

Assignment 11.3: Senior Design Plan

Week 16

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EE 322 - A

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We pledge our honor that we have abided by the Stevens Honor System

Summary of Senior Design Plan

The Autonomous Roomba Cleaning System offers a comprehensive approach to resolving common inefficiencies in the current Roomba experience. Through a combination of software enhancements, material/component optimization, and streamlined repair services, our system aims to alleviate consumer concerns about household cleaning.

To ensure successful implementation, we employ a Gantt chart to guide the development process. Through ongoing experimentation with various components and software/firmware configurations, we aim to mitigate issues that arise during typical consumer use. By identifying optimal parts that minimize costs for both manufacturers and consumers, and by refining our mobile app to provide a seamless user experience, we establish a clear roadmap for product development. We recognize the importance of balancing the needs and interests of all stakeholders throughout this process.

Regarding hardware, we focus on minimizing unnecessary expenditures in the Roomba's design. If the navigation and cleaning software can function with reduced computational resources, we can reallocate those savings to other design areas. Additionally, we seek alternative materials that do not compromise cleaning effectiveness, contributing to a more efficient and cost-effective product.

Effective deployment of the cleaning system relies on robust communication between Roombas and the mobile app. A well-designed software solution ensures synchronized operation across all units, enhancing the overall cleaning experience. Using a Kepner-Tregoe (KT) decision and evaluation matrix, we prioritize key factors such as system performance and minimized repair requirements.

Our project represents an ideal senior design endeavor, offering meaningful improvements to a well-established technology. While the proposed changes may not be as visually striking, they deliver tangible benefits by addressing fundamental inefficiencies. By implementing our solution, we aim to enhance the consumer experience and create a more sustainable approach to automated cleaning.