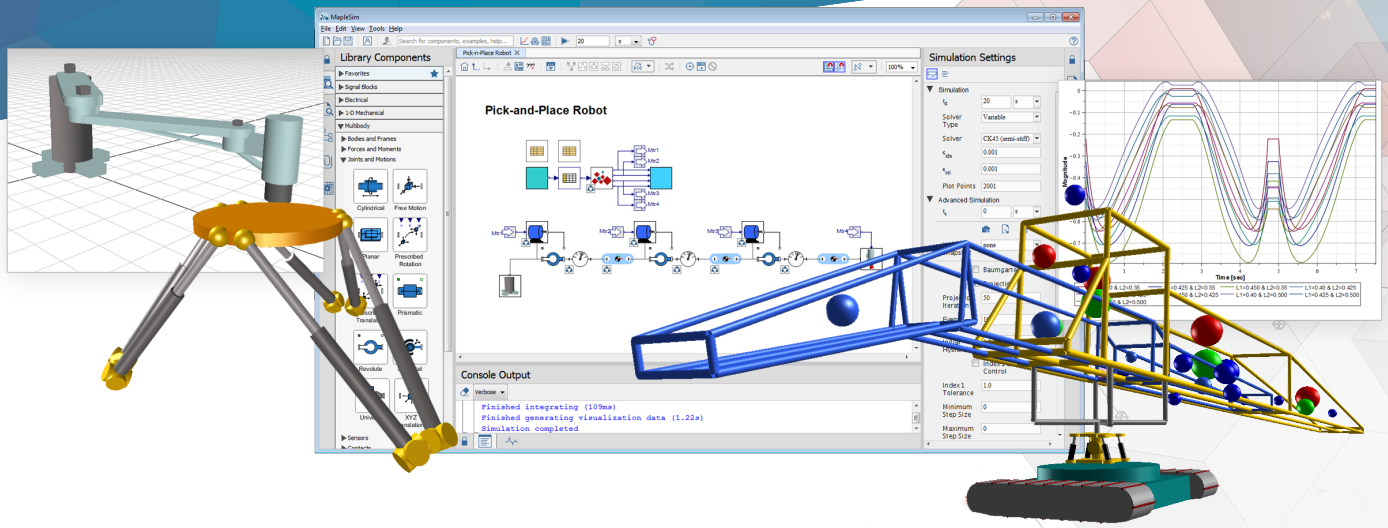
What's New in MapleSim™

Release 2017



The MapleSim™ 2017 family of products offers new and improved model development and analysis tools, expands your modeling scope, introduces new deployment options, and strengthens toolchain connectivity.

Model Analysis

MapleSim Apps give you point-and-click access to powerful Maple-based analysis and utility tools from within the MapleSim environment. MapleSim 2017 includes powerful new MapleSim Apps that help you analyze your model, as well as enhancements to existing tools.

Model Initialization

Choosing the correct initial values for your model is an extremely important and often extremely difficult task. MapleSim 2017 expands the collection of tools that simplify the initialization task with a new **Initialization Diagnostics App**, which provides insight into the initialization process to help you determine how your initial values are computed and what you need to do to adjust them.

- The Initialization Diagnostics App **tracks exactly how the initialization for your model happens**, showing how each variable is computed, in the order it is computed.
- You can **test different configurations by overriding the initial values of selected variables**, and the App will show you how the change affects the initial values of all the other variables in your model.
- To **determine exactly how a particular variable's initial value is calculated**, you can search for it by name, and then use the Initialization Diagnostics App to trace back the variables and values it was computed from.
- If initialization fails, the App shows you all variables calculated up to that point, **giving you tools to determine the root cause of the failure**.

Vibration Analysis

The new **Modal Analysis App** helps you explore and understand the natural vibration modes of your mechanism, so you can identify which modes will have the biggest impact on your design and determine how to reduce the vibration in the final product. For example, you can extract all suspension modes of a full vehicle model, or analyze the natural frequencies of a robot and how they change based on its configuration. The Modal Analysis App:

- **Calculates and visualizes the natural vibration modes** of your compliant mechanism.
- **Works with any multidomain MapleSim model**, including systems with multibody constraints.
- Provides an option for removing damping from the model after it has been linearized so you can **explore the undamped natural frequencies.**

Additional MapleSim App Improvements

Several MapleSim Apps now offer expanded functionality.

- The **Parameter Sweep, Monte Carlo**, and **Optimization Apps** now provide Maple code that can be used to reproduce the results generated in the App. This allows you to use the interactive application as the first step of your analysis, and then **use the provided code as a starting point for creating a customized analysis tool** specific to your particular application.
- The **Parameter Identification Apps in the MapleSim Battery Library**, which is available as a separate add-on, have been improved so that user-supplied charge/discharge data can now be at different temperatures, and plots update continuously as slider parameters change.

Model Development

MapleSim 2017 includes many additions and improvements to make it even easier to develop your system-level models.

- MapleSim 2017 **includes over 100 new components**, including a collection of power converters in the Electrical library, and expansions to the Magnetic library to support quasi-static components and components with hysteresis.
- A **Modelica® code editor makes it easier to create new Modelica-based custom components**. It lets you take an existing Modelica component from MapleSim or other sources, understand how the component code is structured, find and modify the aspects you want to change, and save it as a new MapleSim component that is immediately accessible.
- MapleSim is now based on the **Modelica 3.2.2 Standard Library**, taking advantage of the most recent release throughout the product.
- The Multibody component library includes **performance improvements to contact modeling**.
- **Plotting efficiency and responsiveness has been significantly improved** when plotting large numbers of variables.
- **Installation is simplified** with the adoption and integration of the LLVM® compiler infrastructure in MapleSim, which means that Microsoft® Visual Studio® is no longer needed on 64-bit Windows® when using MapleSim and most add-ons.

New Product! MapleSim Heat Transfer Library from CYBERNET

The MapleSim Heat Transfer Library from CYBERNET gives you a comprehensive view into the heat transfer effects present in your model, enabling you to refine your design to improve performance and avoid overheating. This component library is useful for any situation where heat generation is a concern, especially when there are moving boundaries between heat generating components, such as motors, batteries, printers, and manufacturing equipment.

- Gain a comprehensive understanding of the heat transfer effects in your model.
- Easily test out new configurations much more quickly than with other modeling tools.
- Generate the discretized model using common, built-in geometries and then automatically check the temperature distribution in system-level simulations.
- Customize the materials and geometry of your design when dealing with more complicated geometries.

Toolchain Connectivity

MapleSim includes many features and add-on products to ensure smooth integration with your toolchain, such as importing models from a variety of modeling tools, and exporting highly efficient model code for use in other simulation tools. The MapleSim 2017 family of products includes enhancements that support toolchain integration.

- The **MapleSim Connector for FMI**, which allows you to export MapleSim models to any FMI-compatible modeling tool, now supports directional derivatives, critical for using FMUs with stiff solvers or in linearization applications.
- The **MapleSim CAD Toolbox**, which imports CAD models into MapleSim, has been extended to support the latest versions of Inventor®, NX®, SOLIDWORKS®, CATIA®, Solid Edge®, and more.

New Product! MapleSim Explorer

The MapleSim Explorer provides a cost-effective deployment solution that enables you to make your MapleSim models available to more people in your organization. With the MapleSim Explorer, you can make the knowledge embedded in your MapleSim models available to other engineers to support their decision making. As a result, you can avoid overloading your modeling experts with requests that do not require modeling expertise, while still getting the answers your organization needs.

- Run simulations of any MapleSim model
- Change model parameters
- Investigate and plot any model variables
- View 2-D simulation results and 3-D simulation animations
- Compare simulation runs and analyze the effects of parameter changes using the MapleSim Results Manager
- View the model diagram, default parameter values, and component definitions
- Analyze the model using MapleSim Apps, such as Parameter Sweep, Optimization, and Monte Carlo

The MapleSim Explorer is a complementary deployment solution to the MapleSim Server, which provides access to interactive applications based on MapleSim models through a web browser.

MapleSim™

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