The China AI and Autonomy Report

A biweekly newsletter on AI and autonomy developments in China

Welcome to the *China AI and Autonomy Report*, a biweekly newsletter published by CNA. Read in browser. Happy Lunar New Year! In this issue, we cover allegations that PRC drone manufacturer DJI has been obscuring its financial ties to the PRC government. The People's Liberation Army (PLA) has welcomed in the new year with a celebration in the metaverse. PRC researchers have developed an AI agent to conduct air combat simulations against human pilots. The Wing Loong unmanned aerial vehicle (UAV) has been upgraded. The PRC government is shifting its focus to support innovative small enterprises. SenseTime has opened up one of the largest AI computing centers in Asia. China has released more policies and regulations for the high-tech industry. The Beijing Olympics have started, and AI is playing a role. In particular, a *People's Daily* commentary has dismissed concerns that an app developed for COVID-19 tracing has data vulnerabilities.

THIS WEEK'S CONTENTS

NEW CNA NEWSLETTER

CNA is excited to announce the launch of *PLA UPDATE,* a monthly newsletter of noteworthy developments in the PLA. The newsletter features selected articles from Chinese language sources that may not otherwise receive wide attention. Those wishing to subscribe can send an email to PLAUPDATE@CNA.ORG.

MILITARY AND NATIONAL SECURITY

PRC drone manufacturer alleged to have obscured PRC government support. According to an investigation conducted by the *Washington Post* and video surveillance research group IPVM, DJI—a leading PRC manufacturer of drones—has received state investments despite statements to the contrary. [1] According to the article, "the documents show that four investment bodies owned or administered by Beijing have invested in the popular drone brand in recent years, including a state asset manager that has pledged to play a key role in promoting partnerships between private enterprises and the Chinese military."

In 2020, DJI stated on its blog that it "did not receive any Chinese government investments." According to a DJI statement, "DJI is privately held. The company is solely managed by and majority-owned by the founder team. Shareholders other than the founders do not participate in the company's management and operation."

PLA Rocket Force unit employs intelligent training and management system. According to *China Military Online*, an official media outlet for the PLA, a PLA Rocket Force brigade developed an intelligent training and management system to record training data automatically. [2] In the past, thousands of data points concerning missile operation training, evaluation and assessment, and daily management had to be collected manually.

PLA conducts Lunar New Year celebration in the metaverse. On February 1, the first day of the Lunar New Year, the PLA invited 400 service personnel to celebrate in the metaverse.[3] The celebration integrated AI, image recognition, semantic analysis, holographic imaging, and other technologies to guide participants through multiple types of experiences, allowing them to virtually visit different PLA units around the world and even in outer space. Units in the metaverse included Gobi Desert-based unit 321134, an honor guard brigade, a PLA unit conducting peacekeeping operations in South Sudan, and the crew of the Shenzhou-12, who conducted the first mission to the Tianhe space station in 2021.

Scenes from the PLA's Lunar New Year celebration in the metaverse

Left, Main hall of the Lunar New Year; *right:* Invitees comment on a short drama based in the Gobi Desert. Source: *China Military Online,* Feb. 3, 2022.

UNMANNED SYSTEMS

PRC researchers develop AI agent to teach UAVs air combat (see article [here](#)). [4] Researchers from the China Aerodynamics Research and Development Centre, described as the PRC's largest air propulsion research institute, wrote an article in the peer-reviewed PRC journal *Acta Aeronautica et Astronautica Sinica* describing the development of a simulation to train an AI agent to engage manned aircraft in air-to-air combat. According to the researchers, it took 800,000 simulations for the AI to win most of the encounters against a human pilot. The simulations appear to be similar to a 2020 [contest](#) conducted by Maryland-based Heron Systems in which an AI algorithm beat an F-16 pilot 5-0.

J-20 fighter may get unmanned and "loyal wingman" variants. [According to the state-run *Global Times*](#), a PRC military analyst speaking on China Central Television stated that the J-20 could encompass several variants, include versions armed with a directed-energy weapon, an early-warning variant, an unmanned variant, and a variant that can control "loyal wingman"-type drones that accompany the aircraft in air superiority and/or ground attack missions.[5] This is not the first time that the J-20 has been discussed as potentially having unmanned roles. In October 2021, *[Air Force Magazine](#)* reported on the appearance of a two-seat version of the J-20 that led to speculation that it could be used to develop the "loyal wingman" concept.[6] The J-20 Mighty Dragon is a fifth-generation, multi-role fighter developed by the Chengdu Aircraft Industries (Group) Company, a subsidiary of the state-owned aviation conglomerate Aviation Industry Corporation of China (AVIC). According to Janes, the first flight of the J-20 occurred in 2011, and it entered into service in February 2018.[7]

AVIC announced that the Wing Loong-1E UAV conducted its maiden flight on January 18. The *Global Times* [reports](#) that the UAV is manufactured out of lightweight composite materials that give the aircraft greater range, longer endurance, and better reliability than previous variants.[8] According to PRC media [reports](#), the aircraft has been designed to compete in international markets and is similar to the [US MQ-1C Gray Eagle](#), which according to the US Army has a range of 2,500 miles and an endurance of more than 27 hours.[9]

According to *[China Military Online](#)*, the new Wing Loong variant "highlights China's determination and persistent efforts in mastering independent key and core technologies in its aerospace sector, to safeguard national security, economic development and people's livelihoods." The Wing Loong-1E is developed by AVIC (Chengdu) Unmanned Aerial Vehicle System Co., Ltd., an AVIC subsidiary located in Chengdu.[10]

PRC-based logistics company SF Express has become the first company in the PRC to receive permission to test regional UAVs. According to the PRC's official English-language newspaper, *[China Daily](#)*, SF Express technology unit SF UAS has been allowed to test commercial operations of a regional logistics drone capable of carrying a payload of more than a ton.[11] Flight operations will be limited to the city of Yulin, Shaanxi Province and surrounding areas in central China. SF Express is one of China's largest delivery services and logistics companies and is based in Guangdong. SF Express is following a three-part development plan consisting of "large manned transport aircraft+large branch drones+terminal delivery drones."

PRC defense industry increases international sales of UAVs. The *South China Morning Post* [reports](#) that Algeria has agreed to purchase six Caihong-5 UAVs, and that Egypt is in talks with the PRC to purchase a number of Wing Loong-1D UAVs.[12] The Caihong-5, or Rainbow-5, manufactured by the China Aerospace Science and Technology Corporation, is described as China's equivalent of the US Air Force's [MQ-9 Reaper](#) UAV, which has a maximum takeoff weight of 10,500 pounds, a range of 1,500 miles, and a ceiling of 50,000

feet. The PRC is offering low pricing and convenient payment options to increase its share of the international armed UAV market, including paying through installments and barter.

The Algerian purchase follows its recent acquisition of Caihong-3 and Caihong-4 UAVs. According to Ben Ho, an air power researcher at the S. Rajaratnam School of International Studies in Singapore, PRC success in selling UAVs is said to be attributable to a manufacturer strategy that offers reasonably priced aircraft with "good enough" capabilities and the US policy of limiting UAV sales to close allies and partners.

INDUSTRY

PRC government promotes "little giants" to advance high-tech industry. Bloomberg reports that the PRC government is increasing support for smaller technology companies called "little giants."[13] The program, more than a decade old but receiving increased attention from Beijing, is seen as a way to reposition government support away from large technology companies like Alibaba and Tencent to smaller innovative companies that have shown promise in core technology areas designated by the central government, such as robotics, quantum computing, and semiconductors. According to Bloomberg, the Ministry of Industry and Information Technology has designated 4,762 companies as little giants since 2019 and plans to create 10,000 little giants by 2025. Companies that are designated as little giants receive tax breaks, favorable loans, and assistance with finding employees.[14]

MIIT is also highlighting its support to small and medium-sized enterprises (SMEs). *Global Times* notes in an article that the Ministry of Industry and Information Technology (MIIT) pledged to cultivate "innovative SMEs" in high-end digital industries such as the metaverse, blockchain, and other AI-enabled technology.[15] The article also argues that because China is an early pioneer of 5G technology, there is a natural interest for the country to "embrace the metaverse." Earlier in January, *Global Times* also noted that many local governments in China incorporated government support for metaverse applications into their work plans for 2022.[16]

SenseTime launches computing center in Shanghai. SenseTime, the PRC's largest AI company by revenue, has started operations of one of the largest AI computing centers in Asia (see English language *Global Times* article here and Chinese language *Liberation Daily* article here).[17] The computing center, located in Shanghai's Lingang New Area, started operations on January 31 and has a peak computing power of 3,740 petaflops (one petaflop is equivalent to a quadrillion operations per second)—reported to be the fastest in China. The computing center cost 5.6 billion yuan (approximately US$880,364,688) and encompasses 130,000 square meters. It is intended to lower the barriers to entry for organizations looking to integrate AI into their applications and research and to accelerate the development and use of smart chips. According to Yang Fan, SenseTime's vice president, the computing center can provide cloud computing services and modeling and simulation capabilities for government, industry, and scientific research communities.

AInnovation lists on Hong Kong Stock Exchange with IPO. AInnovation, a business AI provider, was officially listed on the Hong Kong Stock Exchange as Qingdao Chuangxinqizhi Technology Group Ltd. on January 27. The IPO was reported by Phoenix News, noting that AInnovation's listing follows the path of the "four AI dragons," referring to the companies Cloudwalk, SenseTime, Yitu, and Megvii, which listed on the Shanghai Stock Exchange in 2021.[18] According to AInnovation's Hong Kong listing, Kai-Fu Lee, who wrote the popular book *AI Superpowers*, is chairman of the board.[19] According to *Phoenix News*, AInnovation's business is concentrated in the manufacturing and financial sectors.

POLICY AND GOVERNANCE

PRC government releases a set of "opinions" on e-commerce platforms and other guidance on building the "platform economy." The National Development and Reform Commission, an organization responsible for macro-level economic management, released "Opinions on Promoting Standardized, Healthy and Sustainable Development of the Platform Economy" (see PRC government announcement [here](#)).[20] According to the opinions, the "platform economy" is a recognition that there is a new economic form with the internet as the main carrier and network information infrastructure as the key element of that system. The opinions describe how to support "sustainable development" of internet-based firms, guidance for managing financial sector data, recommendations on "safe supervision" of algorithms used by e-commerce platforms, and improving support to small and medium-sized enterprises.

These latest opinions also discuss the [draft Anti-Monopoly Law,](#) which was released in 2020.[21] The original Anti-Monopoly Law was passed in 2008, but the law has recently been used to increase control over China's tech sector and several new amendments were drafted in 2020–2021. Amendments to the Anti-Monopoly Law are [expected to go into effect](#) later this year.[22] In the PRC bureaucracy, "opinions" express current views from the implementing ministries but are not legally binding.

PRC government and industry met to discuss abovementioned PRC government "opinions" on the platform economy. On January 29, representatives from the Cyberspace Administration of China, the National Development and Reform Commission, the Ministry of Industry and Information Technology, and the State Administration for Market Administration met to discuss the latest "opinions" for the platform economy. Zhuang Rong, deputy director of the Central Propaganda Department, called for internet companies to enhance their ["sense of responsibility"](#) while continuing to "bravely innovate."[23] According to the [government announcement](#), 27 major internet firms attended this meeting to discuss how to ensure the health and "sustainable development of Internet companies."[24] Representatives included personnel from JD.com, Meituan, Xiaomi, and Kuaishou.

PRC State Council issued plan for "metrology development" out to 2035. On December 31, the PRC State Council released the "[Metrology Development Plan (2021–2035),](#)" which highlighted the need for effective instrumentation and technical standards in the maritime, meteorological, technology, and other domains.[25] The PRC plan described the importance of metrology for AI in intelligent manufacturing and the need for additional research on designs that support "intelligent industrial control systems."[26]

The English-language summary of the plan emphasized ["quantum metrology,"](#) which is necessary for the measurement of nanoscale technologies.[27] The plan also described goals in marine satellite navigation, ocean digital measurement, and high-quality infrastructure development. The [State Administration for Market Regulation](#) will oversee technical standards implementation through subordinate units such as the Certification and Accreditation Administration and the Standardization Administration of China, which both fall under its purview.[28] ["Metrology"](#) is the science of measurement and includes calibration, testing, measurement quality, laboratory accreditation, and traceability.[29]

Cyberspace Administration of China issued the "Internet Information Service Deep Synthesis Management Regulations" related to deep fakes. According to the *[South China Morning Post](#)*, the new regulations, issued on January 28, are meant "to regulate technologies that generate or manipulate text, images, audio or video using deep learning, such as face swap and image enhancement." The regulations require companies offering these services to verify the identities of their customers through a registration process.[30] The [draft provisions](#) are open for public comment until the end of February and include various measures meant to "safeguard national security and the public interest."[31] For example, Article 6 notes that

"deep synthesis services" must not disrupt social order, subvert state sovereignty, or endanger national security. The provisions describe how "generative sequencing algorithms" should be used in deep learning and virtual reality platforms. [32] China Law Translate has provided an English translation of the draft regulations.

AI WORKFORCE

The China Association for Artificial Intelligence announces "Wu Wenjun AI Science and Technology Awards" for 2021. The award, which was established in 2011 with support from the Ministry of Science and Technology, is given to individuals who make "outstanding contributions" to the field of AI.[33] The highest award was given to three researchers: Chen Junlong, the dean of South China University of Technology; Hu Dewen of the PLA's National University of Defense Technology (NUDT); and Qi Tian of Huawei Technologies. Chen Junong's award was based on contributions to "cybernetics, intelligent control systems, and computational intelligence." Hu Dewen is a professor at NUDT whose research areas are neural networks and brain function imaging analysis. Hu has led more than 10 projects under the National 863 research program.[34] Qi Tian is the chief scientist of computer vision at Huawei Technologies.[35]

US dominates Tsinghua University's list of AI's most influential AI scholars. AMiner, a data-mining service that analyzes peer-reviewed academic publications housed at Tsinghua University's China Engineering Science and Technology Knowledge Center, has released its list of the world's top 2,000 AI scholars (see article here).[36] According to the list, "top talent" for AI continues to be concentrated in the US and China. Among the 2,000 scholars, 1,146 are in the US and 232 are in China. China earned top scholars in two AI sub-fields, information retrieval and multimedia, but the US dominated with top scholars in 13 other fields.

AI & THE OLYMPICS

Official newspaper of the Chinese Communist Party (CCP) dismisses concerns that the app mandated for use during the Winter Olympics for COVID-19 tracing contains potential data vulnerabilities. Citizen Lab, an interdisciplinary lab housed at the University of Toronto in Canada, published an article in January outlining potential data vulnerabilities in the app MY2022, which is mandated for use by all attendees of the 2022 Olympic games in Beijing.[37] The official newspaper of the CCP, People's Daily, dismissed this reporting as "cyber-security noise" aimed at trying to detract from the Olympic spirit.[38]

People's Daily referred to the app as using a "digital line of defense" and asserted that "science and technology are the most powerful weapons for mankind to contend with disease." It further stated that "the vigorous development of digital technologies represented by the internet, big data, and artificial intelligence has played an important supporting role in accurate identification, precise policy implementation and accurate prevention and control of the epidemic, and the use of digital technology to improve the efficiency of epidemic control measures is also a common practice in various countries."

The commentary was attributed to "Zhong Sheng," a pseudonym for "Voice of China"; used by the *People's Daily* international desk to signal concern on important foreign policy issues.

The PRC Olympic team is applying AI technology to improve athletic performance. According to an article in *Guangming Daily*, an authoritative daily newspaper targeting intellectuals and professionals run by the Chinese Communist Party Propaganda Department, this year's Winter Olympics will be a test-bed

for the "champion model" of training that combines data on physical parameters (e.g., heart rate, lung function) to run various models to help athletes optimize performance.[39] The article also describes the use of an "Artificial Intelligence System for Automatic Recognition of Human Motion without Markers" that uses 3D techniques and augmented reality to allow researchers to study cold weather aerobic endurance performance. *Xinhua* also noted that "artificial intelligence skiing simulators" had been deployed across the country prior to the Olympics to bring winter sports to China's southern provinces.[40]

AI aids navigation within Olympic village. SenseTime, with support from the Ministry of Science and Technology, has integrated AI and augmented reality (AI + AR) into its navigation systems for participants traveling in the Olympic village. The AI + AR system can be used to navigate sports venues and includes 3D maps to guide visitors. Athletes will even be greeted by a 3D version of the official Olympic mascot, Bing Dwen Dwen, equipped in his ice-inspired astronaut suit.[41]

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