



# In AI, Russia Is Hustling To Catch Up

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When Vladimir Putin said last fall that artificial intelligence is "humanity's future" and that the country that masters it will "get to rule the world," some observers guessed that the Russian president was hinting at unrevealed progress and breakthroughs in the field. But a glance at publicly available statistics indicates otherwise. Russia's annual domestic investment in AI is probably around 700 million rubles (\$12.5 million) - a paltry sum next to the billions being spent by American and Chinese companies. Even if private-sector investment rises as expected to 28 billion rubles (\$500 million) by 2020, that will still be just a fraction of the global total.

Instead, Putin's statement should be interpreted as a recognition of Russia's current place in this unfolding technology race, and of the need by the nation's government, private sector, and the military to marshal the needed resources to persevere in this domain. In March, Defense Minister Sergei Shoigu put a finer point on it, calling for civilian and military designers to join forces to develop artificial intelligence technologies to "counter possible threats in the field of technological and economic security of Russia."

This is already beginning to happen. The Russian government is increasingly developing and funding various AI-related projects, many under the auspices of the Ministry of Defense and its affiliated institutions and research centers. A three-year-old AI and semantic data analysis research project led by the military-related United Instrument-Making Corporation — and involving the Russian Academy of Sciences, various universities, and more than 30 private companies — is shaping up to be one of Russia's biggest public-private approaches. Earlier this year, the MOD announced a competition among "designers of robotics technologies" to develop artificial intelligence. The Ministry's Main Directorate for Scientific Research and Technological Support of Advanced Technologies will select the winning designs, with special attention paid to big-data technology, machine vision, and machine learning.

There are also efforts to shape and guide these burgeoning efforts. In March, Russia's six-year-old Foundation for Advanced Studies - created as a parallel to the Pentagon's Defense Advanced Research Project Agency - announced proposals for the MOD to standardize artificial intelligence development along four lines of effort: image recognition, speech recognition, control of autonomous military systems, and information support for weapons' life-cycle. This month brought the latest in a series of government-sponsored forums intended to discuss domestic AI developments, review international achievements in the field — and spur the development of proposals aimed at the "targeted orientation of the Russian scientific community and the Russian state on the issues and tasks of creating artificial intelligence." There is also a new Russian AI Association, which brings together academic and private-sector institutions to plan various technological, socio-cultural, and even philosophical developments.

All this government activity has apparently infused many Russian developers with new confidence. Indeed, some are claiming that AI may arrive in just a few years' time. It is even engendering hope that the country might at long last develop an infrastructure for turning theoretical knowledge, long the strength of its scientific community, into practical solutions. In March, Russian Deputy Minister of Defense Nikolai Pankov said that hundreds of science and technology departments in the nation's military universities are currently engaged in R&D related to "artificial intelligence, robotics, military cybernetics and other promising areas." According to Pankov, the results of this scientific activity "are widely used in the development of new military systems."

But can the Russian government involvement actually foster high-tech development? The answer isn't clear. Its own "Silicon Valley"-like effort at Skolkovo has fizzled out and is today a fraction of the activity and output promised initially, despite massive support at the presidential level and backing from various government institutions.

## Practical Military Uses

Nevertheless, military experts say artificial intelligence could change the strategies, planning and organization of Russia's military. They expect AI to help automate the analysis of satellite imagery and radar data, by quickly identifying targets and picking out unusual behavior by a enemy ground or airborne forces. AI would also allow the Russian military to obtain a so-called "library of goals," which will help weapons with recognition and guidance.

But the biggest and fastest breakthroughs based on machine learning can be expected in the realm of electronic warfare. Last year saw the deployment of Russian EW units to Syria, eastern Ukraine, and Crimea, where they are amassing data about the performance and electronic signals and signatures of American and other western assets in the region: aircraft and airborne sensors, naval vessels, missiles, etc. This data will be fed to machine-learning systems and used to improve Russian EW.

The Russian military openly admits that AI is already used by certain weapons, yet questions about whether and how to use it are still being debated by policymakers, experts, and designers. Recent discussion has focused on the potential fallibility and unpredictability of AI-driven combat machines and the possibility that they might be disabled or even turned against Russian forces by adversary hackers. For now, the official Russian position highlights the "inadmissibility of loss of meaningful human control," placing it in line with the rest of the international community's emerging viewpoint, and the debate seems to be moving toward a requirement to maintain a human in the loop on all lethal decisions.

What kind of military uses for AI is the Russian establishment openly discussing? The future MiG-41 combat aircraft "will be provided with elements of artificial intelligence that will help the pilot to control the aircraft at speeds four to six times higher than the speed of sound," RT reports. The Su-35 jet reportedly already has AI that can match available weapons to potential targets. And starting this year, the Russian military will acquire the "Bylina" electronic warfare system, touted as capable of "independent analysis" and "choosing ways to suppress enemy electronic signals." Russian military experts have said the Bylina is "close to being an actual artificial intelligence system."

Russian designers and military officials are also working on aerial drones that adjust to emerging battlefield conditions and coordinate among themselves when deployed in swarms, though progress appears to trail similar efforts in the United States and China.

Recently, the Russian "Galtel" unmanned underwater vehicle was successfully used to hunt for unexploded ordnance in the port area of Tartus, Syria. It was reportedly equipped with "artificial intelligence," allowing the UUV to problem-solve on the go.

Certain AI-driven successes are also visible in Russia's burgeoning unmanned ground military vehicle sector. For example, the Foundation for Advanced Studies is using the "Nerekhta" unmanned ground vehicle as an AI test bed, learning to cooperate with other ground and aerial unmanned systems.

The Tactical Missiles Corporation has said Russia will roll out artificial intelligence-powered missiles in a few years. A former Russian Air Force chief, Gen. Viktor Bondarev, has said that Russian combat aircraft would get AI-infused cruise missiles that will analyze the air and radar situation and improve its altitude, speed, and direction. The famed arms manufacturer Kalashnikov recently announced that it will launch a range of "autonomous combat drones" which will use artificial intelligence to identify targets and make decisions "on their own."

Based on the available evidence, Western militaries need not be immediately alarmed about the arrival of AI-infused Russian weapons with next-generation capabilities - except, perhaps, in the field of EW. Western and Chinese efforts are currently well ahead of Russian initiatives, in terms of funding, infrastructure, and practical results. But the Russian government is clearly aiming to marshal its existing academic and industrial resources for AI breakthroughs - and just might achieve them.

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