

Russia vs Ukraine: New Generations of Weapons

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By Rossella Muzzeddu

Introduction

Nowadays, the forces deployed in the field are not only composed of people but also of artificial intelligence (AI) systems that take the conflict to the next technological level.

Robots and especially drones have played a central role in Ukraine's defence against the ongoing Russian attack.

A new way to attack: drone

Ukraine is using Turkish Bayraktar TB2 drones, armed with rockets or missiles, which can take off, land and navigate without human intervention (Walker-Munro, 2022).

In this case, however, the weapon systems are not entirely autonomous: a human operator must follow the operations and decide when to release the laser-guided rockets that the drone carries.

Although Turkey is also the production country of the STM Kargu-2, the first drone that killed soldiers in Libya in 2020, Ukrainian forces still do not have it.

Russian President Vladimir Putin said in 2017 that whoever becomes a leader in AI development "will become the ruler of the world" (Fierro, 2022).

Indeed, before this conflict, much useful analysis and commentary was available for review about Russia's development of unmanned aerial, ground and maritime systems.

Just after it invades Ukraine Russia's military autonomous and unmanned performance are weak or completely lacking.

Today, Russian soldiers use either Orlan-10s to directly strike or identify Ukrainian forces or just a commercial DJI model.

That indicates the continued presence of such technologies that have become ordinary to any military formation in this war (Bendett, 2022).

These unmanned instruments are supposed to be expendable and affordable because they are crucial to vital tasks like recognising targets and serving as artillery spotters.

Though, we know from the ashes on the battlefield that Russia has already implemented the Lantset drone, designed to attack military vehicles or troop concentrations autonomously.

This weapon can recognise a type of pre-selected target within a geographical area (geofence), producing the missile to explode (Fierro, 2022).

Another drone type is the KUB-BLA developed by ZALA Aero, a Kalashnikov subsidiary, detonates on impact with the target. The KUB-BLA has on board an artificial intelligence system for object recognition without the need to send and process the images at the base, capable of recognising 1000 types of objects.

These systems are implemented on board because they allow greater immediacy in recognising something for the advantage of a decision to be taken on the spot (presumably by the AI), without relying on precarious radio signals that could be interrupted by the enemy at any time.

However, nothing now suggests that the KUB-BLAs have a decision-making system to independently select the option of swooping down on a target and exploding. Still, in the future, this possibility can be easily implemented (Sambucci, 2022).

The Russian military may have underestimated the strength of Ukrainian air defences and trained its aerial drone units against what they thought were forces like those faced in Syria.

The numerous Russian losses over Ukraine early on may have created the impression that the Russian military overestimated the success of its drone units and technologies.

Robot on field

We can undoubtedly say that drones are ever-present in this conflict while remotely operated robots (Uncrewed Ground Vehicles-UGVs) don't appear.

Russia also has military robots, but so far, the only units seen in Ukraine are Uran-6 demining robots, while the Uran-9 robotic tank seems not to be used in this war.

Ukrainian forces now have a new helper: GNOM ("Gnome"), a robotic battlefield scout.

It is made by "Temerland", a company based in Zaporizhia and this small machine will recognize Russian positions and provide fire support with a machinegun.

GNOM is highly mobile on four large wheels with 4x4 drive and a quiet 5-horsepower electric motor, weight 50 kg and armed with a 7.62mm machinegun.

While most UGVs are radio-controlled, GNOM spools out a reel of fibre-optic cable behind it.

"Control of GNOM is possible in the most aggressive environment during the operation of the enemy's electronic warfare equipment," says Trotsenko, head of Temerland.

Also, because the operator is not using a radio, they cannot be detected and targeted by artillery, and the cable does not create thermal radiation that a thermal imager could see.

GNOM's cable gives it a range of 2,000 meters (1.25 miles) and, if broken, the vehicle automatically returns to a predetermined location (Hambling, 2022).

This robot can be equipped with a 360-degree camera on a telescoping mast to give a detailed view of the surroundings, and it is nearly silent with a low profile.

GNOM, thanks to the machinegun, can defend itself and provide fire support in situations which might be too dangerous for soldiers. In the meantime, GNOM has been used on scouting duty.

Another automaton will go into action in the capital: the robot-dog Spot. It is one of the most advanced models created by the American Boston Dynamics.

It has four legs to move and a mechanical arm with which it can lift and remove mines and unexploded devices by exploiting artificial intelligence that teaches it to act independently without the need for human commands.

It sees the mine, grabs it without touching the trigger and carries it where it will be neutralised.

Tactical robots have long been promoted to reduce casualties and keep soldiers out of the line of fire while maintaining contact with the enemy.

Accountability

All modern military forces involve trust in subordinates to follow orders and in commanders to give lawful orders. When instead of a human, it operates a machine, the superior should trust that machine as much as a human being.

This produces significant problems.

Researchers always speak about “machine bias” because we trust machines to make decisions simply because they’re machines (Walker-Munro, 2022).

However, erroneous trust in machines' decisions can have catastrophic results, especially if they make life and death.

This is the case of the new modern army system “drone kamikaze”, which combines a drone’s manoeuvrability with destructive missile capabilities. Able to fly autopilot to the engagement zone and, if necessary, identify and hit the target without input from a human operator (Valesini, 2022).

One way to limit military drones is to make them do simple roles like acting as an airborne camera. Whereas a drone scanning video footage to identify targets is far more likely to make a fatal mistake. In 2007, John Canning, a researcher at the Naval Surface Warfare Center, suggested future autonomous weapons might attack rifles or ammunition instead of attacking the human holding them (Walker-Munro, 2022).

Another problem is that there is no legislation on these weapons, so whose responsibility is it when a car decides to kill?

It seems a very theoretical problem, but it is not: as the human rights expert James Dawes recalls in an article published in *The Conversation*, the law of war, since the Geneva Convention, is based on the idea that even in war be held accountable for their actions. A soldier who commits a war crime can be tried and sentenced by an international court (Dawes, 2021).

In 2016, the Future of Life Institute - an organisation that fights to prevent the existential risks of new technologies - promoted an open letter calling for a moratorium on offensive autonomous weapons. Among the over 31,000 signatories were also Stephen Hawking, Elon Musk and Jack Dorsey, and many of the most important AI researchers (Sambucci, 2022).

In the end, the matter was discussed last December during the United Nations Convention on Certain Conventional Weapons, unfortunately without reaching a final decision.

U.N. Secretary-General Antonio Guterres had called for countries to devise an “ambitious plan” for new rules.

The United States, Russia, Israel, India and many other nations have opposed the banning of autonomous weapons, postponing the negotiations until a later date.

The United States proposes to regulate the matter with a less binding voluntary code of conduct. A solution that would hardly represent a concrete deterrent to the development of these technologies and the impossibility of establishing when drones and intelligent missiles are used in modality autonomous.

Therefore, the conflict in Ukraine risks becoming the official baptism of a new generation of weapons, which will make an answer to such questions increasingly urgent and an international position on their use.

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