Thesis Portfolio

Explorer51 - Indoor Mapping, Discovery, and Navigation for an Autonomous Mobile Robot
(Technical Paper)

Investigation of Social Pressures on the Evolution of Machine Learning and Autonomous Robot Systems
(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science in Systems and Information Engineering

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Sociotechnical Synthesis

The perceptions and evolution of autonomous robots and advanced machine learning by individuals involved in rescue and relief efforts have contributed to noticeable disparities in faith in the technology. As part of our year-long project, my Capstone team developed an autonomous robot to perform actions of our choosing, including navigating and mapping an indoor space, identifying targets, and communicating necessary information for future improvement. The technology is notable in that it raises questions about the needs of the two major groups involved in a typical autonomous robot system: the engineers in charge of the technology and the victims who receive the actual care in some capacity. My team's work on the robot may bring to light some of the engineer's objectives while designing a robot system, but does little to represent those receiving support in times of need. Analysis of the strengths, challenges, opportunities, and threats (SCOT analysis) of autonomous robot systems in society would provide the necessary framework to outline the different perspectives of the two stakeholder groups. Considering the ethics of care in technology may also be useful to explore the role of attributing responsibility when addressing the needs of those offering relief and those receiving it. My chosen method of conducting research is constituted by the delivery of a survey and analysis of its results, along with comparison to relevant documents regarding sentiment regarding autonomous robots. The preliminary survey results should provide empirical evidence regarding public attitude toward autonomous robots, with which I can reveal and study trends which may or may not have been documented in previous research studies. I expect to highlight the differences between the needs and requirements of the two chosen stakeholder groups, and understand the levels of contribution from both groups in the development of autonomous technology. The implications of my findings may elucidate how the decision-makers (engineers) of the sociotechnical system choose to choose to develop autonomous robots, and how they could better do so to mitigate public fear of the technology and better satisfy the desires of those in need.