



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](#). We hope our US readers had a relaxing and safe Thanksgiving holiday. In this issue, we report that People's Liberation Army (PLA) researchers have coauthored a paper on defeating image classifiers. Italian authorities have accused an Italian drone manufacturer of hiding its acquisition by a PRC company. PLA media carried another article on cognitive warfare, and a Chinese Communist Party (CCP) website published an article on the need for PRC citizens to improve their "intelligent media" literacy to combat disinformation on the internet. We also include reports on Turkey replacing the PRC as a key supplier of unmanned aerial vehicles (UAVs), and the PRC government fining several AI champions for anti-trust violations. Finally, despite increasing tensions between the PRC and Taiwan, associations from both sides of the strait conducted a conference on the use of UAVs in maritime rescue.

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MILITARY AND NATIONAL SECURITY

PLA researchers participated in a recent computer vision competition. Several members of the PLA Engineering University are listed as co-authors of a recent [paper](#) in preprint format that summarizes the results of a machine learning competition held at the [2021 Conference on Computer Vision and Pattern Recognition \(CVPR\)](#) in June. Seven of the article's 38 co-authors are affiliated with the PLA.

The competition at the CVPR-2021 conference was designed to look at a general class of *unrestricted* adversarial attacks in which the attacker is allowed to make large, visible modifications of an image (e.g., rotating the image, adding a shadow, or cropping it) to induce an incorrect classification in such a way that normal human observation remains unaffected. As reported in the summary paper, the best result was an "attack success rate" of 90.69 percent, meaning that 9 out of 10 images managed to "fool" the classifiers.¹

The PLA could use a competition such as this to refine its ability to defeat an adversary's image classifiers by degrading the data upon which algorithms are based. Conversely, the PLA could also seek to ensure that its image classifiers are robust against adversarial attack.

Italian authorities allege that an Italian drone company that supplies UAVs to Italian special forces was purchased illegally by a PRC company. According to [The Wall Street Journal](#), Italian authorities have launched an [investigation](#) into the 2018 acquisition of a 75 percent stake in the Italian drone manufacturer Alpi Aviation by the Hong Kong-based Mars Information Technology Co. Ltd., which they say had registered in Hong Kong two months earlier. Alpi Aviation manufactures the [Strix UAV](#), which weighs 10 kilograms, has a 3-meter wingspan, and can relay video and infrared imagery in real time. According to the article, Italian authorities "traced Mars's ownership of Alpi through a web of intermediaries to two companies controlled by the Chinese state: China Railway Rolling Stock Corp., a state-controlled rail giant, and an investment group controlled by the municipal government of Wuxi, a city near Shanghai. This information led the Italian police to conclude that Mars was a shell company created to bring Alpi under the control of the Chinese government."²

The acquisition is alleged to have violated Italy's so-called Golden Power law, which requires that companies in defense and other strategic industries receive permission from the government before being sold outside of Italy. Italian authorities assert that the transaction was "opaque" and designed to conceal the role of the PRC companies. According to a police statement, Alpi Aviation had been bought "exclusively for the acquisition of its technological and production know-how, including military," and that plans were "allegedly underway to transfer production facilities to the eastern Chinese city of Wuxi." Lawyers for Alpi Aviation have denied allegations that the company broke any laws.³

UNMANNED SYSTEMS

The PLA is reported to have launched a mini aircraft carrier for drones. *The War Zone* [reports](#) that photos of an apparent launch ceremony for a catamaran vessel in May have appeared on the internet. The photos show a vessel that is similar to a model of a catamaran vessel displayed at this year's Zhuhai Airshow that depicted a flat foredeck in front of a superstructure that could hold five drone helicopters. The airshow display described the vessel as a platform that could be used to replicate "blue" force systems during training (the PLA refers to enemy militaries in exercises as "blue" forces). According to the report, "this ship will be able to simulate hostile drone swarms, along with other kinds

of threats, such as high-volume anti-ship missile strikes and distributed electronic warfare attacks.” *The War Zone* notes that the ship may also reflect the development of or an extant offensive capability.⁴

The PLA uses commercial drones to resupply troops in remote areas. A video on *China Military Video Online*, a website operated by the PLA, showed a commercial drone being used to resupply troops in a mountainous area of China. The drone, a [Multicopter UAV KWT-X6L-15](#) built by the Shenzhen-based Alltech (aka Shenzhen Keweitai Enterprise Development Co., Ltd./深圳市科卫泰实业发展有限公司), is described as a 6-rotor, multi-use drone with a flight duration of 70 minutes, a 15-meter/second flight speed, and a maximum payload of 5 kilograms. The video shows the drone delivering a box of supplies tethered to a rope and, on a separate occasion, delivering a birthday cake that was “air dropped” from a box attached to the drone. According to a PLA soldier responsible for the drone, the UAV can also be used to conduct surveillance, reconnaissance, and strike missions.⁵

A PLA Daily article questioned the potentially destabilizing use of unmanned systems. An article in the *PLA Daily*, the official newspaper of the PLA, titled [“Unmanned Weapons: ‘Revolution’ or Abuse,”](#) discusses the increasing use of unmanned systems and their potential to produce destabilizing effects. The article notes that unmanned systems were used in the 2019 attack on Saudi oil facilities that affected global oil markets, and in the targeted or attempted killings of Iraqi Prime Minister Mustafa al-Kadhimi, Venezuelan President Nicolas Maduro, Iranian Islamic Revolutionary Guard Corps Quds Force Commander Qasem Soleimani, and Iranian nuclear physicist Mohsen Fakhrizadeh Mahabadi, raising international concern over their use of unmanned systems. The article also argues that the use of unmanned systems can desensitize operators to the real costs of war and asserts that nearly one-third of casualties from US drone strikes have been civilian. Despite these concerns, the article notes that the low cost of unmanned systems facilitates their proliferation and makes arms control measures difficult to achieve. The article also expresses concern that the development of fully autonomous weapon systems will remove machines from human control and argues that unmanned systems will need to maintain a human in the loop.⁶

PRC media report that troops in the Xinjiang Uygur Autonomous Region are using drones to conduct border patrols. The state-run *Global Times* [reports](#) that troops based in the prefecture of Tacheng, which borders Kazakhstan, use drones to detect people who may try to cross the border illegally. According to the report, the drones are equipped with a loudspeaker that “can be used to send warnings and expel the suspects. Then, ground troops would arrive, thanks to the drone’s guidance, and capture the suspects.”⁷

FUTURE WARFARE

China Military Online carried a substantive article on cognitive warfare titled “Artificial Intelligence: The Winning Blade of Cognitive Warfare.” The article was written by Chen Dongheng, a researcher at the Chinese Academy of Military Sciences’ Academy of Military Political Work (军事科学院军队政治工作研究院) whose writings appear frequently in PRC media. The topic of cognitive warfare, which refers to influencing human perception, appears to be receiving more attention in [PRC writings](#).⁸ Chen argues that cognition is based on “perceptions, identification, analysis, judgment, decision-making, and the selection of objective things,” and that “the facts fully show that data can be manipulated, information can be mixed with water, ‘truth’ can be shaped, and human hearts can be influenced.”

Chen asserts that denial and deception have always been key factors in war, but the importance of AI to cognitive warfare lies in its ability to “better embody human will” and “more implicitly and efficiently influence opponents.” As a result, AI-enabled denial and deception efforts are often more effective

than are those conducted by humans, in part because of the ability of AI-enabled systems to repeatedly transmit large amounts of information and disinformation. According to Chen, one of the advantages of using AI in cognitive warfare is its “ubiquitous, pervasive and highly automated existence, constructing flexible cognitive scenes.” Chen concludes that whichever side develops faster and more precise algorithms will gain the advantage and “seize the command heights of the cognitive competition.”⁹

PRC media carried a lengthy article on the role of satellite navigation in intelligent warfare. The article, titled “[Satellite Navigation on the Intelligentized Battlefield](#),” was written by an unidentified academician from the Chinese Academy of Engineering. The author argues that satellite navigation will become more important in future warfare as unmanned systems become more prominent. He adds that satellite navigation will have to evolve to better serve military operations that are geographically broader and that require better accuracy, reliability, and security. In addition to serving traditional domains, satellite navigation will be required to support operations in deep space and deep sea environments. As a result, alternative navigation technologies such as pulsar and quantum navigation will be required to supplement traditional satellite navigation.

The article argues that future “intelligentized” satellite navigation systems will need to transition from a dependence on ground systems to placing more reliance and greater functionality on satellites to include the incorporation of more accurate atomic clocks, astronomical measuring equipment, and laser interstellar measurement equipment. According to the author, future satellite navigation systems will more seamlessly integrate navigation and communication functions and incorporate cloud computing to facilitate on-orbit maintenance of the satellite signal.¹⁰

INDUSTRY

Turkey is taking away market share from the PRC in the UAV market. According to a report in the [Aviation Week Intelligence Network](#), militaries in the Middle East, Central Asia, and North Africa are increasingly turning to Turkey rather than the PRC for UAVs. The report notes that the PRC has sold “dozens, perhaps hundreds” of UAVs to these regions but is now losing out to Turkish systems because of concerns over the reliability and maintainability of PRC UAVs and their inability to connect with Western command and control systems.¹¹

PRC eVTOL Manufacturer Autoflight has received a \$100 million investment from Berlin-based Team Global. Shanghai-based electric vehicle takeoff and landing (eVTOL) manufacturer AutoFlight states in a [press release](#) that the additional funding will be used to convert its cargo aircraft to carry passengers, expand its business internationally, and certify its aircraft according to European Aviation Safety Association standards. The company will also establish a European subsidiary in southern Germany.

AutoFlight describes itself as a “global high-tech startup, born in China, specializing in developing and manufacturing UAVs. AutoFlight’s mission is to provide safe and reliable aerial logistic systems and urban air mobility solutions for human society. By leveraging new technologies in aviation, new material, artificial intelligence, autonomous driving, and 5G, AutoFlight actively drives development in eVTOL (electric Vertical Takeoff and Landing) industry.”¹² The company states on its [English language website](#) that, because of its commitment to social responsibility, it has decided “not to supply defense clients at this moment.” However, this statement is not made on [the Chinese language version of its website](#).¹³ [Team Global](#) is a Berlin-based technology holding company that invests in digital technologies, clean aviation, and clean energy.

RESEARCH AND DEVELOPMENT

Chinese companies Great Wall and Baidu successfully completed a compatibility test between Great Wall's dual-socket server and Baidu's AI accelerator chip, [according to Chinese media source *The Paper*](#).¹⁴ The test involved Great Wall's Qingtian EF860 two-socket server, a high-performance server,¹⁵ and Baidu's Kunlun AI computing processor, which is designed for cloud and edge computing of deep learning and machine learning algorithms and is used in computer vision, natural language processing, large-scale speech recognition, and large-scale recommendation.¹⁶ *The Paper* highlights that this test is occurring amidst increased demand for AI servers and represents a strategic opportunity for Great Wall and Baidu, especially as the Chinese market is turning increasingly to domestically made solutions.

POLICY AND LAW

China's State Administration for Market Regulation (SAMR) fined several companies, including China's "AI champions" [Alibaba, Tencent, Baidu, and JD.com, for violations of China's Anti-Monopoly Law](#) (see SAMR's website for the complete list of violations [here](#)).¹⁸ According to SAMR, the cases announced at this time are all previous transactions that, according to law, should have been declared in the past. The transactions include various investments, acquisitions, and joint ventures. Companies were fined 500,000 yuan (or about US \$78,000) for each violation, with some companies, such as Alibaba and Tencent, paying fines for multiple violations adding up to more than 6 million yuan (US \$938,628), [according to calculations by Chinese finance news website Caixin Global](#).¹⁹

Although the fines are negligible for such large companies, they are occurring within the context of [China's crackdown on big tech](#) and ongoing revisions to China's Anti-Monopoly Law, which are under review and expected to go into force next year.²⁰ [According to reporting from the *South China Morning Post*](#), the new draft of the law significantly increases penalties, expands the discretionary power of SAMR, and sends a clear signal of tightening control over tech firms.²¹

A senior editor at China's official state news agency *Xinhua* penned an article advocating for greater "intelligent media" literacy among the population as AI has become the foundation of the media industry (see article posted by the news website of the CCP [here](#)).²² In the article, *Xinhua* senior editor and researcher at Renmin University's Audiovisual Communication Research Center Huang Xiaoyong argues that, while China has laws to protect user rights and security with the Cybersecurity Law, Data Security Law, and Personal Information Protection Law, people cannot rely solely on external governance to mitigate the risks that come with an AI-enhanced media environment.

Huang contends that users must also develop "intelligent media" literacy, especially as AI becomes the foundation of society. Huang highlighted various issues with "intelligent media," such as deepfakes used for scams and recommendation algorithms that promote fake news. He argues that, because the technical nature of intelligent media makes it difficult for users to learn on their own, there should be targeted education for different groups based on their varying levels of technical understanding. He suggests that professional platforms, news organizations, and ordinary netizens can all play a role in smart media education. For example, he suggests that news platforms embed intelligent literacy media education in their content to raise awareness of it in the population.

This article is notable because it implies that the PRC government alone cannot completely monitor all the effects of AI on China's media environment and because the CCP news reposted it on its website.

Going forward, the CCP may seek to develop more programs to improve the population's AI and media literacy.

CROSS-STRAIT COOPERATION

Associations from the PRC and Taiwan held a conference focusing on the application of UAVs in rescue operations. On November 20, associations from Miaoli, Taiwan, and Wuhan, China, held the first-ever Han River Bay Tai-Han People-to-People Rescue Exchange Conference. According to *Xinhua*, the meeting was held via video conference and through live events on both sides of the Strait (see article from *Xinhua* [here](#)).²³ The conference featured a discussion on the use of UAVs in rescue operations, an introduction to the current state of cross-Strait rescue services, talks on establishing a rescue exchange platform, and exchanges on different types of rescue equipment. The meeting also featured live UAV rescue drills and demonstrations of drone flight skills and water-rescue UAVs and boats. The conference was co-organized by the Cross-Strait Exchange Promotion Associations of Hubei Province and Wuhan City, the Taiwan Miaoli County UAV Application Services Innovation and Development Association, and the Taiwan Cross-Strait Emergency Management Association. For photos, see article from a Chinese UAV website [here](#).²⁴

EVENTS

Chinese companies displayed UAVs at the Dubai Airshow (November 14–18). [According to China's official TV station, CCTV](#), the airshow featured PRC-made UAVs, such as state-owned defense corporation Norinco's Golden Eagle 500A unmanned helicopter (also labeled as the CR500).²⁵ Developed for military use, the Golden Eagle 500A reportedly carries a variety of payloads, such as ammunition and sensors. It performs tactical tasks such as battlefield reconnaissance, target localization, irradiation guidance, precision strikes, and damage assessment. [In the video CCTV posted featuring the platform](#), staff from Norinco appear to have some operational control of the UAV.²⁶ [According to Defense News](#), United Arab Emirates (UAE)-based International Golden Group also hosted intelligence, surveillance, and reconnaissance drones developed at the China-Emirates Science and Technology innovation laboratory²⁷—[a joint project between UAE's International Golden Group and Norinco](#).²⁸ [Defense News reported](#) that although the PRC made a "solid" showing at the Dubai air show, there were no major announcements from the PRC at the event.²⁹

The Third Haitong International Artificial Intelligence Conference, which had the theme of AI software and hardware, was held in Shanghai from November 24–25 (see summary of conference in Chinese from Haitong company website [here](#)).³⁰ The meeting focused on the development of chip manufacturing, medical care, smart transportation, and other software and hardware technologies related to the AI industry. Several notable companies attended the meeting, including Chinese semiconductor companies SMIC, Hua Hong Semiconductor, and Will Semiconductor (see list of corporate attendees from conference website [here](#)).³¹ In his keynote speech, Vice President and Chief Analyst Wu Lianfeng of IDC China expressed an optimistic outlook on China's AI market, predicting that it will exceed US \$16.3 billion by 2025, with the AI software sector of the market growing the fastest. (Note: other studies predict China's future AI market growth to be even greater and to surpass that of the US; for example, see summary of study from Global Industry Analyst [here](#)).³² According to Haitong Securities Communist Party Committee Secretary and Chairman Zhou Jie, Hong-Kong-based financial institution Haitong International and its parent company, Shanghai-based Haitong Securities, have assisted Chinese AI software and hardware companies in entering domestic and foreign capital markets and have promoted the cultivation and development of AI in China.³³

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