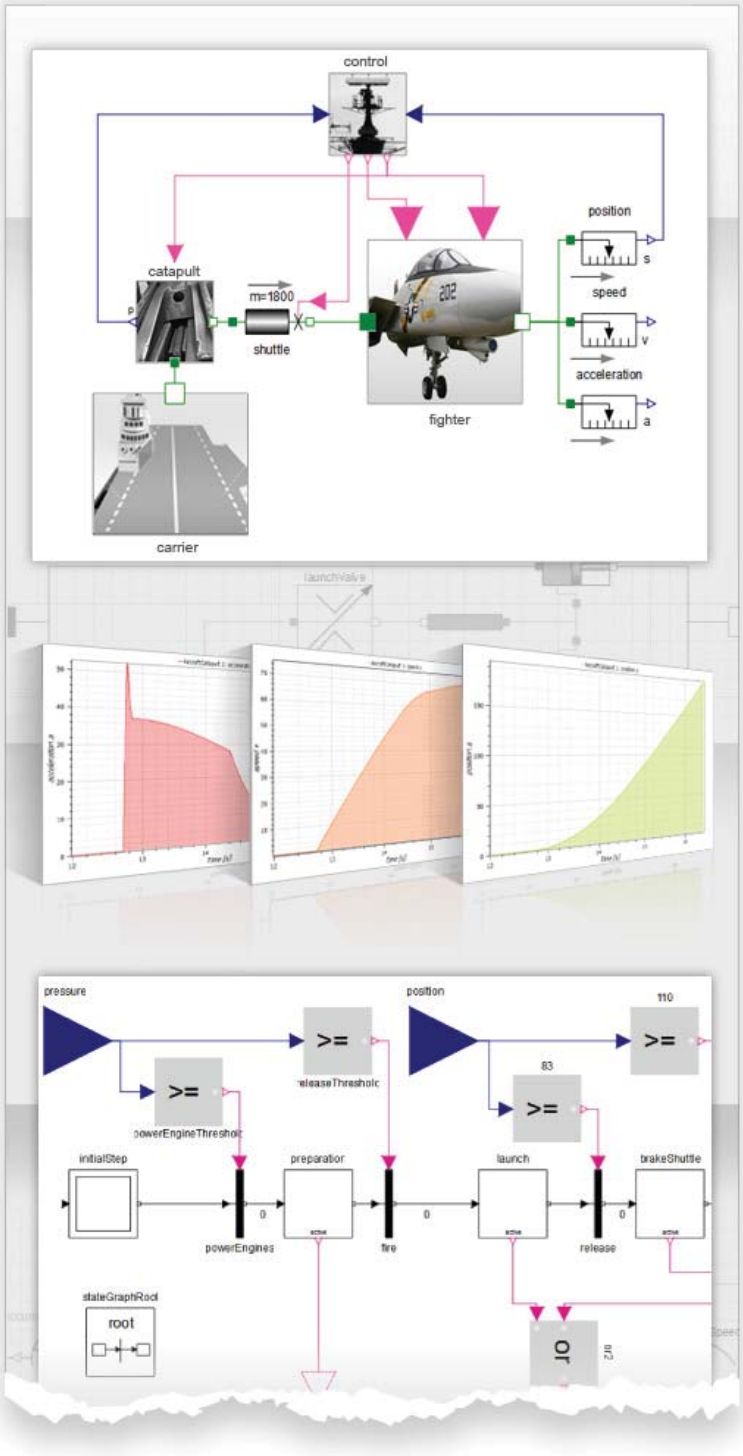
A New Era of Integrated Design Optimization

SystemModeler is the most complete physical modeling and simulation tool.

Model with Real-World Topology

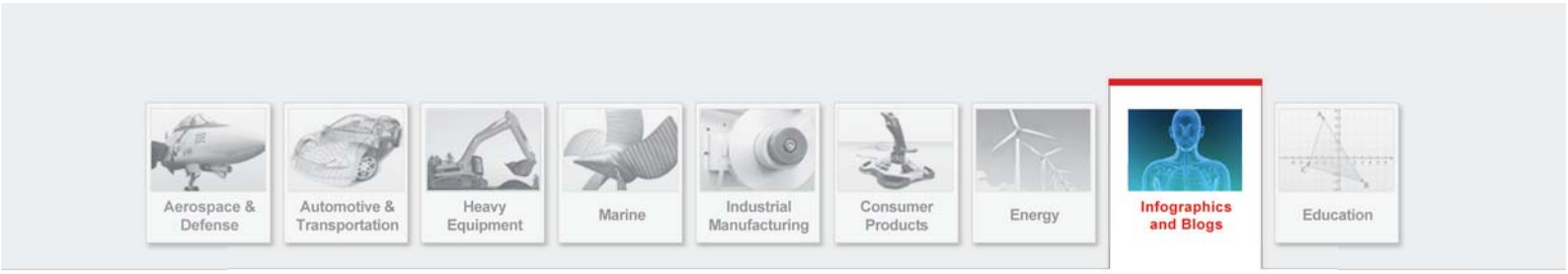
Connections between model components, such as the carrier, catapult, and control logic, mirror the real-world interactions between the corresponding objects and subsystems.



Built-in Model Libraries

Combine components from built-in logical and state graph libraries to control the launch sequence of the catapult.

Unlike other systems, *SystemModeler* requires no add-ons and fully supports the standard Modelica model language.

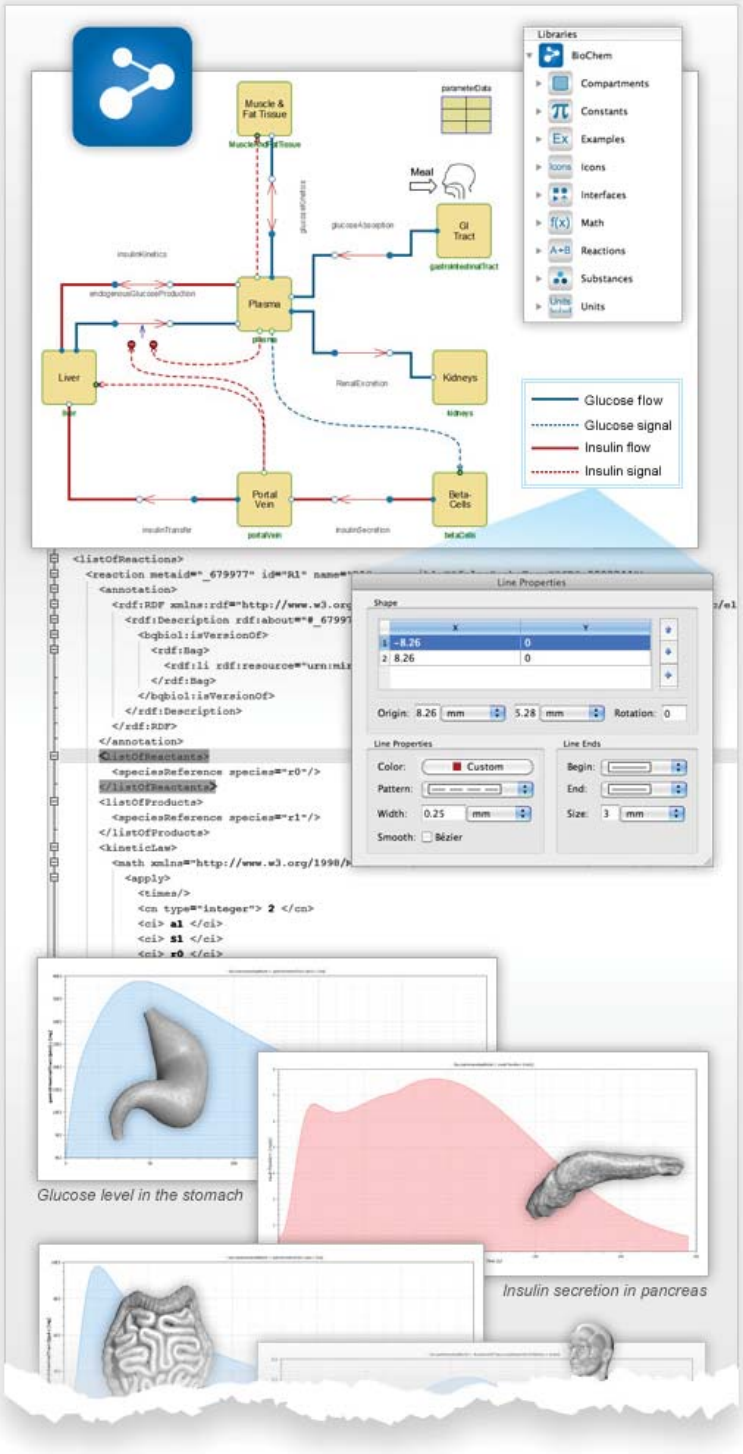


Model Biological Systems

Use the built-in `BioChem` library to model the glucose-insulin system in a human body.

Use SBML Models

Import and export Systems Biology Markup Language (SBML) models.



Annotate the Model

Add text and graphical content to make the model easy to understand.

Instantly Plot Results

Plot the response to glucose intake in different organs.

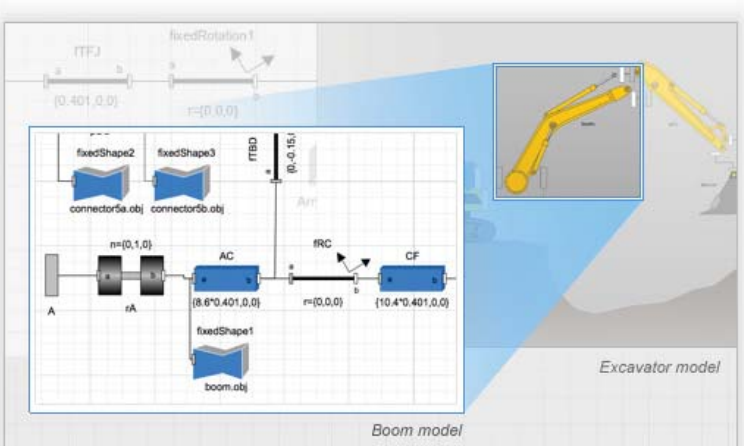
To explore more examples, visit

➔ www.wolfram.com/system-modeler

And *SystemModeler* is designed to connect perfectly with *Mathematica*® for the ultimate integrated modeling, simulation, and analysis workflow.

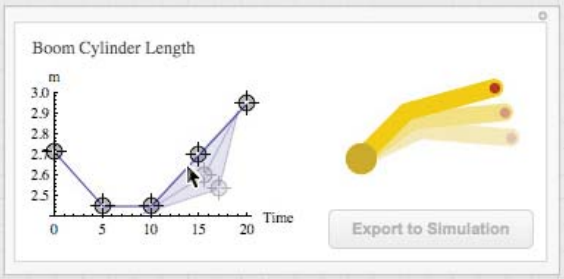
Model 3D Mechanical Systems

Use the built-in multibody library to model an excavator.



Simulation and Experimentation

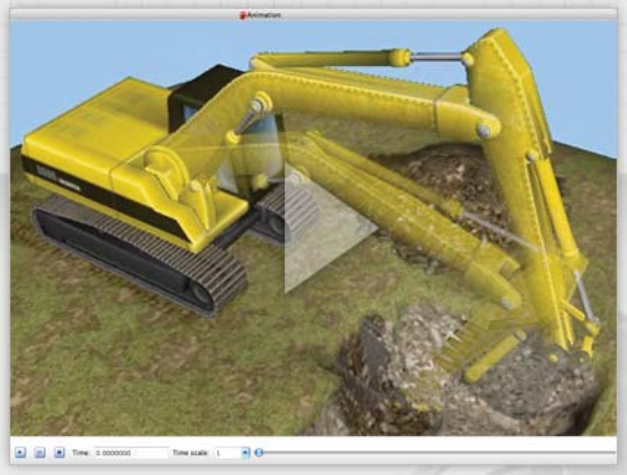
Analyze simulation results and perform sensitivity analysis, model calibration, parameter sweeps, and more in *Mathematica*.



Vary the length of the cylinder controlling the boom at different time points and immediately see the resulting movement

CAD Animation

Attach textures to a model and clearly see the real-world resemblance.



MODELING AND SIMULATION

Build high-fidelity models using predefined components in an easy drag-and-drop environment. Perform numerical experiments on your models to explore and tune system behavior. Key features include:

Drag-and-Drop Modeling

Simply pick up components like transistors or springs and drop them onto the canvas to create models.

Built-in Model Libraries

Model mechanical systems, biochemical pathways, electronics, and more with built-in libraries.

Hierarchical Modeling

Create hierarchical, component-based models with individually testable and reusable subcomponents.

Hybrid Systems Modeling

Detect and handle discontinuities in hybrid systems so models with sudden events are correctly simulated.

Multi-domain Modeling

Correctly model and simulate real-world systems that include parts from multiple physical domains.

Simulation & Experimentation

Perform numerical experiments with simulation executables automatically compiled from your model.

Instant Visualization

Plot any system variable with a single click, and automatically animate 3D mechanical systems.

ANALYSIS AND DESIGN WITH *MATHEMATICA*

Get a deeper understanding of model behavior using *Mathematica*. Analyze model equations and simulation results using all of *Mathematica*'s features, including visualization, control systems design, and more. Highlights include:

Programmatic Simulation Control

Drive *SystemModeler* simulations from *Mathematica* for parameter sweeps, optimization, and more.

Notebook Environment

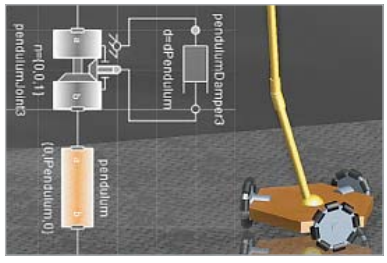
Combine code, data, explanatory text, plots and graphics, and interactive elements in a single document.

Sensitivity Analysis

Predict the effect of uncertainty in parameter values and discover parameters that have the largest effect on system behavior.

Plotting & Custom Visualization

Plot variables and sensitivity bands directly from simulation results, and create custom graphics and user interfaces.



SystemModeler model equations and simulation results are accessible in Mathematica in a completely native form, immediately suitable for use with Mathematica's large collections of algorithms for symbolic and numerical mathematics.

Model Calibration

Use *Mathematica* to calibrate and optimally fit model parameters to real-world data.

Model & Equation Analysis

Analyze system equations and other model properties using *Mathematica*.

Control System Design

Automatically linearize models into state-space form to analyze stability, design controllers, and more.

WHO USES WOLFRAM TECHNOLOGY?

Millions of users from Fortune 500 companies to government departments to thousands of universities worldwide, including:

- **Bosch Rexroth**
- **EADS**
- **NASA**
- **Saab**
- **Scania**
- **Siemens**
- **Rolls-Royce**
- **Tetra Pak**

WHAT EXPERTS ARE SAYING

"By using [Wolfram] MathCore as an external partner, we can be sure that we really obtain a finished model with correct results, within the given constraints. We can therefore give MathCore our best recommendations."

–Lennart Näs
Manager, Gas Turbine Performance and Thermal Processes,
Siemens Industrial Turbomachinery AB

"As a world leader in ship propulsion development, it is crucial to have an in-depth understanding of system dynamics. Therefore, we collaborate with [Wolfram] MathCore whenever we need to develop and analyze dynamic models of our systems."

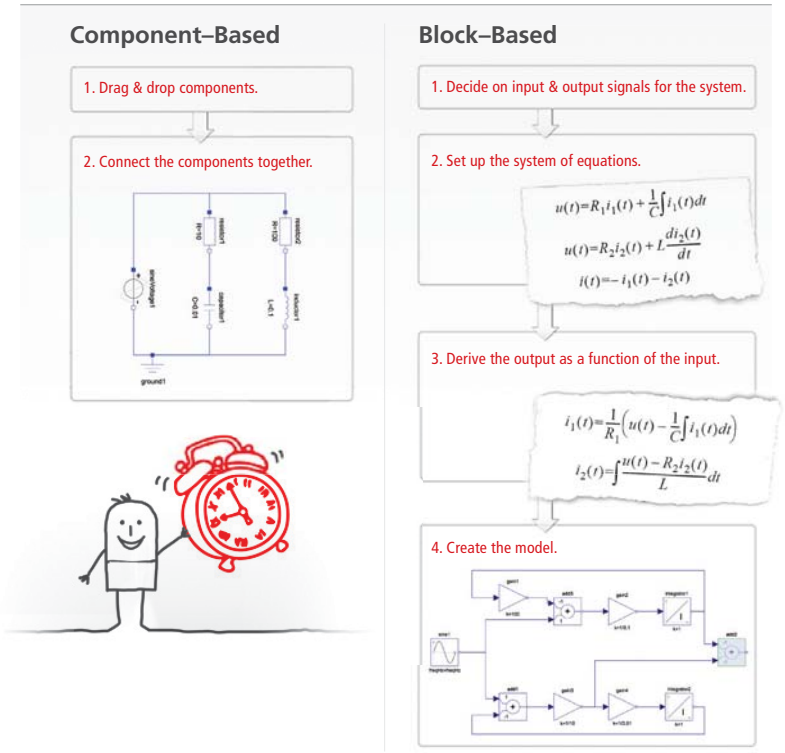
–Stig Lönngren
Responsible for Development of Pod Propulsion Mermaid™,
Rolls-Royce AB

"[SystemModeler] MathModelica provides state-of-the-art tools for kinetic analysis, which accelerates progress in the experimental area of systems biology."

–Dr. Vitaly Selivanov
Universitat de Barcelona

WHY *SYSTEMMODELER*

***SystemModeler* is the most complete physical modeling and simulation tool. Unlike other systems, *SystemModeler* requires no add-ons and fully supports the standard Modelica model language.**



NEXT STEPS

Take a Free On-Demand Course

Get a quick introduction to *SystemModeler* capabilities, learn how to extend your model analysis and design with *Mathematica*, get an in-depth tour of the Modelica language, and much more.

View Online Documentation

Find the complete up-to-date documentation of *SystemModeler*'s functions and capabilities.

Get Help with Your Projects

Wolfram MathCore consultants and support staff bring technical skills, vertical industry prowess, and unmatched expertise to meet customer goals.

To request a free trial and learn more, visit:

➔ **www.wolfram.com/system-modeler**

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