Simulate a Driverless Future.
Aimsun Auto is a software platform for large-scale design and validation of path planning algorithms for self-driving vehicles.

Auto is a perfect complement to sensor testing tools and driving simulation software. It can integrate seamlessly into your testing environment, providing a scenario generation engine to cater for both ordinary and non-compliant situations.

Auto performs safe, repeatable, and efficient testing of path planning on anything from a single intersection to an entire city: thousands of scenarios can be set up effortlessly without the need for expensive field testing or laborious scripting.
Why use Auto?

Path planning testing is important. You can perform exhaustive sensor testing, but that won’t make an AV any better at merging onto a highway, to take just one example. Working in Aimsun Auto, it only takes a few hours to create a full typology of highway on-ramp geometries, load them with demand ranging from free-flow to gridlock, and vary the mix of driver aggression/cooperation. This synthetic generation, execution, and analysis of tens of thousands of scenarios is exponentially more efficient and wider-ranging than any methodology based on field data.

Unlike trajectory analysis and scripted scenario creation, Aimsun Auto is the perfect tool for analyzing edge cases: traffic violations such as rolling stops, running red lights, jaywalking or speeding - even the often cited moral dilemma of choosing who to spare in a fatal accident. With Auto there is no need to drive around seeking the conditions that you want to test, or to laboriously script each actor’s behavior frame-by-frame: scale and speed are of the essence.

Auto gives you all the rich operational complexity that comes from working in a wide-area city or highway network: broken traffic signals, blocked lanes, occupied yellow boxes and variable speed limits are an integral part of the environment.

Who is Auto for?

AI start-ups and vehicle manufacturers can use Auto as part of their simulation-based verification and validation during the design and development of the AV stack, and to test new versions before deploying them in the field. Government regulators can use Auto to test and authorize the deployment of an AV on public roads, similar to issuing a learner permit to a human driver. AV test tracks can use Auto to generate synthetic traffic for testing the AV in an augmented reality environment.
What can I test with Auto?

The scope of testing is virtually unlimited and includes public transport, human-driven vehicles, pedestrians, bicycles and motorcycles on highways and urban environments. The emphasis is on the scale of these virtual environments which, unlike other tools, is not limited to a set route, has no predetermined number of actors or sequences, and can vary the testing scope without extensive and laborious intervention.

Testing with Auto can include extraordinary scenarios with rogue actors that would be prohibitively expensive or impossible to perform in the field; with Auto you can also run wide-area regression tests to ensure that a new release of autonomy stack continues to meet prior safety standards. Obtaining realistic estimates on overall journey time, emissions profile, energy consumption and smoothness of ride for door-to-door trips is a unique feature of Auto.

Used in combination with sensor testing tools and vehicle dynamics simulation tools, such as Simcenter PreScan®, Auto provides a test harness that is full-stack, highly automated and infinitely scalable.

This provides a much more varied and realistic environment for the test vehicle, mirroring real-life conditions, where drivers can’t anticipate their interactions with other vehicles or road users, or the state of traffic signals ahead.
Top Features.

- Capable of seamless integration with 3D sensor simulation tools such as Simcenter PreScan®, and 3D visualization engines such as Unity® and Unreal Engine®.

- Customizable to automatically create wide-area simulation models from imported high definition maps, whether proprietary or standard-based.

- Automatic synthesis of realistic background traffic demand and signal timings so that tests can be performed by simply selecting a geographic area with HD map coverage.

- 100 Hz interfacing with the AV stack to exchange vehicle positions and communicated intentions.

- High-fidelity, space-based behavioral models incorporating vehicle kinematics.

- Launch, execution and control of thousands of instances on private and commercial cloud on Linux® or Windows®.

- Support for direct, prescriptive and semantic definition of rogue behavior including taking direct control of actors; prescribing action sequences; and defining sets of conditions to be met.

- Repeatable, deterministic experiments given a fixed random seed.

- Robust, industry-leading scenario support enabling thousands of scenarios to be stored in and executed from a single file.

- Sophisticated event detection and filtering tools allow testing teams to focus on real risks and minimize false positives.

- On-site configuration and project support.

Our track record.

1. Active participation in prominent CAV research projects: FLOURISH, CAPRI, HumanDrive, OmniCAV, VeriCAV, LAMBDA-V, and Levitate, among others.

2. A major, multi-year effort with a top-3 leading AV developer.

3. Accumulated know-how from billions of simulated miles in 80+ countries over 22 years.

4. An industry-leading team that has worked on some of the world’s most complex mobility challenges and can support your testing program, both remotely and on-site.
Move Brilliantly.

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