carSIM®

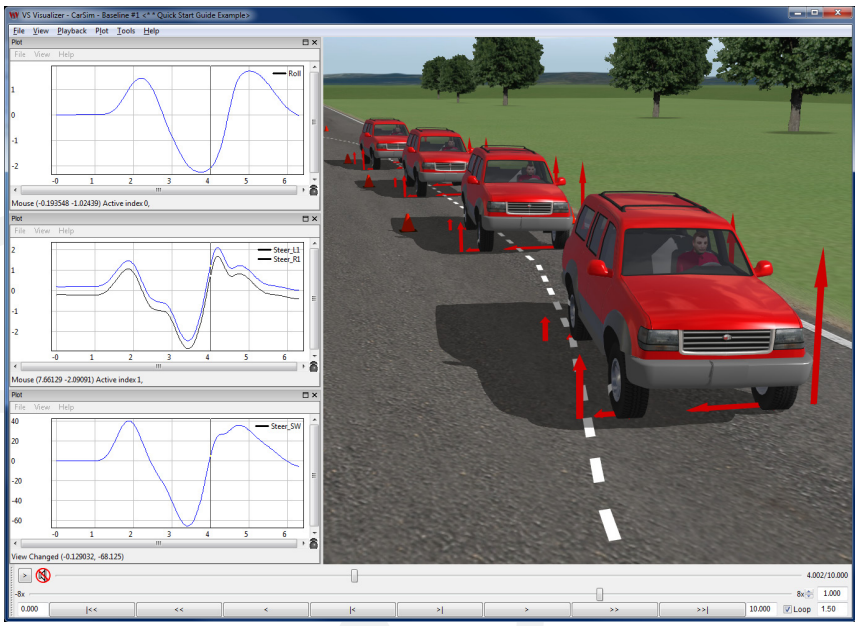
MECHANICAL SIMULATION™

World's most trusted vehicle simulation platform enables accelerated engineering throughout your entire product design cycle

Mechanical Simulation Corporation provides the most accurate and computationally efficient methods for simulating the dynamic performance of cars, trucks, motorcycles, and specialty vehicles.

After more than thirty-five years of development and real-world validation by automotive engineers, Mechanical Simulation's suite of vehicle simulation products are universally the preferred tools for vehicle dynamics, ECU development, and test engineering.

In a time of limited resources and compressed design and testing cycles, Mechanical Simulation has designed a unique set of tools for analyzing vehicle performance in complex simulated driving environments.



CarSim's Intuitive Simulation Analysis Tools

TECHNOLOGIES DEVELOPED WITH CARSIM

- ABS Braking
- Electronic Stability Control
- Adaptive Cruise Control
- Active Suspension
- Power Steering
- Airbag Deployment
- Anti-sway Trailer Hauling
- Rollover Detection
- Lane Departure
- Tire Performance
- Hybrid Powertrains
- Driving Simulators
- Racecar Setup
- Vehicle to Vehicle V2V
- Roadway Engineering
- Fuel Economy Studies

INTEGRATE CARSIM WITH YOUR EXISTING ENGINEERING TOOLS

While many of our customers are vehicle dynamics experts, a growing number of engineers from other disciplines use CarSim's architecture as a platform to evaluate their own adaptive vehicle subsystems. CarSim is designed to seamlessly communicate with your existing modeling (MIL), software (SIL) and hardware (HIL) technologies. This lets your team focus on algorithm design – not on writing custom testing code that only roughly approximates real-world scenarios and provides limited test conditions.

Modular Vehicle Definition: each vehicle sub-system is defined with discrete properties and performance tables. This modular, parameter-based architecture lets you modify the behavior of any system and lets you run simulations any time during the design cycle – other simulation tools can only be used after the entire vehicle is designed.

Integrate your own technologies using standard design tools: Mechanical Simulation provides seamless interfaces to other standard simulation and design tools such as Simulink, LabVIEW, and ASCET. Advanced users can develop stand alone technologies using Visual Studio and CarSim's API.

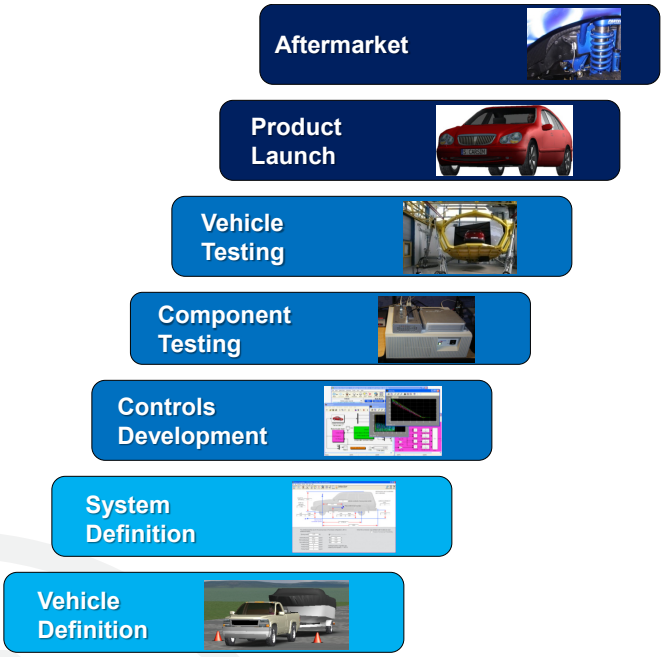
VS Commands: this powerful scripting language provides tools to automatically control test runs, extend our vehicle model, control complex driving maneuvers, and model auxiliary sensors.

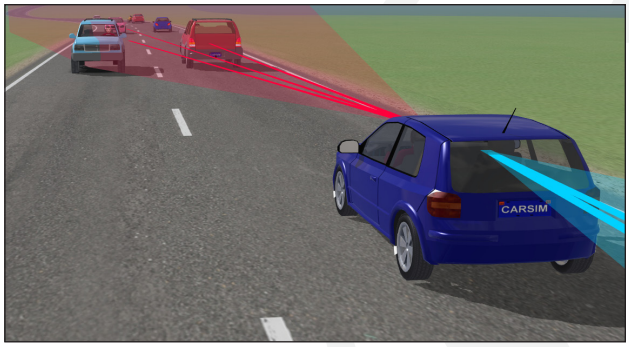
DATA DRIVEN PRODUCT DESIGN

From initial product conception to control algorithm development and all the way to product launch—CarSim provides sophisticated tools that help optimize your design, development, and testing processes.

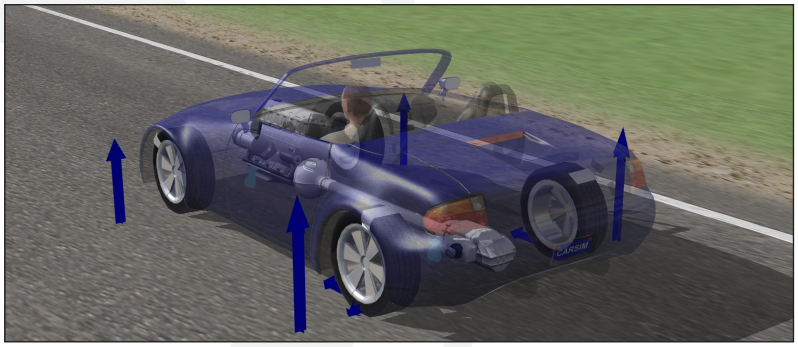
CarSim supports all industry standard design tools and a wide range of real-time hardware systems allowing you to use the same vehicle data and test procedures in all product development phases. CarSim's support for industry standard HIL platforms allows you to choose the hardware that is best for your application—without locking you into expensive, proprietary hardware.

A discussion of CarSim is not complete without highlighting the software's ease-of-use and workflow optimization features. Unlike complex tools requiring steep learning curves or expensive consulting services, CarSim is an economical tool for engineers who use multiple software tools and must produce results quickly. CarSim features a streamlined user interface, extensive online help, and a complete set of example vehicles, 3D roads, and test procedures that demonstrate software features and provide new users with a good starting point.





Sensors Option



Powertrain Mount Model

PRODUCT HIGHLIGHTS

Bundled Data Sets
- 15 example test vehicles
- 25 roads and test tracks
- 150+ test runs with comprehensive design notes

Engineering Tools
- Interactive 3D animator
- Engineering plots—800 parameters
- Spectrum Analyzer

Integration Technologies
- Microsoft COM API
- Excel import and export

Third Party Support
- MATLAB/Simulink
- LabVIEW
- ASCET
- Visual Studio

HIL Platforms (optional)
- dSPACE
- National Instruments
- Opal-RT
- ETAS
- Fujitsu-TEN
- A&D RT-Linux

Tire Models
- Combined slip
- External shear with camber
- Pacejka 5.2
- MF-Tyre
- MF-Swift (optional)

VehicleSim (VS) Commands
- Powerful programming language
- Automate complex driving maneuvers
- Create new variables and equations

Animator Features
- Interactive 3D animations
- Tracking camera
- Export for use in PowerPoint
- Overlay compare of multiple tests
- Ghost vehicle path
- Realistic user-defined
- environments—trees, buildings, signs, textured roads.
- Tire skid marks and tracks
- Sounds—engine, wind, and tire

Optional CarSim Modules
- Trailer
- Frame Twist
- Sensors
- AVL Cruise Interface
- Powertrain Mount Model
- Driving Simulators

Mechanical Simulation

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