



Artificial Intelligence in Russia Issue 17, December 18, 2020

The Russia Studies Program

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Abstract

This report, the seventeenth 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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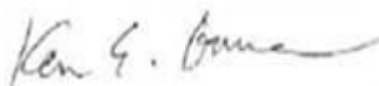
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Approved by:

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Governance and Legal Developments

1. Putin outlines AI development strategies at Sber-organized conference

On December 4, Russian president Vladimir Putin gave a speech at an annual AI-focused conference, organized by Russia's Sberbank (now Sber). In his remarks, Putin outlined the evolution of Russia's AI development strategy to date and argued for the continued importance of digital transformation for Russia's development. He asserted that AI "is not a so-called fashionable hype, not a prestigious trend that will disappear altogether tomorrow or the day after." *We offer a summary of Putin's speech below, and its full text is available at the end of this newsletter.*

Stressing the importance of indigenous technology, Putin highlighted the assistance of AI-enabled systems in COVID diagnostics and noted advancements in the testing and deployment of unmanned transport, agriculture machinery, and ships. He stated that Russia would create six research centers focused on ICT and AI technologies, increase the number of subsidized spots in AI-focused higher education, improve STEM education at all levels, and seek to attract talent from abroad.

Putin argued that, over the next 10 years, it will be important to conduct a digital transformation that will ensure that digital technologies improve the lives of Russian citizens. He called on the government to continue experimentation with legal frameworks for AI, and to develop strategies for the digital transformation in 10 areas of the Russian economy. He noted efforts to finalize the legislation on the access to large datasets, including those held by the government, by companies developing neural networks. At the same time, he pointed out the importance of eliminating risks of leaks of personal information. Putin also discussed risks associated with AI development and the importance of creating a moral-ethical code.

Coverage of the event quoted numerous Russian academic and industry experts as saying that AI-enabled systems have already begun transforming Russia's financial, agricultural, heavy industry, transport, and education spheres. They noted Russia's progress, including Yandex translations, unmanned trucks by Kamaz, facial recognition systems, and voice assistants (developed by Sber and Yandex), but pointed out that the United States and China remain the two leading superpowers in the AI sphere. Although Russia is lagging behind them and other states in Europe and Asia, the experts noted that the country has made progress. Some noted

that, despite the growth of Russia’s AI business ecosystem, Russia still has a relatively low level of AI research and needs to invest in this area. For example, one expert noted that Chinese participants make up about 50 to 60 percent of attendees at global conferences, whereas Russian researchers are in the minority.

The president of Kazakhstan was also present at the conference to highlight the cooperation between the two countries in the AI sphere, as discussed in past issues of *AI in Russia*.

Sources: “News from the future: how Russia is learning AI” [Новости из будущего: как в России осваивают искусственный интеллект], *Izvestiya*, Dec. 4, 2020, <https://iz.ru/1096059/dmitrii-laru-mariia-nediuk/novosti-iz-budushchego-kak-v-rossii-osvaivaiut-iskusstvennyi-intellekt>; “Digitization in medicine and AI codex: main points of Putin AI Journey speech,” TASS, Dec. 4, 2020, <https://tass.ru/ekonomika/10173575>.

2. Final AI federal project budget is three times less than initial proposal

In early December, the Russian government approved the final version of the federal project, Artificial Intelligence, the total cost of which amounted to 36.3 billion rubles for 2021 through 2024, about three times less than the amount proposed in the initial draft. As discussed in past issues of *AI in Russia*, the first version, drafted by Sberbank, proposed a budget of 120 billion rubles, 90.5 billion of which would come from the federal budget and 29.5 billion of which would come from outside the federal budget. Earlier roadmaps projected an even higher budget of around 392 billion rubles. In the final version, developed by Sberbank’s Competence Center for Artificial Intelligence, just 29.4 billion rubles will come out of the federal budget, and 6.9 billion rubles will come from other sources. Ani Aslanyan, creator of a Telegram channel about the digital economy, explained why the government decided to cut the budget: because of the COVID crisis, it did not have the ability to spend large amounts on developing digital technologies.

The most expensive planned AI development activities include the following:

- Support by the Skolkovo Foundation for pilot projects testing AI in priority industries, which will cost 10.2 billion rubles. This amount will be divided equally between the federal budget and other sources, and at least 50 projects should receive support by 2024.
- Support for AI research centers, which will cost 7.3 billion rubles. The federal budget will provide 5.7 billion of those rubles. The government plans to support at least six AI research centers annually, starting in 2021.
- Grant support to small businesses—7.08 billion rubles from the federal budget—for the development, application, and commercialization of products, services, and

solutions using AI technologies. By 2024, the government will provide support to at least 569 small businesses. In addition, the Foundation for Assistance to the Development of Small Forms of Enterprise in the Scientific and Technical Sphere (the Bortnik Foundation) will provide support for the acceleration of AI projects and to developers of open libraries in the field of AI.

Activities related to the development of AI hardware will include the following:

- The development of niche hardware and software for AI purposes, which will cost the federal budget 6 billion rubles. Starting in 2021, the government will finance at least two projects in this area annually; by 2024, it aims to develop at least three complexes.
- The creation of a shared use center with equipment and software for developing hardware-software complexes for the use of AI, requiring 800 million rubles from the federal budget. The centers will have verification tools, engineering software, and so on. Starting in 2022, at least 10 companies will conduct activities annually to develop and test hardware-software complexes for AI at the center.
- Marketing research on the domestic and global industries of hardware-software complexes for AI use, on which the government will spend an additional 110 million rubles. This will help determine the main priority areas for the hardware-software complexes, as well as help identify potential customers.

A wealth of activity in the field of AI education will include the following:

- The formation of AI projects for students under the program called University 20.35, which will cost the federal budget 1.24 billion rubles. This includes activities to ensure that citizens can receive continuing professional education in AI and related fields by obtaining digital certificates.
- The development of bachelor's and master's programs in AI, which will require 600 million rubles from the federal budget. Part of this effort is also to improve the qualifications of those in the higher education field as related to AI. Starting in 2022, there will be online access to the content from AI educational programs, and at least 50 regional universities will boast relevant programs. By 2022, Russia aims to have 40 master's programs in this field. By 2024, it will have 10 or more bachelor's programs. At least 3,360 teachers will improve their qualifications to teach AI-related topics.

Four additional efforts related to AI follow:

- The development of AI-related hackathons and lectures, which will cost 985 million rubles, mostly from the federal budget. By 2024, Russia aims to have at least 115 AI hackathons with at least 21,500 participants. At least 85 lectures will be held on AI topics.

- A popularization campaign to increase confidence in AI, requiring 300 million rubles from the federal budget. The plan is to reach at least 32 million people by 2024.
- The development of a set of AI standards at a cost of 240 million rubles from the federal budget. The government plans to approve at least 111 AI standards by 2024.
- A wealth of other activities (amounting to 900 million rubles), such as monitoring the implementation of the federal project on AI and the National Strategy for the Development of AI, developing an index of the readiness of companies in the priority industries to implement AI, conducting public discussion to identify key issues in the ethics of AI use, and creating a national portal in the field of AI.

Sources: “The state will cut spending on artificial intelligence by three times: what the remaining 36 billion rubles will be spent on,” Государство сократит в три раза расходы на искусственный интеллект: на что потратят оставшиеся 36 млрд руб, C-News, Dec. 7, 2020, https://www.cnews.ru/articles/2020-12-07_kak_vlasti_potratyat_36_mlrd_rublej.

3. Russian PM announces integration of development institutions into five centers

On November 23, Russian prime minister Mikhail Mishustin stated that the Russian government plans an “optimization” of the national development institutions with the goal of more readily meeting national development targets set by President Putin. Mishustin asserted that “our analysis showed that the activities of those institutions is poorly connected with new national development targets.” Emerging challenges have caused the institutions to stray from their original purposes, and, owing to the lack of a coordinating mechanism, the functions of these entities often overlap with those of both federal executive bodies and private organizations. Therefore, Mishustin announced the creation of an investment block on the basis of VEB.RF (a Russian state development corporation) which will include the SME Corporation, the Russian Export Center, EXIAR, Rusnano, and four funds—namely, Skolkovo Foundation, the Fund for Assistance to Small Innovative Enterprises, the Fund for Infrastructure and Educational Programs, and the Industrial Development Fund. The government plans to shutter eight development institutions, redistributing their duties between VEB.RF and state executive organs, and consolidate others with overlapping functions. According to Mishustin, “All that will allow reducing duplicate functions and forming five large development institutions.” The *AI in Russia* team believes that this move is likely to affect Russia’s AI development efforts, though at present the nature of this impact is unclear.

Source: “Russian PM announces integration of development institutions into five centers,” TASS, Nov. 23, 2020, <https://tass.com/politics/1226647>.

4. Russian authorities discuss AI developer intellectual property rights

On October 21, 2020, Alexey Kobilev, a deputy of United Russia, Russia's ruling political party, sent the Ministry of Economic Development a State Duma-proposed document that would grant the rights for AI-generated intellectual property to developers, rather than to the AI technology itself. Under current Russian law, the AI itself would own this property. The proposal's explanatory note states that the current legislation regarding rights to AI activities could result in ownership disputes and, were this bill to become law, any content created by AI would automatically belong to the AI developer, rather than the computer itself.

The reaction among Russians was mixed. Alexander Zhuravlev, head of the commission on legal support for the digital economy in the Moscow branch of the Russian Lawyers Association, stated that this would be a positive development because, otherwise, a business that develops and invests in the creation of AI could have difficulty monetizing. However, Maxim Labzin, a senior partner in the law firm, Intellect, said it could be difficult to apply this law in practice because it may prove hard to distinguish between human-generated and AI-generated results in certain circumstances.

Source: "Russian authorities want to take away copyrights from artificial intelligence," *Власти России хотят отобрать у искусственного интеллекта авторские права*, C-News, Nov. 10, 2020, https://www.cnews.ru/news/top/2020-11-11_vlasti_zadumali_otobrat.

5. Health ministry to launch AI-based platform

As discussed in past issues of *AI in Russia*, the COVID pandemic may have sped up the adoption of AI-enabled technologies in Russia's medical sphere. According to the Russian Ministry of Health's Department of Digital Development and Information Technologies, the first stage of an industry platform using AI for healthcare should appear by the end of the year. The platform will provide access to anonymized medical data for domestic developers, researchers, and medical organizations to label data and formulate solutions using AI. The first stage will include a set of ready-made solutions for entities and individuals to use. The Ministry of Health representative also stated that it submitted a draft decree to the government that would nearly double the speed at which the state registered medical software using AI.

By 2027, the government plans to develop around 50 standards for AI use in healthcare. According to Deputy Ministry of Health Pavel Pugachev, the hope is to optimize the patient

treatment plan through the use of AI because the technology should help detect disease early, prevent its development, and assist doctors in treatment.

Source: “The Ministry of Health plans to launch an AI-based platform by the end of the year,” Минздрав планирует запустить платформу на основе ИИ к концу года, D-Russia, Nov. 25, 2020, <https://d-russia.ru/minzdrav-planiruet-zapustit-platformu-na-osnove-ii-k-koncu-goda.html>.

6. Moscow continues medical AI tech adoption

At a November 24 meeting with AI service developers and IT company representatives, Anastasia Rakov, the Deputy Moscow Mayor for Social Development, stated that the city of Moscow plans to expand the scope of its experiment of introducing AI and digital technologies into the healthcare field. The plan is to include more developers, research areas, and medical organizations and doctors covered by the program. As discussed in past issues of *AI in Russia*, the city’s experiment, which has run since the end of 2019, has thus far involved 21 companies, which have offered 38 services in the field of AI. Now that Moscow has created the necessary infrastructure, Rakov says it plans to increase the number of research areas in the experiment from four to 10.

As one example of Moscow’s use of AI in the healthcare field, on November 25, Moscow mayor Sergei Sobyanin wrote on his VKontakte page (a Russian social media site similar to Facebook) that the city had so far processed over 500,000 CT scans for COVID diagnostics with AI technology. According to Sobyanin, “Artificial intelligence sees the degree of lung damage, increases the quality and speed of diagnostics. It is very important with COVID-19 when the decision on treatment approaches should be made in mere hours.”

Sources: “Moscow will expand its experiment on the implementation of artificial intelligence in medicine,” Москва расширит эксперимент по внедрению искусственного интеллекта в медицину, Lenta.ru, Nov. 24, 2020, <https://lenta.ru/news/2020/11/24/med/>; “Moscow authorities decided to expand the number of medical applications of artificial intelligence to 10,” Власти Москвы решили расширить до 10 число медицинских применений ИИ, D-Russia, Nov. 26, 2020, <https://d-russia.ru/vlasti-moskvy-reshili-rasshirit-do-10-chislo-meditsinskih-primenenij-ii.html>; “Artificial intelligence helps check 500,000 CT scans for COVID-19 in Moscow,” TASS, Nov. 25, 2020, <https://tass.com/society/1227967>.

Military and Security Developments

7. Russian military prepares for robotic and AI-enabled smart combat systems

According to Sergei Chemezov, CEO of Rostec State Corporation, the unmanned version of the newest Russian T-14 Armata tank will not be mass-produced; the vehicle will be a demonstrator of advanced robotics technologies. Earlier, the Uralvagonzavod press service announced that the Armata had successfully passed unmanned tests. At the same time, the Rostec CEO noted that the AI technologies introduced into the standard version of the Armata MBT can automate most of the operations of this armored vehicle.

Many Russian UGV projects end up as demonstrators only to be redeveloped and even redesigned for a new role for MOD. This happened with the Soratnik mid-sized combat UGV. Initially, there were announcements that Soratnik would not be acquired into service, but this year the MOD announced that it will rework Soratnik into an entirely new UGV. At the same time, Soratnik's technical data and testing results will be crucial in this new vehicle. This suggests that the Armata will likely serve as a technical demonstrator for further development of combat UGVs, including applying AI to the machine's command and control. Following the example of the 2018 Uran-9 UGV tests in Syria, the MOD will probably be most interested in the unmanned Armata's vulnerabilities as an autonomous vehicle, in order to address such concerns early on.

Sources: "Unmanned 'Armata' will not be mass-produced" [Беспилотная "Армата" не будет производиться серийно], Ria.Ru, Dec. 7, 2020, <https://ria.ru/20201207/armata-1587961052.html>; "Soratnik UGV will not be mass produced" [Боевой робот "Соратник" не пойдет в серийное производство], Военное, RF, May 22, 2017, <http://военное.рф/2017/%D0%9A%D0%B0%D0%BB%D0%B0%D1%88%D0%BD%D0%B8%D0%BA%D0%BE%D0%B29/>; "The expert named the main duties for the new Soratnik combat robot" [Эксперт назвал основные задачи нового боевого робота "Соратник"], Ria.ru, Apr. 14, 2020, <https://ria.ru/20200414/1570014939.html>.

8. AI-enabled tech used in naval pilot training

The MOD reported that the latest simulator facility with AI elements has become operational in Yeisk to train naval pilots. The facility comprises the latest system of simulators for full-

fledged training of flight and ground personnel of the Russian Navy's fighter, anti-submarine, and deck-based aviation forces.

The MOD states that it will use this new technology in six specialized classes of dynamic simulators of Ka-27M, Ka-29 and Ka-52K helicopters, along with an Su-30SM multirole fighter trainer. As its specific feature, the Su-30SM fighter simulator embraces AI elements for practicing piloting and the aircraft's combat employment in a full range of altitudes and speeds. Russia's Defense Ministry specified that the simulators help practice the entire range of flight assignments with maximum realism, including anti-submarine warfare and the employment of air-launched weapons, while also simulating any technical failures or weather and tactical conditions.

In his address to the servicemen during the launch of this initiative, the commander-in-chief of the Navy, Admiral Evmenov, noted that equipping the Center for Combat Use and Retraining of Flight Personnel with an AI-enabled simulator is essential for continued improvement in the quality of training and qualification for flight and engineering personnel. At this point, this is a first-of-its-kind training system in the Russian Navy.

Sources: "Russia's top brass to train naval pilots using artificial intelligence," Tass.com, Dec. 2, 2020, <https://tass.com/defense/123385>; Aleksandr Pinchuk, "AI will assist in flight training" [Искусственный интеллект поможет учиться летать], RedStar.ru, Dec. 4, 2020, <http://redstar.ru/iskusstvennyj-intellekt-pomozhet-uchitsya-letat/>.

9. Okhotnik combat unmanned aerial vehicle is tested with air-to-air missiles

The Okhotnik heavy attack drone conducted several test flights in a fighter-interceptor role with simulated air-to-air missiles for the first time in its development. The test took place at the Ashuluk training ground. Prior to this, the Okhotnik had performed a number of flights that included testing its in-flight characteristics and its main onboard systems.

Earlier, Okhotnik flew in a manned-unmanned (MUM-T) configuration with the Su-57 fourth-generation stealth combat aircraft. The RIA Novosti article, citing an unnamed MOD source, explained that the December 2020 test flights will make it possible to assess the compatibility of the drone's avionics with Su-57's missile guidance and other key systems. According to this MOD source, Okhotnik tests used missile simulators with infrared and radar homing heads.

The Okhotnik UCAV was developed by the Sukhoi Design Bureau and should become Russia's first heavy attack drone in the Russian Aerospace Forces. Earlier, the MOD also touted

Okhotnik as an adversary air defense penetrator that will have onboard AI for conducting military operations. According to Russian military sources, the human pilot in the Su-57 is supposed to make the final decision to launch missiles at the target, but the UCAV's onboard AI also alludes to a more independent role should that become necessary in combat.

Source: "Okhotnik UCAV is tested with missiles for the first time" [Источник: ударный беспилотник "Охотник" впервые испытали с ракетами], Ria.ru, Dec. 2, 2020, <https://ria.ru/20201202/isyvaniya-1587264518.html>.

10. Sotnik soldier combat gear can include AI

According to Rostec's armaments director, Bekkhan Ozdoev, next-generation Sotnik (formerly known as Ratnik-3) soldier combat gear can include new technology, such as elements of artificial intelligence. According to Ozdoev, the Russian military's experience operating the Ratnik, including in combat conditions, showed where RDT&E is more needed. Ozdoev alludes that the third-generation combat equipment will be lighter, more ergonomic, reliable, and technologically advanced. This combat equipment can be updated with robotics and AI.

Ozdoev stressed that Sotnik will be a completely new development, but will take into account the experience gained in the development of Ratnik. According to Rostec, the main developer of this combat equipment—the Central Research Institute of Precision Engineering (TSNIITOCHMASH)—has not yet received an official MOD technical assignment for the development of Sotnik; however, the company is already working on some elements included in the subsystems of this new combat equipment.

Earlier, Rostec announced plans to begin the development of the third-generation soldier equipment in 2020. The then general director of the institute, Albert Bakov, said in an interview with RIA Novosti that the Russian Ministry of Defense should formulate the Sotnik requirements by December 2020.

The Ratnik soldier combat equipment is designed to improve the security of servicemen, their mobility, maneuverability, and efficiency in different types of combat operations. The gear is designed to give each soldier the ability to function independently for at least three days. Earlier Ratnik versions have been supplied to the troops since 2015, equipping 70 percent of the ground forces. The Ratnik integrates weapons, sights, individual protection gear, autonomous sources of heat, communication devices, and an active hearing protection system. Other equipment that can be part of Sotnik could include exoskeletons.

Sources: "Sotnik soldier combat gear can include AI" [Экипировка "Сотник" может получить искусственный интеллект], Ria.ru, Nov. 27, 2020, <https://ria.ru/20201127/rosteekh-1586552725.html>; "Equipment for the 'soldier of the future': from 'Ratnik' to Sotnik" [Экипировка для «солдата будущего»: от «Ратника» до «Сотника»], July 3, 2019, Rostec, <https://rostec.ru/news/ekipirovka-dlya-soldata-budushchego-ot-ratnika-do-sotnika/>.

11. Russian industry rep provides perspective on AI-enabled law enforcement technology

Can AI investigate crimes, decide who gets out of prison, predict who will break the law, or who will be the victim? These issues were analyzed by Alexey Rybakov, the CEO of the Omega IT company. According to his interview, this kind of AI work in Russian law enforcement agencies is hampered mainly by the financial factor, but Alexei Rybakov also calls the insufficient legal regulation as the primary problem to address when discussing the application of AI in such roles. Rybakov, the representative of Russia's growing high-tech private sector, thinks that, although the Russian government has developed a concept for the development of regulation for AI and robotics through 2024, this is still not enough. He thinks that civil legislation as the basis of intellectual property, as well as administrative and criminal laws, deserves the most attention when discussing the use of AI in possible law enforcement capacity.

According to Rybakov, Russia can already outline law enforcement roles where the use of AI will be relatively safe. They include investigation of cybercrimes and technologies for facial recognition that are currently operating in Moscow, St. Petersburg, and 10 other cities across Russia. Rybakov also cited risk assessment for prisons and correctional institutions, where AI can help to identify and monitor a criminal so there are no conflicts with other prisoners. This system studies the behavior of people, before and after their sentencing, and takes stock of their relationships, activity on the internet, and other factors.

On a related note, Rybakov named risk assessment in parole as another area for AI application. The system analyzes the criminal history, age, gender, ethnicity of the prisoner, his or her relationship to society, criminal ties, education, leisure activities, and other related factors. Then, using a special algorithm, the AI calculates the likelihood of a prisoner's relapse. Rybakov names other AI law enforcement duties: automatic identification of changed fingerprints, work with documents, and DNA analysis. The last two AI law enforcement duties named by Rybakov were ballistics research and prediction of crimes. Rybakov notes that the Russian Criminal Code contains a large number of crimes, along with data and information on possible violators, places of future crimes, and possible victims. Using AI would allow the police to prioritize resource management, such as sending more patrols to where crime could take place.

Rybakov did not cite ethics as a major issue to explore when using AI in law enforcement. His approach, as outlined in the interview, is a strictly objective application of artificial intelligence to data management. This is one area where the Russian civil society, the government, and the high-tech sector are expected to have the more visceral debate on using AI, especially given an already complicated relationship between the Russian people and their law enforcement. Prior decades of Soviet and Russian life have resulted in frayed trust, multiple corruption cases, and a general sense of caution by the regular people when dealing with the nation's law

enforcement agencies and officers. Perhaps the introduction of AI would make this process more objective and data driven, resulting in the lessening of a “faulty” human factor role.

Sources: “AI is a colleague to law enforcement” [Искусственный интеллект - сотрудник правоохранительных органов], Ru-Bezh.ru, Nov. 25, 2020, <https://ru-bezh.ru/gossektor/news/20/11/25/iskusstvennyij-intellekt-sotrudnik-pravooxranitelnyix-organov>; Serguei Cheloukhine, Nesibeli Kalkayeva, Tima Khvedelidze, and A. R. Bizhanova, “Corruption in Russian Law Enforcement,” *Communist and Post-Communist Studies*, vol. 53 (1), 2020: 117–134, <https://online.ucpress.edu/cpcs/article-abstract/53/1/117/107205/Corruption-in-Russian-Law-Enforcement>.

Corporate and Market Developments

12. Sber launches new applications and announces new AI nonprofit

Sberbank has announced the launch of a new service that will process business lending operations through automated AI algorithms. According to Vice-President and Director of Credit Products and Processes Sergey Bessonov, Sberbank is rolling out the project in its Central and South-Western Russian territorial banks. The service is available to businesses with annual revenues of more than 400 million rubles and will allow for the processing of "loans in seven minutes"—in practice, less than two days at maximum.

Sberbank also announced a new cloud platform, ML Space, in cooperation with the SberCloud partner entity. This cloud platform will be available for developers testing new AI technologies, including complex neural networks using platform-based, machine-learning modeling modules. It is housed using the Christofari supercomputer, built by Sberbank and Nvidia in 2019; it is Russia's fastest supercomputer. The new platform can be accessed by smaller scale startups, rather than the large corporations that usually dominate access to supercomputer capabilities. The Skolkovo data center has certified the redundancy and failsafe standards for ML Space at the high-level Tier III requirement.

New smart-home devices, SberPortal and SberBox TV, have also been announced by Sberbank, seeking to compete with Amazon and Google as well as with national competitors in the Russian smart device and voice AI market, such as Tinkoff Bank, Mail.ru, and Yandex. The voice assistant program is understood to be particularly advanced and can schedule appointments in ways that rival or exceed competitors. The company stressed that the goal of the new devices and coordinating platform is to make the experience as user friendly as possible, rather than to introduce brand new technology.

Finally, Sberbank has announced a new nonprofit academic institute focusing on AI research. CEO German Gref noted that the "main mission of the institute is to provide an interdisciplinary approach to research to create general artificial intelligence." Jürgen Schmidhuber, a well-known AI scientist and director of the Swiss-based IDSIA laboratory, has been invited to serve as Honorary Director of Science. In early December, he was a participant at a conference on Sberbank's various AI projects, AI Journey, along with other leading Western researchers in the AI field.

Sources: "Sber Business Lending based on AI" ["Сбер Кредитование бизнеса на базе AI"], TAdviser, Dec. 3, 2020, <https://www.tadviser.ru/>; Vladimir Bakhur, "Sberbank and SberCloud open their supercomputer cloud to all developers" ["Сбербанк и SberCloud открыли свое суперкомпьютерное облако для всех разработчиков"], CNews, Dec. 4, 2020, https://www.cnews.ru/news/top/2020-12-04_sber_otkryl_svoe_superkompyuternoe; Eric Hal Schwartz, "Russian Banking Giant Sber Sheds Finance for Tech, Debuts Smart Display and Voice Assistant With Multiple Personalities," voicebot.ai, Nov. 30, 2020, <https://voicebot.ai/2020/11/30/russian-banking-giant-sber-sheds-finance-for-tech-debuts-smart-display-and-voice-assistant-with-multiple-personalities/>; "Sberbank plans to open Russia's first AI institute," TASS, Dec. 3, 2020, <https://tass.com/economy/1230907>; "Sber will present new AI solutions at AI Journey" ["Сбер представит на AI Journey новые решения в сфере ИИ"], CNews, Nov. 27, 2020, https://www.cnews.ru/news/line/2020-11-27_sber_predstavit_na_ai_journey.

13. Private venture capital club to focus on applied AI research

Investors Artem Ermolaev and Andrei Belozarov have announced a new club for venture capital (VC) named Digital Disrupt. The private club has mostly focused on startups in Russia and abroad in the broader digital and IT fields. Investments include new apps and platforms for online education, on-demand services, "micromobility" projects such as car-sharing, eSports, and applied AI research. The club has partnered with other VC funds in the United States, including Mindrock Capital, Starta Ventures, and 13 Ventures. Digital Disrupt invests mostly in projects at their earlier stages, according to Belozarov, when products are available for their "minimum usage" stage and need guidance and network connections to better find market opportunities.

Source: "Launch of the closed private venture capital club Digital Disrupt" ["Запуск закрытого частного клуба венчурного капитала Digital Disrupt"], TA Adviser, Dec. 3, 2020, <https://www.tadviser.ru/>.

14. New investment into AI solutions for agriculture

The Russian IT and AI technology firm, Cleverbots, announced \$1 million in new investment money from the AST holding company. Cleverbots is an important partner for digitalization and AI development in Russian industrial agribusiness, including a partnership with AST, which includes a wide range of companies based in Russia and elsewhere. Cleverbots itself focuses on natural language processing, computer vision algorithms, data analytics, and web interfaces, including chatbots and mobile applications. Cleverbots has been tapped as a

primary partner in digitalization and AI integration for the agro-industrial components of the AST group. With the new investment, Cleverbots intends to expand its development team and increase its marketing and sales presence. AST offices in Switzerland and the UAE are expected to aid in this planned expansion. The company itself has been working on AI projects for the last three years, and it has a significant number of smaller, successful projects completed in Russia and Europe.

Sources: “Cleverbots,” TAdviser, Dec. 4, 2020, <https://www.tadviser.ru/>; “Russian integrator of AI solutions Cleverbots attracted investments of \$ 1 million” [“Российский интегратор ИИ-решений Cleverbots привлёк инвестиции в размере \$1 млн”], CNews, Dec. 2, 2020, https://www.cnews.ru/news/line/2020-12-02_rossijskij_integrator_ireshenij.

15. Yandex announces new AI text analytics

The search function used by the Russian search engine, Yandex, has switched over to using a new AI text analysis algorithm. The algorithm has been in development for 10 years, according to the company, and is based on AI-based “neural network transformers.” Transformers are a class of IT architecture that is better able to match user requests with document content in a web search through automated semantic analysis and a streamlined hardware component undergirding the AI-assisted search.

In an interview with CNews, Yandex Managing Director Tigran Khudaverdyan noted that the company has used AI technologies in all aspects for over two decades, but that it has also consistently sought to fine-tune the basic search technology. The new transformer-based AI is not only an algorithm; it also includes hardware changes involving networked and clustered GPU accelerators in functional matrices. These can be trained on big datasets to then provide more precision help on smaller sets of information. He noted that this whole approach vastly increases the utility of searches across more diverse platforms, giving the example of searching for a movie by “a voice description of just a small fragment [of the movie].” This comes at the cost of needing much more processing capacity—hence the need to pair the more advanced neural net search models with a physical hardware architecture that enables, rather than hinders the process.

Source: “Yandex Search has switched to neural network technology, which it worked on for 10 years” [“Поиск «Яндекса» перешел на нейротехнологию, над которой работал 10 лет”], CNews, Nov. 25, 2020, https://www.cnews.ru/news/top/2020-11-25_poisk_yandeksa_pereshel.

Education and Training Developments

16. AI solution helps TSU grads find job opportunities

According to a November 23 TASS article, an application using artificial intelligence will help Tomsk State University (TSU) graduates find job opportunities. The service is being created jointly by TSU programmers and their industry partner, HeadHunter, and will be launched in 2021. The AI program will collect student data (including grades and coursework), assist in developing resumes, and search for job vacancies that would be a good match.

The article also notes that three Tomsk universities (TSU, Tomsk State University of Control Systems and Radioelectronics, and Tomsk Polytechnic University) received a grant in 2019 for the creation of a digital university, under the Digital Economy of the Russian Federation national program. Using the grant funds, the three Tomsk universities are jointly developing curriculums on Big Data analysis, AI, and digital economy.

AI in Russia covered TSU in Issue 1, when its scientists created an application using Big Data analytics to better understand how anti-vaccination conspiracies are spread. TSU was also covered in Issue 7, when researchers signed a cooperation agreement with the All-Russian Center for the Study of Public Opinion (VTsIOM) to monitor social media trends.

Source: “Artificial intelligence will help graduates of Tomsk university in finding a job”
[Искусственный интеллект поможет в поиске работы выпускникам томского вуза],
Future Russia [Будущее России], Nov. 23, 2020, <https://futuresrussia.gov.ru/nacionalnye-proekty/iskusstvennyj-intellekt-pomozet-v-poiske-raboty-vypuschnikam-tomskogo-vuza>.

17. National Technology Initiative program head discusses IT careers

In a December 4 Sputnik interview, head of the National Technology Initiative’s Artificial Intelligence program, Nadezhda Surova, discussed Russia’s IT field, offering remarks on trends, priorities, and outlook. According to Surova, the most important field to further develop is data management. “The country which will become the first in creating a platform-based solution with the use of data will achieve technological superiority.” She notes that the field of data science is gaining popularity in Russia, following an increase in demand for highly trained specialists. She notes that the high-quality Russian universities—as well as their unique

training programs developed in conjunction with industry partners—have been successful in attracting foreign and domestic students. When asked what she views as the main task Russia faces in digitalization, Surova identified the popularization of new technologies, so that every Russian understands how to use them. “It is important to constantly learn and develop. Russians need to understand that only together we will be able to achieve technological superiority and create a digital superpower, something that we and our kids will be proud of.”

Russia’s National Technology Initiative program has been covered in past issues of this newsletter, including the Circle Movement competition that was held in June 2020. In this competition, 280 students received weeks of training from top IT experts before creating digital assistants to help users develop competencies in public speaking, communication, emotional intelligence, time management, and negotiation.

Source: “Head of ‘Artificial Intelligence’ Project Reveals How to Succeed in IT,” Sputnik News, Dec. 4, 2020, <https://sputniknews.com/science/202012041081364125-head-of-artificial-intelligence-project-reveals-how-to-succeed-in-it/>.

18. RuCode hosts intensive algorithmic programming festival

RuCode 2.5, an intensive training festival on AI and algorithmic programming, was held from November 30 to December 6, 2020. This was a follow-on event for two RuCode training festivals that took place in spring and fall of this year, both of which were covered by *AI in Russia* (Issues 1 and 9). The third RuCode is scheduled to begin in 2021.

According to the event’s website, the training festival included three components: free online courses on AI and coding, an intensive training program on algorithmic programming, and a competition. The event was free and open to anyone interested. It was organized by leaders from more than 15 Russian universities and public organizations, including the Moscow Institute of Physics and Technology (MIPT), the Higher School of Economics (HSE), and the Far Eastern Federal University (FEFU). Partners included Sber, Gazprombank, the Presidential Grant Fund, and the Ministry of Science and High Education of the Russian Federation. More than 30,000 people have reportedly participated in RuCode competitions thus far. Free training programs and competitions like these remain a key component of Russia’s efforts to engage the next generation of AI experts.

Sources: Anastasia Kalinina, “RuCode 2.5 training intensifies on artificial intelligence launched in Russia,” [Учебные интенсивы RuCode 2.5 по искусственному интеллекту стартовали в России], 360TV.Ru, <https://360tv.ru/news/obrazovanie/uchebnyj-onlajn-festival-po-iskusstvennomu-intellektu-startoval-v-rossii/>; “RuCode Festival: About the Festival,” RuCode, accessed Dec. 13, 2020, <https://rucode.net/>.

19. Digital Breakthrough competition winners announced

According to a December 12 press release from the Digital Breakthrough website, 13 IT solutions were selected as winners in the competition's grand finale. Most of the partner organizations (which include VKontakte, Rosatom, Sberbank, Gazprombank, Rostelecom, and the Ministry of Energy) will continue to work with the winning teams to implement the digital solutions that they produced. These solutions include applications for predicting a region's energy consumption, automating the hiring and training new employees, and detecting circulatory system diseases at earlier stages—all of which use VR, speech recognition, Big Data analysis, and/or other AI tools. In addition, job offers from top Russian corporations were extended to individuals from six of the teams.

As part of the competition, a vote was held to identify what should be considered the "IT capital of Russia." The prompt was to choose a city that "has a developed IT infrastructure, a good training base, strong and promising projects and startups, supports the IT business and is attractive to professionals." Rostov-on Don overwhelmingly received the most votes (28,200), with Nizhny Novgorod (15,036) and Belgorod (12,975) following in second and third place. As winner, Rostov-on Don will host one of the stages of the 2021 Digital Breakthrough competition.

AI in Russia has covered various stages of the Digital Breakthrough competition in prior issues (e.g., Issues 4, 7, 9, 11, and 16). The Digital Breakthrough competition is hosted by the autonomous nonprofit organization (ANO) "Россия – страна возможностей" ("Russia—Country of Opportunity").

Sources: "The Grand Finale of the Digital Breakthrough identified 13 IT solutions for implementation" [Гранд-финал «Цифрового прорыва» определил 13 IT-решений для реализации], Digital Breakthrough [Цифровой прорыв], Dec. 12, 2020, <https://leadersofdigital.ru/news/506536>; Digital Breakthrough [Цифровой прорыв], accessed Dec. 13, 2020, https://leadersofdigital.ru/#_blank.

20. Novgorod State University to begin AI and data-mining curriculum

According to a November 24 Interfax article, Novgorod State University's Department of Information and Communication Policy will begin to offer coursework on data mining and AI in 2021. The program was developed with assistance from scientists from the St. Petersburg State University. Because of the Coronavirus pandemic, some of the coursework will be taught

online. According to the article, Novgorod State University is the region's largest university, with more than 10,000 students enrolled. Previous issues of *AI in Russia* have covered similar artificial intelligence training or degree programs that have opened at universities, including ITMO, MISiS, URTK, and RANEPА.

Source: "Training of students under the program 'Artificial Intelligence' is introduced at the Novgorod State University" [Обучение студентов по программе "Искусственный интеллект" вводят в Новгородском госуниверситете], Interfax, Nov. 24, 2020, <https://www.interfax-russia.ru/northwest/news/obuchenie-studentov-po-programme-iskusstvenny-intellekt-vvodyat-v-novgorodskom-gosuniversitete>.

21. Perm Polytechnic scientist publishes book on data mining and AI

According to a November 30 *Scientific Russia* article, Perm Polytechnic scientist Leonid Mylnikov recently published a book titled *Statistical Methods of Data Mining*. In the book, the author discusses how AI can be used to aid in procurement by forecasting necessary production volumes, even taking into account various contingencies in emergency situations. According to the author, "Using real data and intelligent information technologies, it is possible to build models that help better manage risk." Mylnikov is a candidate of technical sciences, as well as an associate professor of microprocessor automation and information technologies. Perm Polytechnic was also featured in Issue 12 of *AI in Russia*, when it began offering a new master's program in robotics.

Source: Natalia Safronova, "How artificial intelligence solves problems with a high degree of uncertainty" [Как искусственный интеллект решает задачи с высокой степенью неопределенности], *Scientific Russia* [Научная Россия], Nov. 30, 2020, <https://scientificrussia.ru/articles/kak-iskusstvennyj-intellekt-reshaet-zadachi-s-vysokoj-stepenyu-neopredelennosti>.

22. Material sciences forum discusses importance of AI

According to a *Scientific Russia* article, the Third International Composite Forum was hosted by Tass and the Bauman Moscow State Technical University on November 20, 2020. The forum, which focuses on material sciences and manufacturing, paid considerable attention to AI and the transition to intelligent digital production technologies. The article states that participants discussed how AI algorithms are used to develop new synthetic materials with precise characteristics suitable for various conditions. AI is also of use in scientific modeling

experiments. There is hope that digitization of the materials science sector will aid the Russian Federation in a number of fields, including aircraft construction, shipbuilding, and the oil and gas industry. Because of the Coronavirus pandemic, this year's forum was held in an online format.

Sources: "III International Forum 'Key Trends in Composites: Science and Technology'" [III Международный форум «Ключевые тренды в композитах: наука и технологии»], Scientific Russia [Научная Россия], Nov. 23, 2020, <https://scientificrussia.ru/articles/zavershilsya-iii-mezhdunarodnyj-forum-klyuchevye-trendy-v-kompozitah-nauka-i-tehnologii>; "KEY TRENDS IN COMPOSITES SCIENCE AND TECHNOLOGY" [КЛЮЧЕВЫЕ ТРЕНДЫ В КОМПОЗИТАХ НАУКА И ТЕХНОЛОГИИ], Forum.EMTC.Ru, accessed Dec. 14, 2020, <https://forum.emtc.ru/>.

International Collaboration

23. Sberbank strengthens leadership position in international partnerships

As discussed in past issues of *AI in Russia*, Sberbank is continuing to further its reinvention from national savings bank to leading Russian technology company, Sber, by pursuing a wide variety of partnerships with leading international technology companies. The AI Journey conference, which took place December 3-5 and featured Russia's President Putin as a speaker, as discussed in this issue of *AI in Russia*, also allowed Sberbank leadership to engage more directly with foreign governments. To this end, Sberbank CEO German Gref recently discussed Kazakhstan's interest in Russia's experience in AI development with that country's president, while both were participating at AI Journey.

One of the most significant recent partnerships is Sberbank's joint project with Microsoft to develop an AI system that teaches robots to manipulate physical objects of unstable shape. A key goal of the research project was to develop a robotic system that could collaborate with human operators in changing environments, freeing teams from performing routine work and ensuring greater safety throughout the operation. The project began in October 2019 and reached a key milestone on December 7, when the two companies announced that they had succeeded in transferring such technology from simulation to the real world by implementing and testing the trained system at Sber's Robotics Laboratory in Moscow.

The project's practical objective was to "develop technology using a robot-manipulator to unload collection bags with coins weighing up to 6 kilograms from mobile carts for further processing in counting machines. In contrast to gripping solid objects, manipulating unsteady objects with a moving center of gravity requires constant calculation of the gripper's position and orientation in each particular case. Methods of deep learning and reinforcement learning were used to calculate and predict these parameters. Tests showed that bags could be unloaded successfully under real conditions on the first attempt in over 95 percent of cases.

Work on the project was carried out in three stages. The first stage was the development of a realistic simulation of the robotic unit and the objects of manipulation—deformable bags with coins and their physical characteristics. The second stage was integration of simulators with the machine-learning framework and its reinforcements and conducting experiments in the simulation environment to train an intelligent agent to control a virtual robot. For this purpose, the researchers applied the machine-teaching approach. That technique involves algorithms not only learning by interacting with the environment, as in classical reinforcement learning,

but also by using human prompts. In the final stage, the intelligent agent trained in the simulators was transferred directly to the physical robot. As a result, Sber's Robotics Laboratory successfully tested real manipulations of the robot unloading sacks of coins from a cart. The project managers expect to apply this technology to a wide range of areas, such as rescue operations, oil production, logistics, and other fields where it is necessary to perform actions with objects of unstable form.

In addition, SberAI is working with Huawei and Russia's Higher School of Economics to maintain a ratings system for Russian Language neural networks called Russian SuperGLUE (General Language Understanding Evaluation). A network's place in the ratings system depends on how well it solves problems in the fields of logic, common sense, goal-setting, and textual comprehension. These metrics are designed to measure progress on the path to building a strong AI system. The most recent update of the system has expanded the types of problems posed to the neural networks and the scope of programming language models. The project has been successfully presented at such international conferences as EMNLP (the Conference on Empirical Methods in Natural Language Processing) and the AI Journey conference co-organized by Sberbank, and it will be presented at a natural language processing seminar at Huawei University.

Sources: "Sber and Microsoft develop a unique AI robot control system," Microsoft, Dec. 7, 2020, <https://news.microsoft.com/ru-ru/sber-microsoft-ai-robot-control-system/>; "Sberbank and Microsoft have created a robot that carries sacks of money" [Сбербанк и Microsoft создали робота, который таскает мешки с деньгами], CNews, Dec. 7, 2020, https://www.cnews.ru/news/top/2020-12-07_sberbank_i_microsoft_sozdali; "Kazakhstan interested in Russia's experience in AI development," TASS, Dec, 4, 2020, <https://tass.com/world/1231509>; "Sber has improved the rating of Russian language neural networks" [Сбер усовершенствовал рейтинг русскоязычных нейросетей], CNews, Nov. 26, 2020, https://www.cnews.ru/news/line/2020-11-26_sber_usovershenstvoval_rejting.

24. BRICS challenge competition held in Moscow

The closing ceremony of the international BRICS (the acronym coined to associate Brazil, Russia, India, China, and South Africa) Future Skills Challenge Competition was held in Moscow on November 16. The competition, supported by WorldSkills Russia and the Moscow Regional Coordination Centre, was held in a hybrid format with competitors participating from around the world via videoconference. Participants worked on their competition tasks in real time from venues in their own countries.

Winners were announced in 19 skills: Additive Manufacturing, Space Systems Engineering, Internet of Things, Internet Marketing; Quantum Technology, Enterprise Information Systems

Security, Machine Learning and Big Data, Digital Capabilities for Business, Robot Systems Integration, Industrial Design Technology, Mobile Application Development, Blockchain-based Solutions, Robotic Welding, Building Information Modeling (BIM), Life-Cycle Management, Digital Factory, Digital Capabilities for Business, Aerial Robotics (Drones Operating), and Service Robotics.

Most of the Russian venues were located at Moscow schools and universities. Moscow also hosted the Competition Management Centers where international and Russian experts evaluated the performance of the competitors. The organizers declared the remote format a success and highlighted their plans to integrate it into the educational system in order to further develop international communication in the technological sphere. The next competition will be hosted by India in 2021.

Source: "Results of the BRICS Future Skills Challenge International Competition: Contest, co-creativity and cooperation," BRICS, Nov. 24, 2020, <https://eng.brics-russia2020.ru/news/20201124/1149253/Results-of-the-BRICS-Future-Skills-Challenge-International-Competition-Contest-co-creativity-and.html>.

25. Gazprom partners with Zyfra to work on Indian energy market

Gazprom Neft, a subsidiary of Gazprom and the third largest oil producer in Russia, has partnered with the Finnish-Russian industrial digitalization firm, Zyfra, to create a joint venture focused on developing new technological solutions for the oil and gas industry, with a focus on the Indian market. Please see past issues of *AI in Russia* for coverage of Zyfra.

According to reports, this joint venture will develop a digital production management platform that allows oil and gas companies to centralize operational management through the use of AI. The platform will be based on a combination of Zyfra's Industrial Internet of Things platform (IIoT), Gazprom Neft's developments relating to process control in the oil and gas industry, and additional digital services for oil refining developed by Zyfra.

Gazprom Neft's experts will provide industry expertise and access to big data and production sites for the practical evaluation of technological developments. Zyfra will ensure the promotion of the JV's products on foreign markets, mainly in the countries of South Asia and Latin America, where the company is already working intensively.

Zyfra started its operations in September 2017 in Helsinki, Finland. The company develops industrial digitalization technologies for machinery, metallurgy, mining and oil & gas. The solutions include predictive analytics and data analysis, tech processes optimization, automatic dispatch systems,

autonomous dump trucks and teleoperated equipment. Zyfra's earnings in 2019 amounted to more than \$ 50 million.

Gazprom Neft is a vertically integrated oil company, primarily engaged in the exploration and development of oil and gas fields, oil refining, and the production and sale of petroleum products. Gazprom Neft is one of the Russian oil industry's leading companies in terms of efficiency. Gazprom Neft's largest shareholder is Gazprom PJSC, which holds a 95.68% interest. The remaining shares are in free circulation.

Source: "Gazprom & Zyfra JV on digital industrialisation eyes India's oil & gas market," Economic Times, Nov. 25, 2020, <https://m.economictimes.com/industry/energy/oil-gas/gazprom-zyfra-jv-on-digital-industrialisation-eyes-indias-oil-gas-market/articleshow/79392935.cms>.

26. VisionLabs optical recognition company expanding into UAE

VisionLabs is continuing to expand its presence in the Middle East, most recently by opening an office in Dubai. The office will be focused on sales and providing technical support for pilot projects in the region. The new office, opened using the company's own funds, is part of the company's strategic development plan and will allow it to expand its position in the region and to work more effectively with partners and vendors throughout the Middle East.

The Middle East is the company's second largest market. It works in countries throughout the Persian Gulf, as well as in India and Africa, focusing on sales through local partners. Its biometric products are being used by Dubai police, in the development of a smart city network in Singapore, and on US school buses. In the Middle East, its most popular products include the LUNA biometric platform for smart and safe cities, which is used to direct transport and manage traffic flows, and a KYC identity verification product for banking. In the current pandemic environment, it has also focused on adapting its facial recognition software for contactless payments and distance identification for government and financial institutions. The company is next planning to focus on expanding its presence in Northern and Latin America, including opening an office in the United States.

As discussed in past issues of AI in Russia, VisionLabs has been a core member of the Skolkovo AI startup ecosystem, working in virtual reality and facial/object recognition.

Source: "VisionLabs will assist AI development in the UAE" [VisionLabs поможет развитию искусственного интеллекта в ОАЭ], CNews, Nov. 25, 2020, https://www.cnews.ru/news/line/2020-11-25_visionlabs_pomozhet_razvitiyu_iskusstvennogo.

Spotlight: Msta-SM 2S19M2 Self-Propelled Howitzer



"Msta-SM 2S19M2."

Source: <https://iz.ru/1092597/anton-lavrov-aleksei-ramm/kromeshnaia-msta-na-iug-rossii-pridut-robotizirovannye-artustanovki>

The Ministry of Defense is equipping the Southern Military District's forces with the latest Msta-SM 2S19M2 self-propelled robotized artillery systems and expects deliveries to be complete within one to two years. These systems not only have an increased range and accuracy, but also can use "smart" high-precision shells.

Msta's claim to robotization is its integration of the tactical control system—a new automated guidance and fire control system for the howitzers. As a result, each combat vehicle can now automatically exchange information with battalion and battery command posts and with artillery radars. This includes the ability to receive and transmit information about each shot fired. If necessary, Msta can function remotely. Msta's capabilities will also benefit from closer integration with Orlan-10 UAVs that conduct reconnaissance and assist in adjusting firing over the entire firing range of these howitzers.

Rostec's Scientific Research Institute of Electronic Devices (part of the Tekhnomash concern of the Rostec State Corporation) has also developed AI-enabled ammunition that can reach a target despite an adversary's radio electronic countermeasures.

Sources: Anton Lavrov, Aleksei Ramm, “Nothing but Msta: roboticised artillery systems are due to arrive at Russia’s south” [Кромешная «Мста»: на юг России придут роботизированные артиллерийские установки], Iz.ru, Nov. 27, 2020, <https://iz.ru/1092597/anton-lavrov-aleksei-ramm/kromeshnaia-msta-na-iug-rossii-privut-robotizirovannye-artustanovki>; “Russia tested AI-enabled smart munitions” [В России разработали боеприпасы с искусственным интеллектом], Ria.ru, Dec. 2, 2020, <https://ria.ru/20201202/boepripasy-1587365229.html>.

V. Putin's Remarks at AI Journey

On December 4, 2020, Vladimir Putin took part, via videoconference, in the main discussion at the Artificial Intelligence Journey Conference (AI Journey 2020) titled Artificial Intelligence as the Prime Technology of the 21st Century, hosted by Sberbank CEO German Gref. This section presents Putin's remarks. For full text, including the Q/A session, please see the link at the end.

* * *

Artificial intelligence is certainly the basis for another leap forward in human history. These are the so-called crosscutting technologies that, as you have just said, permeate and will permeate all areas of our life: industrial production, the social sphere, science and even culture—all of them will be intertwined.

Can machines stage an uprising? We all know and will definitely talk about this today: when we talk about powerful intelligence, and not just any artificial intelligence, this implies that these will be self-learning machines. This is the first point.

Now the second point: are there any dangers or risks in this connection? Yes, there are.

Everyone can see the role the internet plays in the life of the individual and all of humanity today. There are also risks there, but the internet must follow the same rules that have been used up to now. I am primarily referring to legal regulations as well as the moral and ethical standards that humanity has elaborated over millennia. Yes, the internet is a new sphere, a new type of activity, new systems, but they [regulations] must be applied here on the same scale as in other fields.

The same applies to artificial intelligence. It is up to each individual person how carefully he or she will use these opportunities. Just as it depends on them how they use nuclear energy or other achievements, including military ones. This is why I believe we should bear these risks in mind and think in advance of ways to neutralise them.

[...]

Today, our meeting is devoted to artificial intelligence. Obviously, this has already become a real phenomenon in our lives, as we have just noted, and relates to everything, to all areas. It is with full responsibility that we must approach the issues that we have started discussing, beginning with Mr. Gref's first question, with the understanding that this is a frontier in the life of civilisation and international cooperation.

Artificial intelligence will never replace humans. This is why I said that, yes, machines will control people to a large extent, just like many other modern technological devices do, but in the final analysis, people must control these machines.

Nevertheless, artificial intelligence is also becoming a helpful assistant that opens up new horizons for implementing the numerous tasks facing humanity. Humanity will benefit if, of course, these enormous resources are used properly.

We must build a relationship with it in a way that lets breakthrough technologies help us achieve our national goals. That is, speaking about our country, to transform Russia and to strengthen its global positions and, hence, first and foremost, improve the welfare and living standards of our citizens.

As for what we will do to effectively and safely use breakthrough technologies, I will certainly be glad to share my ideas with you. This is the reason why we are here today.

Clearly, this work is becoming more and more extensive and relevant all over the world. The venue where we have gathered is also becoming a traditional place for exchanging ideas and meaningful experience on artificial intelligence. It attracts genuine trailblazers from various countries. We probably will see your foreign colleagues at our meeting today as well.

I think President Tokayev's presence at our meeting speaks volumes. I am delighted that the head of Kazakhstan joined in our work, because Kazakhstan is one of our closest allies.

Almost a year ago, we discussed in detail the prospects for developing artificial intelligence. Let us face it; back then, many were thinking that certain projects were part of a distant or even nearly fantastic future. This was the case a year ago, but already in the spring, when the pressure on the healthcare system increased several times over due to the coronavirus pandemic, the AI algorithms certainly helped and continue to help our doctors to quickly diagnose this dangerous disease, analyse test results with a fairly high level of accuracy and, no less importantly, made it possible to significantly boost the testing quality and volume. Next year, we look forward to 10 percent of our country's medical institutions using this technology.

I would like to point out that the pace of technological change has increased many times over, which is clearly so. In a matter of several short months, our country and the entire world have covered a distance that could otherwise have taken years, or even decades. Right before our eyes, AI technology and big data analysis are changing our everyday habits and lives, and opening the door to outstanding corporate and individual achievements in advanced business models. This creates new opportunities and offers new tools for achieving success to everyone who seeks renewal and progress.

Of course, it is impossible to reject progress. It never happened before and will never happen in the future. This is an irreversible process. We need to learn how to control artificial intelligence. When I said that people would control the machines, I was talking about this. We

need to master one of the greatest technologies ever created by humanity, and to do so, we need to be bold, competent and forward-looking.

All of us—the state, society, business and individuals—need to keep up with the impressive dynamics of change, master new knowledge and technology, and move faster and more resolutely into a new era. Sberbank is a good example of how to work in the high-tech sector.

(Addressing German Gref) Sber has created a new digital platform, a so-called ecosystem—we spoke about this several years ago, and you are making good progress, this is great, this is really impressive—a system where a citizen can get not only banking services but the widest range of other services—call a taxi, order groceries, shop, find information—and all this can be done by pressing one button or simply by saying a voice command.

At the same time, Mr. Gref, I would ask you not to forget that the bank was created back in 1841. The founders of the bank, of banks, could not even imagine in their wildest fantasies that this was possible. But still, we should not forget that although Sber is an ecosystem, it is a bank in the first place and must adhere to the Central Bank's requirements for a financial institution.

At the same time, I am proud to say that there are many companies in our country that do what we only recently could only dream of, without any doubt. We already have self-driving cars on the streets of some cities—so far in test mode, but still. In our inland waters, there are already ships that can sail without a captain or crew. We ourselves are creating unmanned ships, including submarines, for the defence industry in this case. Combines with autonomous control systems are being tested in 15 regions.

And most importantly, our AI developments are based on world-class domestic scientific and technological groundwork. Moreover, they are created not only at universities and research institutes. Thus, among private companies, Yandex is one of the world's leaders in AI research; it ranks in the top five, if I am not mistaken.

I would like to emphasise, it is necessary to boldly conduct a scientific search where research prospects are still intangible. Sometimes we have to feel around, I understand that perfectly.

And such is the case with—what I have already mentioned—strong artificial intelligence, self-learning, when the machine itself will solve any issues better than a human, self-learn and constantly improve. This is where incredible discoveries and technological breakthroughs are possible.

I would also like to note that an AI research centre is already taking shape in southern Russia, in the Imereti Valley, which certainly involves convenient working conditions for specialists, as well as a special legal and regulatory framework for inventing future technologies. And for this purpose, in accordance with the new provisions of the Constitution of Russia, this site will become a federal territory. Its heart, a magnet for talented young people, will be the Sirius

centre, where, as far as I know, Sber is also ready. I asked you about it, and I know that you are ready to launch specific projects here, too.

[...]

Friends, Time is not only about the pace of change. Our goals must also be in line with the scale, content and pace of technological progress never seen before. In the coming decade, we will need to carry out a digital transformation of our country, all of Russia, and introduce AI technology and big data analysis everywhere. As we implement our plans, we must rely on sovereign technological achievements. As I have mentioned earlier, we must build on the achievements of our domestic innovative and start-up companies, as well as our mathematics schools.

A vast market is being created for technological and scientific discoveries and products. (We need to develop the domestic market by all means.) There is large demand on behalf of the economy and the social sphere. Billions of rubles will go towards the digital transformation of public administration and shifting almost all public services to an e-format. Most of them will be provided automatically, on an as-needed basis and proactively.

For example, when a family has a child, the algorithms will issue the necessary papers and certificates, including the ones needed for obtaining maternity capital.

This is how the public service mechanism should operate in the modern world. We must launch it soon. In fact, we must create a public ecosystem that is convenient and user friendly, and, of course, safe in terms of personal data protection. I am sure much more will be said about this today.

I would like to note that Moscow is among the leaders when it comes to creating digital services for interaction between the state and its citizens. With regard to the level of readiness for the introduction of AI technology, including urban infrastructure, Moscow is among the world's 10 largest metropolitan areas. I think it is ahead of many capitals and ranks second globally in terms of education and research. We have to check who ranks first on that list.

AI algorithms in Moscow are used in healthcare, education, security and smart city technology. Many technical solutions are significantly ahead of the national regulatory framework.

I would like to say that so far we do not have enough experience in enforcement in terms of cutting-edge technologies. There are a lot of sensitive issues there, but, of course, we must not, should not and will not stand still. We have to move forward, carefully and gradually.

In this sense, I would like to outline decisions that are pending and must be made quickly. In this context, I would like to ask the Government to submit to parliament draft laws on experimental legal frameworks for the use of AI technologies in individual economic and social sectors.

Secondly, very soon the Government will have to adopt a digital transformation strategy for the 10 key sectors of the economy and social sphere with practical measures to introduce AI algorithms so that they can serve as reliable assistants to doctors, transform our cities and be widely used in utility services, transport and industry.

All this must be reflected in the quality of people's lives. I would like to ask the Government to constantly monitor the results achieved in all these areas and timely remove any obstacles and barriers that may arise. I am speaking about the existing ones, but we also have to lift those that are to come. We should also focus on them.

Let me stress that digital transformation programmes and those to introduce artificial intelligence must also be adopted at the regional level, in specific industries, in order to take full advantage of the opportunities provided by breakthrough technologies for our country's powerful spatial development. I believe we will meet with governors to discuss all these matters.

Thirdly, it is necessary to submit to the Government as early as the first quarter of 2021 a draft law to provide neural network developers with competitive access to big data, including state big data, which are a true growing medium for AI technologies in a number of areas. Of course, as I have already said many times and will repeat again, at the same time it is necessary to rule out the risk of personal data leaks and ensure that all citizens' rights are observed.

Fourth. Today, the absolutely correct strategy is to boost the efficiency of production and management processes using advanced technologies, including big data analysis. These initiatives by Russian companies must, of course, be supported. I know that the Government is already drafting proposals to create effective incentives to bring private investment into domestic artificial intelligence technology and software products, which should certainly contribute not only to the technical renewal of traditional industries, but should also promote the IT industry's overall growth.

Let me remind you that we have set ourselves the strategic goal to quadruple investment in Russian software solutions in the coming decade. Notably, insurance premiums for the IT industry will go down for an indefinite term and significantly starting next year.

The Government discussed this issue at length and made an absolutely correct decision regarding two matters: insurance premiums went down from 14 percent to 7.6 percent and revenue tax was reduced, I think, in a revolutionary way, from 20 percent to 3 percent. We will keep looking at what else can be done to make digital technologies and artificial intelligence in Russia globally competitive.

Friends, to reiterate, the pace of technological progress is growing exponentially. Therefore, our education system—I am going to say a few words about it—must, of course, preserve the best traditions of Russian education, but also increase the pace of change. The necessary

changes must be made by all means. Our universities, the industry-specific universities and departments where students study mathematics, computer science, big data technology and information security must become real flagships and sources of advanced knowledge and discoveries. The content and teaching methods of these disciplines, which are essential for creating artificial intelligence algorithms, need significant updating, and this should be done by the beginning of the next academic year. This is my first point.

Secondly, I believe that training courses, the AI and big data analysis modules should be made part of the curricula across all areas of professional activities. This means that starting next academic year, future medical doctors, teachers, agronomists and lawyers, as well as manufacturing industry, communications and transport employees, including, of course, rising managers, should start studying these technologies. That is, the students who will, after graduation, work at our regional and municipal government bodies will need to personally promote the digital development agenda.

We must think, of course, about the younger generation, our smallest citizens. Today's school pupils cannot do without solid knowledge of mathematics. It is really "the true queen of the sciences," as a wonderful German scientist put it in the 18th-19th centuries. Its language and laws are universal. During rapid technological development, literally every person will need it to perform diverse tasks.

Let me note that we have done much to enhance the relevant mathematics education at schools. But when I meet with professionals, they tell me that this is not enough. They are probably right. Let us put it straight. A basic level of mathematics is no longer adequate today.

As for computer science, school pupils are still studying languages and software elements that were used back in the previous century. It is necessary to substantially expand the existing methods of teaching computer science so that schoolchildren learn how to launch their own startups, use advanced technology in various spheres of life, and acquire not only digital knowledge but also so-called soft skills—the ability to work in a team and make decisions independently. We have spoken about this many times at Sirius.

I would also like to note that telecommunications technologies and the digital study platforms created by the leading domestic technology companies have already become good assistants for teachers, instructors and professors. I know that Sberbank is also creating such a platform.

In fact, it has already created it and is using it in its work.

In the difficult period of forced restrictions, as we have seen quite recently, and, unfortunately, this period is ongoing in certain formats, but in these conditions related to the pandemic, this technology helped and is still helping teachers to maintain direct contact with their pupils and students. Obviously, this technology will continue to substantially expand the education space in the future as well.

We must use this experience and opportunities in the future, too. As I said recently, it was a blessing in disguise. This pandemic has pushed us to develop this technology. Incidentally, what we did in the previous years proved to be helpful in this respect. If we had not done what we did in the past, our schools and universities would not have made the fairly successful transition to online work.

We will increase the digital potential of our schools and universities with the future in mind; we will work for the future now. Here I would like to emphasise that in order to be leaders in the field of artificial intelligence, we need to be leaders in the field of school and even preschool education. Although some experts say that there is no and there should be no preschool education, there should be upbringing and preparation for school instead, but it does not matter what you call it. What is important is the content of the childcare programme.

Therefore, I would ask my colleagues to formulate the tasks in the field of education in this way.

In this regard, I instruct the Government to take specific decisions to improve the teaching of mathematics and computer science in schools and to involve our international mathematics centres. They are wonderful, with great potential, leading universities, and Sirius, which I have already mentioned here. And of course, the best Russian physics and mathematics schools, which top the world rankings in terms of the quality of student training. Thank God, back in Soviet times, this system, a network of physics and mathematics schools, was created throughout the country. I repeat, colleagues, I look forward to your thoughtful proposals and practical steps in this direction.

Friends, our country at different stages accomplished very ambitious technological and spatial development tasks: it built railways at a unique pace at the turn of the 19th and 20th centuries and built out electricity grids in the 1920-1930s, as an example of the integrated development of the economy, based on the achievements of the Russian pre-revolutionary engineering and science school.

But our plans for the widespread introduction of artificial intelligence and digital transformation are certainly unparalleled in terms of the depth of change in all areas. They are unprecedented. In fact, they have never existed anywhere. They will really influence every person, every family, every economic and social sector, every organisation and enterprise.

And every level of authority, every level of government, the entire system of government.

We allocate significant resources, both financial and administrative, to create and introduce technology. This is not about using these resources to purchase gadgets as status symbols or other everyday technology. Artificial intelligence is not a so-called fashionable hype, not prestigious trends that will disappear altogether tomorrow or the day after. No, that will never happen. World history has seen many cases when large global corporations and even countries

literally slept through a technological breakthrough and were swept off the historical stage overnight. I will not cite the sad examples of these countries and peoples now. There are plenty of them. And we must remember this.

I want all my colleagues in the ministries and agencies, Russian regions, our state companies, heads of research institutes, university rectors to hear me now – we have to take on issues of a radically new level of complexity. This is a hard test for many of their capability to shed obsolete ideas, routines and stereotypes, a test of their readiness to change, to learn and to lead the way.

However, technological transformation is an inspiring challenge for strong, brave and modern managers, business people and engineers. It truly reveals, allows for revealing personal professional qualities, for completing their mission, and it expands the space for realising the projects of Russia's present and future.

Everything we are doing pursues the main objective—technological progress, and its greatest achievements must ensure the prosperity, higher incomes and quality of life for every family.

Those who are not engaged in that and are not living by it do not understand what might happen there. Meanwhile, you and I know this, and we must work on it so that every person will be needed, will be able to work and do business.

By the way, Mr. Gref asked me a question—about jobs going redundant. But it has always been like that, during all technological revolutions. It has always been like that. We do not need to have strikes here like the ones they had in medieval England. We must think in advance of how to employ people, how to retrain them and prepare for new realities.

Meanwhile, business people have to learn how to do business in new realities, acquire new skills and professions so that our children, the growing generation, could have this throughout the whole 21st century, so that they could have fulfilment in their lives and be happy.

In a nutshell, we must employ all the limitless opportunities opened up by progress to build an independent, free, safe and comfortable country for living in absolutely new conditions, where artificial intelligence serves people, helps them attain great goals. I am confident this is the way it will be, I am certain of that.

Thank you for your attention.

Source: “Artificial Intelligence conference,” Kremlin.ru, Dec. 4, 2020,
<http://en.kremlin.ru/events/president/news/64545>.

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