ADC/DAC SWORDLE

THE ETHICAL AND STRATEGIC DEVELOPMENTS IN WARFARE THROUGH AUTONOMOUS COMBAT TECHNOLOGY

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EXECUTIVE SUMMARY

Each year, the United States spends around 12% of the yearly budget purely on defense, which amounts to billions of dollars. One of the newest fields of innovation when it comes to defense revolves around building Lethal Autonomous Weapons Systems (LAWS), which are combat weapons that utilize artificial intelligence. Although a promising field of development, the true breadth of influence that artificial intelligence has is unknown, especially within the field of integrating artificial intelligence into weapons. The science, technology, and society (STS) paper analyzes this new emerging type of weaponry in order to identify potential dangers in its development trajectory and to guide future development directions and regulations. The analysis of such a complex system is broken down through various technological frameworks and risk studies in order to create a holistic view of how to approach the moral consequences of continuing to develop LAWS. This STS paper is in loose relation to the technical project which focuses on developing an interactive game between a player and human. On an elementary level, the technical project seeks to encourage common users to gain a curiosity about computer systems in order to inspire more knowledge regarding smart technology.

The technical report outlines the development of a game console where users can play other humans or a computer-based opponent. The proposed design functions through a hardware system that interfaces to an embedded component that allows the user to take part in a variety of game styles and opponent types. The inspiration for this design came from the alienation most people felt during the COVID-19 pandemic in addition to a growing need for common understanding of how basic computer algorithms can work. For the technical project itself, several electrical designs were constructed through computer-based PCB design software and a final prototype was successfully fabricated and tested. The desired game rules were correctly

implemented, however a final, more sophisticated, hardware design was incomplete due to time constraints. Overall, a functioning initial prototype was correctly fabricated and tested.

The inspiration for assessing the ethical implications from LAWS came from my own personal career interests in defense. This research answers the question of how the ethical and strategic developments in LAWS speaks to the future risks in warfare and humanitarianism. In this case, Actor-Network Theory was used in order to identify key stakeholders that participate in the construction and development of LAWS, which was implemented through a risk analysis case study that utilized fault-tree analysis.

In the STS paper, a qualitative analysis gave insight into the scope of influence in order to inspire future research into areas of fault within each step in the process from initial research and design to the integration of autonomous weapons into military environments. The various forms of evidence supports the conclusion regarding a call for regulation alongside future assessments of ethics and risk. In combination, this research helped to formulate a direction for product development in order to preserve innocent human life and regulate other autonomous systems, even outside of the scope of combat weaponry.

Presently, there is a valid need for new developments in defense in order to maintain competition with other current and emerging world powers. However, developing LAWS is equivalent to exploring the unknown, and thus must be approached with severe caution. Once growing an understanding for how these weapons function across policy makers and developers, a conservative route for development is possible in order to preserve humanitarianism. This can only come from bridging both societal and technical concerns.

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