Abstract for 2012 ASEE Student Poster Competition

Design of “Floor-Ba” - A Remote-Controlled Robotic Cleaner

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Do you know what a Roomba is? Well if not, it’s an autonomous robotic vacuum cleaner. The way the Roomba functions, it’s simply turned on and placed on the floor to be clean. It moves autonomously and it is assumed that it cleans the entire floor. However, how are you sure it cleans the entire floor? You’re not! This is where the design of the Floor-Ba comes from. Floor-Ba makes it so the whole floor is cleaned thoroughly in an interactive and fun manner.

This project provides the user with the ability to clean the floor with relative ease using a remote controlled cleaning device. This device will have the ability to either vacuum or mop, and the option to do both at the same time. In order to complete this project many physical and mechanical components must be designed and built, along with an electrical system that will be designed and integrated by combining electrical components from a remote controlled tank, a Swiffer Sweeper Vac, and a Swiffer Wet-Jet. The device will need to meet certain requirements that the team defined after some iterative refining process. The main requirements are: size limit of 2ft. x 2ft. x 1ft, weight limit of 20 lb, running time of 30 min, and operating range of 30 ft.

This junior engineering project proposes many engineering challenges that must be tackled in order to meet all of the requirements. These challenges range from making sure all components will fit on to the chassis, and finding a way to integrate the multiple electrical circuits. A special container will need to be designed to house the electronics so they cannot be disturbed. The design is on-going and is going to be wrapped up soon. The next phase of manufacturing, integration and testing will be implemented and finished before the Poster Competition in April. A final SolidWorks Model of the Floor-Ba can be seen below.

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Figure: Final Floor-Ba Design