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A biweekly newsletter on AI and autonomy developments in China

Kevin Pollpeter and Amanda Kerrigan

Welcome to the *China AI and Autonomy Report,* a biweekly newsletter published by CNA. Read in browser.

In this issue, we begin by discussing the first shoot down of a PRC drone by the Taiwan military on September 1. UAV/counter UAV actions have been escalating between the PRC and Taiwan after US House Speaker Nancy Pelosi's visit to Taiwan on August 2 and 3, with Taiwan stating on August 28 that it would take measures to shoot down PRC drones. In other news, the China Institute for Command and Control discusses constraints on the effective military use of AI, using the US military as an example, and a Strategic Support Force researcher highlights the importance of AI and big data for conducting cognitive warfare in coercive campaigns. In non-military news, the PRC government has issued draft guidelines encouraging the use of autonomous buses and other autonomous vehicles for taxi services under "simple and relatively controllable conditions." August and September appear to be a popular time for conferences on high-tech, and we cover many of them in this issue. Of particular interest is the China Internet Civilization Conference held in Tianjin, at which the Party secretary of the *People's Daily Online* called AI a "national weapon" in strengthening Party governance. Finally, the *China AI and Autonomy Report* will be taking a break from publishing. We hope to bring you the latest AI and autonomy developments in the PRC at a later time.

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PRC DRONE OPERATIONS AROUND TAIWAN

Taiwan shoots down PRC drone. On September 1, the Taiwan military reported that it had shot down a PRC civilian UAV flying over restricted waters around the small island of Shiyu. According to the Taiwan military, the engagement occurred after Taiwan military personnel sent warnings to the UAV. The incident marked the third day in a row that Taiwan troops fired on PRC drones.[1] On August 30, the Taiwan military reported that for the first time its troops fired live rounds to warn off a PRC drone.[2] That drone incursion occurred over Erdan Island, part of Taiwan's offshore islands close to the PRC coast. [3]

The use of live rounds follows an August 28 statement by Taiwan's Ministry of National Defense (MND) that the military will shoot down PRC UAVs that fail to heed warnings to leave.[4] The announcement came after a series of PRC drone incursions following the visit of House Speaker Pelosi to Taiwan on August 2 and 3 (see Newsletter Issue 21). Most recently, it comes after two videos taken by PRC drones were posted to the internet (see here and here), with one video showing Taiwan military personnel stationed on Erdan Island throwing rocks at a drone in a vain attempt to drive it off. That video drew condemnation from some in Taiwan, who called it a humiliation.[5] According to the MND, between August 3 (when Speaker Pelosi left Taiwan) and August 28 there had been 23 drone intrusions in the airspace above Jinmen County.

On August 24, the MND announced that it will build 45 counter drone systems between 2022 and 2026. According to *Focus Taiwan*, an English language website of the Taiwan government's official news agency, the MND has stated that it has developed a "remote control drone defense system," which suggests the development of a UAV to shoot down other UAVs.[6]

The PRC Taiwan Affairs Office responded to the drone shoot down by accusing Taiwan of trying to "create tension and confrontation" with the PRC.[7] In an earlier response to the drone incursions, a PRC Foreign Ministry spokesperson stated that "Chinese drones flying about Chinese territory, this is not something to make a fuss about."[8]

MILITARY INTELLIGENTIZATION

China Institute of Command and Control article points to US military when discussing constraints on using AI for military applications. An article written by researchers from the China Institute of Command and Control argues that the use of AI will revolutionize warfare, but that it currently suffers from a number of constraints that limit its use.[9] According to the article, "modern warfare, with its increasingly complex operational environment and accelerating operational processes, has placed higher demands on command and control capabilities...the speed of observation, positioning, decision making, and action is directly related to victory or defeat." In this context, the article asserts that "the use of AI technologies can significantly shorten the decision cycle."

However, citing the US military as an example, the article states that there are constraints on the application of AI to military operations. They include the following:

Lack of qualified personnel and facilities. The article states that militaries require personnel who are qualified in both computer sciences and military operations and that these personnel are in short supply.

The article also asserts that the US military lacks sufficient facilities to use AI fully; in particular, it lacks large datasets and "high-speed, high fidelity simulation environments."

Lack of compatibility between military and commercial technologies. The article asserts that commercial companies play an important role in providing AI technologies to the US military, but that commercial AI technologies are not fully suitable for military use. Further, the article states that given the sensitivity of military data, military AI technologies are not provided with sufficient data for machine learning, which "to some extent hinders the transformation of civilian AI technologies into military AI technologies."

Incompatibility and stove-piping. The article asserts that the US military has encountered difficulties in effectively sharing data across organizations because of organizational stove-piping and restrictions brought about by proprietary commercial data and government security classifications. These problems are exacerbated by incompatible information technology systems.

The article states, however, that the US military is seeking to overcome these limitations through the establishment of joint organizations, such as the Joint Artificial Intelligence Center, and joint strategies, such as the Joint All-Domain Command and Control Strategy, to better regulate the adoption of AI technologies. The article also states that the US military is working to overcome the lack of compatibility between commercial and military systems through Defense Advanced Research Projects Agency projects such as autonomous vehicle competitions.

COGNITIVE WARFARE

***PLA Daily* article highlights use of AI in cognitive warfare as part of coercion campaign.** The *PLA Daily*, the official paper of the PLA, carried an article written by a researcher at the Strategic Support Force's Space Engineering University titled "Fight the 'Five Battles' of Cognition Aiming at Future Wars," which discusses five elements of cognitive warfare's use in coercing opponents.[10] They include the following:

Cognitive warfare is directed at human emotion. Cognitive warfare should focus on the use of big data, AI, and psychological modeling to strike at "cognitive gaps" between social groups, especially the alliance system of the "strong power" (a euphemism for the US), to exploit contradictions in interests and perceptions between groups and create division.

In cognitive warfare, information is king. The PLA should expand databases and create libraries for cognitive warfare operations and tactics and update them accordingly and expand its cognitive warfare talent pool. It should also vigorously develop core technologies such as neural network systems and AI applications to create an interconnected media environment that effectively coordinates messaging and accelerates the linking of information with cognitive domain operations.

Cognitive warfare should be conducted first to shape the situation. The article states that one should "fully understand the importance of preemption" in cognitive warfare. Militaries should take the initiative to define the narrative in order to shape legal issues and capture the moral high ground before a war starts.

Cognitive operations should seek to deter the enemy and control war. Cognitive operations should be coordinated with kinetic strikes against command and control nodes and reconnaissance and early warning systems to deliver a message and create "asymmetric checks and balances" against an opponent.

Cognitive warfare should be enhanced with all-domain operations. Cognitive warfare should exploit information from all domains. In doing so, cognitive operations can be used to amplify the effects of political disintegration, economic sanctions, diplomatic offensives, and military operations in order to "exert full-dimensional pressure on target audiences and achieve the goal of defeating the enemy without fighting."

POLICY

The PRC Ministry of Transport has released the first national draft guideline on the use of autonomous vehicles for public transport.[11] On August 8, the Ministry of Transport publicized the draft of "Autonomous Driving Vehicles Transportation Safety Service Guideline (Trial)" for comments to be submitted until September 7. The draft encourages the use of autonomous buses in enclosed bus rapid transit systems and allows autonomous vehicles to offer taxi services under "simple and relatively controllable conditions."[12] The draft also classifies autonomous vehicles into three types (conditionally, highly, and fully autonomous vehicles) and, based on their level autonomy, determines whether they need human drivers: conditionally and highly autonomous vehicles should have human drivers, while fully autonomous vehicles should have remote drivers or safety supervisors.[13] The guideline further stipulates that the routes of autonomous vehicles be far from densely populated areas such as schools, hospitals, and large shopping malls.[14] In severe weather conditions such as rain, snow, and ice, the draft states that autonomous vehicles in transportation business activities should stop their operations according to regulations. These guidelines follow a series of local policies that have increasingly allowed autonomous vehicles on roads in China: recently Wuhan and Chongqing allowed Baidu to operate fully driverless robotaxis (see Issue 21), Shenzhen's new regulations on Intelligent and Connected Vehicles went into effect on August 1 (Issue 19), and in July, Beijing launched its first pilot area for commercial autonomous vehicles.[15]

INDUSTRY

Software engineers from Microsoft and ByteDance are cooperating through a project called KubeRay to help companies run AI applications more efficiently. According to CNBC, at the Ray Summit held in San Francisco from August 23 to 24, software engineers from Microsoft and ByteDance discussed the technical details behind KubeRay and pitched the software as "helpful for powering AI apps running on multiple computers"—also known as distributed computing.[16] KubeRay was co-founded in 2019 by a group of engineers and is an open-source toolkit that runs Ray—an open-source software. According to MSNBC, tech giants use open-source projects to spread their own technological ideas to a wider community, which can help attract potential recruits and serve as a way to market themselves as technology leaders and developers. Despite tension in US-China relations, US-China collaboration in AI is not unusual: Stanford University's 2022 Artificial Intelligence Index Report found that the US and China dominated cross-country collaborations on AI and that their collaboration has increased five-fold since 2010.[17]

EVENTS

Teams from the PRC dominate Graph Challenge, a data and graph analysis contest organized by MIT and Amazon. According to the *South China Morning Post,* on August 18 two teams from China's Huazhong

University of Science and Technology were named the champions of Graph Challenge 2022.[18] Teams from China's National University of Defense Technology and Huawei Technologies also won two of the four 2022 Innovation Awards. Launched by MIT and Amazon in 2017, the Graph Challenge competition focuses on graph analysis, which is an "emerging area for AI computing and seeks to find links between structures such as relationship maps on social media or transaction histories between a series of accounts."[19] Until last year, all competition champions were from the US (for a full list of competition awardees over the years, see here).[20]

***People's Daily* party official calls AI "national weapon" in strengthening the Party at the 2022 China Internet Civilization Conference.** The 2022 China Internet Civilization Conference was held in the city of Tianjin on August 28 and 29, with the slogan to "carry forward the new style of the times and build a network civilization." Government officials, business executives, and academics attended the event, which was intended to promote the PRC's approach to internet governance. According to an article appearing on the *Tianjin Daily* website, "promoting the construction of a network civilization, shaping and purifying cyberspace with the new style of the times and building a better spiritual home online requires the concerted efforts of network platforms, social organizations and the general public."[21]

According to Ye Zhenzhen, the Party secretary, chairman, and president of the *People's Daily Online*, the official news website of the Chinese Communist Party, "overtly speaking about politics is an essential requirement for party media and party networks, which must focus on transforming institutional advantages into comprehensive advantages." Ye stated that the State Key Laboratory for Communication Content Cognition (传播内容认知全国重点实验室), established by the *People's Daily*, is working to develop cognitive computing applications to guide political direction, public opinion guidance, and values orientation into a "national weapon in the digital era." According to Ye, "the Internet amasses enormous amounts of economic and social data, enables the thorough expression of public opinion, and provides technological support to strengthen the Party's leadership and better serve the people through the use of big data and artificial intelligence."

The conference, held in Tianjin, was co-sponsored by the Central Internet Information Office, the Central Civilization Office, the Tianjin Municipal Communist Party Committee, and the Tianjin Municipal People's Government.

Four other AI-related conferences took place in China at the end of August and beginning of September. These conferences are officially sponsored and may be seen as efforts to increase China's cachet in each of the conference's specialty areas both at home and abroad. They included the following:

- **2022 World Robot Conference (August 18–21, Beijing):** First held in 2015, this conference is hosted by the Ministry of Industry and Information Technology (MIIT), the Beijing municipal government, and the China Association for Science and Technology (see official conference website here).[22] This year's conference consisted of over 40 forums online and offline and included over 300 guests from 15 countries and territories.[23] It held four major robotics competitions and an expo displaying technologies to the public, such as robotic arms for surgeries, robotic marine animals, and unmanned submarine models.[24]
- **Smart China Expo 2022 (August 22–24, Chongqing):** The Smart China Expo is co-hosted by the Chongqing municipal government, the MIIT, the National Development and Reform Commission (NDRC), the Ministry of Science and Technology (MOST), and the Cyberspace Administration of China (CAC), in addition to official professional associations and the Ministry of Trade and Industry

of Singapore. The expo (see official website here) seeks to "implement the important ideas and proposals" from Xi Jinping on the development of the digital economy.[25] The event consists of exhibitions, forums on specialized topics such as smart cities and smart industries, contests, presentations, business activities, and signing ceremonies. According to PR Newswire, this year the expo gathered over 50 Future Global 500 Enterprises and Fortune China 500 Enterprises and was attended by Nobel Prize-winning physicist Konstantin Novoselov and Turing Prize-winner computer scientist Jack Dongarra.[26] The conference focused on smart cities with an aim to accelerate the development of intelligent industries in Chengdu and Chongqing. [27]

- **2022 World Artificial Intelligence Conference (September 1–3, Shanghai):** Co-hosted by the NDRC, MIIT, MOST, CAC, official professional organizations, and the Shanghai municipal government, the World Artificial Intelligence Conference (WAIC) has been held annually since 2018. On its Chinese-language website, WAIC claims it has "gradually become the most influential industry event in the field of artificial intelligence in the world."[28] According to Shanghai Securities News, the conference reportedly has five sub-venues in North America, Europe, Singapore, South Korea, and Hong Kong. WAIC consists of close to 100 forums covering the four mains topics of technological innovation, industry application, law and ethics, and ecology construction, in addition to 30 professional topics, such as AI+metaverse, generative AI, reliable AI, trustworthy AI, and brain computer interface.[29] Xinhua reported that the conference gave the SAIL (Super AI Leader) award to Zidong-Taichu—a multi-modal model that can integrate images, text, and sound, enabling it to approach humanlike abilities such as feelings, thinking, and flexibility. The model was created by the Institute of Automation of Chinese Academy of Sciences and Huawei's Ascend AI platform.[30]

In addition to these conferences held by national-level organizations, a Shanghai municipal government bureau hosted the Global Metaverse Conference from August 18–19, and the Beijing Municipal government held the World Metaverse Conference from August 26–28.[31]

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For additional information, contact: CHINAAI@CNA.ORG.

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China Studies Program/China and Indo-Pacific Security Affairs Division

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