



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](#). In this issue, we cover the People's Republic of China's (PRC) first position paper on regulating the military application of AI. The PRC also signed on to a United Nations Educational, Scientific, and Cultural Organization (UNESCO) set of non-binding AI guidelines that ban social scoring and mass surveillance but the PRC is not expected to abolish its mass surveillance program as a result. AI giant SenseTime suspended its IPO after being sanctioned by the US government. More on cognitive warfare—a *PLA Daily* article outlines four different types of cognitive warfare.

Please check out the US Army's "[The Convergence](#)" podcast, where CNA analysts Kevin Pollpeter and Amanda Kerrigan discuss intelligent warfare and People's Liberation Army (PLA) modernization.

The China AI and Autonomy Report will take a break for the holidays and will return in the new year. We wish everyone a healthy, safe, and happy holiday season and best wishes for 2022!

THIS WEEK'S CONTENTS

MILITARY AND NATIONAL SECURITY	2
UNMANNED SYSTEMS	3
FUTURE WARFARE	4
INDUSTRY	4
RESEARCH AND DEVELOPMENT	5
AI WORKFORCE	5
UNITED NATIONS COOPERATION	6

MILITARY AND NATIONAL SECURITY

PRC publishes first position paper on regulating the military applications of AI. The position paper was presented by Beijing arms control ambassador to the United Nations (UN), Li Song, at the Sixth Review Conference of the UN Convention on Certain Conventional Weapons on December 13 (see article [here](#)).¹

The position paper advocates establishing an “effective governance regime” for the military application of AI. It states that “military applications of AI shall never be used as a tool to start a war or pursue hegemony” and opposes “moves to undermine the sovereignty and territorial security of other countries by using advantages in AI technology.”

The paper asserts that “relevant weapon systems must be under human control,” and that countries need to follow the principle of “AI for good” and “ensure that new weapons and their methods or means of warfare comply with international humanitarian law and other applicable laws.”

On international cooperation, the paper called for the international community “to oppose drawing ideological lines or overstressing the notion of national security, remove man-made barriers in the field of science and technology, and ensure the rights of all countries to technological progress and peaceful uses.”

For the full text of the position paper in English, see the PRC’s permanent mission to the UN website [here](#).²

PLA Daily article outlines three methods of cognitive warfare. The *PLA Daily*, the official newspaper of the PLA, carried another [substantive article](#) on cognitive warfare titled “Information Networks: The Key to Winning Cognitive Warfare.” The article outlines three basic methods of cognitive warfare: 1) Information confusion warfare (信息迷茫战), which uses real and fake information to confuse the enemy. This method is commonly used in the early stages of a conflict; 2) thought misdirection warfare (思维误导战), which is intended “to mislead, deceive, and influence countries, militaries, and people” so that they deviate in a “direction that is beneficial to the attacking country”; and 3) war of will destruction (意志毁伤战), which affects military morale by directly influencing the psychological activities, mental state, and thinking decisions of key individuals.³

The article further argues that “technology” and “strategy” constitute the ways and means of modern cognitive warfare, and that information networks can be used to influence human perception by exploiting the natural tendencies of human psychology. The article asserts that the interconnected nature of information networks amplifies the role of cognitive warfare in both peacetime and wartime.

According to the article, a major difference between information networks and traditional communication media is that they provide a vehicle for large-scale, fast-paced, and efficient interactive communication. Through this interactive mechanism, an attacker can reinforce the preconceptions of the targeted audience and adjust methods and strategies based on changes in feedback from the target audience.

The article also claims that the US is using internet-based cognitive warfare means to divide PRC citizens from the government and argues that “some countries” are using disinformation to turn countries against the PRC.

PLA Daily article calls for more training on AI-enabled command and control. An article titled [“Exploring the Mechanism of Intelligent Operational Command Training”](#) argues that the widespread use of AI-enabled command and control systems requires PLA officers to train on their use. The article

argues that AI will reduce the observe, orient, decide, act (OODA) loop to seconds and will make the “cognitive flow” more important than the flow of information so that garnering a “decision advantage” will become a key factor in winning future wars. It claims that warfare will evolve gradually into machines taking the lead role in carrying out operations, and that humans will be responsible for planning, final decision-making, and top-level control. In this role, officers should train on how to use AI-enabled decision-making technologies correctly and skillfully to exploit the first combat opportunity and seize the initiative.

Because joint warfare will be a key feature of future wars, the article recommends conducting a large number of command training simulations to test scenarios, adjust the algorithms and rules of the AI systems, and exercise the command and control links within theater command headquarters and between the services and the theater command to better coordinate operations in physical and non-physical domains.⁴

PLA article discusses unmanned aerial vehicles (UAVs) in maritime operations. An article on the PLA’s *China Military Online* website lays out key characteristics of UAVs and discusses how to optimize their use in maritime operations. The authors argue that due to their low cost, UAVs should be employed before manned systems and then continually thereafter throughout an operation. The article also recommends that multiple types of UAVs be concentrated against particular targets when conducting first strikes. Due to the ability of UAVs to conduct persistent operations, UAVs should be rotated in and out of the operation to allow for maintenance.

The authors also argue that UAVs should be linked with manned aircraft, naval vessels, and conventional missile forces to form a multidomain force. The actions of UAVs should be coordinated before an operation begins but should be able to adjust planning based on the situation and to act independently should they lose contact with other forces.

Finally, the authors argue that UAV operations should be resilient, should operate in a distributed manner, and should develop technical measures to avoid detection.⁵

PRC researchers claim to have developed a coil gun using AI. The *South China Morning Post* [reports](#) that researchers from the PLA’s Naval University of Engineering have published an article in the PRC journal *Transactions of the China Electrotechnical Society* that details the use of AI to develop a handgun-sized coil gun. A coil gun uses electromagnetism, rather than gunpowder, to propel a round. The researchers reportedly used AI to make continuous improvements in the weapon’s design that “gave the human designers a huge set of optimized data points that nearly doubled the weapon’s efficiency compared with the US rifle by maximizing the joint performance of many different components.” The use of AI “resulted in a massive reduction in the weapon’s size and increased its output energy.”⁶

UNMANNED SYSTEMS

The PRC is developing a marine meteorological observation system using UAVs. *Xinhua* [reports](#) that the China Meteorological Administration is testing the Wing Loong-10 to conduct meteorological observations.⁷ The test was held on November 27 and included payloads to measure the amount of ice in clouds, atmospheric temperature and humidity, sea temperature, and wind speed. The flight also tested the ability of the aircraft to network with surface buoys, weather balloons, and ground weather monitoring systems (see article [here](#)).⁸

CH-4B UAV receives civil aviation airworthiness certificate (see article [here](#)). The CH-4B is the first 1-ton class UAV to receive the certificate from the Civil Aviation Administration of China.⁹ According to

[Janes](#), the CH-4B is a medium altitude/long-endurance UAV manufactured by the China Aerospace Science and Technology Corporation and is a heavier version of the CH-4A.¹⁰

FUTURE WARFARE

PLA Daily article discusses need to conduct research on the “winning mechanism” of intelligent warfare. An [article](#) written by a researcher at the PLA’s National Defense University’s School of National Security called for more research on determining the winning mechanism of intelligent warfare. Although the researcher does not specifically identify the winning mechanism of intelligent warfare, the article notes that it will involve the ever-increasing use of AI to seek advantage through more rapid decision-making, especially through the use of quantum algorithms. According to the author, the PLA should focus its analysis on comparing the weaknesses of the adversary’s unmanned systems against the strengths of the PLA’s unmanned systems, propose requirements, and develop disruptive technologies. In addition, the PLA should promote changes to the “rules of the game” of war to benefit the PRC.¹¹

INDUSTRY

SenseTime postpones IPO after US imposes sanctions. SenseTime, which specializes in facial recognition and is China’s largest AI company, hoped to raise between \$750 and \$767 million on a \$17 billion valuation through the IPO (see article [here](#)).¹² On December 10, the company [was sanctioned by the US Treasury Department](#), which accused it of enabling human rights abuses against Muslim Uyghurs in Xinjiang.

The company was [blacklisted](#) by the US government in 2019. That sanction placed the company on the US government’s Entity List requiring US companies to receive an export license before exporting technology to the company.¹³

These newest sanctions ban US investment in the company and coincided with International Human Rights Day and the day SenseTime was expected to price its shares.¹⁴ SenseTime announced on December 13 that it would postpone its IPO.¹⁵ SenseTime said in a [statement](#),

We strongly oppose the designation and accusations that have been made in connection with it. The accusations are unfounded and reflect a fundamental misperception of our company. We regret to have been caught in the middle of geopolitical tension.

As a software company committed to promoting sustainable, responsible and ethical use of AI, we have complied with the applicable laws and regulations in relation to our business in all material respects in the jurisdictions where we conduct business.

Our AI Ethics Council, comprising both internal and external experts, ensures that our business strictly adheres to recognized ethical principles and standards. We have developed a Code of Ethics for AI Sustainable Development, and we collaborate closely with third-party institutions and international organizations to ensure the responsible and sustainable development of AI technology.

We are an entrepreneurial company founded by AI scientists and practitioners with an aim to use technology to improve people’s lives. We remain committed to accomplishing our mission to create a better AI-empowered future through innovation, and will take appropriate actions to protect the interests of our Company and our stakeholders.¹⁶

SenseTime’s IPO comes as ride-hailing giant Didi [announced](#) that it would de-list from the New York

Stock Exchange and re-list in Hong Kong. This action also comes amid [reports](#) that the PRC government will further limit foreign investment by restricting the use of [variable interest entities](#) that have been used by companies such as Alibaba and Tencent to circumvent restrictions on foreign investment.¹⁷

PRC AI companies received more than 35.6 billion yuan (~US\$ 5.6 billion) between August and October. According to the AI industry news website [Wisdom](#) (智东西), more than 200 companies received financing in the reporting period, with 93 companies receiving more than 100 million yuan (US\$ 15.7 million) and 9 companies receiving more than 1 billion yuan (~US\$ 157 million). Of the companies receiving more than 100 million yuan in financing, 33 are involved in autonomous driving and robotics, 8 are involved in AI medicine and health, including pharmaceutical development and medical imaging, and 6 are involved in AI chip development. Most of the companies receiving an investment of 100 million yuan or more have been in operation since 2015. The majority are based in the cities of Shanghai (23 companies), Beijing (22 companies), Shenzhen (17 companies), and Hangzhou (12 companies).¹⁸

RESEARCH AND DEVELOPMENT

The Ministry of Science and Technology (MOST) has endorsed the establishment of “new generation AI innovation and development pilot zones” in the cities of Harbin, Shenyang, and Zhengzhou.¹⁹ The establishment of these zones is part of a broader 2019 MOST goal to establish around 20 AI innovation and development pilot zones by 2023 (for full text of policy in Chinese see [here](#)). This national-level goal relies on localities to encourage AI technology development and to conduct policy experiments and social experiments to promote AI innovation in China.²⁰ In a recent statement just before the announcement of the new pilot zones, a MOST vice minister stated that 17 of these national pilot zones had already been established.²¹

Peking University (PU) establishes School of Artificial Intelligence on November 29.²² Popular PRC online media outlet *The Paper* [reports](#) that former UCLA professor [Zhu Songchun](#) will be the school's first dean.²³ Zhu also is the head of [PU's Institute for Artificial Intelligence](#).²⁴ *The Paper* reported that, in addition to this school, PU also recently established the Computer Technology School and the Electronics School. *The Paper* highlighted that the establishment of these schools is occurring as PU carries out its 14th Five Year Plan, which, according to the secretary of the PU Communist Party Committee, supports establishing new engineering disciplines to improve innovation at the university.²⁵

AI WORKFORCE

The Ministry of Human Resources and Social Security (MOHRSS) and the Ministry of Industry and Information Technology issued national vocational standards for AI instructors (see standards posted in Chinese by MOHRSS [here](#)). The standards establish five levels for AI instructors, from beginner (level 5) to advanced technical expert (level 1). The standards provide descriptions and requirements for each level according to several categories, such as business analytics, intelligent training abilities (e.g., algorithms, data processing), intelligent system design, and teaching and guidance abilities. The standards were drafted by a group of organizations that include private companies, state-owned enterprises, industry organizations, and skills centers: Alibaba, Zhejiang Skilled Talents Evaluation Management Service Center, iFlyTek, Baidu, Beijing Xinyun Zhixun Technology, Zhongguancun Robot Industry Alliance, China Academy of Sciences Institute of Artificial Intelligence, China National Electronic Import-Export Company, Norinco Vocational Skills Appraisal and Guidance Center, QZ Soft, China Life Insurance Company, China Mobile Online Services Company, and

Tianjin Bohai Petroleum Workers Exchange Center.²⁶

A newly released Chinese management bluebook emphasizes that there is a labor shortage of highly skilled tech workers in China, including in the AI industry. The bluebook, a yearly publication titled *Management Bluebook: China Management Development Report (2021)* was published on November 30 by the [China Management Science Society](#) and the [Social Sciences Academic Press of China](#). The report highlights that, among technology professionals, the “proportion of digital talents with intermediate and senior professional skills is not high, and they are even rarer in cutting-edge technology fields such as AI, virtual reality, and intelligent manufacturing.”²⁷

The bluebook attributes the shortage of digital labor in China to several factors: 1) low levels of unemployment that makes it structurally difficult to meet the growing needs of the industry; 2) concentration of the AI workforce in first-tier cities such as Beijing, Shanghai, Guangzhou, and Shenzhen; 3) a shortage of workers that possess cross-disciplinary skills, especially the ability to integrate a manufacturing background with digital technology skills; and 4) the low skill level of college graduates and a lack of companies that provide in-house training programs.

UNITED NATIONS COOPERATION

Representatives from member states of UNESCO, which includes China, agreed on the text of recommendations for the ethical development and deployment of AI (see full text from UNESCO [here](#)).²⁸ The ethical guidelines, although not legally binding, are the world’s first international guidelines for AI. According to the [South China Morning Post](#), despite the UN agency’s guidelines banning the use of AI for “social scoring or mass surveillance purposes,” China is not expected to alter its adoption of mass surveillance technologies.²⁹

The second annual Tsinghua University International AI Cooperation and Governance Forum was held by Tsinghua University and the United Nations Development Programme (UNDP) on December 4 to 5. The forum was hosted by Tsinghua University’s Institute for AI International Governance (I-AIIG), and the UNDP serves as the international supporting partner. The theme of this year’s forum was how to build a balanced and inclusive AI governing system, and included topics such as the future governance of the metaverse.³⁰ [According to Tsinghua University](#), the event convened thought leaders and practitioners from around the world, including top officials from governments and international organizations, prominent academics, and executives from the tech sector (for a partial list of attendees, see [here](#); for UNDP China Representative remarks at the event see [here](#)).³¹

[According to Chinese media outlet The Observer](#), at the event Ma Shengkun, Deputy Director of the Arms Control Department of the Ministry of Foreign Affairs, said, “In the future, on the issue of how to further regulate the military application of artificial intelligence, it is recommended that, from the perspectives of international law, ethics, technology, and governance, to comply with international law and basic norms of international relations, uphold the concept of ‘intelligence for good,’ strengthen the evaluation and supervision of AI technology, and proactively advocate for shared governance.”³²

Though initial results of the conference have not been released at the time of writing, it is likely that in a few months a white paper of the conference findings will be released, as was the case last year (see 2020 white paper in both Chinese and English [here](#) from forum’s official website).³³

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