THE JOURNEY TO ZERO ACCIDENTS
NVIDIA DRIVE

COMPREHENSIVE SOLUTIONS FOR SELF-DRIVING VEHICLES

NVIDIA DRIVE™ solutions span autonomous vehicle development from the cloud to the car, helping manufacturers collect data, train deep neural networks, and test, validate, and operate self-driving cars. The platform is open, enabling developers to leverage a full software stack to build their own applications. It's also scalable, from Level 2+ to Level 4 and Level 5 autonomous driving, and complies to functional safety standards.

NVIDIA DRIVE AP2X

DRIVE AP2X is a turnkey solution for AI-assisted Level 2+ driving that incorporates DRIVE AV autonomous driving and DRIVE IX intelligent cockpit experience software kits. Each runs on the high-performance, energy-efficient NVIDIA Xavier™ system-on-a-chip (SoC) using DriveWorks acceleration libraries and the DRIVE OS real-time operating system, which offers full support of Adaptive AUTOSAR, the open-standard automotive system architecture and application framework.

NVIDIA DRIVE AGX™

NVIDIA DRIVE AGX is an AI computing platform designed specifically for autonomous driving. Configurations include:

- **NVIDIA DRIVE AGX Xavier:** This system is designed for Level 2+ advanced driver assistance systems and Level 3 automated driving, delivering 30 trillion operations per second (TOPS). At its core is the auto-grade Xavier SoC, the first of its kind in production. It incorporates six different types of processors for running redundant and diverse algorithms for AI, sensor processing, mapping, and driving.

- **NVIDIA DRIVE AGX Pegasus™:** This AI computer leverages the power of two Xavier SoCs and two NVIDIA Turing™ GPUs, and is built for Level 4 highly automated driving and Level 5 autonomous driving and robotaxis—achieving an unprecedented 320 TOPS for safe driverless operation.

NVIDIA DRIVE AGX Xavier

NVIDIA DRIVE AGX Pegasus

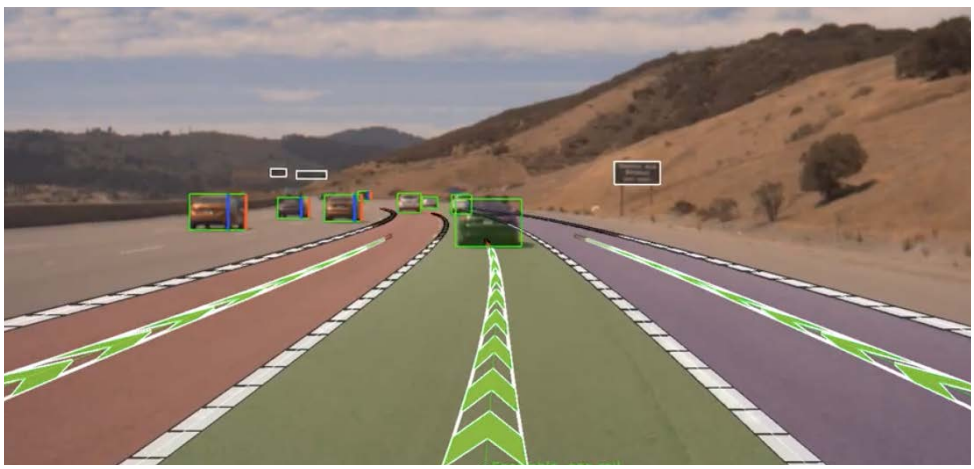
- **NVIDIA DRIVE Hyperion™:** a complete sensor and compute platform setup that can be integrated into a test vehicle. It includes a DRIVE AGX Pegasus development platform along with sensors for autonomous driving, driver monitoring, and localization, allowing developers to experience and evaluate NVIDIA DRIVE Software.

NVIDIA DRIVE SOFTWARE

NVIDIA delivers a full software stack for partners to build custom applications.

NVIDIA DriveWorks is a software framework that enables sensor processing and calibration, deep neural networks, and data recording. It includes:

- A sensor abstraction layer for easy integration of camera, radar, and lidar
- Image-processing acceleration for vehicle sensors
- Camera calibration and egomotion



DRIVE AV is a full software stack for building autonomous vehicle applications.

NVIDIA DRIVE AV powers the functions necessary for full autonomous driving, including the ability to perceive, map, and plan.

DRIVE Perception consists of all the deep neural networks (DNN) necessary to detect driving paths, wait conditions, and other objects in the vehicle's environment. These redundant and diverse DNNs leverage data from cameras, radar, and LIDAR sensors on the vehicle to perform 360-degree perception.

DRIVE Mapping allows vehicles to navigate anywhere in the world. It uses maps from partners such as Baidu, HERE, TomTom, NavInfo, and Zenrin to localize vehicles to high-definition maps with unprecedented breadth and accuracy. It also enables manufacturers to update and create HD maps—a feature known as MyRoute—with the high-performance processing capabilities of NVIDIA DRIVE AGX.

DRIVE Planning uses the data from the perception and mapping modules to determine which route and lane to drive, taking into account both safety and passenger comfort metrics. The mathematically verifiable Safety Force Field (SFF) driving policy in the planning layer monitors all other actors on the road and ensures the vehicle won't cause or contribute to a collision.

NVIDIA DRIVE IX is a world-class in-vehicle experience that can enhance situational awareness, assist in driving functions, and provide intelligent interactions between the vehicle and its occupants. An open platform for intelligent cockpits, DRIVE IX supports a wide range of partner technologies to provide a comprehensive set of capabilities to automakers, suppliers, and startups. These include driver monitoring, natural language processing, and in-vehicle visualization.

The DRIVE AV and DRIVE IX stacks are continuously improving. With over-the-air updates, developers can easily access the latest features in each new software release.

DRIVE IX software enables driver monitoring and other intelligent experience applications.

AUTOMOTIVE SOLUTIONS IN THE DATA CENTER

NVIDIA DRIVE end-to-end capabilities make it possible to train, test, and validate autonomous vehicles in the data center.

NVIDIA DGX deep learning server is the integrated software and hardware system that supports AI training with an optimized combination of compute power, software, and performance.

NVIDIA DRIVE Constellation™ is a cloud-based simulation solution that enables millions of miles to be driven in virtual environments across a broad range of scenarios—from routine driving to rare or even dangerous situations—with greater efficiency, cost-effectiveness, and safety than what's possible in the real world. The platform comprises two side-by-side servers. The first server—DRIVE Constellation Simulator—generates the sensor output from the virtual car. The second server—DRIVE Constellation Computer—contains the DRIVE AGX Pegasus AI car computer. DRIVE AGX Pegasus receives the sensor data, makes decisions, and then sends vehicle control commands back to the simulator. This closed-loop process enables bit-accurate, timing-accurate, hardware-in-the-loop testing.

DRIVE Constellation is a bit-accurate, hardware-in-the-loop simulator for testing and validating AVs.

A GLOBAL ECOSYSTEM

The NVIDIA ecosystem encompasses hundreds of automakers, truck makers, suppliers, software startups, sensor makers, and mapping companies worldwide—all building autonomous vehicle solutions on the NVIDIA DRIVE platform.

"NVIDIA has garnered a pole position in the race to build self-driving cars thanks to its advances in artificial intelligence."

– Wall Street Journal

For more information, visit **www.nvidia.com/drive**

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