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A biweekly newsletter on AI and autonomy developments in Russia

CNA Russia Studies Program

HIGHLIGHTS OF ISSUE 35

- The Digital Economy federal program is undergoing significant changes that factor in Western sanctions and Russia's new economic reality.
- Previously reported semiautonomous antipersonnel mines have appeared in Ukraine.
- The Russian government has reportedly started to allocate funds for a federal project titled "Rise from Startup to IPO" to help small tech-focused companies grow.
- On March 15, Russia announced the initiation of 83 new domestic AI master's degree programs to develop Russian human capital.
- Numerous AI and technology companies continue to stop or draw down production and sales with Russia in the wake of the Russian invasion of Ukraine.

THIS WEEK'S CONTENTS

GOVERNANCE AND LEGISLATION

DIGITAL ECONOMY FEDERAL PROGRAM TO BE ADAPTED TO POOR ECONOMY AND SANCTIONS

According to reports, deputy chairman of the Russian government Dmitry Chernyshenko recently led a meeting of a government commission that focused on how to adapt the Digital Economy program to Russia's new economic realities, including Western sanctions. While it is currently conducting an analysis of required changes in the program's metrics, the government plans to prioritize internet connectivity in distant regions, training and development of human capital, protection of personal data, and the transition of organizations to Russian-made software.

Separately, the head of the Russian Ministry of Digital Development, Communications and Mass Media has written a letter to his subordinates proposing the support of Russian domestic software developers via orders from large companies, the removal of regulatory barriers, and new federal support measures to buttress the IT industry.

Sources: "Vice Premier Chernyshenko has asked to adapt the national program 'Digital Economy' to current economic conditions" [Вице-премьер Чернышенко поручил адаптировать нацпрограмму «Цифровая экономика» под текущую экономическую ситуацию], Mar. 11, 2022, https://www.cnews.ru/news/line/2022-03-11_vitse-premer_chernyshenko; "Head of MinTsifry has written a 'spiritual' letter to subordinates with new measures to save the IT industry" [Глава Минцифры написал подчиненным «духоподъемное» письмо с новыми мерами спасения ИТ-отрасли], CNews, Mar. 7, 2022, https://www.cnews.ru/news/top/2022-03-07_glava_mintsifry_dlya_borby.

APPROVAL OF EXPERIMENTAL LEGAL REGIME FOR SELF-DRIVING CARS

TASS reported on March 17 that the Russian government has approved a new legal regime that would ease the barriers for the testing and eventual introduction of self-driving cars onto Russian roads. The new regime allows self-driving cars, primarily those developed by Yandex, to operate without a human inside in Innopolis and Skolkovo and with a human inside in Moscow and Sirius in Krasnodar region. The initial emphasis will be on determining the feasibility of introducing self-driving taxis in the Moscow region over the next several years.

Source: "Russian government has approved the experimental legal regime for self-driving cars" [Кабмин утвердил экспериментально-правовой режим для работы беспилотного авто], TASS, Mar. 17, 2022, https://tass.ru/ekonomika/14104019.

RUSSIA IN SECOND PLACE IN NUMBER OF AI LAWS

Russian sources reported in mid-March that the Stanford AI Index 2022 listed Russia as holding the second place globally in terms of AI legislation, second only to the US. At the

same time, the rankings note that mentions of AI in Russian legislation are much lower than corresponding mentions in the US and ranked in 17th place. The reporting also states that global indices rank Russia relatively low in terms of AI development, part because of its lower number of publications and registered patents. For example, the 2019 Government AI Readiness Index ranked Russia 29th out of 194.

Source: "RF leads in the number of AI laws—AI Index Report 2022" [РФ вышла в лидеры по числу принятых законов в области ИИ — Artificial Intelligence Index Report 2022], D-Russia, Mar. 17, 2022, https://d-russia.ru/rf-vyshla-v-lidery-po-chislu-prinjatyh-zakonov-v-oblasti-ii-artificial-intelligence-index-report-2022.html.

MILITARY AND SECURITY

POM-3 ANTIPERSONNEL MINE USE IN UKRAINE

Source: This screen grab is one of three photos posted on Twitter by @OSINTtechnical of the Russian POM-3 antipersonnel mines found in Kharkiv, Mar. 30, 2022, https://twitter.com/osinttechnical/status/1509179507667832845.

Adding to the growing list of semiautomated devices we are seeing in the Russia-Ukraine war, there is evidence of the Russian use of the POM-3 antipersonnel mine. This mine was featured in our longer report, *Artificial Intelligence and Autonomy in Russia*. What makes POM-3 unique, according to Russian reporting, is its ability to distinguish between various targets—for example, between a farmer and a soldier. Seismic sensors deployed by the mine in the ground pick up signatures that are then categorized based on profiles. Although mines using signatures are not new, it is unclear from reporting how the mine distinguishes between two entities as similar as a soldier and a farmer.

Sources: Jeffrey Edmonds, Samuel Bendett, Anya Fink, et al., *Artificial Intelligence and Autonomy in Russia,* CNA, DRM-2021-U-029303-Final, May 2021, https://www.cna.org/centers/cna/sppp/rsp/russia-ai.

SHTURM MILITARY-ROBOTIC COMPLEX

Despite the ongoing invasion of Ukraine, the Russian military is continuing to move forward with developing several robotic complexes for use in combat. According to Russian reporting, the Shturm robotic complex is nearly ready for testing. Shturm, which first appeared in the Russian press in August 2018, consists of several robotic packages that take advantage of the T-72BM3 tank chassis. This purportedly provides the robotic platforms with a higher degree of survivability. Actual images of the system have not been released.

Source: Kirill Ryabov, "Robotic complex Shturm is being readied for testing" [Робототехнический комплекс «Штурм»: идет подготовка к испытаниям], Topwar.ru, Mar. 19, 2022, https://topwar.ru/193694-robototehnicheskij-kompleks-shturm-idet-podgotovka-k-ispytanijam.html.

MARKETS AND PRIVATE SECTOR

GRANTS UNDER "RISE FROM STARTUP TO IPO" FEDERAL PROJECT

The Russian government has reportedly allocated funding for grants as part of a federal project titled "Rise from startup to IPO" intended for the development of technologies utilizing AI, 5G networks, new microelectronics, and others. The competitive funding will be allocated to small companies seeking to complete their work for orders by unaffiliated large companies and will also prioritize solutions incorporating import substitution approaches. The rules for this (10 billion rubles over 3 years) program were reportedly developed in December 2021 and do not constitute crisis support measures for the Russian ICT sector in the context of sanctions.

Source: "Mishustin signed: IT-companies will receive hundreds of millions to complete their products for large business" [Мишустин подписал: ИТ-компании получат сотни миллионов на доработку своих продуктов для крупного бизнеса], CNews, Mar. 18, 2022, https://www.cnews.ru/news/top/2022-03-18_tehnologicheskie_kompanii.

AI-BASED MEDICAL TECHNOLOGY ADVANCEMENTS CONTINUE

Russian researchers continue to make advances in medical technology using AI, both in basic research and in applied designs. In recent weeks, Russian researchers have reported that a cheaper version of the "Da Vinci" surgical robot, which assists surgeons during abdominal operations, has now been developed that will allow for more widespread use across medical facilities in the country. The new robot was designed and streamlined through a digital design platform and is one of several AI-enhanced robotic units being developed as surgical assistants. Similar new developments are occurring in the field of electrocardiographs, where a new project by SberMedAI and Neo have integrated an AI-supported imaging system that can detect cardiovascular diseases with up to a 90 percent success rate.

Other areas have also seen considerable growth in AI-based computer vision applications for new medical systems. Research into new radiology methods is moving forward in 22 areas of research, all supported by the Moscow City administration, for use in conditions as diverse as tuberculosis, emphysema, and strokes. This set of projects is building out a massive, shared database of computer images using CT scans, which in turn improve the detection ability of individual systems. The systems have been improved in terms of their interoperability and the speed at which they communicate across platforms, such that now a medical professional can access the scan's results only a few minutes after it is performed.

Sources: "In Russia, they created a cheap analogue of the Da Vinci surgical robot" [В России создали дешевый аналог хирургического робота Da Vinci], *Izvestiya*, Mar. 18, 2022, https://iz.ru/1306936/2022-03-18/v-rossii-sozdali-deshevyi-analog-khirurgicheskogo-robota-da-vinci; "Artificial intelligence in Moscow can be implemented in 22 more areas of radiation research" [Искусственный интеллект в Москве могут внедрить еще в 22 направлениях лучевых исследований], *TASS*, Mar. 17, 2022, https://tass.ru/obschestvo/14098703; Robert Nizamutdinov, "In Russia, artificial intelligence is used to quickly diagnose cardiac diseases" [В России искусственный интеллект применяют для быстрой диагностики кардиозаболеваний], *Today News Ufa*, Mar. 14, 2022, https://tdnu.ru/article/health/v-rossii-iskusstvennyj-intellekt-primenyayut-dlya-bystroj-diagnostiki-kardiozabolevanij/; "A neural network for automatic heart diagnosis has been created" [Создана нейросетевая система для автоматической диагностики сердца], *TASS*, Mar. 1, 2022, https://nauka.tass.ru/nauka/13919357.

COUNTERS TO CYBERTHREATS DEVELOPED AND DEPLOYED BY RUSSIAN IT RESEARCHERS

Researchers at Saint-Petersburg Polytechnic University have developed and published a new approach to "immunize" digital infrastructure from cyberattacks. The AI-based protective system allows for immediate response upon detecting an attack such that "for each unauthorized action the system automatically generates a symmetrical response that neutralizes the damage from the action or minimizes it," according to researchers. The response is calibrated based on a large database of attack vectors and characteristics which train the AI through machine learning. Reports suggest that this will be most useful in the energy and manufacturing sectors, as these industries are "characterized by a large-scale, often distributed, network infrastructure,

[and] the presence of redundant nodes and clearly defined critical components," which are particularly vulnerable to cyberattacks.

Sources: "Russian scientists came up with a 'vaccination' against cyber threats" [Российские ученые придумали "прививку" от киберугроз], *RIA Novosti*, Mar. 15, 2022, https://ria.ru/20220315/spbpu-1778106620.html; "Russian scientists have created an 'immunity' from cyberattacks" [Российские ученые создали иммунитет от кибератак], *Scientific Russia*, Mar. 15, 2022, https://scientificrussia.ru/articles/rossijskie-ucenye-sozdali-immunitet-ot-kiberatak.

HUMAN CAPITAL

OVER 83 NEW AI MASTER'S DEGREE PROGRAMS SET TO BEGIN IN 2022

On March 15, 2022, the Russian government announced the initiation of 83 new AI-focused master's degree programs across Russian universities aimed at developing Russia's human capital. The programs were developed by the Lomonosov Moscow State University, St. Petersburg State University, National Research University ITMO, Bauman Moscow State Technical University, and others. Some courses feature extensive involvement of private sector actors, including Sber, Gazpromneft, Mail.ru, and others. The first programs are set to be inaugurated in Russia's regions in 2022. The government also plans to introduce new AI-focused bachelor's degree programs beginning in 2023.

Source: "Dmitry Chernyshenko: new school year will see 83 new AI-focused masters programs" [Дмитрий Чернышенко: В новом учебном году в российских вузах появится 83 магистерские программы по искусственному интеллекту], Russian government, Mar. 16, 2022, http://government.ru/news/44818/.

THOUSANDS OF IT PERSONNEL DEPART RUSSIA

According to the Russian Association for Electronic Communications, 50,000-70,000 IT personnel left Russia in February and March 2022. In April, another 70,000-100,000 are expected to follow. A March 22 CNews article states that "IT professionals are in a hurry to leave the country as soon as possible, not wanting to put up with a sharply deteriorating economic situation and not paying attention to the state's numerous measures to support the IT industry." The article references recent government-led efforts to reduce brain drain, including tax exemptions and preferential mortgage rates, which were detailed in issue 34 of *AI in Russia*. The article notes, "So far, however, all these measures have not yielded results." In addition to IT individuals, entire IT companies are also leaving Russia. According to the article, "Almost a third of information security companies operating in Russia are going to leave the country in the near future and take their staff with them."

Source: "IT specialists leave Russia by the tens of thousands" [ИТ-специалисты десятками тысяч уезжают из России], CNews, Mar. 22, 2022, https://www.cnews.ru/news/top/2022-03-22_poslableniya_ne_pomogayut.

GOVERNMENT INITIATIVE TO FUND AI TRAINING FOR STUDENTS

According to a March 18 article, the Ministry of Economic Development of Russia has developed a draft resolution on granting subsidies to fund educational training for students. The draft resolution allocates 415,328,695 rubles for the implementation of project-based learning activities for the period up to 2024. Using these funds, the Talent and Success Educational Foundation, which was founded by the Russian government in 2014, will develop and conduct online courses and events for students grades 7-11 on the basics of programming and AI.

Source: "The Government of Russia will financially support the training of schoolchildren in project activities in the field of AI" [Правительство России финансово поддержит обучение школьников проектной деятельности в сфере ИИ], CNews, Mar. 18, 2022, https://www.cnews.ru/news/line/2022-03-18_pravitelstvo_rossii_finansovo.

JOINT AI RESEARCH AND PRODUCT DESIGN

Three articles addressed joint research and AI product design.

- According to a March 14 Tass Science article, the Biryuch Innovation Center of the EFKO company and the Omsk State Technical University (OmSTU) have signed a joint research and development agreement to produce "large" unmanned aerial vehicles. EFKO is currently developing air taxis and cargo drones.
- Another March 14 Tass Science article reports that scientists from the National Research Technological University (MISiS) have developed a method for diagnosing dental abnormalities using AI. Such abnormalities, including improper closure of the jaws and positions of the teeth, are traditionally identified with x-rays, which are time consuming and expensive. This new method takes one to three seconds and requires no special equipment.
- According to a March 9 CNews article, the Avtomatika Concern of the Rostec State Corporation, the Moscow Technical University of Communications and Informatics (MTUSI), and the Kaskad company are jointly developing a line of secure cryptoprocessors for the Internet of Things. These cryptoprocessors, or "computers within computers" help ensure the maximum level of security to protect IoT systems and networks.
- According to a March 11 article, Innopolis University will develop artificial intelligence-based software for the Ministry of Industry and Trade of Russia to search for products in the State Industry Information System catalog. According to the article, the agreement will reduce dependence on foreign trade by enabling quick searches for any necessary Russian-made industrial products.
- According to a March 3 press release, Ruselectronics Holding of the Rostec State Corporation and Omsk State Transport University opened an "Artificial Intelligence Technologies" research laboratory. The laboratory will leverage VR, big data, machine

learning, and deep neural network technologies to develop more advanced radio communication systems.

Sources: "Omsk Technical University will take part in the development of large drones" [Омский технический университет примет участие в разработке больших беспилотников], Tass Science, Mar. 14, 2022, https://nauka.tass.ru/nauka/14058909; "A neural network has been created to improve the accuracy of diagnosing dentoalveolar anomalies" [Создана нейросеть для повышения точности диагностики зубочелюстных аномалий], Tass Science, Mar. 14, 2022, https://nauka.tass.ru/nauka/14060091; "Rostec, together with Cascade and MTUCI, create domestic secure cryptoprocessors" [«Ростех» совместно с «Каскадом» и МТУСИ создают отечественные защищенные криптопроцессоры], Mar. 9, 2022, https://www.cnews.ru/news/line/2022-03-09_rosteh_sovmestno_s_kaskadom; "Innopolis University will develop an AI-based service for the Ministry of Industry and Trade to search for products" [Университет Иннополис разработает для Минпромторга сервис на основе ИИ для поиска продукции], *Realnoe Vremya,* Mar. 11, 2022, https://realnoevremya.ru/news/243988-innopolis-razrabotaet-dlya-minpromtorga-servis-na-osnove-ii; "Ruselectronics enterprise and Omsk University opened an artificial intelligence laboratory" [Предприятие «Росэлектроники» и Омский университет открыли лабораторию по искусственному интеллекту], Rostec, Mar. 3, 2022, https://ruselectronics.ru/news/23457-predpriyatie-roselektroniki-i-omckiy-universitet-otkryli-laboratoriyu-po-iskusstvennomu-intellektu/.

INTERNATIONAL COLLABORATION

NVIDIA WITHDRAWS FROM RUSSIAN MARKETS

NVIDIA has followed AMD and Intel in ending sales to Russia. This will affect the company's entire portfolio, including not just GPUs but also data centers and its artificial intelligence cooperation. Many of NVIDIA's partners are based in China, which has not directly condemned the Russian invasion. However, a few days ago, the country changed its position, saying that it was extremely concerned about the damage caused to the civilian population in Ukraine. Official US sanctions on Russia do not restrict shipping of non-military consumer electronics. However, AMD, Intel, and NVIDIA have done their best to block sales of all of their products to Russia.

Source: Maksim Grigoryev, "NVIDIA stops all deliveries to Russia due to the invasion of Ukraine" [NVIDIA прекращает все поставки в россию из-за вторжения в Украину], ITC.UA, Mar. 6, 2022, https://itc.ua/news/nvidia-prekrashhaet-vse-postavki-v-rossiyu-iz-za-vtorzheniya-v-ukrainu/.

SKOLTECH SEEKS TO AVOID BEING ENSNARED IN POLITICS

In the aftermath of Russia's invasion of Ukraine and the subsequent breaking of academic relationships between most Western institutions and their Russian counterparts, Skoltech is seeking to avoid a complete breakdown in its international cooperation relationships. The leadership of the Skolkovo Institute of Science and Technology—specifically, Rector Alexander Kuleshov and Vice-Rector Keith Stevenson—appealed to the scientific and educational community of Russia and the world, indicating that the goal of the institute is "to develop and

educate a new generation of Russian and international specialists, and not be an arena of political discourse and promotion of personal ambitions."

This statement was made in the aftermath of an announcement by MIT that it was terminating cooperation with the Skolkovo Institute of Science and Technology due to the situation in Ukraine. The press service of Skolkovo noted that this will not have a noticeable impact on the research and educational activities of Skolkovo. The authors of the appeal argue that "science and education are based on facts and evidence" and that in the past "even in the most difficult times for international relations, it was impossible to imagine a situation where an article is automatically rejected by an international scientific journal due to the author's nationality. We hope that people will study and do science regardless of their race and nationality."

Source: "Skoltech said they do not want to be an arena for politics" [В Сколтехе заявили, что не хотят быть ареной политики], RIA-Novosti, Mar. 2, 2022, https://ria.ru/20220302/skoltekh-1776104556.html.

QUANTUM COMPUTING COOPERATION PRODUCES RESULTS

As a reminder of what is being lost with the severing of international cooperation with Russia in the AI field, a recent report highlights one outcome of such cooperation before the invasion. According to this report, a team of Russian scientists, supported by Swiss and US scientists, were able to change the direction of time using a quantum computer. The lead researchers are based at the Quantum Information Physics Laboratory at the Moscow Institute of Physics and Technology.

The "time machine" consists of a rudimentary quantum computer made up of electronic "qubits." A qubit is a unit of information described by a "one," a "zero," or a mixed "superposition" of both states. The experiment set in motion an "evolution program" that caused the qubits to become an increasingly complex changing pattern of zeros and ones. During this process, order was lost. But then another program altered the state of the quantum computer in such a way that it evolved "backward," from chaos to order. This meant that the state of the qubits was rewound back to the original starting point, something that violates the second law of thermodynamics, which describes the progression from order to disorder. The scientists found that by working with just two qubits, "time reversal" was achieved with an 85 percent success rate. When three qubits were involved, more errors occurred, leading to a 50 percent success rate. Error rates are expected to drop as scientists improve devices that used to be more complex, said the researchers behind the discovery. The experiment could have practical applications in the development of quantum computers, as it can be used to test programs written for quantum computers and eliminate noise and errors.

Source: "Scientists succeeded in reversing time using a quantum computer" [Ученым удалось обратить время вспять с помощью квантового компьютера], Ryb.ru, Mar. 10, 2022, https://ryb.ru/2022/03/10/1880522.

CHINA PLANS TO CONTINUE TO COOPERATE WITH RUSSIA IN THE IT SPHERE

According to Wang Jianwei, deputy head of the Information Technology Development Department of the Ministry of Industry and Informatization of the People's Republic of China, China will continue cooperating with Russia in the field of information technology and is ready to work together on standards for the informatization of industries and the creation of common internet platforms. This will increase the level of development of both countries. The official, speaking at the Krasnoyarsk Economic Forum, indicated that China was looking to strengthen cooperation with Russia in areas such as big data and cloud technologies.

He noted that China already has a positive experience in creating informatization standards in using control systems in various economic sectors, such as the power industry. In addition, industrial applications and Internet platforms for industrial enterprises used in the PRC have proven their cost-effectiveness. He concluded that China is ready to share this experience with Russia.

Sources: "China plans to continue cooperation with Russia in the IT field" [Китай планирует продолжить сотрудничество с Россией в IT-сфере], TASS, Mar. 3, 2022, https://tass.ru/ekonomika/13945187; "Cooperation with Russia in the IT field is planned to continue—Ministry of Industry and Informatization of China" [Сотрудничество с Россией в сфере IT планируется продолжить – министерство промышленности и информатизации КНР], D-Russia.ru, Mar. 4, 2022, https://d-russia.ru/sotrudnichestvo-s-rossiej-v-sfere-it-planiruetsja-prodolzhit-ministerstvo-promyshlennosti-i-informatizacii-knr.html.

RUSSIA PRESSES ON WITH INTERNATIONAL IT FORUMS

Despite the breakdown in international cooperation, Russia is continuing to plan international forums in the technology sphere. The 21st International Customer Contacts World Forum was held in Moscow and online from March 22 to 24. According to the organizers, the Customer Contacts World Forum has for more than 20 years "served as the premier platform for dialogue, discussion and exchange of experience between experts and professionals in the contact center and customer service industry." Topics covered at the forum include digital transformation, big data, artificial intelligence, and the smart workplace. Notably, the description of the event does not mention the countries of origin of the participants.

The 13th International IT Forum will take place in Khanty-Mansiysk and virtually from June 7 to 9, with the participation of official representatives and members of the business and expert communities from the BRICS and SCO countries. The agenda of the forum will focus on current international relations, plans for the BRICS and SCO associations, and the tasks of forming a digital economy. The previous forum was held in 2021 in the same region and included a focus on artificial intelligence and digital transformation.

Sources: "XXI International Customer Contacts World Forum will be held in Moscow on March 22-24" [XXI Международный Customer Contacts World Forum пройдет в Москве 22-24 марта], Interfax, Mar. 10, 2022, https://www.interfax.ru/events/news/827387; "International delegations will visit the IT forum in Khanty-Mansiysk" [Международные делегации посетят IT-форум в Ханты-Мансийске], TASS, Mar. 17, 2022, https://tass.ru/obschestvo/14106395.

This report, the thirty-fifth 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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