

SENTRY ROBOTS IN ACTION: ETHICAL AND LEGAL ISSUES OF AUTOMATED WEAPON IN SOUTH KOREA

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South Korea is one of the leading countries both in the development of robot industry and the deployment of lethal robot weapons. The development of the SGR-A1 has brought some ethical controversy regarding the issue of autonomous killing and collateral damage. Based on the ethical and legal policy consideration over the issue of robots for military purposes, which must be the most serious or imminent threat of AI robots, the Paper examines how to develop ethics-based, future-proof law and policy on the development of robots.

1. Officially Unknown Rise of the Automatic Weapon – A South Korean Case

1.1. *World's first-ever 'killer robots' in action?*

South Korea marks one's of the highest level of industrial robots operating in factories around the world today,^a may also be the world's first country where Lethal Automatic Weapons System (LAWs) in action.

It had been reported that a gun-toting sentry robot, developed by Samsung Techwin Co. for the South Korean government is dispatched in the De-Militarized Zone (DMZ) between the two Koreas. SGR-A1 robot [see Figure 1] uses a low-light -camera and pattern recognition software to distinguish humans from animals or other objects and, if necessary, can fire its built-in machine gun.^b



Figure 1. A weapons-grade sentry robot from South Korea^c

^a International Federation of Robotics, World Robotics Report 2020(2020)

^b Jean Kumaga, *A Robotic Sentry for Korea's Demilitarized Zone* (<https://spectrum.ieee.org/a-robotic-sentry-for-koreas-demilitarized-zone>)

^c South Korea Develops Machine-Gun Sentry Robot (Posted on 05/10/2006, <https://www.robotshop.com/community/blog/show/south-korea-develops-machine-gun-sentry-robot>)

South Korean defense ministry sees its goals as to transform the current guard and observation mission on fronts conducted by soldiers into a robot system. Such system may have some advantages, as they do not require communication links, fewer soldiers are needed, and because they are not humans, war crimes such as rape and indiscriminate killing can be reduced.

1.2. *Controversies over the robot in military action*

The development of the SGR-A1 has brought some controversy regarding the issue on ethics of autonomous killing, and innocent killings through collateral damage; The SGR-A1 presumes any person entering the DMZ is an enemy and, upon detection, will attempt to identify the target through voice recognition. If a proper access code is not provided within a short amount of time, the system can choose between sounding an alarm, firing rubber bullets, or engaging the target with other weapons. The system can also be overridden by an operator, who can also communicate via built-in microphone and audio system.

It is believed that human-in-the-loop system is applied to the SGR-A1, which means that the weapon must wait for commands from a human operator before acting upon its targets. However, Committee on International Security and Arms Control and Human Rights Watch believe the SGR-A1 has human over the loop capabilities and would ultimately increase civilian casualties.

2. Ethical and Policy Consideration over the issue of Robots for Military Purposes

2.1. *Ethical concerns against the threats from any automated weapons*

LAWS are unethical because humans are no longer involved in the act of killing, which absents morality from warfare by ultimately pitting a machine against a human. LAWS increase the risk of conflict and war by shifting risks from the nation's soldiers to machines, which distances civilians from war and thus changes how the military and government think about going to war. LAWS introduce a difficulty of assigning responsibility and accountability if scenarios including civilian casualties and violation of international law arise.

Since 2012, the Campaign to Stop Killer Robots has been working to ban fully autonomous weapons. There has been increasing support for such a ban. In 2015, more than 3,000 experts in artificial intelligence and robotics research signed an open letter calling for a treaty to ban lethal autonomous weapons. In 2019, UN Secretary-General also called for banning fully autonomous weapons, saying “machines with the power and discretion to take lives without human involvement are politically unacceptable, morally repugnant and should be prohibited by international law.”^d

United States, China, Israel, South Korea, Russia, and the UK are all developing weapons systems with significant autonomy in the critical functions of selecting and attacking targets. This represents a dangerous new arms race for autonomous weapons. As of 2021, South Korea has not endorsed the call for prohibiting fully autonomous weapons.

In 2019, the South Korean government acknowledged the need for “a concerted response against ... potentially grave challenges” posed by lethal autonomous weapons systems and said that

^d Machines Capable of Taking Lives without Human Involvement Are Unacceptable, Secretary-General Tells Experts on Autonomous Weapons Systems (<https://www.un.org/press/en/2019/sgsm19512.doc.htm>)

“Korea is ... committed to joining international efforts in the long-term to develop realistic international norms” regarding their use.

2.2. *Ethics and robots at issues in South Korea*

In 2018, more than 50 international scholars signed a letter calling for a boycott of Korea Advanced Institute of Science and Technology (KAIST) over concerns that it was developing autonomous weapons. On the other hand, some AI Charter of Ethics have been created: Draft of the Robot Ethics Charter by the Ministry of Commerce Industry and Energy in 2007, Ethical Guidelines for Intelligence Information Society by the Ministry of Science and ICT & National Information Society Agency in 2018, Intelligent Government Ethics Guideline for Utilizing Artificial Intelligence by Korean Internet Ethics Association & National Information Society Agency in 2018, and the Charter of Artificial Intelligence Ethics by Korea Artificial Intelligence Ethics Association in 2019. The core principles of such guidance are this: humans should be able to control AI, and the purpose of AI should be limited so that it cannot be used to injure or kill humans.

South Korean government focuses on the realization of people-centered AI and human-like AI we establish a global level of AI code of ethics based on social debate and consensus. To prevent the dysfunction of AI, It proposes the establishment of a quality management system that verifies reliability and safety in response to the proliferation of AI products and services . It also prepares to establish AI ethical standards that are consistent with global norms by identifying and analyzing the AI Code of Ethics and discussion trends in international organizations and major countries and setting up action plans.[°]

3. How to develop ethics-based, future-proof law and policy on the development of robots

3.1. *When a robot be threat to human, what is to be done with ethics and law?*

While South Korea has made some efforts to appropriately response to the threat of lethal robot weapons, South Korea has been developing a killer AI robot. This may be because provisions involving lethal AI will be difficult to implement because there is already competition for the development of AI weapons among various international military powers. So the practical task will be to devise some AI-risk management system, legal framework of responsibility, and culture of social communication over the AI threat issues, that is national AI governance system which covers possible threats of and from robot in action.

3.2. *On its own ‘Trustworthiness’ of the robots as automated weapons*

Intelligent Robots Development and Distribution Promotion Act of 2008 which amended in 2016, aims to contribute to enhancing the quality of life of citizens and the national economy by establishing and promoting a policy on the sustainable development of the intelligent robot industry to facilitate the development and distribution of intelligent robots. Article 2, para.2 of

[°] Government of Republic of Korea, National Strategy for Artificial Intelligence (2019) pp.47-49.

the Act defines “intelligent robot ethics” as a code of conduct established for persons involved in the development, manufacture, and use of intelligent robots in order to prevent various kinds of harmful or adverse effects, such as destruction of social order, that may arise from the development of functions and intelligence of intelligent robots, and to ensure intelligent robots contribute to enhancing the quality of life of human beings.

For an intelligent and safe robot in use, the governance system and legal framework has to be built upon the ethical value of ‘trustworthiness’, so that lethal weapon should be lawful, complying with all applicable laws and regulations; it should be ethical, ensuring adherence to ethical principles and values; and it should be robust, both from a technical and social perspective.

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