AI and Autonomy in Russia
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The Russia Studies Program

Abstract

This report, the twenty-sixth in a series of biweekly updates, is part of an effort by CNA to provide timely, accurate, and relevant information and analysis of the field of civilian and military artificial intelligence (AI) in Russia and, in particular, how Russia is applying AI to its military capabilities. It relies on Russian-language open source material.

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Highlights of Issue 26

- In defense industry meetings, Putin argues that AI "should ensure a breakthrough in improving combat capabilities of weapons."
- Russia's military and industrial complex is developing kamikaze drones, lethal UAV helicopters, and robots that can walk in space.
- The Russian AI market grew overall in 2020, even as startup investments dropped.
- The Russian government invests in AI hackathons and competitions to incentivize interest and develop human capital.
- Yandex collaborates on robotic product delivery service in Dubai.

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Governance and Legal Developments

1. Putin stresses AI development at numerous defense industry meetings

On November 3, in an annual meeting with Ministry of Defense and Russian defense industry leaders, Russian president Vladimir Putin stated that artificial intelligence "should ensure a breakthrough in improving combat capabilities of weapons" and stressed the need to prioritize AI-enabled systems in the State Armament Program through 2033.

Putin stressed the importance of "develop[ing] and introduce[ing] the technology needed for developing new hypersonic weapon systems, and more powerful lasers and robotic systems that will be capable of effectively countering potential military threats" and argued that "the use of artificial intelligence technology is of primary importance in developing these and other advanced weapons systems." Among such advanced systems, he also noted command and control systems, precision-guided missiles, "advanced robotics with higher autonomy, and [means] to control drones and deep-water vessels." On the previous day of this meeting, Putin also stressed the importance of further development of unmanned aviation, pointing out that the Russian military currently has over 2,000 unmanned aerial systems.

In a separate meeting of the Military-Industrial Commission on November 10, Putin similarly stressed the "need to focus on introducing advanced information, bio- and cognitive technology, hypersonic arms, [and] weapons based on new physical principles, as well as cutting-edge reconnaissance, navigation, communications and control systems." He argued that it was important to "enhance the utility and combat sustainability of military products, partly through artificial intelligence and, of course, extensive use of robotics." He further noted that these technologies "will decisively determine the future look and combat potential of [the Russian] Armed Forces."

Sources: "Meeting with Defence Ministry leadership and heads of defence industry enterprises," President of Russia website, Nov. 3, 2021, http://en.kremlin.ru/events/president/news/67061; "Meeting with Defence Ministry leadership and heads of defence industry enterprises," President of Russia website, Nov. 2, 2021, http://en.kremlin.ru/events/president/news/67056; "Military-Industrial Commission meeting," President of Russia website, Nov. 10, 2021, http://en.kremlin.ru/events/president/news/67093.

2. Russian government conducts industry AI readiness survey

Separately, the Russian government has initiated a confidential survey of business readiness to incorporate AI-enabled technologies, as part of implementing the Russian strategy on AI. The survey was developed by the Analytical Center of the Russian Government, the government pollster VTsIOM, Moscow State University, and Sberbank. The survey is intended to help the government assess private sector needs, develop an index of industry readiness, and, on the whole, support cooperation between the government and private sector on the incorporation of AI-enabled systems.

Source: "Business will be asked on the readiness to incorporate AI" [Бизнес спросят о готовности к внедрению ИИ], Russian Government Analytical Center, Nov. 11, 2021, https://ac.gov.ru /news/page/biznes-sprosat-o-gotovnosti-k-vnedreniu-ii-27087#.

Military and Security Developments

3. Russia is developing the AI-enabled "Termit" helicopter-type UCAV

Strela Design Bureau, part of Kronshtadt Company, is developing the "Termit" reconnaissance and strike helicopter UAV. The drone is equipped with ISR sensors, unguided munitions, and 80 mm laser-guided missiles. According to Russian military commentators, rotary-wing drones are intended for operations in difficult terrain and to conduct radio-technical reconnaissance, target designation, and joint missions with manned helicopters. Strela claims that Termit can engage both stationary and mobile targets and can conduct operations independently, although the level of autonomy was not clear.

According to Strela, the drone operator identifies and designates a given target. Following confirmation, the drone can then act autonomously with the help of artificial intelligence algorithms embedded in the drone control system that allow Termit to choose the most optimal route to target. The operator then makes the final decision to launch a strike. Strela notes that this is an experimental model designed to test certain capabilities and that the goal is to finish testing this year. Termit was first presented at the ARMY-2021 International Military-Technical Forum.

Source: "The development of the Termit helicopter-type drone will be completed in Russia later this year" [В России до конца года завершат разработку беспилотника вертолетного типа "Термит"], Tass.ru, Nov. 3, 2021, https://tass.ru/armiya-i-opk/12833093; Aleksei Zakvasin, Elizaveta Komarova, "Artificial intelligence algorithms: what is unique about Russia's Termit combat helicopter drone" [«Алгоритмы искусственного интеллекта»: в чём особенность российского боевого вертолётного дрона «Термит»], RT.Russian.com, Nov. 3, 2021, https://russian.rt.com/russia/article/923769-rossiiskii-boevoi-vertolyotnyi-dron-termit.

4. Russian reconnaissance squads to get real-time battlefield coordination systems

According to Major-General Alexei Belousov, chief of reconnaissance and deputy chief of the Russian Army Main Staff for Reconnaissance Forces, Russian units will soon get next-generation reconnaissance, command and control, and communications systems integrated with the latest equipment and drone systems to facilitate engaging targets in near-real time.

Belousov noted that the use of aerial drones enables reconnaissance squads to better identify enemy positions and increase personnel survivability. The May 2021 *AI and Autonomy in Russia* report noted the use of the "Strelets" personnel automated control system that allows soldiers to call in a UAV strike following target designation and confirmation. Further use of drones will strengthen Russia's reconnaissance-fire and reconnaissance-strike operations (contours) that proved effective in Syria and are now incorporated in the Russian military's CONOPS and TTPs.

Source: ""Russian reconnaissance squads to get real-time battlefield coordination systems, Tass.com, Nov. 3, 2021, https://tass.com/defense/1357357; Michael Kofman, "A Bad Romance: US Operational Concepts Need to Ditch Their Love Affair with Cognitive Paralysis and Make Peace with Attrition," Modern War Institute, Mar. 31, 2021, https://mwi.usma.edu/a-bad-romance-us-operational-concepts-need-to-ditch-their-love-affair-with-cognitive-paralysis-and-make-peace-with-attrition/.

5. Russia's Teledroid robot can operate inside a space station and in open space

According to the Russian Cosmonaut Training Center, the "Teledroid" robotic spacewalker will be tested in open space in 2024. Teledroid is an evolution of the FEDOR android robotic system manufactured by the Android Technologies and Advanced Research Foundation. FEDOR flew to the International Space Station in 2019 to conduct a number of tests inside the station. Following the tests, Android Technologies announced the development of a robot that can work inside ISS and in open space to replace humans during dangerous missions. In March 2021, the company officially signed a contract with the Russian space agency Roscosmos to develop Teledroid, with the first prototype R&D stage to be completed in late February 2022.

Sources: "Roscosmos plans to orbit its robotic spacewalker in 2024," Tass.com, Oct. 27, 2021, https://tass.com/science/1354475; "Russia's state-of-the-art Teledroid robot can operate inside and outside space station," tass.com, Oct. 28, 2021, https://tass.com/science/1355171.

6. Russian Navy to use "kamikaze" drones

The Russian Navy is considering using loitering munitions, or "kamikaze" drones. Such drones can be based on vessels to strike ground targets and enemy ships, supporting a wide range of close-shore combat operations. These loitering munitions can also be effective against light boats that are commonly used by saboteurs and terrorist organizations. The drones can be placed atop vessels in a short amount of time and do not require special infrastructure or

retrofitting, resulting in minimal changes to existing vessels. The Russian military has already tested two "kamikaze" drones in Syria—"Kub" and Lancet," made by Kalashnikov Design Bureau (part of Rostec). The Russian military recently noted the success of loitering munitions in the 2020 Nagorno-Karabakh conflict, where the Azerbaijani military used a number of Israeli-made loitering munitions with notable success against Armenian forces and air defense units.

Source: "Rosatom's nuclear center to create ammunition to catch drones with a cutting web" [Ядерный центр "Росатома" создаст снаряд для ловли дронов режущей сетью], RIA Novosti, Nov. 3, 2021, https://ria.ru/20211103/drony-1757476025.html.

Corporate and Market Developments

7. Trade conference discusses growth, challenges of Russian AI market

Participants at a conference organized by the trade publication *CNews* discussed the size and state of the Russian AI market. Participants noted that the Russian AI market increased by 22.4 percent in 2020 and growth rates of approximately 18.5 percent are expected through 2024. The growth to-date has been driven by large corporations and the Russian government, which intends to continue increasing investment in AI-enabled solutions. At the same time, the amounts invested in startup companies decreased dramatically (46 percent in the number of transactions and 63 percent in the volume of investments) in 2020. Discussion at the conference also focused on challenges in the development of AI solutions in specific industries; shifts in attitudes toward a greater realism, as opposed to trust in AI technologies; and efforts to tackle the shortage of educated and qualified workforce participants.

Source: "Artificial intelligence: development trends and employment practices" [Искусственный интеллект: тренды развития и практика применения], Oct. 20, 2021, CNews, https://events.cnews.ru/articles/2021-10-10_lyudi_perestayut_verit_v_nepredvzyatost.

8. Sberbank head names most important modern technologies

The CEO of Sberbank, German Gref, stated in an interview with RIA Novosti that the most important technological fields for Russia today are artificial intelligence, quantum computing, 6G mobile communications, unmanned vehicles, and technologies needed for a "green" energy transition. He noted that Sberbank in particular had profited from advances in AI, while he believed that quantum computing had special promise for the financial and business sectors. He also stated that Sberbank, while behind Yandex in terms of unmanned vehicles, was catching up. The interview was wide ranging, and largely focused on the need for further investing in technological developments given the prospects for potential stagnation in the financial and banking industries.

Sources: "Gref names the most important modern technologies" [Греф назвал важнейшие современные технологии], RIA Novosti, Nov. 7, 2021, https://ria.ru/20211107/gref-1757944044.html; "German Gref: classical banks do not have very bright prospects" [Герман Греф: у классических банков не очень радужные перспективы], RIA Novosti, Nov. 7, 2021, https://ria.ru/20211108/gref-1757966466.html.

9. Sberbank develops image creation software

Sber has announced a new neural network program, termed 'ruDALL-E,' that generates pictures based on text description inputs in Russian. The program, which used the Christofari supercomputer to train the network, is the largest Russian neural network project today. David Rafalovsky, Sber CTO, noted that "image generation covers two important needs of modern business—the ability to get a unique image for your own description, as well as in any moment to create the required number of license-free illustrations." At present, the program is available for free on GitHub and is expected to be available on SberCloud's ML Space platform. The technology was first developed for English-language text by the San Francisco firm OpenAI, although it was never released publicly.

Sources: "Sber has created a multimodal neural network that generates pictures according to Russian descriptions" [«Сбер» создал мультимодальную нейросеть, которая генерирует картинки по описанию на русском языке], CNews, Nov. 2, 2021, https://www.cnews.ru/news/line /2021-11-02_sber_sozdal_multimodalnuyu; "ruDALL-E," https://rudalle.ru/en/; ruDALL-E Github, https://github.com/sberbank-ai/ru-dalle.

Education and Training Developments

10. AI competitions take place before AI Journey conference

The Russian-hosted "AI Journey 2021" event was held online on November 10-12. The international conference was jointly organized by Sberbank and the Alliance for Artificial Intelligence. This is the third such iteration, and, according to reports, the attendance hit a record high of more than 52,000 participants. According to the event website, there were more than 50 keynote speakers and more than 40 million views. *The conference will be covered in greater detail in issue 27 of* AI in Russia.

From September to November, several competitions preceded the conference with a prize fund of 8 million rubles. Participants were tasked with creating AI technologies to forecast the spread of fires across Russia, to develop AI solutions to make rail travel safer, and to create "multimodal, multitask and multilingual" models. An "AI Journey Junior" for those under the age of 18 was also held, on November 12.

Sources: "AI Journey Conference," AI Journey, https://ai-journey.ru/en/conference, accessed Nov. 15, 2021; Alexander Chernov, "Sber announces the winners of the AIIJC International Artificial Intelligence Competition for Children" [Сбер объявил победителей международного конкурса по искусственному интеллекту для детей AIIJC], Gazeta.Ru, Nov. 11, 2021, https://www.gazeta.ru/business/news/2021/11/11/n_16839517.shtml; Sber, "Sber's AI Journey Conference: Tech development must be human-centric," PR Newswire, Nov. 14, 2021, https://www.prnewswire.com/news-releases/sbers-ai-journey-conference-tech-development-must-be-human-centric-301423563.html.

11. Russian government allocates 700 million rubles to AI hackathons

According to a government article in the November 3 issue of *Rossiyskaya Gazeta*, the Russian government allocated over 700 million rubles to AI-related hackathons over the next three years. As mentioned in issue 23 of *AI in Russia*, 116 hackathons will be hosted across Russia by 2024, with an anticipated total attendance of more than 21,000 participants. Dmitry Chernyshenko, deputy prime minister of Russia, stated: "Thanks to hackathons, the professional AI community of the country and the corresponding infrastructure are expanding. For participants, this is an excellent chance to demonstrate their professional qualities and contribute to the development of the digital economy." According to the "Hackathon 2021"

website, the eighth of these hackathons was held in St. Petersburg on November 12-14, 2021. Participants were assigned several tasks, including creating machine learning systems to help pharmaceutical supply chains track and meet fluctuating demands.

Sources: Oleg Kapranov, "Government will allocate over 700 million rubles for AI hackathons" [Правительство выделит более 700 миллионов рублей на хакатоны по ИИ], RG.Ru, Nov. 3, 2021, https://rg.ru/2021/11/03/pravitelstvo-vydelit-bolee-700-millionov-rublej-na-hakatony-po-ii.html; "St. Petersburg" [Санкт-Петербург], Hackathon 2021, https://hacks-ai.ru/hakaton /sankt-peterburg.

12. Ministry of Education creates AI training module

According to the website of Russia's Ministry of Education and Science, the ministry has developed a module for universities to use when training new specialists in the field of AI. The module was developed to help address a shortage of qualified personnel and is designed to standardize and help build certain digital competencies among students. According to the press release, the module, which will be "widely implemented in universities," was developed in coordination with key businesses and employers in the field, including Gazprom Neft, Sberbank, and Mail.ru.

Sources: "'It is necessary to form digital competencies for each graduate'" [«Необходимо сформировать цифровые компетенции у каждого выпускника»], Ministry of Education and Science, Oct. 29, 2021, https://minobrnauki.gov.ru/press-center/news/?ELEMENT_ID=41766; "Universities will introduce an educational module in the field of artificial intelligence" [В вузах внедрят образовательный модуль в области искусственного интеллекта], *Argumenti i Fakti,* Oct. 29, 2021, https://aif.ru/society/education/v_vuzah_vnedryat_obrazovatelnyy_modul _v_oblasti_iskusstvennogo_intellekta.

International Collaboration

13. Yandex and Majid Al Futtaim to launch robotic delivery service in Dubai

According to reports, Yandex and Majid Al Futtaim have agreed to use robotic technologies to launch a robotic consumer product delivery service in Dubai. Majid Al Futtaim is one of the largest operators of stores in the Middle East, Africa, and Central Asia. The service will be launched in 2022 with robotic delivery of goods from Carrefour supermarkets. Customers will be able to track the delivery robot's movement in real time through an app. Yandex's autonomous robots can independently plan their route and can detect approaching vehicles and pedestrians while moving at up to 8 km per hour along sidewalks and other pedestrian zones. They have been operating in Moscow since the end of 2020. In 2021, they reportedly began to operate on several university campuses in the United States.

Source: "Yandex and Majid Al Futtain agree to launch robotic delivery service from Carrefour supermarkets in Dubai" [«Яндекс» и Majid Al Futtaim договорились запустить доставку роботами из магазинов Carrefour в Дубае], CNews, Nov. 3, 2021, https://www.cnews.ru /news/line/2021-11-03_yandeks_i_majid_al_futtaim_dogovorilis.

14. Russia's ZALA drones are used across Latin America

Unmanned aerial vehicles produced by Russia's ZALA Aero, part of the Kalashnikov Group within the state tech corporation Rostec, have been put into operation in several Latin American countries. According to a company spokesman, speaking on the sidelines of the SITDEF 2021 international arms show in Peru, UAV Latam is using four sets of ZALA Aero 421-08M drones to provide services in the fuel and energy sector as well as in the agricultural sphere. According to TASS, "the ZALA 421-08M is a lightweight drone that can be hand-launched. It has a flight time of over an hour and a half, a communications range of 15 to 30 km and a maximum weight of 2.5 kg. As its payload, it can carry a thermal imager with a video camera. The drone's fixed design, light weight and smart control system allow for its operation by the personnel with a minimal level of training. ZALA Aero is a leading Russian developer and manufacturer of unmanned aerial vehicles and mobile systems."

Source: "Russia's ZALA latest drones already in use over Latin America, says UAV Latam spokesman," TASS, Oct. 30, 2021, https://tass.com/defense/1355909.

Spotlight: The Kaspersky Antidrone System

Source: "Overview," Kaspersky Antidrone website, accessed Nov. 16, 2021,
https://antidrone.kaspersky.com/en/solution/overview/.

Kaspersky Labs, a Russia-based global cybersecurity company, has recently developed an antidrone system, called Kaspersky Antidrone, that purportedly protects facilities and large public gatherings from civilian and unauthorized UAVs. The system uses the Racoon Radar (енот) produced by Rosoborenexport to detect unmanned systems in the 9.2–9.4 Gigahertz range out to 1,800 meters, according to the Kaspersky company website. Once the radar has detected the UAV, the identification module uses neural networks to classify the object in real time. Company documents suggest that the system can neutralize UAVs but do not give any details on how it does so.

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