ChatGPT

Rise of the Machines: Deep Research on AI Robotics (Humanoid Focus)

Introduction: Humanoid robots are rapidly advancing beyond science fiction. Over the past week (mid-July 2025), multiple teams reported new designs and AI controls that make bipedal robots more capable and practical. Leaders note that general-purpose humanoids are drawing global attention (one CEO remarked they've "seized the attention of people from around the world"). We survey the latest humanoid breakthroughs – new hardware, algorithms, and demos – drawing on multiple credible sources. We also briefly contrast these with non-humanoid robotics trends.

Major Breakthroughs

- **Mass Deployment & New Models:** Chinese startup AiMOGA announced it has delivered *220 humanoid robots* as of April 2025 and is scaling up deployment in partnership with automaker Chery. These robots integrate Chery's autonomous-driving/cockpit systems with AiMOGA's own large AI model (called "CheryGPT"), which the company says yields "stable mobility, multi-modal understanding, and commercial-ready interaction". In practice, AiMOGA reports its robots are already active in car showrooms (greeting customers and answering questions), boosting sales leads and reducing front-desk workload. The company's roadmap now extends from auto dealerships into malls, service centers, and even household assistance. This represents a major hardware and integration advance: bipedal robots built for real service environments, backed by strong engineering and supply chains.

- **Collaborative Research:** China continues to build humanoid expertise through partnerships. For example, on July 9 the Beijing Humanoid Robot Innovation Center joined with sports giant Li Ning to launch a *"Humanoid Robot Movement Science"* joint laboratory. This lab will explore theoretical and technological breakthroughs in robot locomotion and dynamics – reflecting an emphasis on rigorous science to improve stability, agility, and safety. Such initiatives underscore the push to translate research into real robots.

- **Production Scale:** Established companies report rapidly growing output. Unitree Robotics (a leading Chinese humanoid-maker) said in a July 15 press conference that it has **"significantly increased deliveries"** of robots in H1 2025. Its founder noted that interest in Chinese humanoids is surging worldwide. This ramp-up suggests production lines and supply chains are maturing, a vital step toward lowering costs and meeting demand.

- **AI-Driven Dexterity:** On the algorithm front, learning-based control is yielding big gains in manipulation. For instance, Figure AI reports that its humanoid *Helix* has made dramatic progress via scaled-up training. After just three months in a logistics warehouse, Helix now sorts a wide variety of packages (rigid boxes, poly mailers, padded envelopes, etc.) with **near-human dexterity and speed** [1]. It handles new item types and has increased throughput by ~20% (≈4.05 seconds per package) while maintaining ~95% barcode-scanning success [2]. This leap – achieved through additional

demo data, new vision/memory modules, and even force feedback – highlights how deep learning and large training sets are making humanoids more proficient at real tasks.

Together, these breakthroughs – new robot models, partnerships, mass production, and smarter AI controls – represent concrete steps toward useful humanoids.

Demonstrations and Prototypes

Recent demos have shown these advances in action. At a July 2025 Beijing conference, AiMOGA hosted *3,000*+ auto dealers who saw live humanoid robots in operation. In those demos the robots greeted visitors, explained car features, and answered questions, illustrating readiness for customer-facing roles. Early trials reportedly increased lead conversions, validating the technology in a real commercial setting.

Figure AI has likewise demonstrated its Helix performing continuous work. The company shows Helix executing hour-long logistics runs without human intervention – exemplifying reliable, uninterrupted operation. (In public materials they note Helix now "handles a wider variety of packaging" and approaches human speed and precision [1].) These live showcases – in showrooms and warehouses – signal that humanoids are moving from lab prototypes to fieldable systems. (Other prototypes also appeared: e.g., UK startup *Humanoid.ai* exhibited its wheeled general-purpose robot HMND 01 at a recent expo, highlighting conversational and grasping capabilities – though that event was in June.)

AI Integration

All these robots leverage cutting-edge AI for control and perception. A key trend is embedding large language and vision models on the robot or in its system. AiMOGA's CheryGPT is one example: their humanoids pair Chery's autonomous driving stack with this generative model to interpret multi-modal inputs and plan motion. In warehousing, Amazon has begun deploying its own in-house AI: it rolled out a "DeepFleet" generative foundation model to coordinate its 1,000,000+ mobile robots [3]. DeepFleet acts like a smart traffic controller – it plans optimal routes for each unit, reducing robot travel time by ~10% [3]. This illustrates how AI (especially generative or agentic models) is moving onto the edge of robotics, enabling fleets of robots to adapt and optimize themselves in real time.

On-board control is also advancing: Figure AI's Helix uses neural-network policies with new memory modules. A "vision memory" allows Helix to remember past camera views, and a state history lets it react mid-motion if a grasp slips [4]. These AI-driven controllers mean the robot isn't just following pre-scripted motions but learning fluid strategies (e.g. Helix even learned to pat down packages to flatten them for scanning [5]). In sum, recent breakthroughs are as much about *AI integration* (learning algorithms, large models, perception fusion) as about hardware – demonstrating that advanced software is now powering humanoid capabilities.

Comparative Advances (Non-Humanoid)

It's worth noting that many of the highest-profile robotic advances remain in specialized (non-humanoid) form factors. For example, Amazon's warehouse robots are a mature success: the company just marked its one-millionth deployed robot and uses AI (DeepFleet) to make these specialized bots much more efficient [3]. In contrast, humanoids are still largely used in controlled environments. As one industry observer

notes, China and the US bring different strengths to humanoids – China excels in hardware, the US in AI software – and true general-purpose humanoids are still an open challenge. (Indeed, a Boston Dynamics executive quipped that fully general humanoids "have not really been invented yet," reflecting cautious industry views.) Nevertheless, by highlighting the complementary advances – AI coordination for fleets (Amazon), and hardware-software integration for humanoids – we see a full ecosystem emerging.

Applications and Implications

The emerging use cases for humanoids are broad. Today we see them in **customer service and logistics**. AiMOGA's target deployments are auto showrooms and retail: its robots already help customers at dealerships and, in future, are planned for malls, service centers, and even homes. In industry, robots like Helix could transform warehouses and e-commerce logistics by autonomously sorting goods. Other reported scenarios (in China and elsewhere) include manufacturing assistance and elderly care, reflecting both commercial and social goals.

These applications have major implications. Proponents argue that robots will augment, not replace, humans. For example, Amazon emphasizes that its robots make work safer and have actually **created** new jobs: since 2019 it has upskilled over 700,000 employees for robot-centric roles and its latest fulfillment centers require *30% more* maintenance and engineering staff [6]. Similarly, Chinese policies (e.g. a national plan announced earlier in 2025) explicitly promote humanoids to help address aging and labor shortages.

At the same time, challenges remain. Experts stress that humanoid robotics is technically hard: balancing, dexterity, perception – these are nontrivial. Unitree's CEO noted that international collaboration and open ecosystems will be crucial to surmounting these hurdles. Safety and trust are also under consideration (China's guidelines call for risk controls on humanoid deployment). Regulators worldwide are still catching up: for example, recent U.S. policy debates on AI signal that consistent rules for robotics are not yet in place.

Outlook: Despite challenges, the pace is accelerating. Humanoid robot costs are expected to fall (one estimate suggests parts cost could halve by 2030), and billions of dollars are flowing into this sector. In the coming months we will see more demos (e.g. sports or skill contests) and possibly consumer-facing pilots. Analysts predict that within a decade humanoids could enter homes and more complex environments – achieving, as one founder put it, "human-level" versatility. The past week's developments – from scaled deployments to smarter AI brains – show that the "rise of the machines" is not just hype but a concrete, global trend in robotics [3].

Sources: Authoritative press releases and news reports from robotics companies and media [1] [2] [3] (see citations above).

---

[1] [2] [4] [5] Scaling Helix: a New State of the Art in Humanoid Logistics
https://www.figure.ai/news/scaling-helix-logistics

[3] [6] Amazon deploys over 1 million robots and launches new AI foundation model
https://www.aboutamazon.com/news/operations/amazon-millionrobots-ai-foundation-model