



NVIDIA Announces Halos for Robotics, the Industry's First Full-Stack Safety System for Physical AI

News Summary:

- NVIDIA Halos for Robotics is the industry's only full-stack, open robotics safety system, extending NVIDIA Halos' proven autonomous vehicle safety to robotics and physical AI to give machines that sense, decide and act in the real world a single common safety architecture.
- Safety is built in every layer, with NVIDIA IGX Thor and Holoscan Sensor Bridge for AI compute and sensor connectivity, the Halos OS software stack for safety functions and applications, and the NVIDIA Halos AI Systems Inspection Lab to help partners prepare for third-party certification with confidence.
- Humanoid robotics and physical AI innovator Agility is the first company to team with NVIDIA to incorporate elements of Halos for Robotics into its proprietary safety system, bringing a new standard of responsible automation to factories, warehouses and logistics operations.

NVIDIA today announced [NVIDIA Halos for Robotics](#), the industry's first full-stack, comprehensive safety system for [robotics](#) and [physical AI](#) that unifies AI compute and safety.

[Agility](#), a leading humanoid robotics and physical AI company, is the first to use NVIDIA Halos for Robotics to build safety into its humanoids working in factories, warehouses and logistics operations for customers including Amazon, GXO, Schaeffler and Toyota Motor Manufacturing Canada.

The next generation of autonomous robots will operate in dynamic environments alongside humans, using AI foundation models, accelerated compute and distributed sensors. Scaling these systems requires a full-stack safety architecture.

NVIDIA Halos enables companies to rely on a standardized, unified safety architecture that connects AI compute, system software, sensor data, safety applications and inspection for robotic systems.

"Physical AI is transforming how factories, warehouses and logistics operations work, and robotics teams need a unified safety architecture to scale autonomous systems into these environments," said Deepu Talla, vice president of robotics and edge AI at NVIDIA. "With NVIDIA Halos for Robotics, developers and system builders can harness NVIDIA's proven autonomous vehicle safety foundation to develop safer robots faster and bring them into industrial operations alongside workers with greater confidence."

A Full-Stack Foundation for Robot Safety

Drawing on 18,600+ engineering years of [autonomous vehicle safety development](#), NVIDIA Halos for Robotics provides developers with a common safety architecture for building, validating and deploying physical AI systems.

The system spans the key layers needed for robot safety:

- **NVIDIA IGX Thor™** and **NVIDIA Holoscan Sensor Bridge** provide industrial-grade AI compute, built-in safety and sensor connectivity for real-time robotics and safety workloads.
- **NVIDIA Halos OS** provides the software stack for robotics safety, including Halos Core to support safety-related operating functions and safety applications built with the NVIDIA Halos Outside-In Safety Blueprint, which extends robot perception using external cameras and AI agents to dynamically control robot behavior in industrial settings.
- The **NVIDIA Halos AI Systems Inspection Lab** is the world's first [ANSI](#) National Accreditation Board ([ANAB](#))-accredited program for functional and AI safety for physical AI, helping partners prepare Halos integrations for third-party certification by leading certification bodies including TÜV Rheinland, UL Solutions, TÜV SÜD, exida, SGS and CertX.

"As AI-enabled robotics moves into industrial environments, the industry needs standardized, internationally recognized frameworks to assess safety across increasingly complex systems," said Laurie E. Locascio, president and CEO of [ANSI](#). "ANAB's accreditation of the NVIDIA Halos AI Systems Inspection Lab confirms the program has the competence and impartiality to evaluate robotic AI systems against recognized safety requirements, giving companies a rigorous and internationally recognized foundation for their path to certification."

Agility Incorporates Halos for Industrial Humanoids

Humanoid robots are designed to operate in dynamic environments alongside workers, equipment and other robots that are constantly in motion. That requires safety engineered for every layer of the stack.

Agility is extending its leadership in humanoid safety by teaming with NVIDIA to integrate NVIDIA IGX Thor and Halos Core into its proprietary safe human detection system for its humanoid robot Digit, which is designed for industrial work in logistics, manufacturing and warehouse operations. For Digit, NVIDIA IGX Thor delivers industrial-grade AI compute with built-in

safety capabilities, while Halos Core supports the software layer for safety-related operating functions.

Agility will also participate in the [NVIDIA Halos AI Systems Inspection Lab](#). Together, Agility and NVIDIA will use the lab to ensure Digit's safety-related software, AI components and cybersecurity protections meet rigorous standards such as IEC 61508, ISO 13849 and ISO/IEC TR 5469 before final third-party certification.

"For humanoids to deliver value at scale, safety has to be built into the robot and validated across the entire system," said Peggy Johnson, CEO of Agility. "Partnering with NVIDIA to implement and optimize the Halos for Robotics system extends our leadership in responsible automation, which is a nonnegotiable requirement for bringing humanoids safely into industrial workflows. This collaboration unlocks true human-robot teamwork, driving the long-term returns that will power next-generation manufacturing and logistics operations."

A Robotics Safety Ecosystem Built for Scale

The NVIDIA Halos for Robotics ecosystem brings together partners across software, systems, sensors and silicon, industrial applications and certification bodies to support safety from development through deployment:

- **Software:** [Acontis](#), FreeRTOS and QNX support the real-time operating environment, safety communications and embedded software layers needed for functional safety development.
- **Embedded systems:** Advantech and [NexCobot](#) deliver safety-designed NVIDIA IGX-based systems for robotics deployments.
- **Sensors and silicon:** Infineon, [NXP Semiconductors](#), [STMicroelectronics](#) and Texas Instruments contribute sensor, safety microcontroller and other semiconductor technologies.
- **Industrial applications:** FORT Robotics, Inventec, KION Group, Lyte AI and [Neurealm](#) are developing functional safety agents using the NVIDIA Halos Outside-In Safety Blueprint.
- **Assessment Agencies:** TÜV Rheinland is inspecting NVIDIA IGX Thor, Halos OS and Holoscan Sensor Bridge for functional safety certification readiness, building on TÜV SÜD's inspection of Thor SoC and Halos Core for ISO 26262.

The NVIDIA Halos AI Systems Inspection Lab includes more than 40 companies across manufacturers, certification bodies and safety vendors working to move safe physical AI systems from design to real-world deployment. TÜV Rheinland, TÜV SÜD, UL Solutions, exida, SGS and CertX all recognize the NVIDIA Halos AI Systems Inspection Lab as part of their certification process.

Availability

NVIDIA Halos Core for NVIDIA IGX™ is available in early access for registered developers in Linux and Linux plus QNX OS for Safety 8.0 configurations. The open source NVIDIA Halos Outside-In Safety Blueprint, part of the Halos Applications layer of Halos OS, is now available in early access on [GitHub](#).

Learn more about NVIDIA Halos for Robotics in this [technical blog](#) and [webpage](#).

Featured image courtesy of Agility.

About NVIDIA

[NVIDIA](#) (NASDAQ: NVDA) is the world leader in AI and accelerated computing.

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