



8.055 

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Objective

The BOSS, intends to use fluorescence and a camera for in vitro real-time imaging and sensing of fibroblast and fibrosarcoma cells, in order to help researchers understand the molecular make-up of these cells. This tool will be useful in imaging and creating a spectrum to analyze different chemical compounds in the cells. The BOSS is comprised of three high level subsystems: the fiber bundle, free space optics, and motor control.

Block Diagram

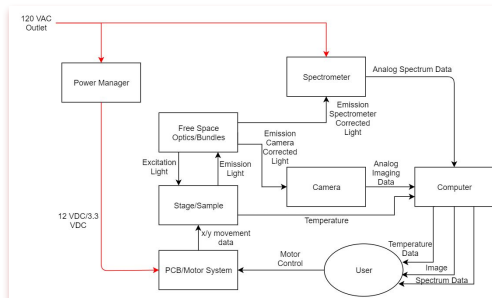


Fig. 1: BOSS Block Diagram

Custom PCB

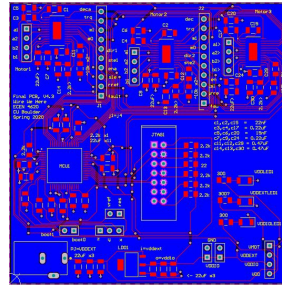


Fig. 3: Custom PCB Layout

Software Flow Diagram

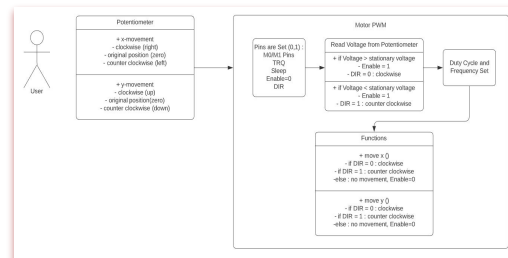


Fig. 2: Motor Control Software Flow Diagram

Acknowledgements

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COVID-19 and Rescope

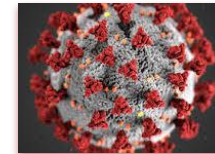


Fig. 4: COVID-19 Effects Our Project

Due to COVID-19 and transition to remote learning, we were unable to complete the initial project scope as we no longer had access to an proper lab equipment. We were only able to work on motor control code and parts of its integration to the mechanical stage.

Future Work

Looking forward, the BOSS is a modular product and could be successfully implemented by a future team. First, the alignment and build of the optical hardware must be completed. Next, the integration of the camera and spectrometer would need to be performed. Once these are completed, the LabView and motor control can be successfully integrated into the final product.