TROY TECHNICAL

DRONES & ROBOTICS

WEEKLY REPORT

November 8 - November 14, 2026 | Issue 2026-W45

Safe autonomy, task economics, fleet operations and regulatory access

10	10
ANALYZED ARTICLES	PRIORITY THEMES

Issued 2026-11-14 | English edition | fixed approved cover artwork



Drones & Robotics: the boundary moved from isolated claims to qualification evidence

10 English articles were reviewed independently from the Japanese edition. Ten themes are retained for management decisions.

SIGNAL 01 | SENSING & AI

Virtuoso Surgical: FDA de novo authorisation for bladder cancer robot

Virtuoso Surgical has received FDA de novo authorisation for its Virtuoso Endoscopy System, the first device in a new classification of electromechanical surgical systems for endoluminal procedures.

SIGNAL 02 | ROBOT PLATFORM

Gemini Robotics 2.5: Google DeepMind's VLA Model and Mercedes-Benz Deployment

Google DeepMind has released Gemini Robotics 2.5, a Vision-Language-Action (VLA) model that achieved a 96% success rate in parts kitting at Mercedes-Benz factories.

SIGNAL 03 | TASK EXECUTION

Runway Praxis-1: 27B Parameter Robot AI Model and Specs

Runway has open-sourced Praxis-1, a 27 billion parameter robot control AI that leverages video-prediction knowledge for action generation under the Apache 2.0 license.

SIGNAL 04 | FLEET OPERATIONS

NVIDIA Alpamayo 2 Edge: Weights and Specs for Autonomous Driving

NVIDIA has released the model weights for Alpamayo 2 Edge, a 2-billion parameter model optimized for DRIVE AGX Thor.

DECISION

Focus this week's management attention on safe autonomy, task economics, fleet operations and regulatory access. Move only when the linked evidence can be reproduced under your own operating conditions.

THREE MANAGEMENT MOVES

1. Buyers: compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics.
2. Suppliers: provide sensors, actuators, compute and service evidence under real operating conditions.
3. Executives: track intervention, safety, uptime, liability, regulation, fleet scale and cost.

EVIDENCE DISCIPLINE

FACT states what the collected English source reports. BUSINESS READ and ACTION are editorial interpretations. UNKNOWN lists information that the source file does not establish. A linked article is not treated as independent confirmation of every claim.

Numbers and evidence anchors that require conditions

96%
A04

SOURCE-BOUND CONDITION
Google DeepMind has released Gemini Robotics 2.5, a Vision-Language-Action (VLA) model that achieved a 96% success rate in parts kitting at Mercedes-Benz factories.

27 billion
A02

SOURCE-BOUND CONDITION
Runway has open-sourced Praxis-1, a 27 billion parameter robot control AI that leverages video-prediction knowledge for action generation under the Apache 2.0 license.

100%
A07

SOURCE-BOUND CONDITION
When integrated into a hexapod robot, the system achieved a 100% traversal success rate and reduced traversal time by 34.6% in complex terrains.

30%
A01

SOURCE-BOUND CONDITION
The device maintains its rectifying function even when stretched 30% in length, enabling more accurate tactile sensing for robots and wearable devices.

73.1%
A03

SOURCE-BOUND CONDITION
In tests involving small robot luggage stacking, the technology increased the task success rate from 73.1% to 92.3%.

HOW TO USE THESE NUMBERS
Each value is shown with the condition stated in the collected English article. Do not compare values across different test methods, device sizes, operating temperatures or commercial stages without normalizing those conditions.

Where the value chain moved

Each stage combines one leading theme and one supporting theme. The report treats handoffs as evidence transfers, not decorative arrows.

1

Sensing & AI

P01/P06

Virtuoso Surgical has received FDA de novo authorisation for its Virtuoso Endoscopy System, the first device in a new.

2

Robot platform

P02/P07

Google DeepMind has released Gemini Robotics 2.5, a Vision-Language-Action (VLA) model that achieved a 96% success rate in.

3

Task execution

P03/P08

Runway has open-sourced Praxis-1, a 27 billion parameter robot control AI that leverages video-prediction knowledge for.

4

Fleet operations

P04/P09

NVIDIA has released the model weights for Alpamayo 2 Edge, a 2-billion parameter model optimized for DRIVE AGX Thor.

5

Regulation & service

P05/P10

Researchers have developed the Bioinspired Adaptive Tunable Sensing System (BATSS), which autonomously adjusts parameters to.

EVIDENCE REQUIRED AT EACH HANDOFF

Sensing & AI to Robot platform	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck intervention, safety, uptime, liability, regulation, fleet scale and cost.
Robot platform to Task execution	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck intervention, safety, uptime, liability, regulation, fleet scale and cost.
Task execution to Fleet operations	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck intervention, safety, uptime, liability, regulation, fleet scale and cost.
Fleet operations to Regulation & service	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck intervention, safety, uptime, liability, regulation, fleet scale and cost.

COMMON CONTROL POINT

No theme moves to a commercial commitment until a named owner has reproduced the relevant evidence and documented intervention, safety, uptime, liability, regulation, fleet scale and cost.

Priority map: maturity and next decision locus



P01	Virtuoso Surgical: FDA de novo authorisation for bladder cancer robot Business / rules | cue: FDA
P02	Gemini Robotics 2.5: Google DeepMind's VLA Model and Mercedes-Benz Deployment System / adoption | cue: Deployment
P03	Runway Praxis-1: 27B Parameter Robot AI Model and Specs System / adoption | cue: deployment
P04	NVIDIA Alpamayo 2 Edge: Weights and Specs for Autonomous Driving System / adoption | cue: deployment
P05	BATSS: Scorpion-inspired adaptive vibration sensing for robotics System / adoption | cue: System
P06	Stretchable Organic Diode: Reducing Signal Errors in Robot Skin Tech / process | cue: no system/business cue
P07	NTT World Model: Physical AI for Robot Failure Avoidance System / adoption | cue: integrates
P08	Zipline Acoustic Flight Optimization: Real-Time Noise Reduction Specs System / adoption | cue: integration
P09	Impossible Metals: Autonomous Robot for Selective Nodule Harvest System / adoption | cue: system
P10	EPFZ Microrobots: Magnetic Blood Clot Dissolution Performance Tech / process | cue: no system/business cue

REPRODUCIBLE POSITIONING RULE

Horizontal position uses five discrete stages: Research, Prototype, Joint evaluation, Product adoption and Scale. The vertical bands classify the next decision locus: Tech / process, System / adoption, or Business / rules (including supply systems). Article-title cues take precedence; the overview is used only when the title is silent. These are categories, not impact ranks. Bubble diameter reflects the editorial score.

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P01 Virtuoso Surgical: FDA de novo authorisation for bladder cancer robot

A09 | Sensing & AI | Research

2026-11-12

FACT

Virtuoso Surgical has received FDA de novo authorisation for its Virtuoso Endoscopy System, the first device in a new classification of electromechanical surgical systems for endoluminal procedures. The system enables en bloc resection of bladder tumours to improve diagnostic staging, with a planned US launch at leading urology centres in 2027.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P01.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 20/25 | MATURITY 1/5 | DECISION LOCUS: BUSINESS / RULES

P02 Gemini Robotics 2.5: Google DeepMind's VLA Model and Mercedes-Benz Deployment

A04 | Robot platform | Joint evaluation

2026-11-11

FACT

Google DeepMind has released Gemini Robotics 2.5, a Vision-Language-Action (VLA) model that achieved a 96% success rate in parts kitting at Mercedes-Benz factories. The model demonstrates significant performance gains over its predecessor across 200+ tasks, signaling a leap in physical AI capabilities for industrial automation.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P02.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 20/25 | MATURITY 3/5 | DECISION LOCUS: SYSTEM / ADOPTION

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P03 Runway Praxis-1: 27B Parameter Robot AI Model and Specs

A02 | Task execution | Research

2026-11-12

FACT

Runway has open-sourced Praxis-1, a 27 billion parameter robot control AI that leverages video-prediction knowledge for action generation under the Apache 2.0 license. While simulation success rates reached up to 80.0% after fine-tuning, the model requires significant computational resources and robot-specific data for real-world deployment.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P03.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 20/25 | MATURITY 1/5 | DECISION LOCUS: SYSTEM / ADOPTION

P04 NVIDIA Alpamayo 2 Edge: Weights and Specs for Autonomous Driving

A10 | Fleet operations | Pilot

2026-11-10

FACT

NVIDIA has released the model weights for Alpamayo 2 Edge, a 2-billion parameter model optimized for DRIVE AGX Thor. The release includes evaluation tools and deployment procedures to enable real-time trajectory generation and causal reasoning in vehicle environments.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P04.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: SYSTEM / ADOPTION

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P05 BATSS: Scorpion-inspired adaptive vibration sensing for robotics

A07 | Regulation & service | Pilot

Prior release 2026-11-07

FACT

Researchers have developed the Bioinspired Adaptive Tunable Sensing System (BATSS), which autonomously adjusts parameters to detect vibrations across a 500-fold dynamic range. When integrated into a hexapod robot, the system achieved a 100% traversal success rate and reduced traversal time by 34.6% in complex terrains.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P05.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: SYSTEM / ADOPTION

P06 Stretchable Organic Diode: Reducing Signal Errors in Robot Skin

A01 | Sensing & AI | Pilot

2026-11-11

FACT

Researchers at UNIST have developed a stretchable organic diode that significantly reduces signal interference between pressure sensors in electronic skin. The device maintains its rectifying function even when stretched 30% in length, enabling more accurate tactile sensing for robots and wearable devices.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P06.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: TECH / PROCESS

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P07 NTT World Model: Physical AI for Robot Failure Avoidance

A03 | Robot platform | Pilot

2026-11-11

FACT

NTT has developed a world model that integrates a physical control adapter with a video generation model to predict and avoid robot task failures. In tests involving small robot luggage stacking, the technology increased the task success rate from 73.1% to 92.3%.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P07.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: SYSTEM / ADOPTION

P08 Zipline Acoustic Flight Optimization: Real-Time Noise Reduction Specs

A08 | Task execution | Research

2026-11-11

FACT

Zipline has implemented sound-optimized dynamic flying to reduce overall sound exposure per flight by 68 percent compared to its 2025 fleet. By utilizing onboard sound modeling and weather sensors to optimize trajectories in real time, the company has simultaneously reduced energy consumption by 21 percent. This advancement enables quieter urban integration and more efficient transition to on-wing flight.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P08.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 1/5 | DECISION LOCUS: SYSTEM / ADOPTION

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P09 Impossible Metals: Autonomous Robot for Selective Nodule Harvest

A05 | Fleet operations | Research

2026-11-09

FACT

Impossible Metals has successfully demonstrated the Eureka Collection SystemTM, the first fully autonomous underwater robot to selectively recover polymetallic nodules at depths exceeding 4,000 meters. By utilizing a buoyancy engine and AI-driven perception, the system avoids the use of riser pipes and preserves deep-sea habitats.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P09.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 1/5 | DECISION LOCUS: SYSTEM / ADOPTION

P10 EPFZ Microrobots: Magnetic Blood Clot Dissolution Performance

A06 | Regulation & service | Pilot

2026-11-09

FACT

EPFZ has developed magnetic microrobots that dissolve blood clots six times faster than medication alone in artificial vessel tests. By utilizing a rotating magnetic field to navigate and generate flow, these devices address the challenge of delivering thrombolytic agents to obstructed vascular sites.

WHY IT MATTERS

The decision relevance is safe autonomy, task economics, fleet operations and regulatory access. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, provide sensors, actuators, compute and service evidence under real operating conditions.

ACTION

Within 30 days, compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics; record the evidence and owner against P10.

UNKNOWN

Still unproven or incompletely stated: intervention, safety, uptime, liability, regulation, fleet scale and cost.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: TECH / PROCESS

Playbook and 0-5 year roadmap

STAKEHOLDER	NOW | 0-30 DAYS	NEXT | 1-12 MONTHS	LATER | 1-5 YEARS
Operating companies	compare humanoids, drones and robotaxis by task success, intervention rate, safety and unit economics	Run production-like qualification with explicit acceptance and stop criteria.	Build a portfolio and architecture that can absorb technology and supplier changes.
Materials, equipment and technology suppliers	provide sensors, actuators, compute and service evidence under real operating conditions	Create shared reliability, process-window and failure-analysis data with customers.	Standardize interfaces, traceability, lifecycle support and recovery services.
Trading, investment and legal teams	Map intervention, safety, uptime, liability, regulation, fleet scale and cost.	Contract for capacity, quality, change notice, liability, alternatives and exit.	Diversify regional, technical and customer concentration risk.

ROADMAP

NOW | 0-30 DAYS
Evidence ledger
Owner: Strategy + quality
Deliverable: claim, source, condition, owner

NOW | 0-30 DAYS
Risk screen
Owner: Procurement + legal
Deliverable: unknowns, alternatives, stop

NEXT | 1-12 MONTHS
Joint qualification
Owner: R&D + supplier
Deliverable: process window and failure data

NEXT | 1-12 MONTHS
Commercial gate
Owner: Business + finance
Deliverable: unit economics and capacity

LATER | 1-5 YEARS
Platform strategy
Owner: Executive team
Deliverable: portfolio and interface roadmap

LATER | 1-5 YEARS
Service layer
Owner: Operations + channel
Deliverable: monitoring, maintenance and recovery

GO / NO-GO GATES

GATE	OWNER	REQUIRED EVIDENCE	NO-GO CONDITION
G1 Evidence	**Quality**	Source, test conditions and reproducibility	No traceable evidence
G2 Integration	**R&D**	Interface, process window and failure analysis	Cannot meet system conditions
G3 Commercial	**Business**	Capacity, total cost, contract and alternatives	Economics or supply cannot be supported
G4 Lifecycle	**Operations**	Monitoring, maintenance, change notice and exit	No accountable operating plan

ANALYZED ARTICLES | ITEMS 01-10

Every title and URL is displayed in full. URLs wrap without shortening and remain clickable. A verified-reference label means the translated HTML did not retain its original source URL.

ID	FULL ARTICLE TITLE	FULL SOURCE / VERIFIED REFERENCE URL - CLICKABLE
A01	Stretchable Organic Diode: Reducing Signal Errors in Robot Skin	https://en.sedaily.com/business/2026/11/11/stretchable-diode-cuts-signal-errors-in-robot-skin
A02	Runway Praxis-1: 27B Parameter Robot AI Model and Specs	https://xenospectrum.com/runway-praxis-1-open-robot-model/
A03	NTT World Model: Physical AI for Robot Failure Avoidance	https://news.mynavi.jp/techplus/article/20261111-5296066/
A04	Gemini Robotics 2.5: Google DeepMind's VLA Model and Mercedes-Benz Deployment	https://news.yahoo.co.jp/articles/e8082fe67d29c2d827755695d76f7b8f014fa3c6
A05	Impossible Metals: Autonomous Robot for Selective Nodule Harvest	https://finance.yahoo.com/technology/articles/impossible-metals-autonomous-robot-selectively-140000712.html
A06	EPFZ Microrobots: Magnetic Blood Clot Dissolution Performance	https://www.rts.ch/info/sciences-tech/2026/article/epfz-des-microrobots-pour-dissoudre-les-caillots-sanguins-29410851.html
A07	BATSS: Scorpion-inspired adaptive vibration sensing for robotics	https://bioengineer.org/scorpion-inspired-sensing-system-enhances-dynamic-vibration-perception-in-robotics/
A08	Zipline Acoustic Flight Optimization: Real-Time Noise Reduction Specs	https://roboticsandautomationnews.com/2026/11/11/zipline-makes-drone-deliveries-quieter-with-real-time-acoustic-flight-optimization/107003/
A09	Virtuoso Surgical: FDA de novo authorisation for bladder cancer robot	https://finance.yahoo.com/healthcare/articles/virtuoso-surgical-bladder-cancer-resection-171510892.html
A10	NVIDIA Alpamayo 2 Edge: Weights and Specs for Autonomous Driving	https://www.unite.ai/ja/nvidia-releases-alpamayo-2-edge-weights-for-autonomous-driving/

Drones_Robotics — Selected Articles

Date: 2026-11-15

Articles: 10

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#01 Stretchable Organic Diode: Reducing Signal Errors in Robot Skin

Published November 11, 2026 Seoul Economic Daily South Korea



OVERVIEW

Researchers at UNIST have developed a stretchable organic diode that significantly reduces signal interference between pressure sensors in electronic skin. The device maintains its rectifying function even when stretched 30% in length, enabling more accurate tactile sensing for robots and wearable devices.

IN DEPTH

Key Findings

The primary achievement of the research team is a sharp reduction in signal interference between pressure sensors. In tests where only one of two sensors was pressed, the ratio of stray signals from the neighboring sensor dropped from 63.1% to 0.314% after the diode was applied. Even when the skin was stretched 30% in length, the interference ratio fell from 40.0% to 0.697%.

Technical Details

The developed stretchable organic diode is designed to block unwanted current flow between pressure sensors in an electronic skin array. Unlike conventional diodes that rely on rigid substrates and electrodes, this fully flexible organic electrochemical diode utilizes soft materials for its substrate, electrodes, semiconductor, and electrolyte. This material composition allows the device to remain functional during physical deformations, such as when a robot bends a finger.

- **Durability:** The diode retained its rectifying function after 1,000 cycles of stretching and releasing.
- **Elasticity:** The device continued to channel current in one direction when stretched 30% in length.
- **Function:** It allows current to flow easily in one direction while impeding flow in the opposite direction to prevent signal leakage between sensors.

Background & Context

Electronic skin identifies the location and strength of contact via pressure sensor arrays. A common technical error in these systems is the production of signals at neighboring sensors when only a single point is pressed. This research was led by Professor Shim Kyo-seung of the chemistry department at the Ulsan National Institute of Science and Technology (UNIST), with Kim Se-hyun as the first author. The study was supported by the National Research Foundation of Korea and the Ministry of Science and ICT.

Significance & Outlook

The findings, published in *Science Advances* on Oct. 21, demonstrate the potential for system-level integration with various stretchable electronic devices. Professor Shim noted that this technology could be applied to the development of wearable devices and electronic skin that can stretch in tandem with a robot's movements.

Source: https://en.sedaily.com/business/2026/11/11/stretchable-diode-cuts-signal-errors-in-robot-skin

Collected: November 14, 2026 | Automated Research System (AI)

#02 Runway Praxis-1: 27B Parameter Robot AI Model and Specs

Published November 12, 2026 XenoSpectrum USA



OVERVIEW

Runway has open-sourced Praxis-1, a 27 billion parameter robot control AI that leverages video-prediction knowledge for action generation under the Apache 2.0 license. While simulation success rates reached up to 80.0% after fine-tuning, the model requires significant computational resources and robot-specific data for real-world deployment.

IN DEPTH

Key Findings

Runway has released the model weights and inference/training code for Praxis-1, a "world action model" designed to generate robot movements based on instructions and camera feeds. The model is provided under the Apache 2.0 license, allowing for commercial use and custom fine-tuning. Performance evaluations in simulation showed success rates of 80.0% for an RT-1 model in SimplerEnv and 46.2% for a DROID model in RoboLab-120, though these results were achieved only after robot-specific additional training.

Technical Details

Praxis-1 consists of a video-prediction foundation model paired with an action-generation module of approximately 314 million parameters, totaling 27 billion parameters. The system processes instructions, camera images, and robot posture to generate actions—typically 24 steps (1.6 seconds) at 15Hz, with 21 steps for the initial inference.

- **Hardware Requirements:** Standard bf16 weights are 54.4GB, requiring a single 80GB GPU. Inference on an H100 takes approximately 0.55 to 0.6 seconds.
- **Optimization:** A quantized NVFP4 version reduces weight size to 17.5GB, maintaining a success rate of 46.5% compared to 47.8% for the bf16 version in specific tests.
- **Training Pipeline:** The process involves general video pre-training, followed by training on videos of human hands and robots, joint training of video prediction and action generation, and final robot-specific fine-tuning.

Background and Context

Prior to the general release on November 11, 2026, the model was trialed by Noble Machines, Standard Bots, and Ultra. To achieve the reported simulation results, Runway utilized 128 NVIDIA H100 GPUs for 50,000 updates, using approximately 277 hours of successful demonstration data for the DROID model.

Significance and Outlook

Praxis-1 allows developers to utilize general video knowledge rather than building models from scratch. However, Runway notes that the model still struggles with ambiguous instructions, similar-looking objects, and complex multi-step tasks without individual prompts for each stage. Future research will focus on long-term action planning and self-improvement capabilities.

Source: https://xenospectrum.com/runway-praxis-1-open-robot-model/

Collected: November 14, 2026 | Automated Research System (AI)

#03 NTT World Model: Physical AI for Robot Failure Avoidance

Published November 11, 2026　TECH+（マイナビニュース）　Japan



OVERVIEW

NTT has developed a world model that integrates a physical control adapter with a video generation model to predict and avoid robot task failures. In tests involving small robot luggage stacking, the technology increased the task success rate from 73.1% to 92.3%.

IN DEPTH

Key Findings

NTT has developed a physical AI technology that allows robots to simulate multiple future outcomes before executing an action, enabling the selection of the path with the lowest probability of failure. In a practical application involving the stacking of items by a small robot, the success rate improved from 73.1% to 92.3% by evaluating five action candidates and avoiding those leading to object drops.

Technical Details

The system utilizes a "world model" that predicts how the environment changes based on robot actions. To overcome the tendency of standard video generation models to produce "plausible" but physically impossible results (such as disappearing objects), NTT integrated a proprietary physical control adapter. This adapter estimates physical quantities—including position, posture, velocity, angular velocity, mass, and moment of inertia—and calculates future states based on laws of motion and equations of movement.

The workflow operates as follows:

- Action candidates are generated by a Vision-Language-Action (VLA) model or motion planner.
- The world model generates these candidates as videos to evaluate risks like collisions or collapses.
- The physical control adapter provides explainability by outputting physical values as intermediate data, unlike black-box neural networks.

In the "OBJ3D" benchmark for physical prediction accuracy, the NTT model achieved an LPIPS×100 score of 7.81, compared to 7.92 for the "OCK" method and 21.90 for NVIDIA Cosmos Predict 2.5.

Background and Context

While general-purpose vision-language models have expanded robot capabilities, achieving high success rates remains difficult for tasks involving objects with varying shapes, weights, and friction, such as airport luggage. NTT's approach combines the empirical strengths of video generation (e.g., predicting biological movement) with the precision of physics-based calculations.

Significance and Outlook

NTT plans to implement this technology in airport luggage loading and unloading in collaboration with Mujin. A primary remaining challenge is processing speed; currently, predicting a 5-second future takes 2 to 3 seconds. NTT intends to use model distillation to reduce latency and ensure robots can operate without stopping.

Source: https://news.mynavi.jp/techplus/article/20261111-5296066/

Collected: November 14, 2026 | Automated Research System (AI)

#04 Gemini Robotics 2.5: Google DeepMind's VLA Model and Mercedes-Benz Deployment

Published November 11, 2026　Yahoo!ニュース（ビジネス＋IT）　Japan



OVERVIEW

Google DeepMind has released Gemini Robotics 2.5, a Vision-Language-Action (VLA) model that achieved a 96% success rate in parts kitting at Mercedes-Benz factories. The model demonstrates significant performance gains over its predecessor across 200+ tasks, signaling a leap in physical AI capabilities for industrial automation.

IN DEPTH

Key Findings

Google DeepMind's latest robot AI model, Gemini Robotics 2.5, achieved a 96% success rate in a real-world deployment at Mercedes-Benz automotive plants in Kecskemét, Hungary, and Sindelfingen, Germany. In this application, humanoid robots performed parts kitting by extracting metal brackets from bulk bins and arranging them in sequence containers. Evaluation across more than 200 diverse tasks showed that Gemini Robotics 2.5 improved success rates by 30% to 100% and increased operation speeds by 20% to 30% compared to the previous Gemini Robotics 2 generation.

Technical Details

The system utilizes a Vision-Language-Action (VLA) architecture to translate visual and linguistic data into physical movement. The deployment at Mercedes-Benz utilized a dual-model approach: the Gemini Robotics ER reasoning model managed the overall workflow, while Gemini Robotics 2.5 handled the precise control of the hands and arms. The hardware used included the Apollo 2 humanoid robot from Apptronik, equipped with the 22-degree-of-freedom "SharpaWave" five-finger hand. The model was also tested on the Franka Duo, which uses a two-finger gripper.

Safety enhancements were integrated via inference-time guidance to avoid physical hazards. Internal evaluations indicated that the rate of successfully completing tasks while avoiding obstacles improved by 33%, and performance in environments with nearby humans improved by 43%.

Background and Context

Apptronik CEO Jeff Caldernas noted that the system's performance improved significantly following several weeks of post-training, with minimal degradation when transitioned to the actual Mercedes-Benz production environment. The 200+ evaluated tasks ranged from high-precision work, such as using pipettes for liquids, to complex manual tasks like tying ribbons on gift boxes and scooping food with tongs.

Significance and Outlook

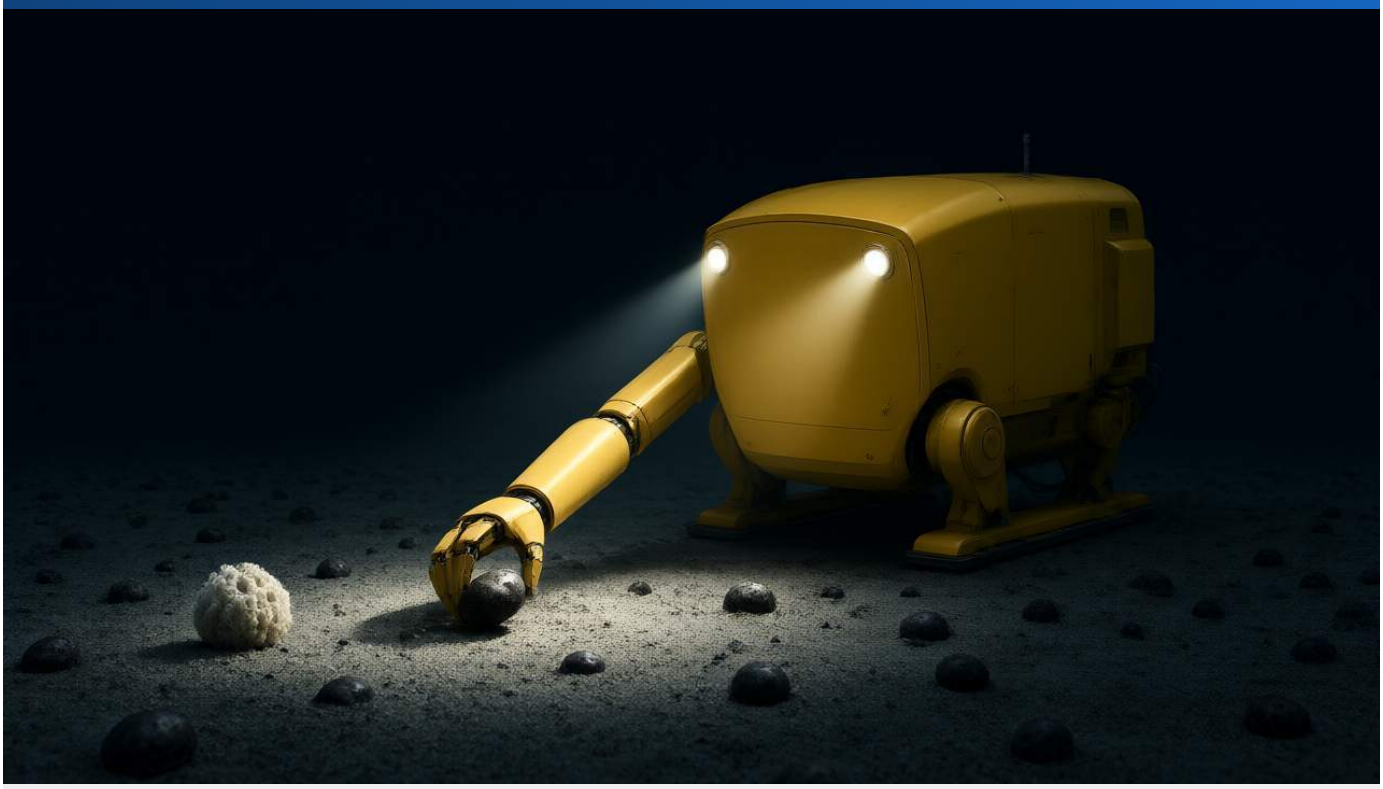
The release of Gemini Robotics 2.5 occurs amidst intensifying competition in physical AI, highlighted by NVIDIA's announcement of GR00T 2 on November 9. Google DeepMind has begun providing this VLA model to its partner companies in the robotics sector.

Source: https://news.yahoo.co.jp/articles/e8082fe67d29c2d827755695d76f7b8f014fa3c6

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#05 Impossible Metals: Autonomous Robot for Selective Nodule Harvest

Published November 09, 2026　Yahoo Finance（プレスリリース）　USA



OVERVIEW

Impossible Metals has successfully demonstrated the Eureka Collection System™, the first fully autonomous underwater robot to selectively recover polymetallic nodules at depths exceeding 4,000 meters. By utilizing a buoyancy engine and AI-driven perception, the system avoids the use of riser pipes and preserves deep-sea habitats.

IN DEPTH

Key Findings

Impossible Metals has completed a scientific dive in the Clarion-Clipperton Zone, recovering approximately 450 grams of polymetallic nodules from a depth of over 4,000 meters (2.5 miles). Unlike traditional deep-sea collection methods that indiscriminately harvest material using riser systems, the Eureka Collection System™ selectively recovers targeted nodules while leaving others undisturbed to preserve the habitat.

Technical Details

The Eureka system employs several distinct technical innovations to minimize environmental impact and reduce infrastructure costs:

- **Hovering Capability:** The vehicle hovers above the seabed rather than driving across it, avoiding direct contact with the seafloor.
- **Buoyancy Engine:** The system uses a buoyancy engine to lift payloads via water displacement physics, eliminating the need for riser pipes and the associated process-water discharge.
- **Perception Layer:** An AI-driven perception system identifies visible life on and around nodules, allowing the robotic arms to select only those without visible fauna.
- **Intellectual Property:** These elements are protected by US patent 12,704,065, granted on August 11, 2026.

Background & Context

The recovered material will be used by research partner Viridian Biometals to study bacterial populations and develop metal recovery methods that avoid acids and reduce water and energy consumption. The company is backed by significant investors, including In-Q-Tel (IQT) and the Smith family of FedEx. All scientific data from the dive will be published openly, following a similar transparency protocol used during Eureka II dives on the Blake Plateau two years prior.

Significance & Outlook

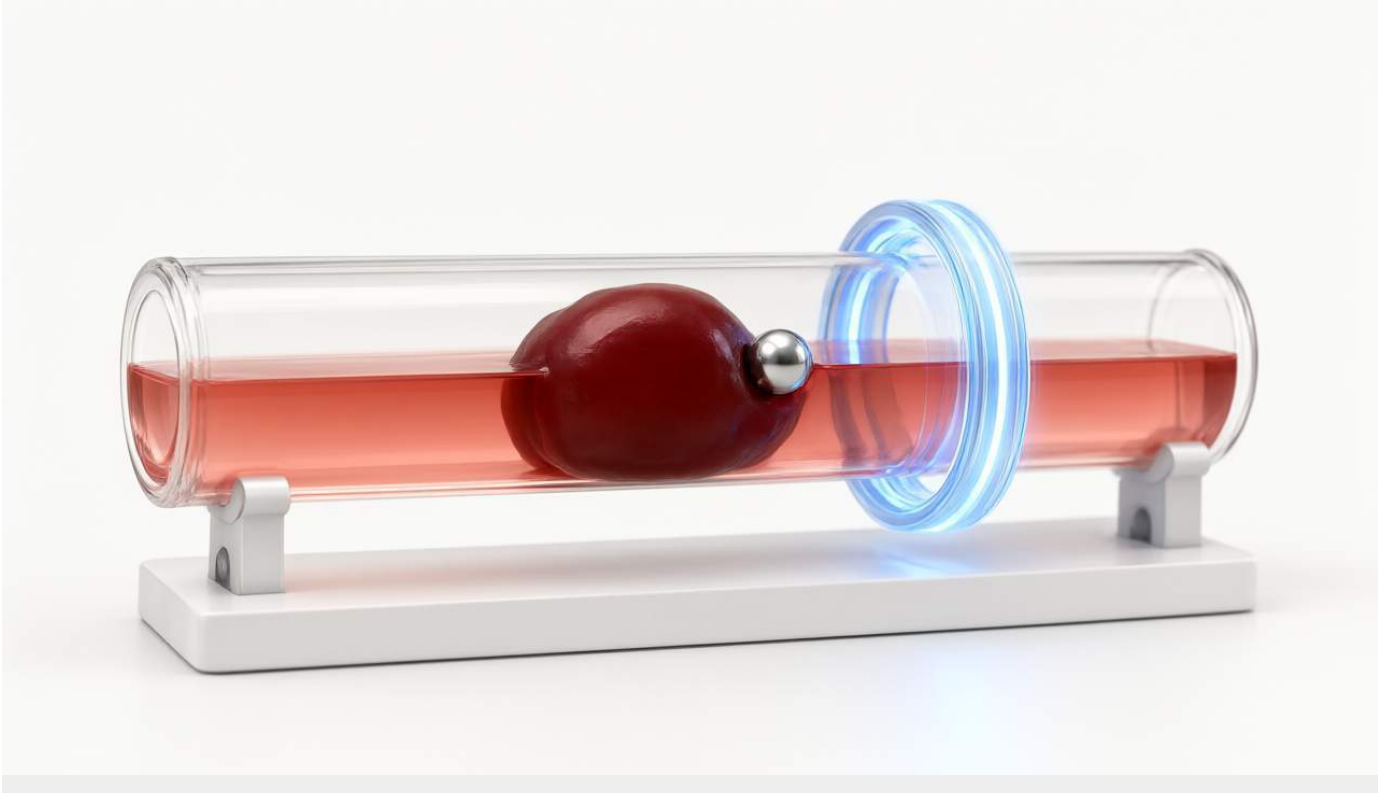
Impossible Metals intends to provide a "robots-as-a-service" solution, partnering with licensed resource holders to operate the system. Because the technology scales by adding individual robots rather than building massive fixed infrastructure, the company claims a fundamentally different cost structure than riser-based systems. In 2027, the scaled-up Eureka III will undergo an environmental impact study by Germany's Federal Institute for Geosciences and Natural Resources (BGR) aboard the RV SONNE.

Source: https://finance.yahoo.com/technology/articles/impossible-metals-autonomous-robot-selectively-140000712.html

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#06 EPFZ Microrobots: Magnetic Blood Clot Dissolution Performance

Published November 09, 2026 RTS（Radio Télévision Suisse） Switzerland



OVERVIEW

EPFZ has developed magnetic microrobots that dissolve blood clots six times faster than medication alone in artificial vessel tests. By utilizing a rotating magnetic field to navigate and generate flow, these devices address the challenge of delivering thrombolytic agents to obstructed vascular sites.

IN DEPTH

Key Findings

In tests using artificial blood vessels and porcine blood clots, microrobots developed by EPFZ dissolved clots six times faster than treatments using medication alone. Further trials conducted on living pigs demonstrated increased efficacy; after 30 minutes, the surface area of the irrigated vasculature was twice as large compared to treatments administered without the microrobots.

Technical Details

The microrobots measure approximately eight micrometers in size. They are constructed from a biocompatible sugar polymer gel integrated with magnetic iron oxide nanoparticles. These nanoparticles are not distributed uniformly but are instead clustered along the longitudinal axis of the robot.

Navigation and propulsion are achieved through the following mechanisms:

- **Control:** The robots respond to an externally generated rotating magnetic field, allowing for precise steering through blood vessels.
- **Movement:** The devices move along the vascular wall using a motion described as similar to a gymnast performing "flips."
- **Drug Delivery:** This specific movement generates a current that actively transports medication toward the target blood clot.

Background and Context

The technology addresses a critical limitation in treating vascular occlusions. While medications to dissolve clots exist, they often fail to reach the site of action in a timely manner because the obstruction itself halts the blood circulation necessary for drug transport. Such occlusions can lead to severe medical emergencies, including stroke, myocardial infarction, or pulmonary embolism, depending on the affected vessel.

Significance and Outlook

EPFZ has filed a patent application for this invention. However, the technology is not yet ready for clinical use in humans suffering from acute vascular obstruction. The research team intends to conduct further animal studies to evaluate long-term safety and test the robots in specific medical models, such as heart attack simulations. The corresponding scientific article has not yet been published and remains subject to independent peer review.

Source: https://www.rts.ch/info/sciences-tech/2026/article/epfz-des-microrobots-pour-dissoudre-les-caillots-sanguins-29410851.html

Collected: November 14, 2026 | Automated Research System (AI)

#07 BATSS: Scorpion-inspired adaptive vibration sensing for robotics

Published November 07, 2026 BIOENGINEER.ORG USA



OVERVIEW

Researchers have developed the Bioinspired Adaptive Tunable Sensing System (BATSS), which autonomously adjusts parameters to detect vibrations across a 500-fold dynamic range. When integrated into a hexapod robot, the system achieved a 100% traversal success rate and reduced traversal time by 34.6% in complex terrains.

IN DEPTH

Key Findings

The Bioinspired Adaptive Tunable Sensing System (BATSS) enables robotic platforms to perceive dynamic vibrations in unstructured environments by autonomously switching between sensing states. In performance evaluations, the system demonstrated a tunable gauge factor between 17,889 and 29,558 and a strain range from 0.012% to 2.83%. Most notably, the architecture allows for the precise discrimination of vibration amplitudes across a 500-fold dynamic range, spanning from 0.04 g to 20 g.

Technical Details

To overcome the limitations of fixed-parameter sensors, BATSS replicates the biological closed loop used by scorpions to maintain optimal detection states. The system operates by autonomously transitioning among three distinct sensing states based on real-time signal variations. Each state utilizes a dedicated parameter configuration, allowing the sensor to balance high sensitivity with wide operational margins. This adaptive mechanism ensures the system can process unpredictable signals that would typically exceed the range of conventional sensing paradigms.

Background and Context

Conventional robotic sensors typically rely on fixed parameter configurations, which restrict their ability to respond to signals that vary unpredictably in real-world, unstructured settings. This creates a sensory bottleneck for embodied intelligence. Natural scorpions solve this problem through a biological architecture that dynamically tunes vibration perception regardless of fluctuations in incoming mechanical signals, providing the blueprint for the BATSS architecture.

Significance and Outlook

The practical utility of BATSS was validated using a hexapod robot navigating complex and irregular terrains. The sensing system allowed the robot to actively modulate its physical posture and locomotion gait in real-time based on terrain feedback. This resulted in a 100% traversal success rate and a 34.6% reduction in total traversal time. These results suggest significant potential for autonomous machines requiring high levels of physical adaptability, operational robustness, and perceptual autonomy in unpredictable environments.

Source: https://bioengineer.org/scorpion-inspired-sensing-system-enhances-dynamic-vibration-perception-in-robotics/

Collected: November 14, 2026 | Automated Research System (AI)

#08 Zipline Acoustic Flight Optimization: Real-Time Noise Reduction Specs

Published November 11, 2026 Robotics & Automation News USA



OVERVIEW

Zipline has implemented sound-optimized dynamic flying to reduce overall sound exposure per flight by 68 percent compared to its 2025 fleet. By utilizing onboard sound modeling and weather sensors to optimize trajectories in real time, the company has simultaneously reduced energy consumption by 21 percent. This advancement enables quieter urban integration and more efficient transition to on-wing flight.

IN DEPTH

Key Findings

Zipline has deployed a fleet-wide upgrade featuring sound-optimized dynamic flying, which has reduced peak volume by 24 percent and overall sound exposure per flight by 68 percent relative to the 2025 fleet. Beyond noise reduction, the system has decreased average flight times by 53 seconds and reduced energy usage per flight by 21 percent.

Technical Details

Unlike standard drones that require continuous motor operation, Zipline utilizes a fixed-wing design that allows the aircraft to disable all but one motor once cruising speed and altitude are reached. The new dynamic flying system optimizes the transition to this "on-wing" state by balancing wind, altitude, and speed in real time.

- **Real-time Modeling:** Onboard weather sensors measure current wind conditions, which are then processed through a custom sound model.
- **Dynamic Trajectories:** Instead of static paths, the drones adjust their pitch—dipping the nose to gain speed or popping upwards to decelerate—to minimize noise.
- **Efficiency Gains:** The drones now spend roughly 50 percent longer traveling "on-wing" due to faster transitions.

Background & Context

This software update complements existing hardware and architectural strategies designed to blend drones into the background of daily life. These include the use of patented ultra-quiet propellers and a two-part architecture that maintains a delivery altitude of roughly 330 ft, significantly higher than the 32 ft average of other delivery drone services.

Significance & Outlook

According to CTO Keenan Wyrobek, the goal is to move beyond mere tolerance of drone services toward a future with less noise, traffic, and pollution. The implementation of sound-optimized dynamic flying provides the technical foundation for future developments, including more sophisticated maneuvers and deliveries at even higher altitudes to further reduce the acoustic footprint.

Source: https://roboticsandautomationnews.com/2026/11/11/zipline-makes-drone-deliveries-quieter-with-real-time-acoustic-flight-optimization/107003/

Collected: November 14, 2026 | Automated Research System (AI)

#09 Virtuoso Surgical: FDA de novo authorisation for bladder cancer robot

Published November 12, 2026　Medical Device Network（Yahoo Finance掲載）　USA



OVERVIEW

Virtuoso Surgical has received FDA de novo authorisation for its Virtuoso Endoscopy System, the first device in a new classification of electromechanical surgical systems for endoluminal procedures. The system enables en bloc resection of bladder tumours to improve diagnostic staging, with a planned US launch at leading urology centres in 2027.

IN DEPTH

Key Findings

The US Food and Drug Administration (FDA) has granted de novo authorisation to Virtuoso Surgical for its endoscopic robot designed for the intact (en bloc) removal of bladder tumours. This authorisation establishes a new FDA classification for electromechanical surgical systems used in endoluminal surgical procedures. The system previously received breakthrough device designation in September 2025.

Technical Details

The Virtuoso Endoscopy System utilizes a rigid endoscope equipped with two needle-sized robotic arms at the tip. These arms translate the surgeon's hand motions from a console to provide two-handed dexterity within the urethra. One arm is dedicated to lifting and retracting tumour tissue, while the second arm performs the dissection beneath the tissue.

In the VIABLE study (NCT06940648) conducted at The Chinese University of Hong Kong, the system demonstrated high efficacy in obtaining tissue samples. In the first 20 patients, detrusor muscle was present in 94% of removed lesions. This result exceeds the study's 60% performance goal and the median rate of approximately 70% typically reported in conventional transurethral resection of bladder tumour (TURBT) therapy.

Background & Context

Bladder cancer affected over 600,000 cases worldwide in 2022. While TURBT has been the historical standard of care—often followed by immunotherapy—bladder cancers frequently recur and require lifelong monitoring. The presence of the detrusor muscle in removed specimens is critical for pathologists to determine the cancer stage.

Significance & Outlook

By enabling en bloc resection, the system provides better tissue specimens for clearer diagnosis and staging compared to conventional methods. Virtuoso Surgical intends to launch the system in the US at leading urology centres in 2027. This enters a broader robotic surgery market that GlobalData forecasts will grow from a valuation of $12.8bn in 2025 to $23.6bn by 2035, representing a CAGR of 6.3%.

Source: https://finance.yahoo.com/healthcare/articles/virtuoso-surgical-bladder-cancer-resection-171510892.html

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#10 NVIDIA Alpamayo 2 Edge: Weights and Specs for Autonomous Driving

Published November 10, 2026 Unite.AI USA



OVERVIEW

NVIDIA has released the model weights for Alpamayo 2 Edge, a 2-billion parameter model optimized for DRIVE AGX Thor. The release includes evaluation tools and deployment procedures to enable real-time trajectory generation and causal reasoning in vehicle environments.

IN DEPTH

Key Findings

NVIDIA released the weights for Alpamayo 2 Edge on Hugging Face on November 10, 2026. The 2-billion parameter model is designed for on-vehicle computing with strict latency constraints, specifically optimized for DRIVE AGX Thor to operate at 10 Hz. In AlpaSim closed-loop simulations, Alpamayo 2 Edge demonstrated a mean displacement error of 0.53 meters and a fault-free distance of 15.15 kilometers, significantly outperforming Qwen-Drive-1.0, which recorded a 1.68-meter error and a 0.25-kilometer fault-free distance.

Technical Details

The architecture utilizes Cosmos 3 Edge as the inference backbone based on Nemotron, paired with action-specialized modules using diffusion models. It processes camera feeds, temporal context, vehicle history, and navigation text to output future trajectories and causal explanations. To reduce computation, the model can output a NOMINAL token to skip reasoning traces during standard driving.

- **Training:** The model was trained on approximately 115,000 hours of multi-camera driving footage and 3.7 million causal reasoning traces. It utilized offline distillation from Alpamayo 2 Super (340 billion parameters) and closed-loop reinforcement learning via the AlpaGym simulator, which improved driving performance by 48.9% over the best non-RL checkpoint.
- **Deployment:** While BF16 weights run on PyTorch, real-time operation on DRIVE AGX Thor-X requires FP8 calibration, ONNX export, and TensorRT-Edge-LLM. Using DFlash2 speculative decoding, latency from camera input to trajectory output is reported between 160 and 190 milliseconds.
- **Licensing:** Weights are under the OpenMDW-1.1 license, and source code is under Apache License 2.0.

Evaluation and Validation

NVIDIA also released AlpaJudge, a human-aligned reward model. AlpaJudge-RB provides a reference-based consistency probability (0 to 1), while AlpaJudge-RF uses six camera images and metadata to provide five rubric-based probabilities and overall scores. These tools allow developers to identify rare failures and target specific scenes for retraining.

Significance and Outlook

The release enables a development cycle combining on-vehicle inference, scored explanations, and targeted retraining. Integration requires further validation using use-case-specific data and iterative system-level testing.

Source: https://www.unite.ai/ja/nvidia-releases-alpamayo-2-edge-weights-for-autonomous-driving/

Collected: November 14, 2026 | Automated Research System (AI)