Toolbox*
 - Import various CAD models into MapleSim then automatically recreating the model components in MapleSim
- *MapleSim Tire Library*
 - Industry standard tire component library which includes Fiala, Calspan and Pacejka 2002 types.
- *MapleSim Driveline Library*
 - Component library for powertrain modeling in automotive engineering such as differential, wheels and road loads.
- *MapleSim Battery Library*
 - Supports electrochemical and equivalent-circuit models for battery system modeling
- *MapleSim Hydraulics Library from Modelon*
 - Third-party version for Hydraulics component models
- *MapleSim Pneumatics Library from Modelon*
 - Third-party version for Pneumatics component models
- *MapleSim Engine Dynamics Library from Modelon*
 - Third-party version of Engine Dynamics Library which can be used for modeling and simulation for combustion engine in automotive applications.
- *MapleSim Heat Transfer Library from CYBERNET*
 - System-level simulation for Heat Transfer effects in MapleSim model based on automatically generated discretization approach.
- *MapleSim Control Design Toolbox*
 - Provides a set of commands for controller design such as PID working with plant models designed by MapleSim. These commands are used in [Maple](#).
- *MapleSim Explorer*
 - Viewer version of MapleSim that can run simulation of MapleSim models.
- *MapleSim Server*

- Web deployment option that can serve MapleSim models on web browser or tablets.

See also

- [AMESim](#)
- [APMonitor](#)
- [Computer simulation](#)
- [Control engineering](#)
- [Dymola](#)
- [EcosimPro](#)
- [EMSO simulator](#)
- [Hardware-in-the-loop simulation](#)
- [Maple \(software\)](#)
- [Mechatronics](#)
- [Model-based design](#)
- [Modelica](#)
- [SimulationX](#)
- [Vehicle dynamics](#)
- [Wolfram SystemModeler](#)