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Artificial Intelligence in Russia
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The Russia Studies Program

Abstract

This report 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.

Approved by: **July 2020**
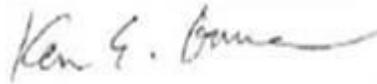
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Governance and Legal Developments

1. Putin pushes AI federal project, private sector concerned with government role

RIA Novosti reported on July 3 that the Russian business community was opposed to a proposed consolidation of the AI federal project with the Digital Technologies federal project. The opposition was motivated by overall cuts in federal spending on national projects: experts in the industry worry that the consolidation could lead to cuts in funding for the federal AI project. The government developed the federal project in October 2019 in accordance with the national strategy for the development of AI. According to reports, the project it aims to ensure that AI contributes to the growth of welfare and quality of life of Russians; to ensure national security and law and order; and to ensure that the Russian economy achieves a sustainable level of competitiveness. The government is planning to allocate over 89 billion rubles ($1,250 million) of budget funds to implement over 40 specific AI-related tasks by 2024, notes RIA Novosti.

On July 6, TASS and other news agencies reported that Russia's president Vladimir Putin has ordered the government to "take final measures" to approve the AI federal project and its funding, which includes funding from the "Digital Economy" national program. This was one of the outcomes of a June 10 meeting between Putin and ICT industry representatives, discussed in issue 4 of *AI in Russia*.

Sources: "Бизнес выступил против объединения проекта ИИ с "Цифровыми технологиями,"" RIA Novosti, July 3, 2020, https://ria.ru/20200703/1573826331.html; "Путин поручил правительству до конца лета утвердить федеральный проект по искусственному интеллекту," TASS, July 6, 2020, https://futurerussia.gov.ru/nacionalnye-proekty/putin-porucil-pravitelstvu-do-konca-leta-utverdit-federalnyj-proekt-po-iskusstvennomu-intellektu; "Программа развития ИИ, особые правовые режимы для IT-инноваций, помощь индустрии – поручения президента," D-Russia, July 6, 2020, https://d-russia.ru/programma-razvitija-ii-osobye-pravovye-rezhimy-dlja-it-innovacij-pomoshh-industrii-poruchenija-prezidenta.html.

CNA Commentary: This large investment underscores the importance placed on AI development in government agencies tasked with designing and implementing specific steps outlined in the AI strategy. Russia's high-tech development is a personal issue for Putin and Prime Minister Mikhail Mishustin, who support the rapid digitization of the Russian economy. However, there is pushback, including within the industry, to combining the AI federal project

with the Digital Technologies federal project out of concern that federal funding could be misappropriated from AI to other information and communication technology ICT. This pushback is rooted in cynicism in Russia, especially in its budding private sector, towards the overwhelming government role in fostering innovation in the high-tech sector.

2. Russian government proposes biometric data processing without citizen consent

On June 17, 2020, *Kommersant* reported that the Russian Ministry of Economic Development published a proposed exception to the law "On Personal Data," which will allow for the processing of citizen's personal biometric data without their written consent in certain cases. This law is part of a package of amendments introduced in addition to the bill on "regulatory sandboxes," which aims to foster innovation by allowing companies that develop new products and services in a number of areas to test them without risk of violating current legislation. The law on regulatory sandboxes is now ready for its second reading.

Currently, a person's written consent is necessary for the processing of biometric data, but the Ministry of Economic Development stated that, though consent continues to be necessary, physical signatures are not efficient in the digital era. This exception makes it possible to use remote biometric identification technologies, for example, to conclude contracts for communications services remotely without the need to visit the operator in person.

Experts expressed fears that this exception carries the risk of abuse and leaks. According to Alexey Muntyan, founder of the Association of Russian Data Protection Specialists, the application of these alternative legal grounds carries a potential for abuse, because citizens could lose control over the processing of their data. Alexander Savelyev, the deputy chairman of the Digital Economy Legal Support Committee of the Russian Bar Association's Moscow branch, stated that, given the intrinsic connection a person has with their biometric data and the impossibility of replacing it in the event of a leak, liberalization of the legal requirements seems risky for citizens. The experts also suggested some mitigation strategies, including the right of citizens to give a statement that would require operators to stop processing their data within a certain timeframe.

Source: "Личные данные пропесочат: Над их обработкой предложило поставить регуляторный эксперимент" [Personal data is trashed: It is proposed to do a regulatory experiment with its processing], *Kommersant*, June 26, 2020, https://www.kommersant.ru/doc/4391725; also see https://www.economy.gov.ru/material/directions/gosudarstvennoe_upravlenie/normativnoe_regulirovanie_cifrovoy_sredy/regulyatornye_pesochnicy/.

CNA Commentary: This proposal by the Russian Ministry of Economic Development, particularly in light of the outcry to the draft law "On Information, Information Technologies,

and Information Protection," discussed in issue 5 of *AI in Russia*, suggests continuing tensions in balancing security and privacy in Russian society.

3. Legal changes to enable military innovation

On June 17, 2020, the Russian Ministry of Economic Development published a list of sections of federal laws, which may be temporarily relaxed in order to create an experimental legal regime that aids digital projects. The list includes provisions of federal laws related to medicine, telecommunications, design, production, the operation of highly automated vehicles (included UAVs), and the use of AI in the provision of services.

Organizations proposed additional provisions to the Ministry of Economic Development based on projects for which they need exemptions in order to foster innovation. The projects include the following:

- An MTS project (MTS is Russia's largest mobile carrier) involving the provision of medical care via telemedicine. Currently, medical exams and patient identification using telemedicine technologies are not possible, and the company wants a limited exception to the law "On the Basis of Protecting the Health of Citizens of the Russian Federation."

- An MTS project providing protection to cellular subscribers and bank customers from fraudulent calls aimed at embezzling their funds. Currently, the law "On Communications" classifies any technical data on telephone communications as confidential, hindering the ability of telecom operators to use software and hardware to automatically detect fraudulent activities.

- An MTS project involving biometric technologies for remote agreements to contracts for the provision of communication services. Currently, the laws "On Communications" and "On Personal Data" prohibit the implementation of this project due to a strict reading of the need for physical presence in concluding a communication agreement using citizens' biometric data. See the separate summary article on this provision.

- An MTS project providing for the creation of a robotic hotel without the physical presence of personnel, called the "Smart Hotel." The implementing team must ensure legal access to technology of the "Internet of Things," virtual reality, electronic payments, and remote identification, to which there are currently barriers in the federal law "On Personal Data."

- A project of the Foundation for Advanced Research, which involves the creation of a cargo transport service using unmanned aerial systems that ensure delivery of a wide range of goods. Current aviation legislation is founded on regulating manned aviation

and, according to the TAdviser article, imposes unrealistic requirements on unmanned aircraft systems. The draft law provides for the possibility of exemptions from certain provisions of the air code within the framework of the experimental legal regime.

- A project from Yandex for the commercial use of unmanned ground vehicles. Current road legislation disallows the use of driverless cars, and, according to the article, the current testing requirements of highly automated vehicles on public highways significantly limit their development. Thus, this bill would allow for the exemption of such technology from several legal provisions.

Source: "Российские законы на время изменят для экспериментов Яндекса, МТС и госфонда, связанного с военными разработками" [Russian laws will temporarily change for Yandex, MTS, and state fund experiments related to military developments], TAdviser, June 23, 2020, https://www.tadviser.ru/.

CNA Commentary: The Russian government has continued to revise legal frameworks in anticipation of the introduction of new digital and AI-enabled technologies.

4. Huawei continues investment in and collaboration on Russian ICT market

A June 25 TASS article profiled Russia's engagement with Huawei and discussed the Chinese company's strategy for the Russian market. The strategy, called TIGER (Technology, Industry, Growth, Ecosystem, Reliability) involves joint work with Russian companies on the "development and employment of technologies, creation of industrial solutions, programs to stimulate partners and create an ecosystem, which would ultimately lead to the development of Russia's own industry."

Huawei will focus on expanding Russia's AI ecosystem in three areas:

> First, the company will continue to solidify collaboration with Russian partners in the development of joint innovation in AI on the basis of the innovation laboratory Huawei OpenLab in Moscow; second, it will conduct the preparation of Russian developers on the basis of the global community Ascend Developer Community; third, it will develop various courses, connected to AI technologies, and expand the circle of Russian universities engaged in training in these areas.

The article notes that Huawei will invest $5 million into partnerships in Russia in 2020. It plans to increase purchases from Russian suppliers from $392 million in 2017-2019 to $800 million in 2020-2025 and will increase the number of R&D centers in Russia to five.

Source: "Huawei готова инвестировать в новые технологии для создания в РФ цифровой инфраструктуры," TASS, June 25, 2020, https://tass.ru/ekonomika/8816823.

CNA Commentary: Huawei has launched multiple initiatives to tap what it perceives to be Russia's academic RDT&E potential. Huawei also sees Russia as a high-value market for Huawei and, more broadly, China- developed ICT products. Given the ongoing partnership, and a growing amount of investment in Russia, this is definitely a space to watch. For past *AI in Russia* articles on Huawei investment in Russia, see "URTK and Huawei offer new AI training course," in issue 5 and "MIPT and Huawei open joint R&D lab for development of AI technologies," in issue 1. The CNA Team plans to spotlight Russia's relationship with Huawei in a future issue of *AI in Russia*.

Military and Security Developments

5. MOD accelerates trials of autonomous and AI-enabled military vehicles

According to July reports, the National Center for Development of Technologies and Basic Elements of Robotics of Russia's Advanced Research Foundation (ARF) is conducting tests for controlling combat robots with voice commands, with commanders issuing orders to the robots the same way they would to human soldiers. These solutions are being tested on the Marker unmanned ground vehicle (UGV) platform, which is supposed to be the key element of joint operation between ground robots, unmanned aviation, and Special Operations forces. ARF's Oleg Martyanov stated that the Marker is "learning to understand the received commands and act, like a human." There are also efforts to increase the UGV's autonomy and teach Marker to perform tasks on its own at a significant distance from the operator, with the UGV updating the route and target locations on its own. (*ARF is cooperating with the ERA Technopolis on AI and unmanned systems development. For more on the ARF, please see the Spotlight in issue 5 of AI in Russia*.)

Russia's newest T-14 Armata main battle tank, first unveiled in 2010, is now entering limited production. As the first next-generation, post-1992 MBT, it has a greater share of automation than previous or modernized tank models. Armata's many functions are fully automated and require only limited control from the crew. One such system is an Afganit active defense system that detects and destroys antitank munitions. Reports suggest that, in July 2020, Armata was tested in an unmanned mode. This unmanned version was created in 2018. The MOD has touted the vehicle's open digital architecture, though few details are available.

In June 2020, the MOD placed an order for developing multirole medical robots for evacuating the wounded from the battlefield. According to reports, the contract is estimated at 250 million rubles ($3.6 million) and the work should be completed by the end of 2022. The military assesses that robotized vehicles would be able to independently find, identify, and withdraw wounded people from the battlefield.

Sources: ""Теперь их не узнать": что сделали с новейшими танками T-14" ["Now you can't recognize them": what was done with the latest T-14 tanks], RIA Novosti, July 1, 2020, https://ria.ru/20200701/1573690648.html; "Танк T-14 "Армата" испытали в беспилотном режиме" [T-14 Armata tank tested in unmanned mode], RIA Novosti, July 7, 2020, https://ria.ru/20200704/1573878330.html; "Russia's top brass to get casualty evacuation robots by 2023," TASS, June 26, 2020, https://tass.com/defense/1171911; "Russia begins trials on voice control of military robots," TASS, June 29, 2020, https://tass.com/defense/1172663.

CNA Commentary: In 2019, the Russian MOD announced the requirements for developing autonomous/unmanned military systems capable of independent operation in combat and "uncertain environments," following trials of several UGVs in Syria. A key element of this future UGV operation is an AI system capable of navigating the vehicle and enabling it with decision-making in critical situations. The above-mentioned vehicle tests and R&D work are in line with the MOD's larger goal of incorporating such AI-enabled autonomous vehicles into armed forces' CONOPS and TTPs.

6. AI in Russia's maritime security

Voenno-Promyshlennyj Ku'er, a respected online military journal, published an op-ed by Captain Second Rank (Ret.) Vitaliy Shpikerman, in which the author envisioned how an AI system could assist Russian naval forces. This would include situational analysis and classification of surface and subsurface domains, including potential threats, which in the near future would also include domestic and adversary unmanned systems. Based on these classification results, AI technologies could determine the necessary steps to deal with potential and credible threats. This system would predict the level of threat and determine the best response—for example, the use of electronic warfare, sonar countermeasures, air defense or antitorpedo defense, or course and speed deviation. The op-ed further proposed the integration of AI-enabled systems in military automated control systems for threat detection and management.

Source: Vitaliy Shpikerman, "Искусственный интеллект встанет на страже наших морей" [AI will guard Russia's seas], *Voenno-Promyshlennyj Ku'er*, June 25, 2020 https://vpk-news.ru/articles/57500.

CNA Commentary: The Russian MOD has announced its intention of fielding a wide range of unmanned and autonomous vehicles as mission multipliers and combat systems. The MOD and the Navy in particular have also expressed the desire for better situational awareness in the "global ocean," with the ability to better identify and classify maritime assets using AI technology. The above-described AI-enabled concept is very ambitious and difficult to implement. However, it is in line with the Russian Navy's wishes for a greater role for smart and "intellectual" systems capable of performing offensive and defensive tasks, as well as allowing for better situational analysis and awareness.

7. Developing AI for unmanned aerial vehicle swarm

The Robotic Aviation Systems project of the Zhukovsky Institute's Scientific Research Center is reportedly developing methods to use AI technologies to develop and manage unmanned aerial systems. It is developing solutions to assist operators and commanders in comprehending the heterogeneous information received during UAV flight, to correctly analyze the situation, as well as "teach" drones to independently assess the situation and organize swarm management in case contact with the operator is lost. According to reports, Zhukovsky researchers have the following RDT&E goals: the distribution of tasks and the spatial arrangement of vehicles in a swarm; definition of the hierarchy of swarm management; target allocation between drones in a group; and target designation for each UAV in accordance with the drone's spatial location. They are also working on the reconfiguration of the swarm in accordance with combat losses, taking into account the targeting and strike results.

Source: "В России работают над созданием искусственного интеллекта для беспилотников" [Russians are developing AI for UAVs], ArmyStandard.ru, June 25, 2020, https://armystandard.ru/news/t/20206231146-GIcZr.html.

CNA Commentary: The Zhukovsky Institute works for the Ministry of Defense, developing proofs of concept for unmanned systems. Zhukovsky will add to the ongoing work at other institutions such as the ARF and ERA Technopolis. The distribution of functions between small, less expensive and more numerous unmanned platforms can provide greater stability in terms of existing risks, as well as provide better adaptation to accelerating technical update cycles. As swarms, the UAVs can form squadrons, regiments, and divisions to carry out the MOD orders.

Corporate and Market Developments

8. Russian-Ukrainian startup funding points to interest in private AI investment

On July 7, 2020, CNews.ru reported that a new Russian-Ukrainian startup, called Signum.ai, raised $500,000 from two venture capital firms (Starta Ventures and Next Ventures) as well as an anonymous angel investor. Signum.ai is designed to collect and analyze data from social media, blogs, forums, and other internet portals in real time, and is pitched as a tool particularly useful for marketing and sales teams. It reportedly uses a variety of methods, including finding leads through network analysis based on event chain triggers, market research and competitive intelligence for advertising, and the automatic identification of micro- and macro-influencers and their subscriber base. The founder, Artem Gladkikh, had previously worked on a tool to analyze business ideas called Test4startup, but left after failing to earn sufficient revenue.

Source: "Стартап с русско-украинскими корнями Signum.ai привлек $500 тысяч" [Startup with Russian-Ukrainian Roots Signum.ai attracted $500 thousand], Cnews.ru, July 7, 2020, https://www.cnews.ru/news/line/2020-07-07_startap_s_russkoukrainskimi.

CNA Commentary: The Russian startup ecosystem focusing on AI-enabled technology is experiencing growth but still may be able to compete with the increased role of government entities in Russia's innovation ecosystem.

9. Turmoil at MIPT's innovation hub

According to reports, a co-founder of the iPavlov AI research project, Olga Kairova, has decided to leave the project in order to launch a new, as-yet-unnamed business using the same DeepPavlov open source library developed by the iPavlov project. According to reports, Kairova is currently looking for funding and preparing a new team, and plans to create new dialogue systems and chatbots among other products. The iPavlov project is based on research done at the Laboratory for Neural Systems and Deep Learning at the Moscow Institute of Physics and Technology (MIPT), with grant funding of 500 million rubles for commercial development provided by RBK and Sberbank in 2017. MIPT owns the iPavlov and DeepPavlov brands as well as the associated commercial venture, but is not allowed to create additional legal entities. Kairova left iPavlov after MIPT replaced its CEO Tagir Aushev with Loran Akopian and subsequently fired its application development team, which had been headed by Kairova.

MIPT is reported to have said that despite this drama, there is no conflict with iPavlov leader Mikhail Burtsev (profiled as one of Russia's top NLP experts in issue 5 of *AI in Russia*) and work on the project continues.

Source: "Сооснователница AI-проекта iPavlov запустит новую компанию на фоне перестановок в команде" [Co-founder of the AI-project iPavlov will launch a new company amid a team reshuffle] Rusbase, July 2, 2020, https://rb.ru/news/ipavlov-new.

CNA Commentary: While Olga Kairova and MIPT settle the intellectual property rights to the chatbot, the story is evidence of the emerging weight and importance of MIPT to the Russian AI RDT&E. The university is one of the major AI development nodes in the country: it is home to one of the national AI centers managed by the National Technology Initiative, and was recently named by Forbes as one of the top three Russian universities (along with MSU and the Higher School of Economics, which also work on AI R&D).

Education and Training Developments

CNA Commentary for articles 10-13: The Russian government is continuing to invest in AI and digital technologies research and development at Russian universities. This is consistent with its national AI strategy, unveiled last October that places high importance on growing and developing the next-gen workforce capable of AI development and implementation. As profiled in issue 4 of *AI in Russia*, the demand for AI specialists in Russia greatly outpaces the supply.

10. Total of 721 million rubles awarded to research and educational centers

According to a June 29th D-Russia article, the Russian government has selected a list of research and educational centers to receive a total of 721 million rubles ($10 million) in grants this year. The five grantees, each awarded 144 million rubles ($2 million) are Tyumen State University, Belgorod State National Research University, Kemerovo State University, Perm Federal Research Center of the Ural Branch of the Russian Academy of Sciences, and the REC Management Company from the Nizhny Novgorod Region. According to the official announcement, the grantees were selected by a council led by Deputy Prime Minister Tatyana Golikova and Assistant to the President of Russia Andrei Fursenko. Developing at least 15 world-class innovative sites that combine science and tech with business is part of the national project "Science," which was laid out in a presidential decree by Putin. According to the article, priority areas for these centers include AI, robotics, and digital technologies.

Sources: "Правительство определило список получателей грантов среди научно-образовательных центров" [The government determined the list of grant recipients among research and educational centers] D-Russia, June 29, 2020; "Утверждён список получателей грантов среди научно-образовательных центров" [List of grant recipients among research and educational centers approved], Russian Government, June 27, 2020, http://government.ru/news/39940/.

11. Cybersecurity Institute opens at St. Petersburg Polytechnic University

According to a July 3rd TASS article, St. Petersburg Polytechnic University (SPbPU) recently opened an Institute of Cybersecurity and Information Protection. SPbPU describes the institute as "practice oriented" and aimed at developing practical skills. The announcement on SPbPU's website states that the first programs to be offered will include cyberpsychology, protection

against digital reproduction, and penetration testing. The announcement says that the new institute will also offer joint scientific and technical projects with key businesses, and notes that the university already collaborates with industry leaders such as LG, Bosch, Cisco, Huawei, Gazprom Neft, GosNIIAS, and Transmashholding JSC. The creation of the new institute will reportedly allow for development of various technologies in digital medicine IT, unmanned transport systems, and distributed automated banking services.

Sources: "Институт кибербезопасности открылся в Петербургском Политехе" [Cybersecurity Institute opens in St. Petersburg Polytechnic University], TASS, July 3, 2020, https://tass.ru/obschestvo/8879257; "В Политехе создан Институт кибербезопасности и защиты информации" [Institute of Cybersecurity and Information Protection established at Polytech], St. Petersburg Polytechnic University of Peter the Great, July 6, 2020, https://www.spbstu.ru/media/news/education/institute-cybersecurity-information-protection-polytech/.

12. Mari State University to open Institute of Digital Technologies

According to a June 29th article from Potok Media, Mari State University, in Yoshkar-Ola, will be opening a new Institute of Digital Technologies. The institute will train students in the subjects of AI, IT, electric power, engineering, and digital economy, including coursework on mathematical modeling, big data analysis, neural network technologies, nanotechnology, and high-performance computing. According to the article, the opening of the institute is made possible through various partnerships, including with the following: the Moscow Institute of Physics and Technology and Radiotechnical Institute; IAC "Vympel"; the Central Research Institute of Engineering; the Russian Federal Nuclear Center – All-Russian Research Institute of Experimental Physics; the Semiconductor Instrumentation Plant; the Mari Engineering Plant; Southwest Jiaotong University (China); and the University of Cantabria (Spain).

The institute will consist of faculty from a broad range of the university's disciplines, including members of the economics, electric power, physics, and mathematics departments. In the article, Mari State University rector Mikhail Shvetsov explains the rationale for opening the institute, and the unique model of concurrent employment available to students.

Source: "В МАРГУ будут готовить специалистов в области цифровых технологий" [MarSU will train specialists in the field of information technology], Potok Media, June 29, 2020, https://potokmedia.ru/news/198650/v-margu-budut-gotovit-specialistov-v-oblasti-cifrovyh-tehnologij/.

13. Sirius students to develop AI applications for program certification

According to a June 30th *Future Russia* article, students from the Sirius Scientific and Technological University in Sochi are working to develop five AI products for partner companies as part of their final certification. According to the university website, the institute was founded in 2019 by the Talent and Success Foundation, through a national charter and in partnership with a number of companies, including VKontake, Yandex, and Biocad.

Throughout July, 25 students who have completed their prior training are working in teams of three or four to plan and build various AI applications for partner companies, including Russian Railways, Tinkoff Branch Development and Implementation Center (CER), and Yandex. According to the article, the projects will include an application that can identify the name, ingredients, and calorie content of a dish based on a photograph, a speech recognition algorithm for filling out technical reports, and a machine-learning model for predicting sales. Students who successfully present their final projects at the end of July will receive their training certification, and some will be offered employment with the partner companies.

The article quotes Elena Shmeleva, head of the Talent and Success Foundation, who says that such partnerships between State, industry, and science, are vital to the success of the Strategy of Scientific and Technological Development of Russia. The article also quotes Alexey Tolstikov, head of regional academic projects, who says that the joint training program allows students to discover which skills they need to develop further, while also helping solve practical problems in business and industry.

Sources: "Воспитанники "Сириуса" предложат бизнесу проекты в области искусственного интеллекта" ["Sirius" students will present business projects in the field of artificial intelligence], *Future Russia,* June 30, 2020, https://futurerussia.gov.ru/nacionalnye-proekty/proekty-v-oblasti-iskusstvennogo-intellekta-dla-vedusih-kompanij-predlozat-v-siriuse "Научно-технологическим университетом «Сириус»" ["Sirius" Scientific and Technological University], https://sochisirius.ru/edu/graduates.

Events and Conferences

14. NTI competition winners created digital assistants

According to a June 22 TASS article, four teams of students won a competition recently held by the National Technological Initiative "Circle Movement." The teams were tasked with producing digital assistants to help users develop competencies in public speaking, communication, emotional intelligence, time management, and negotiation.

The 280 students who participated had received weeks of training with IT experts from partner institutions such as the MTS Center for Artificial Intelligence, Microsoft Students Partners, Sberbank, Merck Sharp & Dohme, Coddy School of Programming for Children, Outliers, and Softline. Participants created a variety of chatbots, applications, and websites that help a user assess and develop a variety of interpersonal skills.

The National Technological Initiative (NTI) "Circle Movement" is part of the national project "Science" designed to train the next generation of science and tech experts and enhance Russia's overall technological development. The leader of the "Circle Movement," Dmitry Zemtsov, is quoted, explaining that the purpose of the competition is to explore how technology can strengthen "something truly human" in a world where AI is playing an increasingly significant role, such as "the ability to recognize emotions and feelings" or "to freely express thoughts in front of an audience."

Source: "Участники челленджа Кружкового движения НТИ создали "помощников" для личных навыков" [Participants in the STI Circle movement challenge create "assistants" for personal skills], TASS, June 22, 2020, https://nauka.tass.ru/nauka/8784081.

CNA Commentary: NTI is a countrywide program that identifies new technology markets, and the products and services likely to emerge from these new markets. NTI aims to create and support special infrastructure and technical competence centers that bring together Russia's high-tech community and enable this community with logistical and financial support, especially for startups. NTI support for youth innovation clubs is in line with the Russian government's efforts to develop a qualified workforce—an effort that is part of the national AI strategy unveiled in October 2019.

15. Russian AI Association issues call for papers on robotic swarms

In June, the Russian AI Association issued a call for papers on robotic swarms. The notice stated that the association plans to conclude an agreement with Springer for an annual publication that would focus on the following subjects: decision-making by a single robot, decision-making by a group of cooperative robots, decision-making by a group of robots with an operator, decision-making by a group of robots with a leader, and decision-making by a group of robots with a leader operator.

The call for papers also noted that previous Springer-published and Scopus-indexed volumes included four publications from 2016-2019 on smart electromechanical systems, edited by Andrey E. Gorodetskiy, Vugar G. Kurbanov, and Irina L. Tarasova.

Source: http://www.raai.org.

CNA Commentary: Swarm robotics is getting a boost in both the military and civilian marketplaces. With Russian MOD agencies such as the Advanced Research Foundation, profiled in issue 5 of *AI in Russia*, investing in swarm RDT&E, the civilian developers are doing so as well. The above-mentioned call for papers represents a growing academic and intellectual debate in Russia on the development and operation of swarms.

Spotlight: The Skolkovo Ecosystem

Launched in 2010 by then-president Dmitry Medvedev, the Russian government intended the Skolkovo innovation cluster to be Russia's equivalent to Silicon Valley in the United States. The goal was to create a sustainable ecosystem of entrepreneurship and innovation, engendering a startup culture and encouraging venture capitalism. To this end, the government granted participants in the project various tax privileges and more liberal visa rules for securing the employment of foreign nationals. The federal government also built an extensive new transport infrastructure to connect the district to central Moscow and to local transportation hubs. Skolkovo includes five research clusters: IT, Energy, Nuclear, Biomedicine, and Space. Development of AI technologies is one of the primary focus areas of the Information Technologies Cluster.[1] To attract more international partnerships, Skolkovo recently launched the Softlanding program, which is designed to encourage foreign startups in the high-tech field to base themselves at Skolkovo.[2] This is a two-week program that familiarizes participants with the services and benefits offered by Skolkovo and the advantages of setting up a startup there.[3]

Although it has long been seen as a pet project of Dmitry Medvedev, Skolkovo remains highly active in the Russian technology sphere. It continues to have strong backing from Medvedev, now serving as the deputy chair of Russia's Security Council and the director of the Skolkovo board of trustees. His direct involvement was highlighted by a recent meeting he led, during which the directors of several Skolkovo startups presented their work. These included Intellogic, which uses AI technology to analyze medical imaging; Visionlabs, which works in virtual reality and facial/object recognition; and Security Vision, an IT platform for machine-based solutions to information security.[4] Other prominent members of the board of trustees include Andrei Belousov, the first deputy prime minister; Denis Manturov, the minister of

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[1] "What is Skolkovo?," Skolkovo, accessed July 14, 2020, https://old.sk.ru/foundation/about/.

[2] "Программа по привлечению зарубежных стартапов запущена в'Сколково,'" (A program to attract foreign startups launched in Skolkovo), Tass, June 25, 2020, https://tass.ru/ekonomika/6588743.

[3] "Skolkovo Softlanding Program," accessed July 14, 2020, http://www.techno-preneur.net/Skolkovo-Softlanding-Program.pdf.

[4] "Дмитрий Медведев встретится с руководителями стартапов «Сколково»," (Dmitry Medvedev will meet with Skolkovo startup leaders), CNews, July 2, 2020, https://www.cnews.ru/news/line/2020-07-02_dmitrij_medvedev_vstretitsya.

industry and trade; Maksim Oreshkin, a senior advisor to President Putin; Anton Siluanov, the minister of finance; and Sergei Sobianin, the mayor of Moscow.[5]

Financing for the program is organized by the Skolkovo Foundation, which is chaired by the prominent businessman Viktor Vekselberg. Other major figures in the foundation's leadership include Arkady Dvorkovich, Mikhail Kovalchuk, and Anatoly Chubais.[6] In 2019, companies based at Skolkovo had total revenues of over 100 billion rubles. The total revenue in the decade since Skolkovo's founding has been over 400 billion rubles. Startups based at Skolkovo currently employ over 35,000 people, and the companies have patented more than 2,900 developments and technological solutions.[7]

The Skolkovo Institute of Science and Technology (Skoltech) is a component of the Skolkovo innovation cluster. It is a private graduate research institute established in 2011 in collaboration with MIT to "cultivate a new generation of researchers and entrepreneurs, promote advanced scientific knowledge and foster innovative technology to address critical issues facing Russia and the world."[8] Viktor Vekselberg has been a critical player driving the initiation of this collaboration. As president of the Skolkovo Foundation, he was one of the key leaders in the establishment of Skolkovo and played a significant role in convincing MIT to partner with Skolkovo in establishing Skoltech, a project for which MIT was paid $300 million in the initial phase of development. After several years of cooperation, Vekselberg was made an MIT trustee in 2013 and remained in that position until 2018. At that time, he was suspended from that position as a result of being named a designated individual on a Treasury Department sanctions list.[9]

The MIT-Skoltech collaboration has now entered its third phase. The first phase, which lasted through 2016, consisted of MIT assistance in the launch of Skoltech, including participation in the hiring of initial faculty and the admission of the first several cohorts of graduate students. During this period, MIT hosted more than 100 Skoltech students, 24 MIT instructors taught classes in Moscow, and 33 courses were developed at MIT for Skoltech as part of a joint

[5] "Skolkovo Foundation Board of Trustees," Skolkovo, accessed July 14, 2020, https://sk.ru/fund-skolkovo/team/board-of-trustees/.

[6] "Skolkovo Foundation Council," Skolkovo, accessed July14, 2020, https://sk.ru/fund-skolkovo/team/board-of-directors/.

[7] "About Skolkovo," Skolkovo, accessed July 14, 2020, https://sk.ru/fund-skolkovo/about-skolkovo/.

[8] "About," Skoltech, accessed July 14, 2020, https://www.skoltech.ru/en/about/.

[9] Mike Eckel, "World-Renowned Scientific University Quietly Untangles Itself From Russian Billionaire," RadioFree Europe RadioLiberty, Jan. 14, 2019, https://www.rferl.org/a/mit-quietly-untangles-itself-from-russian-billionaire/29708417.html.

curriculum development plan. MIT was also involved in the design of the Skoltech campus, provided training for administrative personnel, and helped design Skoltech's initial governance structure, administrative strategy, and operational plans.[10] The second phase, lasting from 2016 to 2019, focused on collaborative activities designed to foster continued development of the institute and Skolkovo as a whole. This phase focused on collaborative research projects that link researchers at the two partner institutions, joint conferences, and advice and support from MIT faculty members to Skoltech on research and institutional matters as needed.[11] Despite constraints on cooperation and exchange stemming from the deterioration of the political relationship between the United States and Russia (and specifically because of sanctions), MIT remains an integral part of Skoltech, having recently signed a new agreement that extends the partnership into a third phase that lasts through 2024 and continues the phase 2 educational exchange programs between the two institutes.[12] Recent collaborative projects announced by the program include two in the field of AI: "Machine Learning for Quantum-Enhanced Sensors" and "Theoretical Foundations of Unsupervised Deep Learning."[13] Skoltech is continuing to expand, having just announced that it will open an academic department for artificial intelligence in September 2020. The new department is also expected to house a think tank on artificial intelligence.[14]

Of the 10 Centers for Research, Education, and Innovation (CREIs) associated with Skoltech, two conduct research relevant to AI development. The Neurobiology and Brain Restoration CREI conducts research on brain interfaces, and the Center for Computational and Data-Intensive Science and Engineering (CDISE) has the lead on big data processing, machine learning, and artificial intelligence. It includes research groups focused on many topics, including the following: use of machine learning for neuroimaging data and predictive analysis of complex engineering systems; reinforcement learning approaches to fulfill safety and trustworthiness requirements; nanorobotics; AI analytics of remote sensing data; deep learning in communications and cryptography; computational imaging; chemical informatics and computational molecular science; computer vision; mobile robotics; natural language

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[10] "History," MIT Skoltech Program, accessed July 14, 2020, https://skoltech.mit.edu/node/8.

[11] "MIT Skoltech Program," MIT Skoltech Program, accessed July 14, 2020, https://skoltech.mit.edu/.

[12] "Skoltech sees new agreement with MIT as success for Russian science as a whole," TASS, Dec. 17, 2019, https://tass.com/economy/1100349.

[13] "Seed Funds," MIT Skoltech Program, accessed July 14, 2020, https://skoltech.mit.edu/collaborative-projects/seed-funds.

[14] Maria Peredok, "Сколтех открывает кафедру искусственного интеллекта" (Skoltech opens the Department of Artificial Intelligence), Rusbase, June 2, 2020, https://rb.ru/young/skolteh-ai/.

processing; statistical machine learning; and wireless sensing.[15] The CDISE CREI lists a large number of foreign industrial and academic partners, though it does not provide details on these partnerships. Listed partners include Western and Asian corporations such as Intel, Huawei, Schlumberger, LG, Samsung, and Philips. They also have a number of academic partners, including MIT, Oxford, ETH Zurich, Imperial College London, UC Berkeley, NYU, the University of Texas, Zhejiang University China, Barcelona Institut de Robotica i Informatica, and Tel Aviv University.[16]

[15] "Welcome to CDISE!," Skoltech CDISE, accessed July 14, 2020, https://crei.skoltech.ru/cdise.

[16] "Partners," Skoltech CDISE, accessed July 14, 2020, https://crei.skoltech.ru/cdise/partners/.

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