Lonely Robo
(Technical Report)

Analyzing the Samsung Galaxy Note 7 Using Care Ethics
(STS Research Paper)

An Undergraduate Thesis Portfolio

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Table of Contents

Socio-technical Synthesis: The Lonely Robo and Samsung Galaxy Note 7 Battery Failures

My technical and STS research are connected through the design and manufacture of electronic devices that are safe for consumer use. It is an electrical engineer's responsibility to first ensure the safety of the consumers that will be using their product, and second to fabricate circuit boards that are inexpensive in order to keep production cost down. This notion of circuit design is critical to both my technical project and research paper. Despite this similarity, the projects differ in most other regards. My technical work focuses on the design and manufacture of a novel child's toy, whereas my research examines the moral judgement of Samsung in their handling of severe Galaxy Note 7 battery failures. Although my technical project and research paper differ in their genre, they both rely on the importance of safe and effective product design.

My technical project focuses on the design and manufacturing of a robot that uses computer vision to physically solve a word puzzle. Computer vision describes the algorithms used to allow computers to visually detect common objects in images, like fruits or letters. The robot is a combination of an off-the-shelf chassis, a custom printed circuit board with two microcontrollers, and a camera. Along with these primary components, the robot also uses several common electrical devices - motors, solenoids, and limit switches - which are responsible for moving the highlighter. The robot's only function is to solve word puzzles in a unique way without requiring human intervention. The goal of our robot is to inspire adolescents to consider computer and electrical engineering as possible future career paths. We also hope to demonstrate the potential that computer vision and robotics have to offer to society.

My STS research paper explores the morality of Samsung in their Galaxy Note 7 scandal. My research focuses on the judgement of Samsung's morality during their design and manufacturing stages of the Note 7, primarily through the lens of the care ethics framework. Care ethics

establishes the notion that morality is not based upon predefined, general moral principles but instead is formulated through roles and obligations present in our relationships with others. My claim is that Samsung failed to be a moral agent of care due to their inability to fulfil their obligations of consumer safety. My paper explores this idea, and breaks down four key areas of care ethics that demonstrate Samsung's failures: attentiveness, competence, responsibility, and responsiveness. The goal of my research is to demonstrate the importance of ethics in the professional engineering work environment.

Working on these two projects concurrently added value to both. My technical work gave me a better understanding of design regulations and how they relate specifically to electrical circuits, which provided context and background for my research paper. Specifically, I was able to better understand the decisions Samsung made in their smartphone designs and why they were not acceptable. Similarly, the research I conduct for my STS paper helped me realize the importance of the regulations that are set in place on product designs, and increased my willingness to strictly adhere to them during our design and manufacturing phases. In conclusion, work on my STS research paper and my technical project jointly has opened my eyes to the realities of professional engineering design and as a result greatly enhanced the quality of each other.