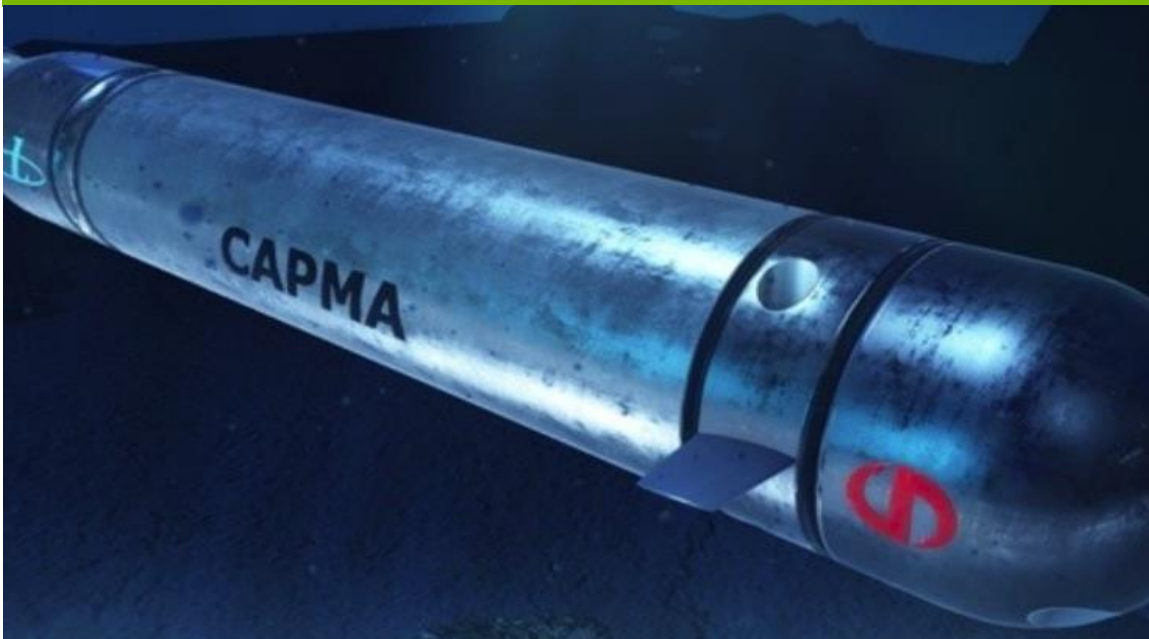


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Abstract

This report, the twenty-third 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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Approved by:

October 2021



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Highlights in Issue 23

- The Russian government creates a new analytical center focused on the implementation of Russia's AI national strategy and AI federal project, and conducts numerous competitions for government subsidies focused on the implementation of AI solutions across business and academia.
- The Russian military is creating a pathway for officers commissioned specifically for commanding units of unmanned systems.
- Wireless provider MTS announces funds for AI startups as Yandex and Cognitive Pilot businesses continue to advance.
- Moscow State University will mandate AI course for all students as Russian schools and universities continue to tackle shortage of AI specialists.
- The agricultural company Cognitive Pilot opens US subsidiary to market control systems for unmanned agricultural drones as Russian companies expand presence in all regions of the world.

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Governance and Legal Developments

1. Russian government creates new center for AI federal project implementation

In July 2021, Russian prime minister Mikhail Mishustin signed a decree creating an AI Analytical Center, as part of a larger Russian Federation government analytical center, focused on the implementation of Russia's AI Strategy and the monitoring of the implementation of the AI federal project. The center will help with the execution of competitions for government subsidies and the development of norms, and focus on AI international cooperation. According to reports, "By the end of 2021, the center will develop an index of readiness of industries toward AI implementation, launch a national portal in the AI sphere, and assess the satisfaction of Russian citizens interested in the development of AI technologies with the work so far."

Among its first projects, the center organized a roundtable focused on the AI ethics code at the Russian Federation Council (part of Russia's bicameral legislature), in September. The code, which is of an advisory nature, is currently under development in the Russian government AI analytical center in collaboration with the Ministry of Economic Development. The ethics code, set to be released at a public event on October 12, will develop "common principles and standards of behavior for various participants in the functioning of AI systems in Russia."

Sources: "National strategy of AI development" (Национальная стратегия развития искусственного интеллекта) TAdviser, July 9, 2021; "An analytical center structure there will be an expertise center on the implementation of AI federal project" (В структуре АЦ появится Центр экспертизы по реализации федерального проекта «Искусственный интеллект»), RF government analytical center press release, July 22, 2021, <https://ac.gov.ru/news/page/v-strukture-ac-poavitsa-centr-ekspertizy-po-realizacii-federalnogo-proekta-iskusstvennyj-intellekt-26988#>; "Federation Council discusses AI ethical code" (Кодекс этики ИИ обсудили в Совете Федерации), RF government analytical center press release, Sept. 17, 2021, <https://ac.gov.ru/news/page/kodeks-etiki-ii-obsudili-v-sovete-federacii-27040#>.

2. Russian PM prioritizes AI as government plans subsidies for business and academics

In his September 1 remarks associated with the first day of school (Knowledge Day) in Russia, Prime Minister Mishustin discussed AI as the “most important direction of Russian development.” He asserted the following:

The artificial intelligence system learns by itself, but the data it contains limits its learning. Today, the transition to the possibilities of applying the laws of physics using artificial intelligence algorithms, expanding the data on which artificial intelligence can learn, will be the most important catalyst for new solutions.... In the future, artificial intelligence may even replace the routine processes associated with checking homework, it is a tool that can be used everywhere.

In the meantime, the Russian government has been conducting competitive selections of businesses, educational establishments, and scientific institutions focused on furthering AI development in Russia as part of the AI federal project. In May, it approved rules for private sector subsidies for the incorporation of AI technologies. In a competitive program that will exist until 2024, the government could distribute over 5 billion rubles (\$70 million) for projects in computer vision, natural language processing (NLP) speech recognition and synthesis, decision-making support, future AI methods (including quantum machine learning), and other topics. Additional subsidies were announced for developers of relevant software and hardware for AI tech. Also in May, the government announced subsidies for the creation of 10 new bachelors degree and 40 new masters degree programs focused on AI. In July, rules for yet additional subsidies were outlined for academic and scientific institutions focused on technological R&D and educational programs in the AI sphere. The competition for 6 spots, which concluded on August 31, attracted 28 proposals from universities and 8 from scientific organizations. The total amount of funding is over 7 billion rubles (\$96 million), most of which is from the government budget, and the focus is on medicine, urban infrastructure, agriculture and food production, environmental monitoring, advanced robotics, and industrial automation, among a dozen priority sectors.

Sources: "Mishustin states that AI direction will be priority" (Мишустин сообщил, что особое внимание будет уделено направлению "Искусственный интеллект"), Sept. 1, 2021, <https://tass.ru/obschestvo/12270987>; "National strategy of AI development" (Национальная стратегия развития искусственного интеллекта), TAdviser, July 9, 2021; "Government approves rules of support for AI projects" (Правительство утвердило правила поддержки проектов в сфере искусственного интеллекта), May 23, 2021, <http://government.ru/news/42285/>; Nikita Korolyov, "Intellect must be common sense" (В интеллекте все должно быть разумно), *Kommersant*, May 25, 2021, <https://www.kommersant.ru/doc/4826683>; "Events of the AI federal project, RF government analytical center press release," RF government analytical center, Aug. 2021, https://ac.gov.ru/uploads/_Projects/AI_central/%D0%B8%D0%B8_%D0%B0%D0%B2%D0%B3%D1%83%D1%81%D1%82_07.09.pdf.

Military and Security Developments

3. Russian military starts training unmanned aviation unit commanders

According to an announcement by the Ministry of Defense, the Russian military is beginning a new officer commissioning pathway to produce officers and commanders specifically for unmanned aviation companies and platoons. Officers complete the course over five years, suggesting that it is a full commission pathway similar to other branch specialties within the Russian military. Until now, qualifications for unmanned units have been secondary specialties for military members serving in those units. This new program is in a trial phase at the Ryazan Guards Higher Airborne Command School. If successful, the Russian military will implement it in other military institutions.

Source: Roman Kretsup, Anton Lavrov, “Commanding the drone: Russian Federation begins mass training of “unmanned commanders”” (Взошли на дрон: в РФ начинается массовая подготовка «беспилотных командиров»), Iz.ru, Aug. 9, 2021, <https://iz.ru/1204444/roman-kretcul-anton-lavrov/vzoshli-na-dron-v-rf-nachinaetsia-massovaia-podgotovka-bespilotnykh-komandirov>.

4. Russia has developed a drone to monitor radioactive and chemical contamination

Russia’s Strategic Rocket Forces has patented a new drone that serves to monitor and transmit data about radioactive and chemical contamination, among other possible missions. The drone design consists of two propellers on a central axis with a mesh covering to increase the drone’s survivability during possible collisions with objects or “living creatures”—likely a reference to collisions with birds that could damage the propellers. Sealed modules used for monitoring the environment attach to the rigid frame. The report indicates that the UAV can carry up to 0.6 kilogram (1.3 pounds). In addition to reporting the location and degree of contamination, the report also mentions the possibility of using the drone to locate missing personnel.

Source: “Russia has developed a drone to monitor radioactive and chemical contamination” (В России разработали беспилотник для мониторинга радиоактивного и химического заражения), Tass.ru, Sept. 10, 2021, <https://tass.ru/armiya-i-opk/12094867>.

5. AI and Autonomy in Russia's Orbital Space Station

Dmitry Rogozin, director of Roskosmos, recently asserted that many functions and systems of Russia's new orbital station will operate autonomously and that the station will feature artificial intelligence. He did not indicate exactly how AI-related capabilities will be used on the station, stating merely that it should "demonstrate intelligence at the highest level." He also indicated that the station could utilize extravehicular robots. Recall that in August-September 2019, Roskosmos sent FEDOR, a "humanoid" robot to the International Space Station, supporting reports that Russian developers are interested in using robots in space in place of humans.

Sources: "Russia's future orbital station to use artificial intelligence — Roscosmos chief," Tass.com, Sept. 2, 2021, <https://tass.com/science/1333311>; "Russia launches life-sized robot into space," BBC.com, Aug. 23, 2019, <https://www.bbc.com/news/world-europe-49431507>; "The Teledroid robot will be able to work in orbit for 3-4 years," VPK.name, May 19, 2021, https://vpk.name/en/508691_the-teledroid-robot-will-be-able-to-work-in-orbit-for-3-4-years.html.

6. Roscosmos considers using robots for facility security and protection, and AI for operations

Roscosmos, Russia's state space agency plans to study the possibility of using autonomous robotic systems—either stationary or mobile—for protection of its facilities against dangers such as terrorism. According to TASS state news agency, the "Okhrana" Scientific and Technical Center will conduct initial R&D at the cost of 564,500 rubles (\$7,500). The small amount mentioned in the report suggests that this initial move is an exploratory effort rather than actual development of the system.

Sources: "Russia's future orbital station to use artificial intelligence — Roscosmos chief," Tass.com, Sept. 2, 2021, <https://tass.com/science/1333311>; "Russia launches life-sized robot into space," BBC.com, Aug. 23, 2019, <https://www.bbc.com/news/world-europe-49431507>; "The Teledroid robot will be able to work in orbit for 3-4 years," VPK.name, May 19, 2021, https://vpk.name/en/508691_the-teledroid-robot-will-be-able-to-work-in-orbit-for-3-4-years.html

Corporate and Market Developments

7. MTS announces fund and support for AI startups

Russia's wireless provider MTS has announced a \$100 million fund for AI startups through the MTS AI Center's "Intelligent Machines (Intema)*" accelerator program. The fund is open to AI ventures worldwide, with its first investment of \$10 million going to Kneron, a San Diego based Edge AI chip maker. The deal awards MTS exclusive rights to supply the chip to the Russian market. The CFO of MTS AI, Alexei Posternak, stated that investment priorities will be given to language, image, and behavioral analysis as well as edge computing and logistics projects.

Separately, the MTS AI Center is partnering with "Plug and Play," a large global innovation platform based in Silicon Valley, to provide collaborative funds for new startups in the AI field. The partnership will provide mentors to startups in the MTS AI Center's "Intelligent Machines (Intema)*" accelerator program. These mentors will include employees from major tech firms such as Samsung, Facebook, Google, and Nvidia. Startups will be offered up to \$100,000 in funds, access to a supercomputer capable of running neural networks, and technical assistance. Said Amidi, the CEO of Plug and Play, noted, "Working with the leading AI platform in Russia is a great honor for Plug and Play. We are pleased to explore the Russian market for artificial intelligence and telecommunications, and use all the ways to promote innovation."

Sources: "Russian Mobile Operator MTS to Invest \$100M in Global AI," *The Moscow Times*, Sept. 23, 2021, <https://www.themoscowtimes.com/2021/09/14/russian-mobile-operator-mts-to-invest-100m-in-global-ai-a751111>; "MTS AI Center and Plug and Play will offer startups smart money" ("Центр ИИ МТС и Plug and Play предложат стартапам smart money"), CNews, Sept. 14, 2021, https://www.cnews.ru/news/line/2021-09-14_tsentr_ii_mts_i_plug_and_play_predlozhat.

8. Yandex in top 10 self-driving car programs

Experts at Morgan Stanley recently estimated the value of Yandex's self-driving car program at \$7 billion, placing it among the top 10 companies in the sector. Current market leaders are Google's Waymo and General Motors' Cruise projects. Yandex's investments in the unmanned technology sector are estimated at \$2.2 billion.

Sources: “Morgan Stanley: Yandex's drone development business is worth \$7 billion” [“Morgan Stanley: Бизнес по разработке беспилотников «Яндекса» стоит 7 миллиардов долларов] Computer World Russia, Aug. 9, 2021, <https://computerworld.ru/news/Morgan-Stanley-Biznes-po-razrabotke-bespilotnikov-Yandexa-stoit-7-milliarda-dollarov>.

9. Cognitive Pilot introduces AI-directed agricultural vehicles to Russian Far East

With support from Sberbank, Cognitive Pilot has launched a smart autopilot project for combine harvesters in the Amur Region of Russia. This is the first introduction of the Cognitive Agro Pilot ecosystem into the Russian Far East. The autonomous control system analyzes images coming from a video feed and uses a learning neural network to determine the types and positions of objects in the direction of travel. This allows for the combine to modify its movement in accordance with the geography. The local company “Amuragrokompleks” is the first user of the system. The company’s chief engineer, Alexander Zharov, stated the following:

The introduction of agricultural pilots will increase productivity, since the equipment will walk more accurately on the edge of the crop. In particular, the Cognitive Agro Pilot autonomous control system will reduce losses during the operation of the combine harvesting corn in the cold season: the more accurately the equipment goes and automatically steers in rows, the less losses occur during harvesting.

Sources: “Cognitive Pilot expands the geography of AI-agropilot applications to the Far East” (“Cognitive Pilot расширяет географию применения ИИ-агропилотов до Дальнего Востока”) Cnews, Aug. 6, 2021, https://www.cnews.ru/news/line/2021-08-06_cognitive_pilot_rasshiryaet_geografiyu.

10. Kaspersky introduces new system for emergencies

Kaspersky Labs is piloting a new program, using the Kaspersky Neural Networks system for quick data analysis during emergencies. The system is designed to deal with three key issues common in emergency situations such as natural disasters or mass casualty events: searching for missing people, animals, and objects in hard-to-reach areas; assessing damage in emergencies, using aerial imagery; and analyzing data necessary for geodetic, cartographic, and cadastral activities, as well as traffic management. It reportedly allows for the quick analysis of massive amounts of video and picture data taken from unmanned aerial vehicles deployed to emergency situations. The system has already been introduced for Albatross, a

Russian manufacturer of unmanned vehicles, and is now installed on the Albatross M5 unmanned aircraft and the Albatross D1 industrial quadcopter.

Sources: “Kaspersky Lab is piloting an intelligent system for emergency analytics” («Лаборатория Касперского» тестирует интеллектуальную систему для аналитики чрезвычайных ситуаций), CNews, July 26, 2021, https://safe.cnews.ru/news/line/2021-07-26_laboratoriya_kasperskogo.

11. Digital medicine projects move forward despite skepticism from Russian doctors

A recent article in the Russian newspaper *Izvestiya* summarized advances in digital medicine in Russia, emphasizing the sector’s continued growth over the last six years as well as continued skepticism over moving medical interactions to the digital domain. Targeted investments in Russian digital medicine lag behind industry leaders such as the United States. The article notes that while there are roughly 3,000 digital medicine startups worldwide, Russia has only 31 at present.

The most competitive and vibrant sections of the current market deal with digital imagery processing, especially for lung images in usage with COVID-19 and other tomographical purposes. Speech recognition programs are also being developed to automate recording diagnoses by doctors. The pandemic experience has jump-started a number of programs using AI to assess relative damage to lungs; these programs remain the most developed aspect of digital medicine in Russia at present. Telemedicine, which is growing worldwide, remains relatively underdeveloped in the Russian market.

The article underlined reticence among Russian healthcare practitioners to adopt AI-based medical practices, as well as the investment and legal environment. The former is growing significantly, largely through government-sponsored initiatives such as Skolkovo, while the latter remains uncertain and subject to significant regulations regarding risk assessment.

Sources: Maria Nemtseva, “Cyber Medicines: Artificial Intelligence Conquers Medicine” (“Киберлекари: искусственный интеллект завоевывает медицину”), *Izvestiya*, July 19, 2021, <https://iz.ru/1193061/mariia-nemtceva/kiberlekari-iskusstvennyi-intellekt-zavoevyvaet-meditsinu>.

Education and Training Developments

12. Moscow State University to require AI course for all students

According to a September 8 announcement from Moscow State University rector Viktor Sadovnichy, all MSU students will be required to take a basic course on artificial intelligence. The course will be required for all full-time students, and must be taken by their third year of undergraduate school, the first year of graduate school, or the third or fourth year of specialized education. Separately, Moscow State University is also offering a new 15-week course called “Fundamentals of Artificial Intelligence in Science” as part of the specialization titled “Neural Networks and Their Application in Scientific Research.” Students can choose to earn a certificate in this field, or they can take individual courses without a certificate for free.

Sources: “MSU students obliged to take a course on artificial intelligence” (Студентов МГУ обязали проходить курс по искусственному интеллекту), RBC, Sept. 10, 2021, <https://www.rbc.ru/rbcfreenews/613b602d9a79476242746221>; “Moscow State University will Teach the Basics of Artificial Intelligence to Everyone for Free” (МГУ бесплатно обучит основам искусственного интеллекта всех желающих), Scientific Russia, Sept. 22, 2021, <https://scientificrussia.ru/articles/mgu-besplatno-obucit-osnovam-iskusstvennogo-intellekta-vseh-zelausih>.

13. Russian schools and universities try to address shortage of IT and AI specialists

On September 1, 2021, around 500 Russian schools in 24 regions began teaching AI courses as part of a statewide pilot program. In 2022, the course will be available to all Russian schools. The course program, developed by Synergy University and Sber Education (part of the Sberbank ecosystem), is in line with the “Artificial Intelligence” federal project, which hopes to address a statewide shortage of between 500,000 and 1 million IT specialists per year. The IT specialist shortage is considered to be the main obstacle to the digitization of Russian businesses. The program offers five modules of varying difficulty for students from primary school through high school, and includes instruction on machine learning, big data analytics, neural networks, and the Python programming language. Synergy University will publish an AI textbook, a workbook and a notebook for testing, educational videos for school children, and guidelines for teachers.

Separately, the Russian Association for Artificial Intelligence (RAII) held a summer school for 130 undergraduate, graduate, and postgraduate students interested in AI and already familiar with the basics of machine learning, mathematical statistics, and programming. The Moscow Institute of Physics and Technology and the Federal Research Center "Informatics and Management" of the Russian Academy of Sciences (FRC IU RAS) partnered with RAII to host the summer program, which was held at the Sochi-based Sirius University of Science and Technology. According to the article, the program included instruction in six thematic areas: reinforcement learning, behavior planning in robotics, logic in artificial intelligence, deep learning in computer vision, neural network analysis of natural language, and neuromorphic computing. More than 30 of Russia's leading AI researchers taught the coursework, and guided the project work and competitions that followed the formal instruction portion of the program. This was the sixth such clinic held by RAII.

In a recent interview, Elena Shmeleva—the head of an educational center for gifted children created by presidential decree in 2015, and a member of the Presidential Council of the Russian Federation for Science and Education—discussed the need to grow AI specialist training capacity in Russia:

Today employers need high-quality technicians and engineers with competencies in working with automated and digitized industries. We need people who can control complex technical devices and interact with AI. In many professions, where previously there was enough secondary vocational education, the requirements for qualifications have sharply increased.

Shmeleva noted that this need to develop AI capacity exists across all Russian regions, not just in Moscow and St. Petersburg. As part of this effort, the Russian government has sought to develop 30 advanced engineering schools across all regions of the country in collaboration with corporate partners who hire some of the graduates.

Sources: "Schoolchildren will be taught to be friends with AI. Experts told why Russia needs a new curriculum" (Школьников научат дружить с ИИ. Эксперты рассказали, зачем России нужна новая учебная программа), Secret Firmi, July 30, 2021, <https://secretmag.ru/technologies/shkolnikov-nauchat-druzhit-s-ii-eksperty-rasskazali-zachem-rossii-nuzhna-novaya-uchebnaya-programma.htm>; "Young researchers from different regions of Russia discussed the development of artificial intelligence" (Молодые исследователи из разных регионов России обсудили развитие искусственного интеллекта), Sirius University, July 22, 2021, <https://siriusuniversity.ru/media/news/molodie-issledovateli-iz-raznih-regionov-rossii-obsudili-razvitie-iskusstvennogo-intellekta>; "Shmeleva: "The country needs people who can interact with artificial intelligence" (Шмелева: «Стране нужны люди, способные взаимодействовать с искусственным интеллектом»), Tatar-Inform, Sept. 9, 2021, <https://www.tatar-inform.ru/news/smeleva-strane-nuzny-lyudi-sposobnye-vzaimodeistvovat-s-iskusstvennym-intellektom-5835552>; "Elena Shmeleva: With the support of the President, together with United Russia, an initiative will be implemented to develop 30 engineering schools" (Елена Шмелева: При поддержке Президента вместе с «Единой

Россией» будет реализована инициатива по развитию 30 инженерных школ), United Russia, Sept. 14, 2021, <https://er.ru/activity/news/elena-shmeleva-pri-podderzhke-prezidenta-vmeste-s-edinoj-rossiej-budet-realizovana-iniciativa-po-razvitiyu-30-inzhenernyh-shkol>.

14. Hackathons and competitions take place across Russia

According to the “Russia—Country of Opportunity” website, an artificial intelligence hackathon was held in Veliky Novgorod on September 10-12, 2021. In the competition, teams developed AI solutions to identify and classify possible corruption-enabling sections of official Russian laws, regulations, and contracts. The event was jointly organized by the Association for Electronic Communications and the Ministry of Economic Development of the Russian Federation. Another competition was held on September 24-26 in Rostov on Don at the Don State Technical University, and was sponsored by a number of partners, including the Steppe Agroholding corporation. In this hackathon, teams developed AI solutions to protect aquatic life from illegal fishing activities. These events are the 4th and 5th in a series of 116 artificial intelligence hackathons to be held from 2021 to 2024 in line with the federal “Artificial Intelligence” project. Out of the 116 planned hackathons, 85 will be regional, 24 will be at the district level, and 7 will be international. There will also be 85 lectures from leading Russian specialists in AI. The next hackathon will take place in Perm on October 15-17.

According to a CNews article, more than 90 students competed in an unmanned aviation championship called “AviaRoboTech—Start,” held at the National Exhibition Center in Moscow on September 11. In the first phase of the competition, participants were required to assemble transport drones from spare components. Participants flew the drones, which lifted cargo secured by elastic suspension, through a number of checkpoints. In the second phase, participants programmed the software for a group of eight drones, aligning them in multidimensional geometric shapes in the air. The event was organized by Moscow’s Department of Entrepreneurship and Innovation, Geoscan, Aeronext, and the autonomous non-profit organization “Human Capital Development.” The finalists are invited to attend the Russia-wide phase of the competition in 2022.

Sources: : “Hackathons and Lectures on Artificial Intelligence” (Хакатоны и лекции по искусственному интеллекту), Russia—Country of Opportunity, accessed Oct. 1, 2021, <https://hacks-ai.ru/results>; “The results of the hackathon on the creation of an anti-corruption analytical system were summed up in Veliky Novgorod” (Итоги хакатона по созданию антикоррупционной аналитической системы подвели в Великом Новгороде), Content Review, Sept. 15, 2021, <https://www.content-review.com/articles/53602/>; “Moscow Championship ‘AviaRoboTech - Start’” (Московский чемпионат «АвиаРобоТех – Старт»), RCMOS, <https://rcmos.moscow/aviastart#rec348865173>; “Youth competitions in unmanned aircraft will be held at VDNKh on City Day in Moscow” (В День города в Москве на ВДНХ пройдут юношеские соревнования по беспилотной авиации), CNews, Sept. 6, 2021, https://www.cnews.ru/news/line/2021-09-06_v_den_goroda_v_moskve_na.

International Collaboration

15. Cognitive Pilot opens US subsidiary

Cognitive Pilot, a joint venture between Sberbank and Cognitive Technologies that develops autopilots for agricultural and railroad companies, has set up a subsidiary in the United States. Cognitive Pilot Corp, based in Texas, will focus on marketing control systems for unmanned agricultural drones, called Cognitive Agro Pilot. The initial focus will be on sales in Texas, Oklahoma, Kansas, and Ohio, with a target of controlling 10 percent of the market in this area in the Western Hemisphere by 2027. Company spokespeople believe the system has superior functionality to that of John Deere, the leading American system. The company's overall export plans for 2022 include 2,000 units; of those, 700 are earmarked for the US and Canada, while the rest will go to South America. The per-unit cost will be around \$11,000–\$16,000, which is approximately half the price of the leading American systems. The company initially plans to sell the equipment in the US via eBay, but is working on finding an American partner for distribution.

Sources: "Cognitive Pilot created a subsidiary in the US" (Cognitive Pilot создала дочернюю компанию в США), D-Russia, Aug. 4, 2021, <https://d-russia.ru/cognitive-pilot-sozdala-dochernjuju-kompaniju-v-ssha.html>; "Cognitive Pilot to trade agricultural autopilots in the US" (Cognitive Pilot будет торговать автопилотами для сельхозтехники в Америке), *Vedomosti*, Aug. 4, 2021, <https://www.vedomosti.ru/technology/articles/2021/08/04/880715-cognitive-pilot>.

16. Samsung IT Academy continues to expand presence in Russia

Samsung Electronics has announced that it will open its Samsung IT Academy at the Far East Federal University in the 2021-22 academic year. The academy will be based at the Informatics, and Mathematical and Computer Modeling Department at the Institute for Mathematics and Computer Technology. Approximately 40 fourth-year students will be able to complete the Internet of Things and Artificial Intelligence educational tracks. Opening the academy is part of the university's effort to become a key science and education center for the region.

Samsung IT Academy is a long-term educational project of the Samsung company to develop Russia's digital economy. In addition to the two tracks offered at the Far East University, the project also includes a Mobile App Development track, offered at other schools. The course offerings are developed by specialists from the Samsung Research Center and the Samsung AI

Center in Moscow. They are currently offered at 22 universities throughout Russia, including in Moscow, St. Petersburg, Volgograd, Ekaterinburg, Cheliabinsk, Novosibirsk, Tomsk, Kazan, Voronezh, and Ufa. During the course of the academic year, students develop individual projects that are entered into a national competition. The 2021 competition will take place in late October.

Sources: "Samsung IT Academy to begin work in Far East Federal University" (ИТ Академия Samsung» начинает работу в Дальневосточном федеральном университете), Samsung, Sept. 10, 2021, <https://news.samsung.com/ru/it-academy-samsung-starts-work-in-dfu>.

17. Russian UAV developer becomes exclusive provider to Oman

The Russian company UVL Robotics, which develops drones for package delivery, has received \$3.5 million in investments over the last four years. It now has offices in the US, Turkey, Europe, and the Middle East, and its clients include multinational corporations such as Pepsi and Toyota. It has now become the exclusive provider of drone-based package delivery in Oman.

UVL Robotics was started by Yevgeny Grankin and Dmitry Teslenko, who decided to build a flying camera with a scanner that could independently scan information about goods located in a warehouse. The first model was built in 2017, and in 2018 participated in competitions that attracted outside investors, initially from Phystech Ventures. The company is focused on the international market. Its early clients included the transport company Itella and PepsiCo Russia. After four unsuccessful tests, the fifth attempt, in 2019, was successful.

The company uses proprietary machine learning algorithms to fly drones inside warehouses without using GPS or Wi-Fi. It buys its hardware from other suppliers. It has expanded rapidly and now has 35 employees. After starting with 10 clients in 2019, that number increased to 20 in 2020, including KraftHeinz, Gazpromneft, and Unilever. Its revenue increased from \$100,000 in 2019, to \$400,000 in 2020, to \$1.5 million in the first nine months of 2021. The pandemic helped the company's rapid growth, because of the increased focus on e-commerce and the concurrent decrease in supply of labor at warehouses. The company is actively working to break into the US market; it opened an office in California and participated in a startup accelerator there. Its partnership with Oman Post began in 2019, when the two companies signed a contract for test flights. Eventually UVL Robotics became the first company to be licensed to operate delivery drones in Oman.

Sources: "How a Russian drone developer became an exclusive supplier in Oman" (Как российский разработчик дронов стал эксклюзивным доставщиком товаров в Омане) Forbes, Sept. 16, 2021, <https://www.forbes.ru/tekhnologii/440211-kak-rossijskij-razrabotcik-dronov-stal-ekskluzivnym-dostavsikom-tovarov-v-omane>.

18. Russian facial recognition systems being used by Indian railways

Indian Railways has started to use 470 video cameras with facial recognition software built by the Russian NtechLab company. NTechLab's systems are now being used at 30 railroad stations in Mumbai, Gujarat, and Maharashtra. These systems, which can identify up to 50 people per frame and can react to a match within three seconds, are to be used to direct and count passenger traffic, as well as to identify criminals and missing persons. The company is also engaged in three other projects in India, in trade, education, and the entertainment industry. NtechLab was founded in 2015 and is considered one of the world's leading companies in videoanalytics. Its algorithms have won numerous competitions, including recognition as the most accurate and fastest algorithm by National Institute of Standards and Technology (NIST) of the US Department of Commerce in 2021. It also won the WIDER Pedestrian Challenge in 2018, which was aimed at detecting pedestrians based on their silhouettes, and took second place at the 2019 ActEV-PC competition for detecting actions on video.

Sources: "Russian face recognition system is working on Indian railroads" (Российская система распознавания лиц заработала на железных дорогах в Индии), D-Russia, Aug. 26, 2021, <https://d-russia.ru/rossijskaja-sistema-raspoznavanija-lic-zarabotala-na-zheleznyh-dorogah-v-indii.html>.

19. Russia is looking to expand cooperation with Armenia in digital technologies

Russia's deputy minister of economic development Dmitry Volvach has announced that Russia is ready to assist Armenia in speeding up its digitization efforts. Russia is willing to provide Armenia with digital products in the spheres of state administration, taxation and finance, trade and logistics, security, education, health, AI technology, and energy efficiency. Armenia may be most interested in Russian automated tax administration software, although the first effort to launch was an app allowing for travel in areas with COVID restrictions by tracking vaccinations and PCR tests.

Volvach also discussed wider efforts at digital cooperation in the Eurasian Economic Union, including digital tracking of trade goods as part of a digital transport corridor system and a system for improving coordination between job seekers and employers across the union. He noted that these were just the first efforts at digital integration across the union.

Sources: "Russia ready to offer Armenia digital technologies and goods" (Россия готова предложить Армении передовые цифровые технологии и продукты), CNews, Sept. 21, 2021, https://www.cnews.ru/news/line/2021-09-21_dmitrij_volvach_rossiya_gotova.

Spotlight: Sarma Autonomous Underwater Vehicle

Russia's Advanced Research Foundation (ARF), an analog of the US DARPA, is in the process of developing an air-independent propulsion (AIP) system for its long-range autonomous underwater vehicle (AUV) Sarma. An AIP propulsion system—in this case, likely a fuel cell AIP that produces electricity from chemical reactions of hydrogen and oxygen—will enable the Sarma to operate untethered for much longer durations. Viktor Litvinenko, deputy head of the Physical and Technical Research Center at ARF, stated that the Sarma will have an endurance of three months underwater and will be potentially capable of traveling 8,000 kilometers.

While ARF plans to use Sarma as a testing platform with multiple mission outfits, recent online reporting suggests a heavy emphasis on using the platform under the Arctic polar ice and along the Northern Sea Route. Possible missions include cartography and the repair and maintenance of underwater communication lines used in the oil and gas industry. The limited operational depth of 1,000 meters, as reported by ARF, suggests that the current configuration would be appropriate for operations closer to shore, such as along the Northern Sea Route.

The company has noted that the financing for the program is challenging, and is working to gain additional funding by collaborating with other Russian companies such as Rosatom and United Shipbuilding Corporation. ARF says that a demonstrator version will be ready in two to three years.

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