

Automotive Simulation Solutions

ANSYS in Automotive

ANSYS is the global leader in engineering simulation for the automotive industry, spanning the multitude of technologies that go into the modern car.

With a pedigree in simulation products, ANSYS delivers design solutions for automotive sub-systems for customers and the ecosystem, including all areas in the figure:



Why Is Design Simulation So Crucial Today?

The design and evolution of a vehicle in the autonomous era is a complex undertaking. To build and iterate until the system is operational can be time-consuming and very costly. Simulation accelerates the design process.

Automotive systems engineers rely heavily on simulation, doing as much work in the front-end virtual world as possible. It is quicker and less expensive to simulate compared to building and testing real hardware prototypes. Design iterations are also faster. ANSYS capabilities enable engineers to simulate their designs at different levels of abstraction, from component to system level for a "get it right the first time" proposition.

Simulation Solution Benefits

Capability	Benefit and Value*
Overall Design	Over 2X time and cost savings
Sensors	Achieve sensor design objectives in a single design iteration
Driving Scenario	Complete over a billion driving scenario simulations daily
Safety-critical Software	Over 50 percent reduction in time and cost of developing ISO 26262 ASIL-D compliant software

* Based on customer feedback and ANSYS assessments

Highlights

Spanning Automotive Sub-Systems

- Autonomous Features & Sensors
- Connectivity & Communication
- Traction Motors
- Battery & Power Systems
- Electronics, Semiconductors & Lighting
- Displays, AR & Infotainment
- Powertrain
- Body & Chassis
- Aerodynamics & Thermal Management
- Software, Safety & Security

Addressing Autonomous Vehicle Needs

- Driving Scenario Simulation
- Safety Critical Software
- Functional Safety
- Closed-Loop Simulation
- Electronics Reliability
- Embedded Software
- Semiconductors, SoCs

Targeting Business Outcomes

- Accelerate to prototyping by low-risk front-end simulation design
- · Reduced development costs
- Moving the "miles-off-the-road" into the lab via simulation results in immediate cost and time savings



Autonomous Vehicle (AV) **Simulation Solutions**



Addressing Your Autonomous Vehicle Simulation Needs

- Sensor Simulation
- Driving Scenario Simulation
- Safety Critical Software

- Closed-Loop Simulation
- **Electronics** Reliability
- Functional Safety
- Embedded Software
- Gemiconductors, SoCs

ANSYS' physics-accurate scenario and sensor simulation is uniquely differentiated by enabling ADAS and AV teams to move verification off-the-road and into the lab. This results in faster, cost-effective, and more extensive training and verification of AI control systems by running 100's of thousands of scenarios overnight using accurate sensor input data in closed-loop simulation.

The Role of Data in Simulation

Real Data

Sensor inputs recorded by real AVs driving on real roads

Simulation techniques between fully real and virtual simulations

Virtual Data Virtual vehicles driving in virtual worlds



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