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2025 World Robot Conference opens in Beijing

Headlines

Cover Story

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Opening ceremony of WRC 2025

From August 8 to 12, the 2025 World Robot Conference (WRC 2025) was held in Beijing. Jointly hosted by the Chinese Institute of Electronics (CIE) and the World Robot Cooperation Organization (WRCO), the event carried the theme "Making Robots Smarter, Making Embodied Agents More Intelligent." Its main forum focused on three topics: industry development, technological innovation, and ecosystem building. More than 400 leading scientists, representatives of international organizations, academy members, and entrepreneurs from around the world gathered to share insights on frontier technologies, industry trends, application practices, and innovation outcomes through keynote speeches, high-level dialogues, and live demonstrations.

At the opening ceremony, CAST President Wan Gang highlighted China's progress in robotics over the past decade, particularly since the launch of the *New Generation Artificial Intelligence Development Plan*. He noted that innovation capacity and industrial strength have steadily advanced, guided by the strategy of "empowering the real economy and supporting social development." Wan emphasized that humanoid robots, as the advanced form of robotics and a vital carrier of embodied intelligence, are playing an increasingly important role in manufacturing, logistics, security, household services, education, and healthcare. He underscored China's commitment to developing this frontier technology to stimulate new consumption, foster emerging industries, create jobs, drive economic growth, and enhance public well-being. Concluding his remarks, Wan expressed hope that WRC would serve as a platform for exchanging ideas, building consensus, strengthening cooperation, and shaping a brighter future for intel-

ligent technologies.

On behalf of the organizers, WRCO President Qiao Hong unveiled *10 Trends in Embodied Intelligent Robots (2025)*. The report systematically reviewed technological advances, industrial applications, and ecosystem development, outlining the future landscape of embodied intelligent robots across ten dimensions, including perception and cognition, decision-making, intelligent control, and robot design.

The conference also released, via video, the report *Top 10 Potential Application Scenarios for Humanoid Robots (2025)*. Compiled by CIE with input from leading experts, the report identifies promising areas such as general industrial operations, automotive manufacturing, 3C manufacturing, shipbuilding, and petrochemicals. It provides a roadmap for advancing humanoid robot technology and accelerating industrial deployment, injecting new momentum into a wide range of sectors.

Adding to the highlights, the world's first comprehensive robot ecosystem platform, Robot World 2.0, officially opened in Beijing E-Town. Compared with the earlier 1.0 version, Robot World 2.0 introduces two innovative consumer formats: the world's first 4S store for embodied intelligent robots and a themed "Robot Restaurant." Serving as core platforms, these initiatives link more than 300 robotics companies in the area, along with the Beijing Innovation Center of Humanoid Robotics and other major projects, to create a new global landmark for the robotics industry that integrates exhibition, trade, application, and immersive experience.

(Sources: Official website of WRC 2025 and gmw.cn)

WRC 2025 releases top 10 potential application scenarios for humanoid robots

Presentation of the top 10 potential application scenarios for humanoid robots
Photo credit: *China Youth Daily*

Humanoid robot technology is advancing at a rapid pace, with products iterating quickly and moving

from the laboratory into real-world applications, revealing enormous potential. At WRC 2025, the Chinese Institute of Electronics (CIE) unveiled *Top 10 Potential Application Scenarios for Humanoid Robots*, a report offering a forward-looking view of how these robots may be deployed across diverse industries.

The ten scenarios identified are: general industrial operations: loading, unloading, and material handling; automotive manufacturing: sorting and material allocation; 3C manufacturing: material quality inspection; shipbuilding: grinding and polishing; petrochemical industry: production line inspection; power generation: power plant operations; emergency response: disaster relief and safety rescue; commercial services: reception and interactive services; home services: daily assistance, companionship, and care; and agricultural production: precision field operations.

"Humanoid robots will become a key driver of industrial upgrading and an essential support for addressing the challenges of an aging society," said CIE President Xu Xiaolan when presenting the report. Xu noted that the field is achieving breakthroughs on multiple fronts and advancing through coordinated innovation, with both industry and applications showing strong momentum. The sector has entered a fast track that moves from technological breakthroughs to capital investment and on to scenario deployment. Leveraging their unique strengths, humanoid robots are poised to deliver transformative impacts across industries and usher in a new era of human-machine collaboration.

(Source: news.cn)

WRC 2025 unveils 10 trends in embodied intelligent robots

10 Trends in Embodied Intelligent Robots (2025) launched at WRC 2025
Photo credit: cctv.com

The opening ceremony of WRC 2025 also officially released *10 Trends in Embodied Intelligent Robots*

(2025), highlighting the directions expected to shape future research and applications. These include:

1. Embodied perception and cognition driven by the synergy of physical practice, simulators, and world models.

2. Multi-level, end-to-end embodied decision-making.

3. Integrated control approaches, combining model predictive control, reinforcement learning, and life sciences.

4. Embodied robot design powered by generative artificial intelligence.

5. Seamless hardware-software integration, with highly coordinated, dynamically adaptive systems.

6. Large-scale simulation "factories" that support natural language interaction, environment generation, robot design, decision-control algorithms, and hardware–software alignment.

7. Large-scale, high-quality embodied intelligence datasets built through both physical data collection and simulation synthesis.

8. Embodied robot clusters and human-robot collaboration powered by advanced multi-agent coordination mechanisms.

9. Cross-disciplinary open-source communities for embodied intelligent robots.

10. Safety evaluation and ethical frameworks for embodied intelligent robots, including behavior verification, decision interpretability, and data security standards.

(Source: Official website of WRC 2025)

Dialogues with Scientists

Global experts discuss future of robotics: From technology trends to governance pathways

On August 9, the main forum of WRC 2025 opened at the Beiren Etrong International Exhibition & Convention Center in Beijing. With a focus on industrial development, representatives from international organizations, national robotics associations, and leading enterprises shared insights on global trends shaping the robotics industry.

Xu Xiaolan delivering a speech

In her speech, Xu Xiaolan, Vice President of the All-China Women's Federation and President of CIE, noted that humanoid robot technology is advancing on multiple fronts and moving from laboratory breakthroughs toward industrial-scale application. Globally, hardware performance continues to improve, AI is making generational leaps in decision-making, and technologies such as datasets and virtual simulation are steadily progressing. Xu emphasized that the humanoid robotics sector shows strong growth potential, as manufacturers accelerate innovation, scale up production, and drive rapid expansion of China's industry. CIE's *Top 10 Potential Application Scenarios for Humanoid Robots* spans industrial manufacturing, commercial services, public well-being, and specialized fields. Looking ahead, Xu stressed that global cooperation on humanoid robotics is essential to meet shared challenges. She called for joint efforts to strengthen the ethical foundation of "robots for good," establish sustainable technological frameworks, introduce a global certification system for robot safety, and build an international platform for collaborative industry governance.

Takayuki Ito delivering a speech

Takayuki Ito, President of the International Federation of Robotics (IFR), highlighted in his address five key trends shaping the industry's future. He noted that the deep integration of AI and robotics will continue to open new applications, while embodied intelligent

Kathleen A. Kramer delivering a speech

robots, though attracting strong attention, still require major advances before becoming truly multipurpose. Rising sustainability demands are driving automation to improve material efficiency, extend product lifespans, and reduce costs. At the same time, emerging sectors such as construction, laboratory automation, and warehouse logistics are becoming important growth engines. Finally, with labor shortages as an ongoing challenge worldwide, the flexible deployment of collaborative robots and mobile manipulators is expected to provide effective solutions.

Kathleen A. Kramer, President and CEO of the Institute of Electrical and Electronics Engineers (IEEE), emphasized that sustainability has always been at the heart of IEEE's approach to guiding technological development. From the outset, IEEE has worked to embed sustainable practices through inclusive design and transparent systems that mitigate technological bias. Sustainability, she noted, must be understood as a multidimensional goal—encompassing environmental, social, and economic aspects. Localized policies are key to turning broad aspirations into practical, context-specific actions. Achieving this vision, Kramer argued, depends on engineers and developers building responsibly, with technical experts embedding transparency and inclusiveness across the entire design process. This forms the foundation of responsible AI and represents the essential

Juha Roening delivering a speech

pathway for the future of technology.

Juha Roening, Vice President of euRobotics, underlined the vast potential of Europe's robotics industry to emerge as a global leader, backed by strong technological expertise, abundant talent, and a broad market base. Yet the sector still lacks integrated strategic goals and unified standards. The most urgent task, he argued, is to fully leverage Europe's strengths in robotics R&D and artificial intelligence while working toward a truly cohesive framework—an area where China's experience provides valuable lessons. Roening also stressed the importance of flexible, efficient collaboration, noting that accelerating real-world deployment will require end users to clearly understand what robots can do in order to unlock their full potential.

(Source: Official website of WRC 2025)

Event Highlights

E-Town Robot Consumption Festival: Where technology sparks everyday living

A humanoid robot waving to guests at the festival's opening ceremony
Photo credit: *China Youth Daily*

On August 2, 2025, Beijing E-Town—the city's Economic-Technological Development Area—launched its first-ever Robot Consumption Festival, a prelude to WRC 2025. With the theme "Robo Deals, E-Town Must-Go!" the festival featured "Four Consumer Scenarios" and "Four Service Systems," offering one-stop experiences for enterprise clients as well as offline and online consumers. Visitors enjoyed everything from robot shopping and specialty dining to cultural products and interactive activities.

One of the biggest draws was the Robot Mall, a 4S store dedicated to embodied intelligent robots. Designed for enterprise users, the mall spans seven application areas—from healthcare and household to industrial and bionic robotics—and features more than 50 products. Guests tested real-world applications through interactive demos and even challenged robots to a game of chess or Go, gaining a compre-

hensive look at the field from iteration to commercialization.

Notably, WRC 2025 also debuted Robot Mall's pioneering full life-cycle service model, marking a shift from one-off product displays to an integrated service ecosystem.

Just steps away, the Robot Restaurant blended technology with daily life. In this futuristic eatery, robots served as bartenders, waste collectors, and even chess partners. Diners sampled robot-prepared dishes and drinks—pancakes, barbecue skewers, coffee—while a "Li Bai" embodied robot entertained guests by trading verses, creating an immersive fusion of gastronomy, culture, and tech.

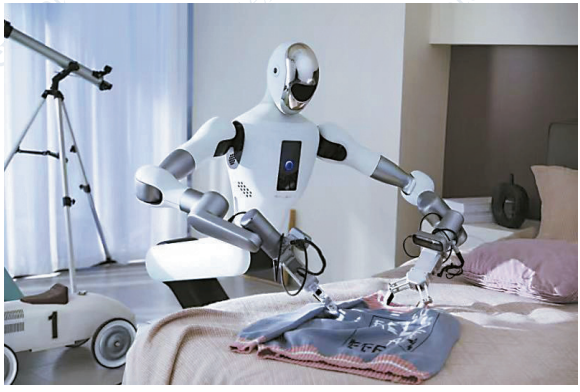
According to organizers, Beijing E-Town is moving full steam ahead in building an area-wide AI hub. The festival not only immersed consumers in cutting-edge experiences but also boosted innovation and channeled consumer demand back into R&D—shifting the robotics industry from technology-driven to demand-driven and fostering a closed cycle of research, application, feedback, and continuous improvement.

(Sources: people.com.cn and *China Youth Daily*)

WRC 2025 showcases "smart" lifestyle

The 2025 World Robot Conference spotlighted a wide range of robots designed to enhance daily living and public well-being, underscoring the vast potential of intelligent technology. From versatile household all-rounders to elder-care companions, from navigation partners for the visually impaired to safety assistants in outdoor settings, these innovations are pushing the boundaries of what robots can do. By combining cutting-edge technology with utility in home care, senior services, and beyond, they bring both warmth and efficiency into everyday life, offering a vivid glimpse of a truly "smart" lifestyle.

Household "all-rounder" at work



Embodied large-model robot Galbot folding clothes

One of the most popular exhibits was Galbot, an embodied large-model robot that impressed visitors with its versatility.

Galbot can hand a glass of water to a family member, pick up scattered items with precision, carefully clean up glass shattered by pets, and even help hang laundry.

"Unlike standardized factory floors, home environments are dynamic, unstructured, and require much more sophisticated human-machine interaction," explained a staff member. For robots to truly integrate into households, they need more than repetitive, preprogrammed actions—they must show adaptability. Advances in embodied intelligence, powered by high-degree-of-freedom robot bodies and end-to-end embodied large models such as GraspVLA and TrackVLA, are making this possible, overcoming long-standing challenges in unstructured domestic settings.

The Galbot team envisions a future where general-purpose robots can adapt across multiple environments and industries. As they become as indispensable as computers and smartphones, these robots could soon play vital roles in manufacturing, retail, and public services.

Smart elder-care attendants on duty

Service robot GoSide delivering a glass of water to an elderly person

Two next-generation embodied intelligent robots also drew strong interest: GoMove, a wheeled-legged robot designed for short-distance travel for old people, and GoSide, a service robot built for attentive in-home care.

In a live demonstration, GoMove switched seamlessly between four-wheel mode for steady driving and a wheel-leg hybrid mode to carry an elderly passenger up and down stairs. Its independent four-wheel drive and decoupled left-right design kept the seat level with the ground, matching the body's natural posture.

With advanced disturbance-resistance and vibration-suppression technologies, GoMove delivered a smooth, comfortable ride, even on cobblestone paths.

GoSide, meanwhile, proved its abilities as an intelligent housekeeper, navigating a simulated home environment with ease. When an elderly participant coughed and asked for a blanket, the robot immediately responded, retrieving it with precision.

According to the development team, GoSide supports both remote operation and local autonomous control. In remote mode, children can use vision-sharing technology to accompany and assist their parents in real time. In local mode, powered by large AI models, the robot can understand natural language, recognize environments, make decisions, and deliver close-range services to help ease loneliness. With more than four hours of continuous operation, GoSide provides reliable, sustained support for elder care.

Outdoor helper makes its debut

MOVENEW T1 quadruped robot fitted with a refrigerator module

The red-and-black MOVENEW T1 quadruped robot can be customized to user needs—serving not only as a dependable camping companion but also a potential life-saving guardian in emergencies.

Its unique "LEGO-style" modular design allows users to swap in accessories for different scenarios, whether a refrigerator, camera gear, or external battery packs. On a camping trip, for example, T1 can automatically regulate refrigerator temperature to keep drinks perfectly chilled.

Built on a self-developed full-stack AI large model, T1 adapts to challenging terrains such as steep slopes, gravel, and marshland. It can carry loads of up to 100 kilograms, run for 12 hours, and, when instructed—for instance, "carry the suitcase to the campsite"—scan the terrain, plan the best route, and adjust its gait for stable movement.

Where T1 excels is safety. Its advanced perception system continuously

monitors the user's condition. If it detects a fall or symptoms of hypothermia, it can assess the risk based on strong local computing power, activate its satellite communication module, and send an SOS with precise location data to the preset contact person. In the face of hazards such as landslides, it instantly triggers obstacle-avoidance protocols and issues warnings.

By integrating vision, inertial navigation, and pressure sensing into a unified control system, T1 achieves centimeter-level obstacle avoidance accuracy and millisecond-level response times—all without relying on cloud computing. Its onboard processing power alone supports path planning, task scheduling, and emergency response, making it a truly autonomous outdoor helper.

(Source: *Science and Technology Daily*)

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