

# **Thesis Project Portfolio**

## **Autonomous Checkers Robot**

(Technical Report)

## **Autonomous Robot Safety**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring, 2023

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## **Sociotechnical Synthesis**

Entertainment and human enjoyment are one of the driving factors in society today, with robotic systems being incorporated into it more and more every day. My capstone project aims to further this development by creating an autonomous checkers playing robot that will draw people's attention away from harmful blue light screens and toward a dynamic single player game. This technology has the potential to promote brain stimulating activity, at the risk of reducing human interaction and safety because of the robot. The ethical and societal concerns of autonomous robot safety and human-robot interaction overall have been topics of consideration throughout my research.

To address these concerns, I searched through current technical papers that propose technologies centered around autonomous robot safety in order to formulate suggestions for new standards and regulations to be implemented as the time moves forward and more systems become autonomous. Through these case studies, I hoped to find promising algorithms and safety protocols that could be enforced in general cases, but primarily in systems where the autonomous robot has to be social. The implications of my proposed regulations include clear expectations for autonomous robots by commercial users, safer work environments for industrial users and built-in fail safes for users of all kinds. Redesigning my team's checkers playing robot with these new standards would provide a safer, more enjoyable experience.