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Abstract

This report, the twelfth 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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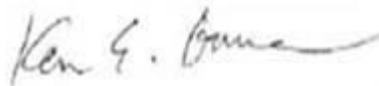
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Governance and Legal Developments

1. Putin discusses AI at UN General Assembly session

On September 22, Vladimir Putin spoke via videoconference at the plenary session of the 75th meeting of the UN General Assembly. One topic he discussed was the regulation of advanced digital technologies and AI. He stated that advanced digital technologies have made it possible to adapt to the changing circumstances of the pandemic, including through the services and distance learning they provide, and that AI has been used in the medical domain to make diagnoses more rapidly and accurately and to choose the ideal treatment for individuals.

At the same time, Putin said that, unlike other innovations, digital technologies could spread uncontrollably and fall into the hands of radicals and extremists around the world, much as conventional weapons can. He therefore urged the UN members to seriously consider the issues of cybersecurity and digital technologies, and to listen to citizens when they express worry over the protection of their privacy, property, and security. Putin concluded by stating that nations must learn how to use advanced technologies to the benefit of society and strike the correct balance between incentivizing the development of AI and implementing appropriate restrictive measures. Ultimately, he believes that states should jointly agree on regulations that would halt potential threats, not just to military and technological security, but to traditions, law, and morality as well.

Sources: “75th session of the UN General Assembly” [75-я сессия Генеральной Ассамблеи ООН], The President of Russia, Президент России, Sept. 22, 2020, <http://kremlin.ru/events/president/news/64074>.

2. Russian government clarifies AI spending

In an explanatory note for the draft budget for 2021-2023 released in September, the Russian government indicated that it plans to allocate about 16.5 billion rubles to finance the federal project “Artificial Intelligence,” which is part of the “Digital Economy” national program. The expected expenditure for 2021 is 4.1 billion rubles, with an addition 6.5 billion rubles allocated for 2022 and 5.9 billion rubles for 2023. As reported in past issues of *AI in Russia*, these numbers represent anticipated cuts to the federal budget due to the COVID pandemic.

At the same time, however, the budget of the “Digital Economy” program is expected to grow from 1.6 trillion rubles up to almost 2 trillion rubles through 2024, following from a new version of the program summary. Financing for the “Digital Technologies” federal project in particular will almost double, increasing from 451 billion rubles up to 854 billion rubles via extra-budgetary sources, though the draft program summary does not contain specifics on the sources of the funding. As reported in past issues of *AI in Russia*, the Russian government had proposed to merge the AI federal project into the “Digital Technologies” federal project, but this was resisted by the business community. Within “Digital Economy,” the government plans to cut funding for certain projects. For example, it has announced cuts to the federal project “Information Security” by almost half, from 30.7 billion rubles to only 17.1 billion.

Sources: “It is planned to spend about 16.5 billion rubles on the development of artificial intelligence in Russia in three years” [На развитие искусственного интеллекта в России за три года планируют потратить около 16,5 млрд рублей], *The Future of Russia* [Будущее России], Sept. 17, 2020, <https://futuresrussia.gov.ru/nacionalnye-proekty/na-razvitie-iskusstvennogo-intellekta-v-rossii-za-tri-goda-planiruut-potratit-okolo-165-mlrd-rublej>; “The digital economy will grow beyond the budget” [«Цифровую экономику» расширят вне бюджета], *Kommersant* [Коммерсант], Sept. 16, 2020, <https://www.kommersant.ru/doc/4492928>.

3. Russian legislator notes US-Russian AI race

On September 17, Russian State Duma deputy Sergei Boyarsky expressed his belief that Russia and the US are in an AI race, although he noted that Russia is willing to cooperate with the US regarding high-tech development. The statement came a day after US senator Will Hurd submitted a draft resolution to the US Congress on building a national strategy for AI, which stated that the US must restrain Russia and China in this area and move into a role as a global leader in AI. Specifically, the draft resolution stated, “The United States should work with its allies to prevent the misuse of artificial intelligence systems by China, Russia, and other adversaries.” Hurd particularly highlighted that Russia has sought leadership in this field.

In response, Boyarsky, the first deputy chairman of the State Duma Committee on Information Policy, Information Technology, and Communications, said, “This is a new race. Previously, there was a race for space, and now [there is one] for artificial intelligence.” He also emphasized that a number of countries have tested and implemented AI for many years, because any nation that “looks to the future” is attempting to take a lead role in AI development. Boyarsky emphasized that no state can reach its full potential alone, and that countries should find ways to cooperate. At the same time, he said that there will be no results without competition, and asserted that Russia is ready to compete with the US over the creation of AI.

Overall, Boyarsky said it is natural for the US to fear Russia moving ahead in the field of AI, because technologies based on AI will deeply intertwine with our lives in the next 30-50 years.

He stated that countries that do not take AI seriously will end up sidelined in the future, so “everyone is afraid and tries to keep secret what they have worked out themselves.”

Sources: “The State Duma spoke about the race between Russian and the United States to create artificial intelligence” [В Госдуме рассказали о гонке РФ и США по созданию искусственного интеллекта], *Crimeangazette.ru*, Sept. 25, 2020, <http://crimeangazette.ru/novosti/v-gosdyme-rasskazali-o-gonke-rf-i-ssha-po-sozdaniu-iskysstvennogo-intellekta.html>.

4. AI discussed in Russian meetings with foreign counterparts

In the latter half of September, Russian government representatives discussed artificial intelligence as a topic on the agenda of meetings with their foreign counterparts, generally highlighting the Russian government’s desire to collaborate with other countries in this sphere.

- In a plenary session of the VII Forum of the Russian and Belarusian Regions conducted via teleconference on September 29, State Secretary Grigory Rapota said that, in a rapidly changing world, the union state of Russia and Belarus should work toward the future. He said the two countries are already discussing the “fifth technological revolution,” including widespread digitalization and artificial intelligence. He also cited joint work between the two countries, including collaboration between Russian and Belarussian scientists to construct the Belarussian Nuclear Power Plant.
- In a phone call with South Korean president Moon Jae-In on September 28, Putin said that he expects Russia and South Korea to actively cooperate on AI and innovative technologies, in addition to a number of other areas.
- On September 21, the Russian Federation Council hosted a plenary session with Germany titled “Artificial Intelligence: Best Practices,” chaired by Vyacheslav Timchenko, chairman of the Federation Council Committee on the Rules and Organization of Parliamentary Activities. Timchenko said that the session’s purpose was to assess the potential for Russian AI development, and to become familiar with AI best practices in Russia and around the globe. He emphasized that Russia is proud of its progress in the AI and high-tech spheres, and noted that the country is actively crafting legislation for regulating AI development. He also stressed that the advancement of these technologies should move forward in harmony with the international community. In addition, Thomas Kunze, head of the Representative Office and authorized representative of the Konrad Adenauer Foundation in Russia, spoke and said that, as the world changes and advances occur in digitization and AI, Germany and Russia have the basic prerequisites for further AI research and development.

- On September 17, Russia hosted the sixth annual meeting of the BRICS communications ministers, with the ministers of Brazil, Russia, India, China, and South Africa speaking virtually about changes in the digital economy and prospects for joint cooperation in the digital sphere. During the meeting, Maxim Parshin, Russia’s deputy minister of digital development, communications, and mass media, spoke on domestic Russian developments related to information and communications technology (ICT). He highlighted the high-tech work Russia is carrying out, including in AI and the Internet of Things, as a part of the national program “Digital Economy.” Parshin stated that, according to several indicators, Russia is a leader in the ICT space, and holds a prominent position in a number of other sectors as well. At the end of the session, the ministers adopted a final declaration, which contains a section on artificial intelligence. In the section, the ministers expressed the great potential for AI to benefit the BRICS countries and recognized the need for cooperation with the partnership to bring trust and accountability to AI.

Sources: “Rapota: The United State of Belarus and the Russian Federation should take into account the development of high technologies” [Рапота: Союзное государство Белоруссии и РФ должно учитывать развитие высоких технологий], TASS, Sept. 29, 2020, <https://tass.ru/politika/9578271>; “In phone talks with Moon, Putin says Russia set to cooperate on Korea peace: Cheong Wa Dae,” Yonhap News Agency, Sept. 28, 2020, <https://en.yna.co.kr/view/AEN20200928013300315>; “V. Timchenko: The legislative sphere for regulation of AI development in Russia is actively developing” [В. Тимченко: Законодательная сфера регулирования развития искусственного интеллекта в России активно развивается], Federation Council [Совет Федерации], Sept. 21, 2020, <http://council.gov.ru/events/news/119232/>; “Sixth Meeting of the BRICS Communications Ministers Held” [Состоялась шестая встреча министров связи стран БРИКС], The Ministry of Digital Development, Communications, and Mass Media of the Russian Federation [Министерство цифрового развития, связи, и массовых коммуникаций Российской Федерации]; “Declaration of the 6th BRICS Communication Ministers Meeting,” BRICS, Sept. 17, 2020, <https://eng.brics-russia2020.ru/documents/>.

5. Russian government pushes ahead with AI-enabled transportation systems

State-supported developments in AI usage for transportation purposes are moving forward in many different areas. Unmanned sea vessels and ground transport vehicles are being developed to use sophisticated AI technology that will enable autonomous transport capabilities. Many projects that began in 2018-2019 are now bearing fruit in new testing regimes across Russia, and new tenders are being issued based on national digitalization frameworks to develop whole new systems for unmanned autonomous transport.

The Ministry of Industry and Trade announced that 11 Russian regions will see the testing of new, unmanned sea vessels. Those regions (Astrakhan, Kaliningrad, Krasnodar, Leningrad, Magadan, Murmansk, Primorsky, Rostov, St. Petersburg, Sakhalin, and Khabarovsk) will undertake testing from the beginning of October through the end of the year. Testing will focus on experiments with unmanned vessels that could be used for commercial fleet purposes, using GLONASS satellite technology and Russian software.

Meanwhile, Governor Natalya Komarova of Khanty-Mansiysk Autonomous Okrug-Yugra and Gazprom Neft chairman Alexander Dyukov have agreed to joint tests on unmanned ground vehicles. “Gazelle” and “Kamaz” unmanned vehicles will be tested in Khanty-Mansiysk in the 2021-2022 timeframe with the goal of further developing AI driving technology and promoting safer cargo transportation on public roads.

Similarly, the Ministry of Transport is also developing a new project to create a standardized protected “computer vision” technology for unmanned vehicles in Russia. The ministry has allocated 50 million rubles to the project, whose competitive tender was launched on September 14 and closes on October 6, with the winner announced on October 20. The administrator of the competition is Russian Railways, and expectations are that the new technology will be able to integrate with ongoing unmanned developments in rail technology.

It is expected that computerized control systems such as vision technology for unmanned vehicles will be classified as critical information technology. Such systems must be able to identify people and obstacles, obey road rules, use AI capabilities for quick decision-making and assessment, and record all information. The Transport Ministry plan is supporting technology that will fully replace a human driver, thus requiring a high level of competence and functionality for the system.

In addition, Russian Railways is also developing an AI algorithm that would replace shunting dispatchers in railyards to better control rail traffic and downtime within rail marshaling yards. A pilot project has been completed and suggests potential efficiency gains of up to 20 percent, using artificial neural networks at the Chelyabinsk-Glavny railyard. Russian Railways has been engaged in a large-scale digitalization strategy since 2019, investing up to 150 billion rubles up to 2025.

These new developments in transportation AI are paralleled with new advances in facial recognition systems used in public transport networks. For example, a new facial recognition system for fare payments in the Moscow Metro was introduced at the beginning of September, using AI-based video surveillance systems.

Sources: "Ministry of Industry and Trade: Tests of Unmanned Vessels Will Take Place in 11 Regions" [Минпромторг: испытания беспилотных судов пройдут в 11 регионах], Future Russia, Sept. 22, 2020, <https://futuresrussia.gov.ru/nacionalnye-proekty/minpromtorg-ispytania-bespilotnyh-sudov-projdut-v-11-regionah>; "Yugra and Gazprom Neft agreed to develop unmanned vehicles together" [Югра и "Газпром нефть" договорились вместе развивать беспилотный транспорт], Future Russia, Aug. 17, 2020, <https://futuresrussia.gov.ru/nacionalnye-proekty/ugra-i-gazprom-neft-dogovorilis-vmeste-razvivat-bespilotnyj-transport>; "A state system of vision for drones is being created in Russia for 50 million" [В России за 50 миллионов создается государственная система зрения беспилотников], CNews, Sept. 15, 2020, https://www.cnews.ru/news/top/2020-09-15_mintrans_za_50_millionov_sozdast; "Artificial intelligence will leave Russian Railways pushing dispatchers out of work" [Искусственный интеллект оставит без работы маневровых диспетчеров РЖД], CNews, Sept. 18, 2020, https://www.cnews.ru/news/top/2020-09-18_iskusstvennyj_intellekt; "Payment by Face is Being Tested in the Moscow Metro" [В московском метро тестируется оплата по лицу], DRussia, Sept. 1, 2020, <https://d-russia.ru/v-moskovskom-metro-testiruetsja-oplata-po-licu.html>.

Military and Security Developments

6. Russian media discusses US AlphaDogfight trials

Russia's RIA Novosti news organization—one of the official news portals in the country—published an interview with a Russian military pilot, who commented on the recent AlphaDogfight Trials (AI vs. human pilot test) in the United States. Discussing the difference between human and AI experience, Vladimir Popov, a decorated pilot, said that the computer will always win, because its information database is much larger. Popov explained that during the simulated aerial contest, the computer contained the maximum number of maneuvers and trajectories that can be calculated and maintained more accurately than a human. The AI program received data on meteorological conditions every second, and took into account humidity, pressure, wind direction, and speed, whereas a human learned about the weather only “on the ground” and performed aerial maneuvers based only on his own feelings and instrument readings. RIA Novosti also noted that this particular test used only airborne guns, and not air-to-air missiles and other weaponry likely to be utilized in combat. RIA also noted the American plans for manned aircraft to become control vehicles for the reconnaissance drones that strike targets or act as decoys for enemy electronic warfare systems.

At the same time, RIA noted that Russia's own plans for the S-70 Okhotnik UCAV to fly as a loyal wingman to the stealthy Su-57 aircraft are ahead of the American plans for such a manned-unmanned teaming. The publication noted that Okhotnik that will become one of the first combat aircraft equipped with artificial intelligence. To realize this plan, RIA notes that the Russian defense establishment has developed an inertial navigation system that allows Okhotnik to navigate in the absence of ground, sea, or space signals. In 2019, the MOD published the video of a flight test involving Su-57 and the Okhotnik prototype.

To further underscore what the Russian military sees as its advantage in the AI flight race, Popov also noted that the Su-57 aircraft, which is Russia's latest stealthy manned fighter, already has a “virtual pilot”—an automated control system that is useful in difficult, critical conditions, or in case of equipment failures, or when psychological factors and the lack of time may affect pilot's decision-making skills. Popov thinks that this level of C2 automation will effectively advise the pilot, reducing dozens of possible options to just two or three optimal scenarios. The MOD announced that the Okhotnik UCAV will be acquired starting in 2024, and that this UCAV will have an air defense penetrator role when accompanying manned fighters.

The Russian defense establishment is pouring resources into AI as a decision-making tool for both manned and unmanned aircraft in order to gain advantage in current and future conflict.

Sources: "They have no chance: why fighter pilots may be unemployed" [У них нет шансов": почему пилоты истребителей могут остаться без работы], RIA.ru, Sept. 23, 2020, <https://ria.ru/20200923/aviatsiya-1577613708.html>.

7. Southern Federal University is building AI-enabled robotic swarms

Russia's Southern Federal University (SFU) is one of the MOD's UARC (university-affiliated research center) research and development institutions. In newsletter #1, we highlighted SFU's work on developing swarm and group applications for unmanned and autonomous vehicles. This year, the SFU's Research Institute of Robotics and Control Processes announced that it has created an AI-based control system for robotic swarms, such as unmanned boats, cars, and flying vehicles. Such a system can function in extreme conditions, commanding an entire group by independently distributing roles between individual robots. The institute underscored that SFU's development differs from that of other competitors because its system can navigate in the rapidly changing environment.

SFU is already developing autonomous assault and reconnaissance UGV and UAV groups for the MOD that can be used in urban combat. SFU also noted that many high-tech systems are becoming dual-use, but that autonomous intelligent robotic systems first find their application in the nation's military. The institute's director, Vyacheslav Pshikhopov, noted that a human aircraft or vehicle operator is the weakest link in the control loop due to his or her psychophysiological characteristics and speed of decision-making; therefore, it is essential to replace the human with an intelligent robotic system. The MOD is discussing the role of a human operator amidst an ever-growing role of automation and AI technologies, noting the need for a balance between smart weapons and a human-in-the-loop approach. For more on this debate, please see newsletter #9.

Sources: "From "defense" to "civilian": Southern Federal University scientists are developing smart technologies based on artificial intelligence for autonomous control of robots" [От «оборонки» к «гражданке»: ученые ЮФУ разрабатывают умные технологии на основе искусственного интеллекта для автономного управления роботами], Southern Federal University (SFU) website, Mar. 26, 2020, <https://www.sfedu.ru/www2/web/press-center/news/62523>.

8. Yalta utilizes “Smart City” surveillance technology

The head of Yalta’s Ministry of Internal Affairs claimed that with the commencement of the “Smart City” project in his town, crime detection statistics had significantly increased. Vikot Shvarts remarked that his department depends on the CCTV cameras across the town for assistance in solving crimes, and that at this point, about 50 percent of all crimes were solved thanks to such surveillance systems. Mr. Shvarts noted that Yalta is adding cameras across town for better security. Such “smart surveillance” now encompasses not just Yalta but the city suburbs as well.

In August 2020, Russia’s Rosstandart state agency approved the first series of eight national standards for the development of Smart Cities. The purpose of these standards is to improve the efficiency of informatization and automation of urban facilities, as well as to simplify the introduction of new digital technologies in the urban environment. Yalta is expected to follow such standards and will synchronize all available tools for their full implementation. Earlier, Moscow became a test-bed for AI-enabled surveillance of the population amidst the COVID-19 pandemic, by utilizing data from CCTVs and other sources. It is expected that lessons learned in Moscow will be applied across Russia’s largest cities, and across major regions. Some Russian rights groups are trying to push back against such surveillance tactics, arguing that the loss of privacy is detrimental to society.

Sources: “Half of the offenses in Yalta were solved thanks to the intelligent video surveillance system” [Половину правонарушений в Ялте удалось раскрыть благодаря системе интеллектуального видеонаблюдения], AI-News.ru, Sept. 14, 2020, https://ai-news.ru/2020/09/polovinu_pravonarushenij_v_yalte_udalos_raskryt_blagodarya_sisteme.html.

Corporate and Market Developments

9. Russian government launches startup grants

As reported in past issues of *AI in Russia*, the Russian government plans to stimulate startups in AI and the broader digital technologies space. In September, the Russian Ministry of Digital Development announced the launch of a grant competition for projects aimed at developing and implementing digital solutions in the country; a total grant allocation of 7.1 billion rubles is planned in 2020. Maxim Parshin, the department's deputy head, stated that both small development teams and large businesses are eligible to receive the grants, with up to 20 million rubles offered to startups and 300 million rubles allocated to major initiatives for business digitalization. There are a number of priority areas for the grants, including recognition systems based on AI, robotic complexes, and control systems for robotic equipment.

The Ministry of Digital Development will implement the grant program under the federal project titled "Digital Technologies," which is a part of the national program "Digital Economy." The Skolkovo Foundation, the Russian Fund for the Development of Information Technologies (RFRIT), and the Innovation Promotion Fund will each fund and support certain types of grants.

- The Skolkovo Foundation will award grants to companies for the pilot implementation of domestic digital products, services, and platform solutions with an amount of up to 80 million rubles for each grant. In 2020, the foundation plans to support up to 10 pilot projects in a number of areas, including AI, augmented and virtual reality, and robotics and sensors. The organization will competitively select grantees on a regular basis until 2024.
- The Innovation Promotion Fund will offer grants to support both new and established IT startups with the aim of developing new digital products from the idea stage to market. The fund will offer two types of grants: the ones called "start" will provide up to 3 million rubles to small businesses and individuals; and those called "development" will offer up to 20 million rubles to finance up to 77 percent of a project's costs, and are also appropriate for small businesses.
- The Russian Fund for the Development of Information Technologies (RFRIT) will allocate grants of up to 300 million rubles for projects aimed at the creation and implementation of software, including for remote work solutions, online education, healthcare, and other digital solutions falling into the priority areas. The grants can

cover up to 80 percent of project costs. In addition, RFRIT will offer grants up to 300 million rubles for projects related to digitally transforming production and management processes. A prerequisite for receiving the second kind of grant is that the proposals must offer domestic Russian solutions, and they must correspond to the priority areas.

The announcement of these grant competitions follows a September speech by Russian prime minister Mikhail Mishustin speaking to young scientists and entrepreneurs in Krasnodar, where he stated that, in the next four years, the Russian government plans to give out 12 billion rubles in grants to domestic startups working on the development of AI technologies. He noted that Putin initiated the AI development strategy after defining AI development as a “matter of the security and survival of the state.”

Sources: “The Ministry of Digital Development will distribute 7 billion to Russian IT developers” [Минцифры раздаст 7 миллиардов российским ИТ-разработчикам], C-News, Sept. 22, 2020, https://www.cnews.ru/news/top/2020-09-22_mintsifry_razdast_7_milliardov.

10. NtechLab raises new funding

The facial recognition and computer vision startup NtechLab has raised \$15 million in new funding from a combination of Russian and foreign sources. The funding is earmarked for further developing its product range and expanding into new markets. The company, which was founded in 2015, uses artificial intelligence and neural networks to identify faces, silhouettes, and actions from video recordings. Its algorithm was originally launched as a consumer app to match smartphone-recorded videos to social media profiles. After complaints about privacy violations, the company retooled its software for use by governments and businesses engaged in surveillance. It was used during the 2018 FIFA World Cup in Russia to monitor crowds and has aided in the arrest of more than 100 people on Russia’s wanted persons list. The software has also been used in Moscow’s surveillance network, including to monitor compliance with coronavirus lockdown procedures.

The new funding comes from the Russian Direct Investment Fund (RDIF) and from sovereign wealth funds from unnamed countries in the Middle East. NtechLab said it plans to use the investment to develop automatic detection of “aggressive behavior” and to develop vehicle recognition software. The funding will also be used to expand into markets in the Middle East, Southeast Asia, and Latin America. The funding was announced on the sidelines of the “Digital Industry of Industrial Russia” conference in Nizhny Novgorod.

Sources: "Facial recognition startup NtechLab scoops \$15m for market expansion," Sept. 24, 2020, <https://www.verdict.co.uk/ntechlab-funding/>; "РФПИ и фонды Ближнего Востока вложили более 1 млрд руб в российского разработчика NtechLab," Sept. 24, 2020, <https://d-russia.ru/rfpi-i-fondy-blizhnego-vostoka-vlozhili-bolee-1-mlrd-rub-v-rossijskogo-razrabotchika-ntechlab.html>.

11. Skolkovo startup uses neural nets to speed data collection and analysis

The Skolkovo-based company Nanosemantika has developed a new service called NLab Marker, which uses neural nets to increase the processing speed and help analyze big datasets. The software can detect significant objects on video, transcribe audio, and analyze medical images. The service can speed data processing, and it reduces error rates in the creation of the dataset and the development of training data for AI systems. The system includes automatic error detection and correction technology. It also includes modules that synthesize speech and categorize texts.

NLab Marker can be used to save time and money by companies with large data science departments that regularly work with big datasets. Projects can be done by staff working remotely, because all that is required is a computer and internet access, a factor that is especially useful in the current environment. The software uses active learning methodologies to continue to improve its functionality. It is also reported to have a robust set of protections for personal data. The software was originally developed to help Nanosemantika improve its own AI products, but is now being offered commercially to help other companies focused on AI and advanced data science. Clients include large Russian companies such as Sberbank, VTB, and Gazprom.

Sources: "Nanosemantika has developed a platform for data gathering to train AI" [Наносемантика разработала платформу сбора данных для обучения ИИ], Sept. 21, 2020, <http://rusneuro.net/novosti/nanosemantika-razrabotala-platformu-sbora-dannyh-dla-obujenia-ii>.

12. Use of AI supercomputer to identify COVID-19 severity

A startup based at the Skoltech Center for Computational and Data-Intensive Science and Engineering (CDISE) has succeeded in using Skoltech's Zhores supercomputer to enhance the speed of COVID-19 diagnosis. Care Mentor AI is a Russian provider of neural network (NN) based computer vision services for the analysis of X-ray and computer tomography (CT) images. The company has built a NN system that estimates the severity of COVID-19 based on

full 3D chest CT scans. This has served to reduce the workload on radiologists and make patient diagnostics faster. The center stated the following:

Care Mentor AI's AI-based system analyzes and interprets the radiological imaging data using a very fast and accurate NN-based technology that helps identify malignant tumors, tuberculosis, pneumonia, and other health problems. The system estimates the severity of COVID-19 and the extent of damage it caused in percent based on both radiological images and CT scans. CT is more accurate when it comes to detecting symptoms of viral lung damage and, primarily, interstitial pulmonary infiltration, which is hard to discern in an X-ray image. It is only with CT that one can get a true picture of the localization, spread, and progression of the disease, which is extremely important for assessing its severity and behavior.

Zhores is the first energy-efficient petaflops supercomputer in Russia, designed specifically for machine learning and data-based modeling tasks. It is specifically focused on working with biomedical research data. Using this supercomputer,

Care Mentor AI experts report that they have trained their neural networks to detect cancers in CT images with 95% accuracy, estimate the percentage of lung damage caused by COVID-19 with 86% accuracy, and calculate the foot arch angle to diagnose flat feet with 99% accuracy. Moreover, the Care Mentor AI application marks and prioritizes abnormalities detected in radiological images with 93% accuracy, thus helping doctors to cope with a larger number of cases.

Pilot testing of Care Mentor AI's chest X-ray screening system is underway at the PJSC Medicina clinic in Moscow. The application is also being tested within the Moscow Experiment, a program that aims to test and integrate innovative computer-vision-based medical image analysis technologies in the Moscow healthcare system. As part of the experiment, Care Mentor AI's service was integrated into over 40 medical institutions in Moscow.

Sources: "Skolkovo resident, Care Mentor AI, uses Zhores supercomputer to identify the severity of COVID-19," Sept. 16, 2020, https://www.eurekalert.org/pub_releases/2020-09/sios-src091620.php.

Education and Training Developments

13. International collaboration trains young Russian AI experts

Key Russian research universities, with the support of the Russian government, are facilitating international collaboration initiatives designed to develop the next generation of AI experts.

According to an NGS24 article, scientists from the Siberian State University (SibSU) won a competition titled “Russia and Germany: scientific and educational bridges,” which was held at the Brandenburg Academy of Sciences (Berlin) and the National Research Technological University, or “MISI” (Moscow), on September 15. The scientists’ proposal outlines a long-term artificial intelligence collaboration initiative between SibSU and Germany’s Ulm University. The initiative would organize exchanges, internships, and joint research projects, thereby creating “new points of growth and centers of excellence” in promising areas of artificial intelligence. Twenty-five winning proposals were selected from more than 125 submissions. The event was sponsored by the minister of foreign affairs of the Russian Federation and the federal minister of foreign affairs of the Federal Republic of Germany.

Additionally, according to a press release, the fifth annual BRICS Young Scientist Forum took place via videoconference on September 21-25, and was hosted by the South Ural State University. About 20 young scientists from each of the BRICS countries (Brazil, Russia, India, China, and South Africa) were invited to present their research in panel sessions, and to participate in workshops and other activities. The 2020 forum’s program is divided into three thematic subjects: ecology, material science, and artificial intelligence. According to the event’s website, the programming on artificial intelligence included discussion of Big Data, neural networks, computer vision, biometrics, and algorithm development, as well as various applications for AI (industry, medicine, ecology, finance, international development, etc.). The forum also includes an annual Young Innovator Prize Competition designed to identify and encourage top research projects. The goals of the forum are listed as follows: “the development of cooperation among young scientists from the BRICS countries, initiating of new young scientific groups in R&D field, encouragement of mobility of scientists, and creation of BRICS cross-cultural talent pools for STI cooperation.”

Sources: "Siberian State University scientists were awarded a diploma for winning the competition "Russia and Germany: scientific and educational bridges"" [Ученым СибГУ вручили диплом за победу в конкурсе «Россия и Германия: научно-образовательные мосты»], NGS24, Sept. 16, 2020, <https://ngs24.ru/news/more/69469139/>; "Young scientists to discuss developing research, innovation and scientific collaboration between BRICS universities," BRICS Russia 2020, Sept. 21, 2020, <https://eng.brics-russia2020.ru/announcements/20200921/583835/Young-scientists-to-discuss-developing-research-innovation-and-scientific-collaboration-between.html>; BRICS Russia 2020 Young Scientist Forum website, <https://brics-ysf2020.ru/>.

14. Samsung provides AI and IT training

According to a press release on the Samsung company's website, experts from the Samsung IT Academy provided training assistance at the Baikal International Youth Forum, which was held online September 18-20. Attending were 1,400 participants between the ages of 18 and 30, from 77 regions of Russia and six countries. The Samsung IT Academy is designed to train experts for the development of digital economy in Russia, and has three educational tracks: Internet of Things (since 2017), Artificial Intelligence (since 2019), and Mobile Systems (since 2019).

Samsung's Research Russia Center also acted as an information partner for the RuCode online AI and algorithmic programming festival, leading several sessions on smartphone biometrics. The event was hosted by the Moscow Institute of Physics and Technology (MIPT) and took place from August 31 to October 4. The festival began with more than 13,000 students and adults taking online courses about programming and AI. After subsequent competitions, it ended with the presentation of the 25 best AI solutions in the finals. The Samsung Research Russia Center was opened in Moscow in 1993 and employs 300 people. *AI in Russia* has reported on the RuCode training festival in past issues.

Sources: "Samsung has become a partner of the MIPT RuCode festival" [Samsung стала партнером фестиваля МФТИ RuCode], Samsung News, Sept. 25, 2020, <https://news.samsung.com/ru/samsung-stala-partnerom-festivalya-mfti-rucode>; "Samsung IT Academy experts took part in the Baikal international youth forum" [Эксперты «ИТ Академии Samsung» приняли участие в международном молодежном форуме «Байкал»], Samsung News, Sept. 22, 2020, <https://news.samsung.com/ru/experti-it-akademii-samsung-prinyali-uchastie-v-mezhdunarodnom-molodezhnom-forume-baikal>; "The second educational festival on programming RuCode has started" [Стартовал второй учебный фестиваль по программированию RuCode], Saratov State University, Sept. 1, 2020, <https://www.sgu.ru/news/2020-09-01/startoval-vtoroy-uchebnyy-festival-po?language=en>.

15. Students test abilities in WorldSkills finals

According to a press release on the organization’s website, the finals of the 8th WorldSkills Russia National Competition were held in Kuzbass from September 6 to 21. More than 2,800 contestants participated; they came from 26 countries, though the vast majority were Russian. The WorldSkills competition is open to students ages 16 to 22, and there is a Junior WorldSkills version for those ages 12-16. The event, which also features education and training sessions in addition to the contests, is divided into 130 different competencies focused on seven skill sectors: building and construction technology, information and communication technology, manufacturing and engineering technology, social and personal services, transportation and logistics, education, and creative arts and fashion. The information and communication technology section features competencies including VR/AR development, neural network design, machine learning and Big Data, cybersecurity, blockchain technology, and application development. The manufacturing and engineering technology section features competencies including mobile robotics, the Internet of Things, and space systems engineering.

The event was held in a hybrid format with multiple in-person locations as well as online participation. The competition is implemented by the “Young Professionals (Raising Competitiveness of Professional Education)” federal project as a part of the national “Education” project. This year’s event was sponsored by the Ministry of Education, the Young Professionals Union (WorldSkills Russia), and the Agency for Strategic Initiatives, as well as more than 50 other partners (including 1C, Rosatom, and Rostech). Speakers included Minister of Education Sergey Kravtsov, Putin’s special representative for digital and technological development Dmitry Peskov, and Minister of Science and Higher Education Valery Falkov.

Source: WorldSkills Russia 2020 website, <https://worldskills.ru/final2020>.

16. FEFU trains AI “synthetic personality”

According to an August 31 Future Russia article, students in the School of Digital Economy at the Far Eastern Federal University (FEFU) have trained an AI named “Tonya” to create paintings. The neural network is given a variety of different images, all with the same subject, and is then asked to produce one of its own. “Tonya’s” paintings include a tiger, buildings of the FEFU campus, and the Golden Bridge in Vladivostok, all of which will be showcased in the university’s exhibition on AI. FEFU has been working to create a “synthetic personality” AI since May 2019 and has since taught “Tonya” to recognize people, to create music, and to score 57 points on Russia’s Unified State Exam (USE). The school’s program is a part of the Digital Economy of the Russian Federation national project.

Sources: Source: “Команда ДВФУ научила искусственный интеллект создавать картины” [FEFU team taught artificial intelligence to create paintings], Future Russia, Aug. 31, 2020, <https://futerussia.gov.ru/nacionalnye-proekty/komanda-dvfu-naucila-iskusstvennyj-intellekt-sozdavat-kartiny>.

17. Perm Polytechnic offers new robotics MA

According to a press release, the Perm National Research Polytechnic University (PNRPU) has begun offering an online master’s degree program in robotics. Ten students are enrolled in the program, and all admission costs are being covered by the regional government. The program will offer a total of 16 courses, and a new laboratory has been created for the “remote implementation of practical tasks.”

According to an article from Future Russia on September 21, the master’s program is part of a joint robotics education project where top philosophers, psychologists, sociologists, and engineers worked together to develop 24 robotics courses for PNRPU, St. Petersburg State Electrotechnical University (LETI), and the Kazan Aviation Institute. At LETI, students will learn how to develop pattern recognition systems and perform digital signal processing in control systems. Students at the Kazan Aviation Institute will study the mechanics of autonomous service robots. Perm’s course will focus on human-machine interaction and the ethics associated with robots.

Sources: “Студентами первой онлайн-магистратуры по робототехнике в пермском вузе стали 10 человек” [10 people became students of the first online master's program in robotics at the Perm university], CNews, Sept. 21, 2020, https://www.cnews.ru/news/line/2020-09-18_sovmestnaya_magisterskaya; “Perm Politekh is continuing to accept students to the first in Russia network online MA on robotics” [Пермский политех продолжает прием на первую в России сетевую онлайн магистратуру по робототехнике], PSTU, July 20, 2020, <https://pstu.ru/news/2020/05/15/10556/>.

Spotlight: Surface naval mine system

According to Russian news sources, the Russian Navy is testing and preparing to field deployable minefields, called Surface [Поверхность], that utilize elements of AI. These systems purportedly analyze the sound and magnetic field—the “magnoacoustic portrait”—of ships, submarines, and hovercraft.¹ The AI component of the minefield control center identifies and decides which platforms to target and is capable of determining friend or foe based on the vessel’s signature.

Once deployed, the mines are capable of self-organizing based on the magnetic and acoustic signatures of platforms in the vicinity of the minefield utilizing a purported AI-enabled self-learning capability. The mines can also accept specific tasks—for example, avoiding mine-detecting ships and lying in wait to destroy only landing ships. The former chief of the main staff of the navy noted in an interview that, although navies have traditionally used mines in coastal areas to defend naval bases, these new technologies enable the mines to operate far from shore, in areas of predicted adversary naval activity.

Earlier reporting stated that numerous platforms could deploy the mine system; however, later reporting from last year singled out the Be-12 amphibious aircraft (pictured on the following page) as being a primary carrier of Surface.²³ Although the aircraft is one of the oldest in the Russian Navy, modernization and upgrades have kept it operational. The aircraft has a three-hour patrol limit and an approximate operating range of 600 km.

¹ Alexey Ramm and Alexey Kozachenko, “Хорошая мина при морской: флот получит боеприпасы с искусственным интеллектом: для ВМФ готовят самоовучающиеся заградительные поля [Good mine for naval play: the fleet will receive artificial intelligence ammunition. Self-learning minefields are being prepared for the navy], *Izvestia*, Mar. 2019, accessed Oct. 2020, <https://iz.ru/841783/aleksei-ramm-aleksei-kozachenko/khoroshaia-mina-pri-morskoi-igre-flot-poluchit-boeprisy-s-iskusstvennym-intellektom>.

² Ryabov Kirill, “Комплекс «Поверхность». Умные мины для военно-морского флота [Complex "Surface". Smart mines for the navy], *Topwar.ru*, Sept. 2019, accessed Oct. 2020, <https://topwar.ru/162249-kompleks-poverhnost-umnye-miny-dlja-voenno-morskogo-flota.html>.

³ Alexey Kozachenko, Alexey Ramm, and Evgeny Dmitriev, “«Чайка»-носитель: самолеты Бе-12 вооружат умными минными комплексами Амфибии смогут устанавливать самообучающиеся заградительные поля [“Seagull” -carrier: Be-12 aircraft will be armed with smart mine systems: Amphibians will be able to establish self-learning barrage fields], *Izvestia*, Sept. 2019, accessed Oct. 2020.



The Be-12 amphibious aircraft. See: Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Russian_Navy_Beriev_Be-12.jpg.

In Brief: Interview with Dr. Artyom Oganov

This issue's "In Brief" presents an interview with Dr. Artyom Oganov, a Russian chemist known for his work on the computer design of new materials and the prediction of crystal structures. After he left the Soviet Union in 1998, he defended his Ph.D. at University College London, received his doctorate from the Zurich Polytechnic Institute, and worked in the UK, Switzerland, and the United States. In 2013, Oganov returned to Russia after receiving a mega grant from the Russian government. He created and now heads the Computational Materials Discovery Laboratory at the Moscow Institute of Physics and Technology (MIPT). Dr. Oganov is also a Skoltech professor, and his team at Skoltech recently developed a neural network model that predicts properties of superhard materials. He is a professor in the State University of New York system, a full member of the European Academy and the Royal Society of Chemistry in London, and a professor at the Russian Academy of Sciences.

In the interview, Dr. Oganov discussed the nature of "weak" vs. "strong" AI and posited that "strong" AI is unlikely to be developed in the near future. He noted that "weak" AI has been developing rapidly and may soon have the capability to enable humans to read others' minds. But "weak" AI will always have a human-in-the-loop. AI could already present some dangers to humanity, given the ability of current AI applications in surveillance, and it could replace humans in certain professions. Dr. Oganov thinks that AI will have a growing role in society, and might even start or end a war in the near future. He believes it could help the government prevent an epidemic, or even affect the national currency exchange rate. He is convinced that AI will most likely be used at some stage in human development in order to predict the consequences of a human decision. Dr. Oganov clarified that today's AI is a computer program first and foremost, no matter how sophisticated it is, and that it can be deleted or destroyed by a human. At the same time, he predicts that human interaction with AI may change, once "strong" artificial intelligence is created and displays human-like behavior and emotions.

Dr. Oganov holds a prominent spot in Russia's AI R&D community precisely because he represents the type of reverse brain-drain that the Russian government wants. Because of the mass departure of many prominent scientists and researchers over the past two decades, the Russian government has launched initiatives and programs to woo its talent back from overseas and retain that talent. As reported in past issues of *AI in Russia*, MIPT is a key node in Russia's academic AI R&D efforts and a focal point for many private-sector efforts across the country. (Please see our past coverage of the Skolkovo ecosystem in issue 6.)

Source: "Artyom Oganov on Russia, science, God and AI" [Артем Оганов о России, науке, Боге и искусственном интеллекте], Verkramas.org, Sept. 27, 2020, <https://yerkramas.org>.

This report was written by CNA's Strategy, Policy, Plans, and Programs Division (SP3).

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