

WORLD

China rises as robotics powerhouse

AI, smart manufacturing drive country's dominance in robot output, deployment

By **LIA ZHU** in San Francisco
liazhu@chinadailyusa.com

China is emerging as one of the world's leading forces in robotics, combining artificial intelligence with smart manufacturing strength to dominate both production and installation, recent industry analyses show.

While the United States, Germany and Japan have historically led in robotics technology, China is now outpacing its peers in terms of output, deployment and domestic adoption.

"China is emerging as a robotics powerhouse as it combines advanced artificial intelligence with low-cost manufacturing to fill industries with smart and affordable robots," said a report by Moody's Ratings.

The country's robust growth in the robotics sector is fueled by rapid advances in supporting technologies, including 5G networks, semiconductors, sensors and battery innovation. These advances are driving not only the development of traditional industrial robots but also a new generation of AI-powered humanoid.

In absolute terms, China has installed more than half of the world's robots since 2021, averaging around 280,000 new units annually, according to the Moody's report shared with China Daily.

The country's robot density — the number of robots per 10,000 employees — climbed from 97 in 2017 to 470 in 2023, a nearly four-fold increase. This placed China second globally, after South Korea (1,012) and ahead of Germany (429), Japan (419) and the US (295), according to Moody's.

A separate report from Morgan Stanley said China's robotics market will more than double from \$47 billion last year to \$108 billion by 2028, expanding at an annual rate of 23 percent. China already accounts for about 40 percent of the global robotics market, underscoring its rising stature as an innovation hub.

Analysts attributed much of the recent boom to China's shift toward emerging high-tech industries such as new energy vehicles, solar panels and lithium-ion batteries — sectors that are increasingly relying on domestically produced, cost-effective robots to meet production demands.

Production surge

Data cited by Moody's showed that lithium-ion battery production in China reached 29 billion units last year, a 20 percent increase year-on-year. Solar panel output hit 685 gigawatts, up 27 percent over the previous year, while new energy vehicle production rose 34 percent to 12.9 million units last year.

China has maintained its position as the world's largest market for industrial robots for more than a decade, with widespread adoption across the automotive, electronics and metal processing industries.

According to research firm Grand View Research, China's industrial robotics market is projected to reach \$16.5 billion by 2033, growing at a compound annual growth rate of 6.1 percent from 2025 onward.

Rising labor costs and an aging workforce are pushing companies to invest more heavily in automation across key manufacturing industries such as electronics and automotive.

In addition, the rising shift toward smart manufacturing is significantly enhancing productivity, quality control and operational efficiency, thereby driving the rapid expansion of China's industrial robotics industry, according to the company.

For example, the Swiss engineering firm ABB launched three new robot product lines at its Shanghai Mega Factory this month. These robots, embedded with AI and cloud-based features, are tailored to midsize and small enterprises seeking flexible, scalable automation solutions. Industry experts expect such innovations to further bolster market expansion.

Complex tasks

As China's population ages and the labor pool contracts, demand is expected to grow for humanoid robots capable of handling complex tasks in both industrial and service settings. These AI-powered robots mimic human form and behavior, expanding their use cases beyond traditional factory lines.

Moody's Ratings highlighted that AI is expected to supercharge robot capabilities, facilitating their integration into daily life.

China has led the world in humanoid-related patent filings over the past five years, with 5,688 filings compared with 1,483 in the US, according to Morgan Stanley's February research note.

Morgan Stanley forecast an adoption push for humanoids in China in the second half of this year, with large State orders driving downstream deployments. Significant commercial deals involve companies such as UBTECH Robotics and Unitree Robotics supplying humanoids to automotive and telecom giants.

The investment bank projected the global humanoid robotics industry will reach a value of \$5 trillion by 2050, with China expected to lead in both technological development and adoption. By that year, China is forecast to have 302.3 million humanoid units in use, compared with 77.7 million in the US.

Foreign robot manufacturers are facing increasing competition from agile Chinese companies that leverage rapid innovation, advanced supply chains and lower costs, according to Moody's Ratings.

Foreign brands' share in China's industrial robot market fell from more than 70 percent in 2020 to 53 percent in 2023, while Chinese suppliers have achieved double-digit sales growth every year since 2020. Domestic robot producers have expanded their global presence, with exports growing steadily. Chinese firms' share in the local robotics market has surged from 29 percent in 2015 to 47 percent in 2023.

Despite the progress, Moody's cautioned that the robotics sector faces significant long-term challenges, particularly fears of mass job displacement and the potential misuse of autonomous machines.



Students from the Chinese mainland and Hong Kong, part of the volunteer team from the GX Foundation, a Hong Kong-based NGO, join Vanuatu's Independence Day celebration in Port Vila on Wednesday. YANG HAN / CHINA DAILY

Vanuatu celebrates Independence Day, with Chinese among crowd

By **YANG HAN** in Port Vila, Vanuatu
kelly@chinadailyapac.com

Vanuatu's celebration of its 45th Independence Day on Wednesday was marked by a special group of Chinese student volunteers, symbolizing the deepening relationship between China and the South Pacific island nation.

Independence Day is a public holiday commemorating Vanuatu's freedom from the United Kingdom and France on July 30, 1980. China officially established diplomatic relations with Vanuatu in 1982.

The ceremony at Independence Park in the capital, Port Vila, was attended by top government leaders, including Vanuatu President Nikenike Vurobaravu and Prime Minister Jotham Napat. Officials, foreign diplomats, including Chinese Ambassador Li Minggang, and around 60 guests also participated in the event.

The celebration also featured nearly 20 student volunteers from the Chinese mainland and the Hong Kong Special Administrative Region, led by the GX Foundation, a Hong Kong-based NGO.

The students are in Vanuatu — an island nation about 1,800 kilometers east of Australia — for humanitarian aid projects such as the control of dengue fever and the distribution of disaster-preparedness kits.

"The participation by students from the Chinese mainland and Hong Kong reflects the increasingly deepened relationship between China and Vanuatu," said Leung Chun-ying, vice-chairman of the National Committee of the Chinese

People's Political Consultative Conference and chairman of the GX Foundation.

Leung said he hopes the foundation's projects in Vanuatu can contribute to people-to-people connectivity and mutual understanding between the two countries.

Wearing the vibrant colors of red, green, black, and yellow — the colors of the Vanuatu flag — people of all ages and all groups gathered as early as 5 am for the parade and flag-raising ceremony.

Tele Samuelu, 35, told China Daily that the infrastructure of Vanuatu has improved over the past decades, with the support of the international community, including China.

"There are a lot of projects that the Chinese government has helped Vanuatu, so ... (I want to say) *xie xie* ... it is good for the Vanuatu people," said Samuelu, using the Chinese equivalent of "thank you".

Harry Atisson, 55, who has participated in every Independence Day celebration since 1980, said China's support — from infrastructure to healthcare and business — has improved local livelihoods.

"China is giving us a lot of support to help with the infrastructure. We want to thank the Chinese government for supporting us and building Vanuatu to another level," Atisson said.

The GX Foundation has helped Vanuatu's Ministry of Health through a program to fight malaria, dengue fever, and other vector-borne diseases in the country.

"On behalf of the government and people of Vanuatu, I extend our

sincere gratitude to China for the continued and generous support to our health sector," Vanuatu's minister of health, John Still Tariqetu, said at a ceremony on Tuesday.

The program will donate 10,000 rapid dengue test kits, 75,000 mosquito nets, 1,000 mosquito lamps, 40,000 sticky fly traps, and various materials — aimed at enhancing public awareness of vector-borne diseases and strengthening local public health prevention efforts.

Leung said he hopes the program will protect the people from vector-borne diseases and build long-term resilience. "Climate change will continue to add to the risks of dengue epidemic. But our cooperation will prevail," he said.

This two-year program was launched under a memorandum of understanding between the GX Foundation and Vanuatu's Ministry of Health, signed in February.

In a pilot phase from March through July, the first batch of 134 sets of prevention supplies was distributed to health clinics in various villages and medical institutions, with 90 sets allocated to Vila Central Hospital.

Robert Vocor, the hospital's acting medical superintendent, said the dengue testing kits have reduced testing time to less than 20 minutes, compared to up to 24 hours for laboratory testing.

Founded in 2018, the GX Foundation focuses on providing humanitarian aid in medical and public health to countries involved in the Belt and Road Initiative. Vanuatu is the eighth country where the foundation has carried out projects.

Concerns rise as Chinese students' tally in US drops

By **MAY ZHOU** in Houston
mayzhou@chinadailyusa.com

In 2023, the number of Chinese students in the United States had dwindled to roughly 277,000 from its height of 373,000 in 2019.

Yet, despite a decline in numbers, Chinese students and their families continue to make significant contribution to the US economy by spending approximately \$14.4 billion in the US in 2023, according to Julia Chang Bloch, executive chair of the US-China Education Trust.

That was about 30 percent of total US education exports and helped to create 143,000 jobs, she said.

"International students and Chinese students fill STEM labs, enrich classrooms, launch startups, and create businesses," Bloch said on Friday at an online discussion organized by her organization and the US-China Business Council. "They are central to US competitiveness, from AI and semiconductors to energy and advanced manufacturing."

Amy Gadsden, executive director of Penn China Initiatives and associate vice-provost for global initiatives at the University of Pennsylvania, said that overall, international students have spent \$43 billion in the US. At the calculation of \$120,000 per job, that means about 358,000 jobs.

Gadsden added that 47 percent of the Massachusetts Institute of Technology's faculty is foreign-born. "That's one of our top universities producing some of the greatest innovations and insights at the cutting edge of science."

Omar Chihane, general manager of TOEFL at Educational Testing Service in New Jersey, said that about 54 percent of international students are in the STEM field. "Many of today's entrepreneurs, engineers, researchers in the US begin their journey with TOEFL score."

He cited anecdotal data that about 15 percent of Meta's researchers and superintelligence are from China, and 75 percent are first-generation immigrants.

However, Bloch said the US education system's attraction is waning as the Donald Trump administration announced that it will aggressively revoke visas for Chinese students.

Chihane said that while the US remains the most popular destination for TOEFL test-takers in China and internationally, he is observing a very distinct shift.

"More students are applying to multiple destinations, hedging their bets. So not just the US, but Canada, the UK, Australia, increasingly now Asia, Europe and the Middle East.

"This diversification isn't just about geopolitics. It reflects really a desire for certainty, respect and future opportunity. The US still holds a prestige advantage, but it can't rely on reputation alone."

Recommendation letters

Sean Stein, president of the US-China Business Council, observed a similar trend. He is asked to write recommendations for students applying to colleges every year.

"Last year, earlier this year, was the first time I've ever had students ask me to not just write letters for American universities, but for universities in Canada or in Australia. ... I do think that we're at risk of losing some of the best and brightest."

Stein said he witnessed one such example at a member company, which is a Silicon Valley startup and an industry leader in a certain type of specialized additive manufacturing technology.

"The technology was developed by two graduate students out of Stanford, that both happened to be Chinese students. They developed the software, they developed the tech, and this company was built around them and the tech.

"They went home after OPT (optional practical training) back to China, and then were unable to get visas to return back to the United States to continue to work at the company despite being sponsored by the company for visas."

Even with the intervention of the US-China Business Council, the two Chinese nationals still cannot obtain a visa more than half year later. "Now the industry leader is in Shenzhen (in Guangdong province) and is not in Silicon Valley," Stein said.

Quake off Russia sparks Pacific tsunamis

CHIBA, Japan — One of the strongest earthquakes ever recorded struck Russia's sparsely populated Far East on Wednesday, causing tsunamis up to 4 meters across the Pacific and sparking evacuations from Hawaii to Japan.

The magnitude 8.8 quake struck off Petropavlovsk-Kamchatsky on Russia's remote Kamchatka Peninsula, and was the largest since 2011 when one of magnitude 9.1 off Japan and a subsequent tsunami killed more than 15,000 people.

Russian authorities said a tsunami hit and flooded the port town of Severo-Kurilsk, crashing through the port area and submerging the local fishing plant.

Authorities said the population of around 2,000 people was evacuated.

The waves, which were up to 4 meters high in some areas, reached as far as the town's World War II monument about 400 meters from the shore line, according to Mayor Alexander Ovsyannikov.

Several people were injured in Russia by the quake, state media reported, but none seriously.

"The walls were shaking," a Kamchatka resident told state-run TV channel Zvezda.

"It's good that we packed a suitcase, there was one with water and clothes near the door. We quickly grabbed it and ran out ... It was very scary," she said.

Later on Wednesday, the authorities in the Kamchatka Peninsula announced the tsunami warning had been lifted.

Officials from countries with a Pacific coastline in North and South America — including the United States, Mexico, Ecuador and Colombia — issued warnings to avoid threatened beaches.



A kindergarten is damaged after an earthquake in Petropavlovsk-Kamchatsky, Russia, on Wednesday. GOVERNMENT OF KAMCHATKA TERRITORY VIA XINHUA

In Japan, nearly 2 million people were advised to evacuate, and many left by car or on foot to higher ground.

One woman was killed as she drove her car off a cliff as she tried to escape, local media reported.

A 1.3-meter high tsunami reached a port in the northern prefecture of Iwate, Japan's weather agency said.

By Wednesday evening, the agency had downgraded its tsunami alerts — issued for much of the archipelago — to advisories.

Nuclear safety

Japanese nuclear power plants reported no abnormalities. The operator of the Fukushima Daiichi plant damaged by the 2011 tsunami said about 4,000 workers are taking shelter on higher ground at the plant complex while monitor-

ing remotely to ensure safety.

In Hawaii, Governor Josh Green said flights in and out of the island of Maui had been canceled as a precaution.

The Pacific Tsunami Warning Center later downgraded the alert for Hawaii to an advisory and local authorities canceled a coastal evacuation order.

Wednesday's quake was the strongest in the Kamchatka region since 1952, the regional seismic monitoring service said, warning of aftershocks of up to 7.5 magnitude.

The epicenter of the earthquake is roughly the same as the massive 9.0 temblor that year, which resulted in a destructive, Pacific-wide tsunami, according to the US Geological Survey.

AGENCIES VIA XINHUA



A robot developed by Chinese tech company EngineAI dances in Shenzhen, Guangdong province, on June 25. LI AN / XINHUA