

NVIDIA DRIVE Constellation Now Available — Virtual Proving Ground for Validating Autonomous Vehicles

Open, Scalable Simulation Platform Enables Large Virtual Fleets of Self-Driving Cars

SAN JOSE, Calif., March 18, 2019 GPU Technology Conference -- NVIDIA today announced the [NVIDIA DRIVE Constellation™](#) autonomous vehicle simulation platform is now available.

The cloud-based platform enables millions of miles to be driven in virtual worlds across a broad range of scenarios -- from routine driving to rare and dangerous situations -- with greater efficiency, cost-effectiveness and safety than what is possible to achieve in the real world.

[First introduced at GTC last year](#), DRIVE Constellation is a data center solution comprised of two side-by-side servers. One server -- DRIVE Constellation Simulator -- uses NVIDIA GPUs running DRIVE Sim™ software to generate the sensor output from the virtual car driving in a virtual world. The other server -- DRIVE Constellation Vehicle -- contains the DRIVE AGX Pegasus™ AI car computer, which processes the simulated sensor data.

The driving decisions from DRIVE Constellation Vehicle are fed back into DRIVE Constellation Simulator, enabling bit-accurate, timing-accurate hardware-in-the-loop testing.

Simulation will become a key component for third-party and regulatory autonomous vehicle standards. Safety agencies such as TÜV SÜD are already using the platform to [formulate their self-driving validation standards](#).

"TÜV SÜD is looking for simulation tools that are trustworthy, robust and scalable for the approval of autonomous vehicles," said Housseem Abdellatif, global head of Autonomous Driving and ADAS at TÜV SÜD. "NVIDIA DRIVE Constellation provides a powerful and highly scalable solution to achieve this goal."

The importance of simulation is recognized by the world's largest automaker. NVIDIA also announced today that Toyota Research Institute-Advanced Development (TRI-AD) is the first customer of DRIVE Constellation. "We believe large-scale simulation tools for software validation and testing are critical for automated driving systems," said Dr. James Kuffner, CEO of TRI-AD.

Cloud-Based, End-to-End Workflow

On stage at GTC, NVIDIA founder and CEO Jensen Huang demonstrated the scalability of the DRIVE Constellation platform seamlessly performing driving tests in the cloud. Developers anywhere in the world can submit simulation scenarios to DRIVE Constellation data centers and evaluate the results from their desks.

This large-scale validation capability is comparable to operating an entire fleet of test vehicles, however, it is able to accomplish years of testing in a fraction of the time.

Open Platform

DRIVE Constellation is an [open platform](#) into which ecosystem partners can integrate their environment models, vehicle models, sensor models and traffic scenarios. By incorporating datasets from the broader simulation ecosystem, the platform can generate comprehensive, diverse and complex testing environments.

To this end, Cognata, a simulation company, announced today that its scenario and traffic model can be supported on DRIVE Constellation. With Cognata's traffic models, developers can define a number of vehicles and other road users, as well as their behavior, based on real-world traffic behavior.

"Cognata and NVIDIA are creating a robust solution that will efficiently and safely accelerate autonomous vehicles' market entry," said Danny Atsmon, CEO of Cognata. "Highly accurate and scalable traffic model simulation technology is essential to validate autonomous vehicle systems with very large combinations of real-world scenarios."

IPG Automotive, a leading automotive simulation company, is another ecosystem partner working with NVIDIA to enable a high-fidelity vehicle models. Its simulation software, CarMaker, is used to create virtual vehicle prototypes, including models of all main vehicle subsystems. Developers can include test vehicle responses to changes in steering, road surface, suspension, powertrain and vehicle control systems for function development.

"Together with the support of our ecosystem partners, we're making available large-scale, cloud-based, open simulation that thoroughly and safely validates self-driving cars under endless challenging situations," said Zvi Greenstein, general manager at NVIDIA.

NVIDIA will demonstrate the DRIVE Constellation simulation platform in the expo hall at GTC, March 19-21, in the San Jose Convention Center.

About NVIDIA

[NVIDIA's](#) (NASDAQ: NVDA) invention of the GPU in 1999 sparked the growth of the PC gaming market, redefined modern computer graphics and revolutionized parallel computing. More recently, GPU deep learning ignited modern AI — the next era of computing — with the GPU acting as the brain of computers, robots and self-driving cars that can perceive and understand the world. More information at <http://nvidianews.nvidia.com/>.

Certain statements in this press release including, but not limited to, statements as to: the benefits, performance, impact, abilities, price and availability of NVIDIA DRIVE Constellation; NVIDIA DRIVE Constellation enabling millions of miles to be driven in virtual worlds with greater efficiency, cost-effectiveness and safety and it moving autonomous test fleet vehicles to the cloud; safety agencies using NVIDIA DRIVE Constellation to formulate self-driving validation standards; NVIDIA DRIVE Constellation providing a powerful and highly scalable solution for simulations for approval of autonomous vehicles; DRIVE Constellation enabling customers to remotely access the platform from anywhere in the world and developers being able to submit specific simulation scenarios to it and evaluate the results from their desks; DRIVE Constellation enabling large-scale validation and accomplishing months or years of testing in a fraction of the time; the benefits and impact of DRIVE Constellation being an open platform; Cognata's model being supported by NVIDIA DRIVE Constellation; Cognata and NVIDIA creating a robust solution that will efficiently and safely accelerate autonomous vehicles' market entry; highly accurate and scalable traffic model simulation technology being essential to validate autonomous vehicle systems within nearly infinite combinations of real-world scenarios; IPG Automotive and NVIDIA working together and

IPG's enabling developers to monitor how the test vehicle reacts to changes in steering, orientation, road surface, suspension and other conditions; NVIDIA working with ecosystem partners to make available large-scale, cloud-based open simulation that thoroughly and safely validates self-driving cars under endless challenging situations; DRIVE Constellation being a best-of-breed offering that's poised to accelerate the safe deployment of AVs and enabling millions of miles of testing in bit-accurate simulation; and NVIDIA's demonstration of DRIVE Constellation are forward-looking statements that are subject to risks and uncertainties that could cause results to be materially different than expectations. Important factors that could cause actual results to differ materially include: global economic conditions; our reliance on third parties to manufacture, assemble, package and test our products; the impact of technological development and competition; development of new products and technologies or enhancements to our existing product and technologies; market acceptance of our products or our partners' products; design, manufacturing or software defects; changes in consumer preferences or demands; changes in industry standards and interfaces; unexpected loss of performance of our products or technologies when integrated into systems; as well as other factors detailed from time to time in the most recent reports NVIDIA files with the Securities and Exchange Commission, or SEC, including, but not limited to, its annual report on Form 10-K and quarterly reports on Form 10-Q. Copies of reports filed with the SEC are posted on the company's website and are available from NVIDIA without charge. These forward-looking statements are not guarantees of future performance and speak only as of the date hereof, and, except as required by law, NVIDIA disclaims any obligation to update these forward-looking statements to reflect future events or circumstances.

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