

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. In this issue, we cover several topics of note. The People's Liberation Army (PLA) Air Force (PLAAF) celebrated its 72nd birthday on November 11. Images of a new two-seat version of the J-20 have been released with media speculating that the second crew member could control drones. Meanwhile, PRC media outlets report that the WZ-7 UAV has been fully integrated into PLAAF training. A substantial article appearing on the PRC Ministry of National Defense website written by a researcher from the PLA's Central Theater argues that future warfare enabled by AI will be global. In non-defense news, the PRC's Personal Information Protection Law went into effect on November 1, and the PRC and Pakistan have signed a MOU to create an AI research center in Pakistan. Finally, Facebook's name change to Meta seems to have sparked PRC media reporting on PRC companies' plans for the metaverse. [Read in browser.](#)

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MILITARY AND NATIONAL SECURITY

The media report that a new two-seat J-20 could be used to develop the "loyal wingman" concept for the PLAAF. Janes, a global open-source intelligence company based in Britain, reports that an image has emerged on the PRC-based social media site Weibo of the first flight of a new two-seat version of the PLAAF's J-20.¹ This follows the release of a [short video](#) that appeared on the internet on October 28 of the two-seat version taxiing. If the videos are legitimate, the J-20 would be the world's first two-seat stealth

fighter.² Although concept art of a two-seat J-20 has been seen at exhibitions, this is the first time that video of the aircraft has been seen. The J-20 *Mighty Dragon* (威龙) is a fifth-generation, multi-role fighter developed by the Chengdu Aircraft Industries (Group) Company, a subsidiary of the state-owned aviation conglomerate Aviation Industries Corporation of China. According to Janes, the first flight of the J-20 occurred in 2011, and it entered into service in February 2018.³

The two-seat version of the J-20 could serve multiple uses. It could be a trainer version of the aircraft, but as [Air Force Magazine](#) points out, its development so long after the development of the single-seat version suggests other uses.⁴ [Speaking](#) at the Zhuhai Airshow, Yang Wei, chief designer of the J-20, stated, “Assuming we do have a twin-seat version of the J-20, it would not be a trainer aircraft, because it would be developed for the enhancement of the aircraft.”⁵ Similar to the US Air Force [F-15 E Strike Eagle](#), the extra seat could be reserved for a weapon systems officer who manages the strike payload. Wang Ya’nan, the chief editor of Beijing-based *Aerospace Knowledge* magazine, told the state-run [Global Times](#) that the additional crew member could control drones in a “loyal wingman” configuration, and that the crew member could eventually be replaced by AI as more data are gathered.⁶

The PRC press reports that the WZ-7 UAV has been fully integrated into PLAAF training. According to Janes, the WZ-7 is “believed to be the PLAAF’s primary high-altitude unmanned platform for terrestrial reconnaissance operations near strategically important locations,” and “has been in PLAAF service since at least 2018.”⁷ According to [China Military](#), the PLA’s official English language website, “during a recent exercise involving multi-type aircraft, by giving full play to its advantages of high-altitude and long-endurance capability, the WZ-7 recon drone quickly captured target traces based on battlefield situation, and uploaded the acquired information to the command post, thus providing strong support for the airborne fighter groups to carry out penetration and assault operations.” According to the article, the integration of the WZ-7 demonstrates that the PLAAF “has made significant progress in using advanced combat means to accelerate the improvement of its systematic combat capability.”

China Military Online, the official media website of the PLA, carried an article on UAV training conducted by an unidentified PLA Navy regiment in the Southern Theater. The article focused on Liu Hao, a UAV pilot, who had participated in an exercise without taking into account adversary actions, resulting in the “downing” of his UAV. The article notes that in 2021 Liu’s unit has improved its “tactical literacy” and has made efforts to resolve deep-rooted problems with a series of training courses, group training, and tactics that have allowed operators to provide “red” aviation forces with targeting information on “blue” ships.⁸

The People’s Daily reported that the People’s Armed Police China Coast Guard Academy is now training students on a variety of new technologies, including drones, and has set up a UAV training center. The article states that drones are used by China Coast Guard to monitor illegal activities, such as smuggling and the illegal dredging of sand.⁹

FUTURE WARFARE

A substantive article about future warfare titled “Research the Military, Research War, Research Fighting Control the Initiative to Win Future Wars” was published on the PRC’s Ministry of National Defense website.¹⁰ The article was written by Zeng Haiqing, identified as being from the Central Theater. According to Zeng, future war will be global and no side will have an absolute advantage. It will be characterized by high-speed, long-range precision strikes, stealthy AI-enabled platforms, and distributed unmanned systems that will rely on data, algorithms, and computing power to achieve dominance on the battlefield. The use of unmanned platforms will result in combat expanding to outer space, the deep sea, and the polar regions, and the reliance on data, algorithms, and computing power will increase the prominence of cyber warfare.

According to Zeng, a military's ability to quickly collect and act on intelligence and conduct real-time decision-making across domains will be the decisive factor in future warfare. As a result, warfare will increasingly involve the use of global assets that will increase the importance of an information network that "integrates military and civilian, space and earth, and multiple domains, strengthens the development and application of mobile communication systems, and enhances mobile communication, broadband communication, and reliable communication capabilities."

The author recommends that the PLA improve its ability to conduct forward-looking research, accurately assess future threats, avoid technological surprise, improve the use of technology in operations, and train personnel on the use of AI-enabled technologies. Zeng also recommends that the PLA adopt AI technologies into planning and exercising through the use of data mining, intelligent identification, deep learning, and machine learning. With the adoption of AI-enabled decision-making, the PLA should take a "humans-in-the-loop" approach in which a human commander retains control over robotic systems.

POLICY AND GOVERNANCE

The Personal Information Protection Law of the People's Republic of China went into effect on November 1 (see original full text from China's National People's Congress [here](#)¹¹ and Stanford's DigiChina's English translation [here](#)).¹² The law clarifies how companies should handle personal information and highlights the need for specialized rules for AI-related data. According to the law, the state cybersecurity and informatization department will coordinate the formulation of specialized personal information protection rules and standards for new technologies, including facial recognition and AI. [According to the popular daily Global Times](#), the Personal Information Protection Law, the Cyber Security Law (effective on June 1, 2017), and the Data Security Law (effective on September 1, 2021) together "create a comprehensive legal framework on information protection of Chinese people, corporate data compliance practices and China's digital economy and the world."¹³

A judge ruled that a property management company could not require residents to use a facial recognition system for entry without their consent (see story from Jiangsu TV's Litchi News [here](#)).¹⁴

A homeowner in Suzhou sued his property management company after it required residents to provide facial information for a new security system that used facial recognition for entry. The homeowner cited concerns over personal privacy in his lawsuit. A judge ruled that the property management company could not force residents to comply with the facial recognition system and must obtain the consent of residents to use it and offer alternative means of verification for residents who do not give consent. As a result of the case, the company reportedly added the option for scanning a card to enter the property. The case [has been cited as an example](#) of the Personal Information Protection Law in action, making clear that that people cannot be forced into using facial recognition.¹⁵

An article in the official newspaper of the Chinese Communist Party, *The People's Daily*, reiterated the importance of maintaining the ethical "bottom line" in technology.¹⁶ The article followed the release of a highly realistic video of Tsinghua University's first fully AI-generated student playing the guitar and singing (see [here](#)¹⁷ for a version on YouTube). The article highlighted that the AI-generated student, called Hua Zhibing, was so realistic that it was difficult to distinguish whether she was real or fake. Her face, voice, and music are all AI-generated (see her introductory video from earlier this year on YouTube in Chinese [here](#)¹⁸ and in English [here](#)).¹⁹ Although the article did not criticize the video explicitly, it used the event as a launching point to reiterate Xi Jinping's words reaffirming the importance of regulating the tech industry: "Technology is a sharp tool for development, and it may also become a source of risk. It is necessary to foresee and determine the conflicts between rules, social risks, and ethical challenges brought about by the development of science and technology, and to improve relevant laws and regulations, ethical review rules, and regulatory frameworks."

INDUSTRY

According to the London-based consulting firm GlobalData, China leads the world in the number of AI “unicorns” (see *AI/News* article [here](#)), a venture capital term describing a startup company with a value exceeding \$1 billion. China had 19 of the 45 international unicorns identified by GlobalData. According to the report, “SenseTime remains China’s biggest AI unicorn with a \$12 billion valuation and total funding to date of \$2.6 billion. This is followed by CloudWalk’s \$3.3 billion valuation and \$500 million total funding so far.”²⁰ The US Department of Commerce [blacklisted](#) both companies in 2020.²¹

The *South China Morning Post* reports that the metaverse is receiving increasing attention from PRC companies. The metaverse is [described](#) as “a digital reality that combines aspects of social media, online gaming, augmented reality, virtual reality, and cryptocurrencies to allow users to interact virtually.” PRC companies Baidu and Netease both filed metaverse-related trademark applications in October. The report notes that Tencent Holdings, the world’s largest video gaming company by revenue, and e-commerce giant Alibaba also appear to be shifting focus to the metaverse.²²

The *South China Morning Post* also [reported](#) that a PRC thinktank affiliated with the PRC Ministry of State Security released a report warning of the national security implications of the metaverse. The China Institutes of Contemporary International Relations warned that the metaverse could introduce “subtle influence” on a country’s political and cultural security and invite new social problems. It could also bring new cybersecurity risks and “technological hegemony” by developed countries.²³

A *Wired* article notes that PRC-based companies SenseTime and Megvii are proceeding with their IPOs at a time when other PRC-based tech giants have faced difficulties.²⁴ In November 2020, Ant Group, a spinoff from Alibaba that runs the Alipay mobile payments system, was forced to [postpone](#) its IPO after PRC regulators announced new regulations governing online lending, a major part of Ant Group’s business.²⁵ The announcement came after Alibaba’s founder publicly criticized the government’s financial regulatory system. The PRC government removed Didi, a popular ride-hailing app, from app stores, fined it for antitrust violations, and ordered it to comply with an extensive cybersecurity review [after it publicly listed](#) on the New York Stock Exchange.²⁶

The article notes that both SenseTime and Megvii are proceeding with IPOs on the Hong Kong and Shanghai exchanges, respectively, and that both companies receive a large portion of their revenue from government clients. SenseTime and Megvii are both providers of facial recognition technologies. SenseTime’s IPO prospectus states that 48 percent of its revenue is derived from its Smart City business involving surveillance and traffic management technologies. In 2019, both companies were [barred](#) from doing business with US companies because of alleged ties to government surveillance of Muslims in Xinjiang.²⁷

Tencent Holdings, a PRC multinational technology company and one of the PRC’s “AI champions” announced progress on its Zixiao (紫霄) AI reasoning chip. [see article [here](#)] The chip combines image, video, and natural language processing with search recommendations that Tencent says provides 100 percent better performance than competing chips. Tencent claims that innovative measures, such as a visual CV accelerator and a video codec accelerator, have optimized the chip’s architecture and resulted in breakthroughs in the chip’s computing power.²⁸

RESEARCH AND DEVELOPMENT

The Beijing Academy of Artificial Intelligence and Tsinghua University have developed the Wudao 2.0 robot, which is [reported to be capable of self-learning](#). The robot uses 1.75 trillion parameters and is [described](#) as the “largest neural network ever created and probably the most powerful.”²⁹ According to a Wudao 2.0 researcher, the robot can create poetry, couplets, text summaries, answer and ask questions, and even paint, and has been close to passing the Turing test, which tests a machine’s ability to display intelligent behavior indistinguishable from human intelligence.³⁰

The Hangzhou-based RoboCT Technological Development Company has developed an exoskeleton to help paralyzed people walk again. The exoskeleton [reportedly](#) uses “sensors integrated with artificial intelligence to adjust the walking movement to fit the user. It gives the user the sensation of walking, rather than simply feeling like their legs are being dragged.”³¹

The Ministry of Information and Technology (MIIT) approved the establishment of the National Intelligent Voice Innovation Center (see announcement from MIIT website [here](#)).³² The National Intelligent Voice Innovation Center (国家智能语音创新中心) was established with the support of the Hefei Intelligent Voice Innovation Development Co., Ltd., and its major shareholders include PRC-based tech industry heavyweights iFlyTek, Cambricon, UCloud Technology, and Leinao. The center will focus on the research areas of multilingual speech recognition, speech synthesis, semantic understanding, and dedicated AI speech chips. The center seeks to enhance the technology level and competitiveness of the PRC speech industry. The National Intelligent Voice Innovation Center is one of four centers that were announced on November 9; the others are the National 5G Middle and High Frequency Device Innovation Center, the National Glass and New Materials Innovation Center, and the National High-end Intelligent Household Appliances Innovation Center. The founding of these centers is part of a larger plan announced by MIIT in 2016 to implement China’s “Made in China 2025” initiative. MIIT seeks to establish around 40 national manufacturing innovation centers by 2025 (see MIIT website for more information on its national manufacturing centers initiative [here](#)).³³ According to a report by Shanghai-based website *The Observer*, 21 centers have been established so far (see the story, which includes a full list of the centers in Chinese, [here](#)).³⁴

INTERNATIONAL COOPERATION

At the Fourth China International Import and Export Expo (CIIE), Microsoft and Sony Semiconductor Solutions announced a [partnership program to expand AI camera-driven solutions in China](#).³⁵ The Partner Enablement Program aims to encourage local independent software vendors and system integrators to create commercial AI camera-driven solutions to achieve AI processing on edge (locally on devices) with Sony’s intelligent vision sensor IMX500 and Microsoft Azure’s AI technology capabilities. As part of the partnership, Microsoft and Sony jointly launched Co-Innovation Labs in China in the areas of computer vision and video analytics. CIIE was held in Shanghai from November 5–10, closing with a reported US \$70.72 billion in intended deals (see summary of event from Shanghai Daily’s online English platform Shine [here](#)).³⁶ Other AI-relevant companies that exhibited at the event include US chipmaker AMD (see article from Shine [here](#))³⁷ and Swiss technology and engineering firm ABB (see Xinhua article [here](#)).³⁸

China and Pakistan have signed a memorandum of understanding (MOU) on the establishment of a Center of Excellence on Artificial Intelligence. The MOU, which will involve the Pakistan University of Engineering and Emerging Technology and Wuhan University of Technology, covers faculty exchanges, joint degrees, and joint efforts on research and development and infrastructure development.³⁹

EVENTS

The China Command and Control Association (中国指挥与控制学会) announced that the Eighth China (Beijing) Military Intelligent Technology Expo (第八届中国（北京）军事智能技术装备博览会) will be held July 7–9, 2022 in Beijing. The exhibition will feature intelligent command information systems, big data and decision-making aids, intelligent modeling, simulation, and training systems, information systems, robotic systems, unmanned systems, intelligent biological systems, and display systems. Past expos have attracted organizations from the Central Military Commission, each of the services, service academies, the People's Armed Police, the Ministry of Public Security, and the defense industry.

The exhibition will also feature sessions on intelligent command and control (C2), rich media command information systems, C4ISR theory and technology, big data, intelligent command management, intelligent simulation, modeling, and training, C2 network technology, unmanned systems theory and technology, network security, and planning and decision-making.⁴⁰

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