CNA

Artificial Intelligence and Autonomy in Russia: A Year's Reflection

Russia Studies Program

This short analytical piece consists of the reflections of analysts from CNA's Russia Studies Program who participated in writing the year-long report *AI and Autonomy in Russia*, released in May 2021.[1] That foundational report was built on biweekly newsletters that mapped out the AI and autonomy ecosystem in Russia. More than that, it provided insights into the constraints, challenges, and efforts in Russia to advance its technological foundations which its leadership views as fundamental to international competition.

This brief contains the reflections of those analysts as they look back since the first report was published. During the past year, CNA analysts continued to produce biweekly newsletters, tracking developments in AI and autonomy in Russia. These include the impacts Russia's invasion of Ukraine have had and continues to have on Russia's technology sector. The intent of this report is not to provide a sourced document but rather to provide the reflections of those analysts who have watched this space over the last several years.

As the war in Ukraine continues, Russia's technology sector will continue to feel the impact of sanctions. The Russian military will continue to adapt to the overwhelming use of semiautonomous systems in Ukraine, facing challenges of acquiring and deploying those systems on the battlefield. It is essential to keep watching this sector for insights into the state of Russia's technological foundations, it's military capabilities as well as the evolution of modern warfare we are witnessing in Ukraine.

Military Sector

The Russian military's war in Ukraine underscores the burgeoning significance of ISR and target acquisition by UAVs on the modern battlefield. Russia's emphasis on fielding different ISR drone types and models in Ukraine has enabled it to use its reconnaissance fire/strike contours with some effectiveness against Ukrainian forces. At the same time, these UAVs have suffered a high level of attrition from Ukrainian defenses, leading to gaps in defense and aerial coverage. This has once again exposed a significant lack of Russian combat long-range drones that are supposed to deliver significant additional aerial combat capability. The fact that Russia may be turning to Iran for military drones exposes fundamental problems with acquiring combat-useful drones that will likely persist given the long-term impacts of sanctions.

The piecemeal use of demining UGVs, the lack of combat UGVs, and the lack of maritime autonomous vehicles speak to the Russian military's priorities in the development of military autonomy but also speak to its constraints. The Russian situation contrasts sharply with Ukrainian military's ability to field many combat UAVs and other related technologies to counter and blunt Russian forces. Nonetheless, the Russian military is pressing ahead with continued development of robotic, autonomous, and uncrewed land, air, and maritime platforms, evidenced by a roster of such technology presented at the ARMY-2022 military expo and forum.

---

[1] That report on other work related to AI and autonomy in Russia can be found at: https://www.cna.org/centers-and-divisions/cna/sppp/russia-studies/artificial-intelligence-and-autonomy-in-russia

Before the war Russia placed significant emphasis on AI in decision-making and data analysis across its weapons systems and platforms; however, open-source data collection has not identified the use of AI and/or ML in Russian military activity in Ukraine. Admittedly this is also more difficult given the nature of AI and its lack of usual visual indicators. The international sanctions imposed on the Russian Federation, the ongoing and uneven import-substitution, and the government's efforts to re-direct and manage the fallout from the sanctions and substitutions on the domestic high-tech and defense ecosystems will have a lasting effect on Russia's ability to develop and field the above-mentioned weapons and systems.

At the same time, the Russian military's widespread use of commercial technology, such as DJI Mavic drones for ISR, target acquisition/coordination, and munitions-dropping roles in this conflict, and the Ukrainian military's adaptation of the same technology to successfully identify and target Russian forces, will have a lasting effect on the way the Russian military uses and trains with UAVs and aerial drones. The volunteer-led effort to deliver such technology and train operators is changing how commercial technology can be applied in conflict.

The Russian defense and civilian establishments have gone ahead with their plans for centralized approaches to AI research, development, testing, evaluation, and fielding. In August 2022, the Russian Ministry of Defense announced the official creation of an AI department for implementing artificial intelligence in weapons development. During the announcement, the MOD discussed the need to consolidate and better manage different AI-related R&D across its departments, research institutions, and defense-industrial corporations. Given statements emphasizing the importance of AI to the Russian MOD, this department may be central in crafting policies and directing actual work. Existing military AI R&D efforts will likely report to this department.

In September 2022, the Russian government launched the National AI Center, charged with implementing the national strategy for the development of artificial intelligence in Russia. This center has a wide range of analytical, practical, expert, and coordination tasks for promoting effective AI solutions for business, science, and the state. The center will regularly monitor key indicators of AI development, will review national regulation, and will provide expert support for the implementation of AI across the private and public sectors.

Governance Sector

Since April 2021, Russia's policies in the AI realm have focused on adapting and implementing the goals of the Digital Economy program and the AI federal project despite significant economic and political headwinds. Just as the Russian economy was overcoming the stresses of the COVID-19 pandemic, the government's efforts to promote the adoption of AI-enabled technologies and to facilitate the transformation to a digital economy were further challenged by Western economic and technological sanctions. These challenges have only reinforced the trend of a growing Russian government role in private industry, as the government has sought to support the floundering ICT sector, develop alternative sources for microelectronics, and seek technological sovereignty. Simply put, it has been and will continue to be challenging to replace and upgrade computers across broad swaths of the Russian government and related stakeholders, let alone develop and implement AI-enabled solutions, without Western software and hardware. The Russian government has also continued extensive funding for academic and scientific institutions and has implemented labor market incentives, seeking to stem the outflow of human capital from Russia.

Despite these challenges, the government has continued to improve the regulatory framework for the development, testing, and deployment of AI-enabled technologies through the creation of additional regulatory sandboxes for projects such as unmanned transport and delivery. Spurred by Putin's remarks, there have been debates about how the government should protect the privacy of citizens as well as ensure the absence of discrimination of citizens by algorithms. The government has also progressed in developing laws and preparing large, anonymized datasets for use by the private sector. In addition, public-private efforts have resulted in the development of draft big data standards and the release of a much-touted AI ethics code for adoption by Russian companies, cities, and regions.

Human Capital

Despite ongoing efforts, Russia continues to struggle to bolster its domestic IT and AI expertise and training capabilities and has been further delayed by its war in Ukraine and the slew of international sanctions it faces. Brain drain, an already serious issue for the Russian tech sector in 2020, has exponentially worsened with the Russia-Ukraine War. A CNews article states that "IT professionals are in a hurry to leave the country as soon as possible, not wanting to put up with a sharply deteriorating economic situation and not paying attention to the state's numerous measures to support the IT industry." Further, government-led efforts such as tax-exemptions and preferential mortgage rates have not yielded results and are unlikely to do so with the worsening economic situation. The war has also exacerbated the flight of IT professionals and young talent to other countries with better living standards and economic promise. We would expect this to continue, as the sanctions' impact worsens and Russia's optimism for autonomy dwindles. Federal decrees and resolutions have been developed to curb IT brain drain, and Russia has implemented significant incentive systems for those who work as IT specialists and has simplified procedures for companies to employ foreigners. Due to this intellectual exodus, the Russian government and Russia's IT industry have considered the reintroduction of a Soviet mandate which requires all state-funded graduates to work at specified IT and tech organizations for three years after graduation.

Before the Russia-Ukraine War, Russian universities made some significant achievements in the development of competitive IT and AI programming. However, due to international sanctions, these programs will inevitably struggle to recruit internationally and have lost access to many foreign guest lecturers and faculty members. Certain universities have publicly opposed Russia's war in Ukraine, while others attempt to carry on as normal, including starting new joint research projects and introducing new IT- and AI-focused programming into their curriculum. The Russian media continuously introduce more refined AI-focused programming, and the past two years have seen continued public-private partnerships to connect IT students with companies that need such talent. The Russian government continues to host and sponsor many IT innovation and technical Olympiads, classes, and competitions. An especially large project, called "Digital Breakthrough," began June 10th and aims to hold 116 hackathons and 85 science lectures on AI by the end of 2024, all throughout Russia. The Russian government continues to fund its IT training sector, having most recently signed a decree providing 1 billion rubles ($16.528 million) in funding to AI training initiatives. These efforts and allocations are expected to continue despite Russia's ongoing military commitments in Ukraine.

Overall, despite the war in Ukraine, Russia persists in its prioritization of developing its capacity to research artificial intelligence and implement AI-based digital solutions. The international sanctions and "pariah state" view of Russia will continue to create limitations on Russia's AI and tech sector. Russia's limited progress and ongoing struggle in global rankings endure and are now coupled with an unprecedented lack of access to much of the international community. As we assessed in the 2021 *AI and Autonomy in Russia* report, there were already limited prospects of realizing a commercial or academic AI sector on par with the United States or China in the medium term. That stands true today, and any timeline for such goals and achievements has been greatly delayed.

Private Sector

Unsurprisingly, private market dynamics in the AI and autonomy sectors have been harshly defined by reaction to the imposition of the Western sanctions regime and the new, state-directed turn towards a full import-substitution economic framework. The bulk of recent reports on private market developments have thus fallen into a few main categories: (1) industry's reaction to the loss of imported hardware in the production process of high-tech, commercial-sector items due to sanctions obstruction; (2) industry's attempts to overcome reliance on foreign software or network and IT infrastructure and replace it with domestic and open-source, third-party alternatives; and (3) the deployment of state grants and emergency funds to support existing AI and autonomy-oriented startups and other medium- and large-scale companies. While these are major, disruptive problems, the private market has long been familiar with the requirements and challenges of import-substitution legislation (having experienced variations in its legal status, enforcement mechanisms, and bureaucratic controls since 2014) and has been aware of the need to work—at a much slower pace—on all these issue-areas. To that end, these critical challenges are intensive, but only speed up already-acknowledged targets for market actors.

These key challenges are influenced by several other important developments that go beyond the private market, including the general 'brain drain' of human capital out of the country, which is impacting the quality and quantity of the tech-industry labor sector, the global chip shortage exacerbated by targeted sanctions, and the dependence on foreign software architecture. Looking ahead, we expect to see further contraction and pressure in the sector, primarily due to the problem of labor and foreign hardware inputs. At the same time, there are very considerable incentives to shock-develop Russian domestic alternatives across the industry. There is both a great deal of state support from the Russian government and a large demand-signal from Russian consumer society to purchase replacements rather than forgo existing technology altogether. We expect the continuation of reshoring and retooling domestic products to replace imports, as well as strong supplementation from the Chinese market. The question of the startup-ecosystem surviving both the labor crunch and the economic downturn remains unanswered, and we expect further reliance on grants as well as linked networks of startup partnerships or survival partnerships with large private companies and state-owned corporations to stay afloat. Over the medium term, Russian AI and autonomy companies will likely become more wholly reliant on the Russian government and large corporations; ultimately, they may also find ready partners in China and other non-Western states that can support the sector's growth and reorientation beyond the Russian state.

International Cooperation

Over the last year, much has changed with regards to Russia's international cooperation in the AI sphere. In 2020-21, the focus was on enhancing ties with leading states in the field and establishing ties with new entrants. However, after Russia's invasion of Ukraine and the subsequent imposition of sanctions on Russian technology, the focus shifted to discussions of how to ameliorate brain drain in the Russian IT field and what international partnerships could still be saved. CNA's 2021 report suggested that Russian officials were eager to highlight their country's progress in developing collaborative relationships with foreign partners in the AI sphere and the benefits such cooperation can bring to both sides. The strongest partnerships were with China, South Korea, UAE, the United States, and EU member states. Samsung and Huawei had a strong presence in the Russian AI research sector, while a partnership with MIT had led to the establishment of Skolkovo, the epicenter of Russian AI development in the last decade.

Most of these relationships have been severed in the last six months. The United States, the EU, and South Korea imposed sanctions on technology sharing with Russia that made AI cooperation largely impossible. While China and the UAE did not subscribe to these sanctions, the fear of secondary sanctions led Huawei to partially withdraw from the Russian market and to severely curtail cooperation in technological research. Before March 2022, the focus of discussions about AI was on the establishment of new partnerships and the development of new markets; since then, Russian media have focused primarily on the withdrawal of key partners such as MIT and Samsung from Russia, the negative impact of sanctions on the import of necessary high-tech goods such as semiconductors, and the departure of large numbers of technology specialists for jobs abroad. It is becoming increasingly clear that the invasion of Ukraine will have a serious and long-term negative impact on Russia's international cooperation in artificial intelligence.

Conclusion

The outlook for AI and autonomy-related progress in Russia is bleak. In the 2021 report, we assessed that Russia was unlikely going to have any technological breakouts in the field but was enthusiastically trying to shore up its technological sector and take advantage of new technological developments. That ahs become even more difficult given the brain drain and sanctions discussed above. That being said, the Russian government has not lost focus on its goal of improving its technological foundation across all sectors of society. It will be important to continue watching Russia cope with these challenges and whether it can find ways to mitigate them.