HIGHLIGHTS OF ISSUE 34

- Presidential spokesman Dmitry Peskov puts a positive spin on Western sanctions on Russia as the government prepares for economic impacts.

- The Russia-Ukraine War sees a growing UAV presence, and training on drone use continues.

- The Russian government announces further grants for the private sector under the AI federal program.

- The Russian government seeks to simplify procedures to hire foreigners and incentivize the domestic cadre while MIPT publishes an open letter against the Russian war in Ukraine.

- Russian ICT sector is hit by the impact of widespread sanctions, particularly as TSMC plans to stop microchip shipments.

THIS WEEK'S CONTENTS

GOVERNANCE AND LEGISLATION

RUSSIAN OFFICIALS PUT ON A BRAVE FACE, GIRD FOR SANCTIONS IMPACT

The Russian government has begun preparing for the impact of Western sanctions. TASS reported on March 1 that Russia's prime minister Mikhail Mishustin will head up an operational headquarters to counter sanctions. He indicated that Russia will need to focus on import substitution as a standard course of doing business and noted the importance of reducing administrative barriers and providing further support to the private sector. Mishustin also reportedly said that "it is necessary to stimulate changes in the structure of the economy as much as possible in order to further get away from raw material dependence, increasing the share of high-tech industries."

At the same time, Dmitry Peskov, the spokesman for Russia's president Vladimir Putin, projected a rapid turnaround for the Russian economies as foreign companies come back to the Russian market. Said Peskov, "Russia was, is, and will always be a country seeking mutually beneficial relationships with foreign business; interested in being appealing in terms of investment. Yes, even though it is difficult to talk about investment attractiveness at the moment, time is passing quickly. Rapid economic growth will come next." He further noted that foreign companies "return to the [Russian] market again and will be more than eager in catching up and reclaiming their positions." The Kremlin spokesman said, "We will wait for them in some sectors very much. In other sectors we will wait less, because companies from other countries around the world will already take their place. This is a normal economic process."

Sources: "Mishustin to lead HQ to counter sanctions" [Мишустин возглавит оперштаб по противодействию санкциям], TASS, Mar. 1, 2022, https://tass.ru/politika/13913547; "Mikhail Mishustin: Import substitution must become the main area of our business" [Михаил Мишустин: «Импортозамещение должно стать основным направлением нашей деятельности»], D-Russia, Mar. 1, 2022, https://d-russia.ru/mihail-mishustin-importozameshhenie-dolzhno-stat-osnovnym-napravleniem-nashej-dejatelnosti.html; "Current situation will turn into rapid economic growth—Kremlin," TASS, Mar. 5, 2022, https://tass.com/economy/1417333.

RUSSIAN GOVERNMENT ANNOUNCES EFFORTS TO BOOST DOMESTIC SOFTWARE AND AI PRODUCTION IN RESPONSE TO SANCTIONS

The Ministry of Digital Development, Communications and Mass Media announced that it will take measures to encourage Russian businesses and individuals to shift to Russian software. These measures will include lower insurance tariffs and no taxes on profits. These measures will include lower insurance tariffs and no taxes on profits. Maksut Shadaev, the head of the ministry, drafted a letter to the ministry's employees laying out three primary goals for dealing with the crisis facing Russia's IT industry: increasing financing for Russian developers to produce domestic analogs of software that was previously purchased abroad; encouraging large Russian companies to buy software from Russian developers; and changing regulations to remove all administrative barriers to working in the new environment. The government announced that it will provide 1.9 billion rubles in credits to support companies in the field of artificial intelligence. An additional 1.5 billion rubles will go to support research centers in artificial intelligence, and 1.7 billion rubles to support companies that purchase domestic AI pilot products.

Sources: "Digital Ministry calls for stimulating the transition to domestic software" [Минцифры выступило за стимулирование перехода на отечественное ПО], *Izvestiya,* Mar. 5, 2022, https://iz.ru/1301087/2022-03-05/mintcifry-vystupilo-za-stimulirovanie-perekhoda-na-otechestvennoe-po; Kristina Kholupova, "The head of the Ministry of Digital Development wrote an 'uplifting' letter to his 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; "Enterprises in the field of artificial intelligence in 2022 will receive almost 2 billion rubles in grants" [Предприятия сферы искусственного интеллекта в 2022 г. получат почти 2 млрд рублей грантов], TASS, Mar. 3, 2022, https://tass.ru/ekonomika/13959441.

MILITARY AND SECURITY

RUSSIAN MILITARY IS STARTING TO USE MILITARY DRONES IN UKRAINE

The Russian military is fielding a growing array of drones and UAVs in Ukraine as it continues to battle significant resistance from the Ukrainian defenders. While Russian ISR and combat drones seemed scarce at the onset of the invasion, more and more Russian unmanned aerial vehicles are appearing on the battlefield. Apart from a strictly military utility, using drones can be an important psychological and public relations tool for the country, which is seeking to showcase its capabilities and to compete in the rapidly evolving information war that is now inseparable from the actual combat. Earlier, Turkish TB2 UCAVs benefited enormously from videos of its strikes in Syria, Libya, and Nagorno-Karabakh, which telegraphed this drone's capacity to operate in different environments and target Russian assets seemingly at will.

Today, Russia is taking a page out of this Turkish playbook by releasing videos of its Orion UCAVs' striking positions across Ukraine. A short MOD video released in early March 2022—validity unverified—showed the drone's guidance system, a strike with a guided munition, and the ensuing explosion on the ground. The Russian military identified the target as the forward operating command and control post belonging to the Ukrainian "Aidar" battalion.

Source: Dmitry Litovkin, "Drone battle over Ukraine" [Над Украиной начались битвы дроно], *Ng.ru,* Mar. 4, 2022, https://www.ng.ru/armies/2022-03-04/100_a04022022; "Russian Aerospace Forces destroy Aidar battalion command post in DPR via Inokhodets drone," Tass.com, Mar. 4, 2022, https://tass.com/politics/1416783.

RUSSIA HOPING TO EXPORT ORION AND ORLAN-10 DRONES

As the war against Ukraine rages next door, a Russian military export agency hopes to capitalize on the growing use of UAVs in this combat, and around the world in general by exporting two of its military drones abroad. Russia's Federal Service for Military-Technical Cooperation of the Russian Federation (FSVTS) recently noted that negotiations were underway with potential foreign customers from the Middle East for the sale of the Orion-E medium-altitude, long-endurance ISR and combat drone. The supposed negotiations were taking place during the World Defense Show 2022 arms exhibition, held in Saudi Arabia in early March 2022. FSVTS also noted that besides Orion drones, there is interest in the Orlan-10 UAV, the mainstay of the Russian military drone fleet.

Prior to the Russian invasion of Ukraine on February 23, 2022, Russian defense exporters were banking on Orion-E exports as a competitor to the Turkish Bayraktar TB2 drone, arguing that the Russian UAV can outperform the TB2. This remains to be seen, as the TB2 is striking Russian military targets across Ukraine, adding to this drone's real and perceived advantages as the go-to military UAV for nations with smaller

military budgets. At the same time, Russia has struggled to export its Orlan-10 drone, with Myanmar and Kirgizstan as its recent customers, despite this UAV's continuous operation in multiple conflicts involving Russian forces. At the same time, one of the likeliest Orlan-10 customers would probably be Syria, given a close cooperation between the two states, although there has been no evidence of the Syrian government acquiring this UAV. The future of Russia's military exports is unclear at this point in the face of growing global sanctions that impact its civilian and military industry alike.

Source: "FSVTS said that Middle Eastern countries are interested in "Orlan" and "Orion" UAVs" [В ФСВТС заявили, что страны Ближнего Востока интересуются БЛА типа "Орлан" и "Орион""], Tass.ru, Mar. 6, 2022, https://tass.ru/armiya-i-opk/13984511.

RUSSIA CONTINUES TO DRILL IN RECONNAISSANCE FIRE/STRIKE CONTOURS

Despite the war, the Russian MOD is overseeing drills and exercises with UAVs in intel-gathering roles. In the Arctic, the Eastern Military District forces discovered "enemy" unmanned aerial vehicles during a counter-UAS drill on Wrangel Island in Chukotka region. According to the exercise, multiple UAV targets were detected and classified, and these data were then transferred to the air defense command post. During another exercise around the same time, the Central Military District's motorized riflemen purportedly destroyed the adversary with the support of T-72B2 and BMP-2, and an artillery strike from the Msta-S launchers. Intel on the adversary forces was provided by Orlan-10 UAVs. This combination is known as a *reconnaissance fire/strike contour (complex)*, with an aerial drone providing data on the target in real time. It is unclear whether this sensor-to-shooter tactic is being used in Ukraine, given the evidence of downed and captured Russian UAVs across the country.

Source: "Air Defense Forces practice spotting enemy drones during the exercises in the Arctic" [На учениях в Арктике военные ВВО засекли беспилотники условного противника], Ria.ru, Feb. 28, 2022, https://ria.ru/20220228/bespilotniki-1775465748.html; "The military destroyed superior "enemy" during exercises in Siberia involving T-72B2 and BMP-2" [В Сибири военные уничтожили превосходящие силы "противника" на учениях с Т-72Б2 и БМП-2], tass.ru, Feb. 24, 2022, https://tass.ru/armiya-i-opk/13830671\.

RUSSIA TO UTILIZE AI IN BORDER PROTECTION

The Russian Transportation Ministry recently proposed an "intelligent checkpoints" model for different types of transportation vehicles that cross the nation's borders. This model will be used as a standard in the construction and modernization of border crossings in order to move from electronic customs to "intelligent" customs, with all operations eventually fully automated. A single digital platform is proposed for the integration with the regulatory authorities' databases and with the border crossings' software applications currently in use. This unified platform will combine information coming from the control and measuring equipment available at the facilities, including streaming scanning, vehicle weight and size measurements, and radiation monitoring. The proposal indicates the use of machine vision technology for automated analysis of images during vehicle inspection and screening. According to the Transportation Ministry, this smart system will contribute to the development of digital transport corridors. It is not known how the Western sanctions imposed on Russia following its February 23, 2022, invasion of Ukraine will impact the research and development of this system.

Source: Maria Abdrimova, "AI will serve at the border" [Искусственный интеллект послужит на границе], *Gudok.ru,* Feb. 28, 2022, https://gudok.ru/content/freighttrans/1596318/.

MARKETS AND PRIVATE SECTOR

NEW SUPPORT ANNOUNCED FOR PRIVATE SECTOR

According to TASS, the Russian government plans to provide an additional 2 billion rubles for corporate grants under the AI federal project. Additional funding under the project is also set to be dedicated to AI ethics, AI pilot projects, and training. Separately, according to RIA, the Russian government plans to purchase stock of Russian companies impacted by Western sanctions.

Sources: "AI enterprises to receive 2 billion USD in grants in 2022" [Предприятия сферы искусственного интеллекта в 2022 г. получат почти 2 млрд рублей грантов], TASS, Mar. 4, 2022, https://tass.ru/ekonomika/13959441; "Government to provide trillion rubles to purchase Russian company stock" [Правительство выделит триллион рублей на покупку акций российских компаний], RIA Novosti, Mar. 1, 2022, https://ria.ru/20220301/sanktsii-1775843804.html.

DEVELOPMENTS IN AI MEDICINE DEPLOYED IN RUSSIAN REGIONS

AI programs in the healthcare sphere have found practical application in multiple regions recently. In Tatarstan, a new skin imaging system, FotoFinder, along with an associated AI algorithm, was introduced to evaluate imagery to help diagnose skin cancer. The program uses a database on neoplasm imagery and can be used during the screening process prior to confirmation of cancer activity. Meanwhile, in Dagestan, a new patient registration program—Promobot Scanner—is being implemented, to speed up the process of entering passport data. The program automatically transfers patient passport data directly into the medical information system of the clinic through an AI application. The device, created by Promobot, a Perm-based company that is also a resident at the Skolkovo IT cluster, can transmit and organize all of these data within four seconds, thus significantly reducing the time needed to input patient data and resulting wait times.

Sources: "Tatarstan uses artificial intelligence to diagnose skin cancer" [В Татарстане используют искусственный интеллект для диагностики рака кожи], TatCenter.ru, Feb. 26, 2022, https://tatcenter.ru/news/v-tatarstane-ispolzuyut-iskusstvennyj-intellekt-dlya-diagnostiki-raka-kozhi/; "Dagestan clinics will start registering patients with artificial intelligence" [В Дагестанских клиниках устройство с искусственным интеллектом начнет регистрировать пациентов], Promo-bot.ru, Feb. 22, 2022, https://promo-bot.ru/news/v-dagestanskih-klinikah-ustrojstvo-s-iskusstvennym-intellektom-nachnet-registrirovat-patsientov/.

NTC MODULE ANNOUNCES 5-NM MICROCHIP DEVELOPMENT

NTC Module has announced the development of new neural processing units for embedded systems, server solutions, and electronic gadgets. These chips were developed through a grant of over 7 billion rubles from the Ministry of Industry and Trade. According to reports, engineering samples of different models of the chips should appear in 2024, 2025, and 2026. The first chip released, Neuro-B, will be used in embedded systems such as medical equipment, unmanned cars, smart cameras, and drones. The second chip, Neuro-C, is designed for servers and will be used for cloud data processing and neural network training. The third chip, Neuro-M, will be used in low-cost wearable devices, smart speakers, and portable multimedia devices. The processors constitute a new chip line with a 5-nm topology on the company's own Neuromatrix chip architecture. Neural processing units, also known as *neuroprocessors* or *AI accelerators,* are specialized chips which can implement all controls and arithmetic logic necessary for executing machine

learning algorithms. The chips are not fully analogs to the Nvidia Jetson Xavier, which was originally the request of the Ministry that funded the project, but remains a significant advance in Russian chip development. The company expects that customers for the chip will primarily be large corporations, including automobile manufacturers, critical information infrastructure facilities, medical and educational institutions, and the Russian Ministry of Transport.

Source: "Three neuroprocessors with 5 nm topology will appear in Russia" [В России появятся три нейропроцессора с топологией в 5 нм], CNews, Feb. 24, 2022, https://www.cnews.ru/news/top/2022-02-24_v_rossii_poyavitsya_tri_nejroprotsessora.

LARGEST CARGO DRONE BEING BUILT AS PROTOTYPE

The largest unmanned aircraft with vertical takeoff capability is being prototyped and assembled at the Sukhoi Design Bureau. The prototype, "Atlas," has been designed in conjunction with engineers from MIPT. The goal is to build a cargo drone that can vertically take off from any flat area, with a flight range in excess of a helicopter's and without the need for an airfield or helipad. The drone relies on eight takeoff propellers, using a push propeller to accelerate and transition to horizontal flight. The drone is built to look like a small plane, 7 meters long with an 11-meter wingspan. The biggest problem is the power needed to power the takeoff propellers, which, according to *Izvestiya*, is "comparable to the power of a small submarine" and requires a specially made battery. The designers are looking to make the drone's operation fully automated—an operator only needs to specify the final destination and the system will do the rest. According to the developers, use of the system could reduce the cost of cargo delivery by up to 40 percent.

Source: "Sky-high 'Atlas,' Russia is creating the largest cargo drone" [Заоблачный «Атлас»: в России создают крупнейший грузовой беспилотник], *Izvestiya*, Feb. 24, 2022, https://iz.ru/1291169/denis-gritcenko/zaoblachnyi-atlas-v-rossii-sozdaiut-krupneishii-gruzovoi-bespilotnik.

IOT TECHNOLOGIES IMPLEMENTED IN SIBERIAN POWER GRID

MTS and Rosseti Siberia have signed an agreement to begin a pilot project implementing "internet of things" (IoT) infrastructural investments for electricity metering systems in Krasnoyarsk. According to the agreement, MTS will build capacity to remote monitor and collect data from power meters using Non-IP Data Delivery technology, which increases the security of the network, reduces load time, and improves operations for IoT devices. According to Vadim Valenko, the technical director of MTS in Krasnoyarsk Krai, "An important feature of the NB-IoT ('narrow-band internet of things') network, is the improved penetration capacity, which provides a stable signal even in hard-to-reach places by other standards. One benefit of this is that intermediary equipment such as data collection and transmission devices separate from the meters themselves, will be unnecessary." According to Dmitry Lagunin, the IT director and head of the Department of Corporate and Technological Automated Management Systems at Rosseti Siberia, this will lead to significant savings and reduce the cost to maintain the system as a whole.

Source: "MTS and Rosseti will implement IoT technologies in the Siberian power grid complex" [МТС и Россети займутся внедрением технологий интернета вещей в электросетевой комплекс Сибири], CNews, Mar. 4, 2022, https://www.cnews.ru/news/line/2022-03-04_mts_i_rosseti_zajmutsya_vnedreniem.

HUMAN CAPITAL

RUSSIAN GOVERNMENT SEEKS TO REDUCE BRAIN DRAIN IN IT

Vladimir Putin signed a decree on measures to accelerate the development of the IT industry in the country. This measure will simplify the procedure for companies to employ foreigners and to obtain a residence permit for them. It will also provide a number of benefits for domestic IT companies, such as a three-year exemption from paying income tax and inspections, as well as discounts on loan rates. Employees of such firms will also be able to obtain preferential mortgage rates and will be exempt from military conscription for the duration of their employment. The goal is to reduce the flight of Russian IT specialists abroad, a trend that has rapidly picked up speed. Russian specialists have set up channels on Telegram to exchange information on how to depart, with 5,000 people expressing interest in emigrating to places including the United States, Turkey, Georgia, Cyprus, Lithuania, and Montenegro. Some IT software and hardware companies are already raising salaries using funds from government subsidies in order to retain workers and prevent brain drain.

Source: Tatiana Isakova, Nikita Korolev, "Programmers will not be demobilized: the Ministry of Digital Development wants to stop the flight of IT specialists from Russia" [Программистам не светит дембель: Минцифры хочет остановить бегство IT-специалистов из России], *Kommersant,* Mar. 1, 2022, https://www.kommersant.ru/doc/5238127.

MIPT PUBLISHES OPEN LETTER AGAINST RUSSIAN INVASION

On March 2, Novoye Vremya published an open letter signed by 2,592 employees, students, and alumni of the Moscow Institute of Physics and Technology (MIPT). The names have since been removed to protect the signatories. The letter reads:

> We, graduates, staff and students of the Moscow Institute of Physics and Technology, oppose the war in Ukraine and want to appeal to the graduates, staff and management of MIPT. We have been taught for many years that our institute is a brotherhood in which physicists come to each other's aid. Now is just such a moment. We ask you not to be silent and to openly express your position. We are sure that MIPT does not support this senseless and outrageous war. War, including against former and current students, MIPT employees, their relatives and friends. We were told that physics and technology departments are an example. And we ask our Institute to become an example for other universities and organizations and publicly condemn the actions of the country's leadership and President Putin. There is no rational justification for this war. The consequences of a military invasion are catastrophic for Ukraine, and for Russia, and, possibly, for the whole world. We ask you not to be afraid to speak out against a horrific war and do everything possible to stop it. We are waiting for an open statement from the management and official representatives.

> With hope for peace,
> [MIPT signatories]

Source: "Anti-war letter of MIPT employees, graduates, and students signed by 2.5 thousand people" [Антивоенное письмо сотрудников, выпускников и студентов МФТИ подписали 2,5 тысячи человек], *Novoye Vremya,* Mar. 2, 2022, https://newtimes.ru/articles/detail/209703.

AI HACKATHONS AND EVENTS

Several AI-related hackathons and training events took place during this reporting period. They include the following:

- According to a CNews article, about 350 teams from 42 regions of Russia have qualified to compete in the First Robotics Championship final, which will take place in Moscow on March 18-20. The theme of this year's competition is "freight transportation."

- According to its website, the fifth Russia-wide RuCode festival began on March 1. The competition is taking place in many stages; first, online courses will be available to participants. These will be followed by qualifying examinations and a final championship at the end of April. There are two tracks: one focused on programming; the other, on artificial intelligence. RuCode competitions are held twice a year, and participation is free to the public. According to the website, the previous four festivals brought together more than 50,000 participants, combined. Organizers include Sber, Yandex, and the Russian Ministry of Science and Higher Education.

- According to its website, applications for the Russia-wide "Big Challenges" competition closed on February 15. The finals will begin on April 10, and the results of the competition will be announced in May. The event is open to students in grades 7-11, as well as more junior college students, and involves 13 tracks, including UAVs, big data and AI, advanced manufacturing technology, and nanotechnology. It is organized by the Sirius Educational Center and includes partner organizations such as Rosatom and Roscosmos.

- According to a TASS article, a two-week, multidisciplinary program was held for gifted students in the Kabardino-Balkarian Republic of the North Caucasus region, where participants received intensive training in robotics. As part of the program, teams of students presented their prototypes of robots designed to help rescue people in emergency situations, which were evaluated in a test scenario.

- On February 28, Nizhny Novgorod's Minin University held an educational forum on the question of whether artificial intelligence will replace human workers. The forum consisted of lectures, master classes, and hands-on trials of various technologies, including VR glasses. The event was organized by the Volga Federal District's "Knowledge" society, and is the first in a series of forums that will discuss other facets of AI, including the degree to which robotization will affect human daily life, the internet of things, and Industry 4.0.

Source: "More than 30 teams will represent the Moscow region at the First Robotics Championship" [Более 30 команд представят Московский регион на чемпионате по робототехнике First Robotics Championship], CNews, Mar. 4, 2022, https://www.cnews.ru/news/line/2022-03-04_bolee_30_komand_predstavyat; "RuCode Festival," RuCode.Net, https://rucode.net/; "Big Challenges" [Большие вызовы]; "Sochi Sirius," https://konkurs.sochisirius.ru/faq; "Students of the center for gifted children in the KBR developed projects of rescue robots" [Учащиеся центра для одаренных детей в КБР разработали проекты роботов-спасателей], TASS, Feb. 28, 2022, https://tass.ru/nacionalnye-proekty /13903511?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.co m; "Minin University studied the possibilities of artificial intelligence" [Мининский университет изучил возможности искусственного интеллекта], *Pravda-NN*, Mar. 1, 2022, https://pravda-nn.ru/news/v-mininskom-universitete-izuchili-vozmozhnosti-iskusstvennogo-intellekta/.

ITMO UNIVERSITY AND NAPOLEON IT LAUNCH ML MASTER'S PROGRAM

ITMO University and Napoleon IT, an IT talent-sourcing agency, have launched a master's program to train machine learning engineers. The two-year master's program offers an innovative, "inverted" model of education, where students are trained on the job at real IT companies instead of in a standard classroom model of teaching. The hopes are that this program design speeds up training of the pipeline of IT students, so that they can more quickly enter the field to meet Russia's demand for IT personnel. Dmitry Botov, one of the project managers, stated: "I think it's this inverted education model that is most missing among the large, online data science courses, of which there are now several hundred of varying quality. It is extremely difficult and costly for a company's team leaders to onboard a graduate after online courses without real experience in production development."

Source: "ITMO and Napoleon IT launch a project master's program to train machine learning engineers" [ИТМО и Napoleon IT запустили проектную магистратуру для подготовки инженеров машинного обучения], CNews, Feb. 28, 2022, https://www.cnews.ru/news/line/2022-02-28_itmo_i_napoleon_it_zapustili_proektnuyu.

YANDEX, MIPT, AND HSE OFFERING JOINT ML RESIDENCY PROGRAM

Yandex's Research Center, the National Research University at the Higher School of Economics, and the Moscow Institute of Physics and Technology (MIPT), are beginning recruitment for a joint residency program to train machine learning experts. The residents will be at the undergraduate or graduate level and will receive a salary. The program is designed for one year but can be extended if needed. According to the article, residents will be paired with laboratory staff who will act as mentors. Together, they will select a research problem and work on its solution, which will result in joint publications or development of products through Yandex.

Source: "'If a person is ready to understand complex problems, then we will definitely work together'" [«Если человек готов разбираться в сложных проблемах, то мы точно сработаемся»], HSE.Ru, Feb. 22, 2022, https://www.hse.ru/news/science/567747785.html.

INTERNATIONAL COLLABORATION

IMPACT OF SANCTIONS ON RUSSIAN TECH COOPERATION

A large number of foreign software and computer technology manufacturers, as well as internet service providers, have suspended their operations in Russia as a result of either the sanctions regime or the reputational and moral costs of continuing to conduct business in Russia. In addition, the Russian media watchdog agency Roskomnadzor, has restricted access to a number of Western social networks. Software firms that have ended or suspended their work in Russia include Oracle, the world's largest database management developer; Autodesk, the world's largest supplier of software for construction and mechanical engineering; network equipment manufacturer Cisco Systems; and German software companies SAP and Siemens. Saber Corporation, a major supplier of software and technology for the US travel business, has terminated its distribution agreement with Aeroflot by deleting data on the Russian company's flights from its global air ticket booking system. Microsoft has temporarily stopped selling its products and services in Russia and has disabled Russian-language support for Microsoft Office in the Android mobile app. Apple and Dell have likewise stopped selling their products and services. Finally, Intel

and AMD, major manufacturers of processors, have stopped shipping their products—including client, server, and graphic processors—to Russia. Even for companies that are not willing to suspend trade with Russia, deliveries of products will become much more difficult, with major logistics and transport companies such as DHL, FedEx, UPS, CMA CGM, and Kuehne+Nage all suspending deliveries in Russia..

Source: "What foreign IT products and services Russia has to substitute," TASS, Mar. 5, 2022, https://tass.com/economy/1417381.

LIMITS ON SEMICONDUCTOR EXPORTS FROM TAIWAN TO HIT RUSSIAN TECH SECTOR

The Taiwan Semiconductor Manufacturing Company (TSMC), which is the world's largest semiconductor manufacturer, will stop supplying its products to Russia, as a result of Taiwan joining the international sanctions regime. TSMC will also stop producing semiconductors developed in Russia under the Elbrus and Baikal brands. As a result of this action, most Russian chip and server manufacturers will not be able to operate for the foreseeable future. Russia does not have domestic alternatives capable of producing semiconductors of the quality required for high-tech needs. Russia also will not be able to develop domestic alternatives, since such development would require the transfer of technologies that are now blocked by sanctions. That said, Russia has a one-to-two-year supply of processors, according to the direction of the Russian Association of Electronics Manufacturers and Developers. Limitations on the import of hard disks and computer memory will hit much sooner, as supplies of these components will only last for three to four months.

Sources: Nikita Korolev, "Semiconductors of microelectronics" [Полупроводы микроэлектроники], *Kommersant,* Feb. 25, 2022, https://www.kommersant.ru/doc/5230512; "Authorities will flood developers of Russian telecom equipment with money. They promise a sharp increase in salaries" [Власти зальют деньгами разработчиков российского телеком-оборудования. Обещан резкий рост зарплат], CNews, Feb. 28, 2022, https://www.cnews.ru/news/top/2022-02-28_vlasti_zavalyat_dengami.

MIT LEADS THE PACK IN ENDING TIES WITH RUSSIAN TECHNOLOGY PROJECTS

After many years of expanding international cooperation in the field of technology, and especially in artificial intelligence, much of this cooperation infrastructure was rapidly dismantled over the course of two weeks. One of the first steps was taken by MIT, which announced that it was ending its decade-long collaboration with the Skolkovo Institute of Science and Technology the day after Russia's invasion of Ukraine began. The program had been initiated in 2011 and had most recently been extended in 2019 for another five years. MIT and Skoltech currently have nine joint projects, which will either be canceled or pursued separately. Russian academics in the technology sphere are particularly dependent on ties with foreign partners. The rapid severing of links between academic institutions is likely to result in a severe negative impact on Russian scholarship in this sphere, including in artificial intelligence.

Sources: Carey Goldberg and Denise Pellegrini, "MIT Cuts Ties With Russia Tech Center in Protest of Invasion," Bloomberg News, Feb. 26, 2022, https://www.bloomberg.com/news/articles/2022-02-26/mit-cuts-ties-with-russian-tech-institute-in-protest-of-invasion; Nataliya Mikhalchenko, Denis Gritsenko, "Scientific anxiety: how researchers from the Russian Federation are 'cut off' from world science" [Ученая тревога: как исследователей из РФ «отрезают» от мировой науки], *Izvestiya,* Mar. 2, 2022, https://iz.ru/1298746/nataliia-mikhalchenko-denis-gritcenko/uchenaia-trevoga-kak-issledovatelei-iz-rf-otrezaiut-ot-mirovoi-nauki.

This report, the thirty-fourth 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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