

ASIAN EXPERT SERIES | **Article 5 of 5**

Why Asia is the investment sweet spot in physical AI

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Physical AI represents the next phase of the AI revolution where intelligence moves from the cloud into the real world via robots, drones and autonomous systems.



The need to process data locally on-device as well as constraints around power, size and cost in physical AI shift value toward hardware, where Asia dominates.



Asia offers investors a wider opportunity set of AI beneficiaries which includes semiconductor manufacturers, sensor makers, precision component suppliers and electronics manufacturing services providers.



What is physical AI?



Physical AI lets autonomous systems like drones, AI-smart factories, robots, and self-driving cars perceive, understand, reason, and perform complex actions in the physical world. Its impact is growing across multiple industries. Amazon's fulfilment centres across the globe are powered by over a million robots - sorting, lifting, and transporting packages to accelerate deliveries to customers. Meanwhile, self-driving taxis are operating

in more than 10 countries, and utility companies have deployed drones to inspect hazardous environments like high-voltage lines and open gas pipes. In healthcare, more than 60% of large hospitals worldwide have integrated surgical robotics into their core platforms, and robotic-assisted procedures make up more than half of complex surgeries at healthcare systems in developed countries¹.



What is the potential of physical AI?



Physical AI is still at early stages. Historically, limited real-world training data has constrained Physical AI development and most robotics solutions today still require some degree of human supervision. However, advances in simulation platforms are helping to provide synthetic training data at scale which paves the way for more autonomous Physical AI applications in the future.

As physical AI unlocks new capabilities that transform industries, the potential is significant. It is estimated that there will be 2 million humanoids (robots that look and behave like humans) in the workplace by 2035 and 300 million by 2050, creating a total addressable market between USD1.4 trillion and USD1.7 trillion². And this forecast does not even include other physical AI categories such as industrial/service robots, autonomous systems and drones etc.

¹ Growth Global Insights. 13 March 2026. ² UBS. 20 June 2025.



Why would the rise in Physical AI create different winners from Generative AI?



Physical AI has different requirements from Generative AI. It needs to compute on the **edge** ie process data locally on-device instead of sending data to a centralised cloud or data center. This is because physical AI requires instant local inference to make real time autonomous decisions in order to prevent failure or safety risks. Physical AI cannot depend on network connectivity which may be intermittent or slow. Fig. 1.

As a result of these requirements, physical AI faces constraints on power where it needs to balance battery life and heat management. It also faces constraints on size as compute must be embedded within the devices. There are also constraints on cost given the need to deploy at scale. These constraints shift value from software to hardware, where Asia dominates.

● Fig. 1 Requirements of Gen AI vs Physical AI



Source: Eastspring Investments. GPU = Graphics Processing Unit. May 2026.



Does Asia have an advantage in Physical AI?



Robots, autonomous systems and industrial machines rely heavily on sensors, semiconductor chips, actuators, controls and other precision components. For robotics in particular, the development of robotic hands capable of

matching the dexterity, precision and adaptability of the human hand is key. These are areas in which Asia has a competitive advantage. Fig. 2.



● Fig 2: Asia provides many of the critical components in a humanoid



Source: Eastspring Investments. May 2026.

Asia's edge in physical AI hardware is rooted in its manufacturing depth, integrated ecosystems, and real-world deployment advantages.

First, the region benefits from decades of manufacturing expertise producing high-precision components at scale for consumer electronics. This experience enables Asian manufacturers to enjoy cost efficiencies. This is important as physical AI scales from pilot projects to mass deployment.

Second, Asia's deeply integrated supply chains allow for faster iteration cycles, lower integration costs, and shorter lead times. This ecosystem density is important in physical AI, where close coordination between sensors, compute modules, and mechanical systems is required.

Finally, Asia's real-world deployment environment provides a powerful feedback loop that further strengthens its competitive advantage in physical AI. As one of the world's core manufacturing regions, Asia benefits from supportive government policies, well-established supply chains, and abundant application scenarios across factories, logistics networks, and automated production systems.

China is a good example: government initiatives have actively promoted the development of robotics and autonomous driving, while companies continue to invest in new product development and commercialisation, gradually forming a complete ecosystem spanning components, system integration, and end applications.



This ecosystem not only supports the upgrading of existing manufacturing supply chains but also accelerates technology validation and market adoption through real-world use cases. Examples include the large-scale coordinated control capabilities demonstrated in the robot performance at the Spring Festival Gala, as well as humanoid robots beginning to work on production lines at electric vehicle factories. Together, these developments highlight how physical AI in Asia is moving from concept to real-world deployment.

However, despite these strengths, there are also challenges. A geographic concentration of supply chains in the region exposes production to geopolitical tensions and trade restrictions. Regulatory constraints, privacy concerns, and fragmented standards across markets may also limit scalability. At the same time, continued innovation and investment in R&D in advanced chip design, packaging and system architecture is needed to maintain Asia's lead in edge AI optimisation.



What does the rise of Physical AI mean for investors?



Physical AI represents the next phase of the AI revolution where intelligence moves from the cloud into the real world. In physical AI, constraints around latency, power, size and cost shift value toward hardware and system integration, reinforcing Asia's strengths. The region's deep manufacturing expertise, tightly integrated supply chains, and real-world deployment ecosystems give it an edge in this transformation.

For investors, the opportunity set is evolving beyond Generative AI and Agentic AI beneficiaries toward Physical AI enablers, including semiconductor manufacturers, sensor makers, precision component suppliers, and electronics manufacturing services (EMS) providers, many of which are based in [Asia](#).

As these companies navigate geopolitical tensions as well as changes to regulatory frameworks and industry standards, [active investing](#) will be needed to identify the alpha opportunities and companies that are most likely to succeed.



This article is the last in a five-part series on the AI technology cycle and the investment opportunities in Asia as the cycle evolves and matures. [Explore the full series.](#)

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