NJ3CT 3D Senior Design Individual Contributions

Lee Paolucci – Project Lead

As project lead, responsible for all communication with Senior Design Coordinator, as well as, organizing and facilitating deadlines for the entirety of the project. Additionally, one of two electrical engineers working on the project, and as such assisted with hardware design and implementation for NJ3CT. Specifically responsible for the circuitry that drove all motor control for the entire machine. Additionally, I helped facilitate communication with the mechanical team in order to help make design decisions and meet deadlines.

Karson Lorey – Hardware Lead

As Hardware Lead, I was responsible for maintaining and organizing all hardware the team worked with. This involved keeping track of the location and state of all hardware so that it was readily available and easy to use for prototyping and troubleshooting. As one of the two electrical engineers on the team as well, I also was responsible for designing the circuit board the team made. More precisely, I was given the overhead of designing the high-voltage control circuity. Or the circuity that was used to control the heating elements and DC Brushed motors on the project.

Brandon Leap – Documentation Manager

My two roles as a member of DT01 were as the Documentation Manager and a software developer for embedded systems. The responsibilities taken on as Documentation Manager were to compile documentation needed for components that the project consisted of and that created as part of the project into an easily accessible area. As an embedded software developer, I was primarily responsible for the development of an interface for the stepper motors that was capable

of moving specific distances accurately, as well as for the encoder that was used for the same purpose on the DC motors. Additionally, I developed an interface for reading files from an SD card. Once all software subsystems were finished, I worked cooperatively with Luke to integrate them into a cohesive system.

Luke Everhart – Software Lead

The individual responsibilities that I had in this project are mostly related to the software aspects of the system. My duties were to design the HMI (Human Machine Interface) for the project, interface with all temperature sensors utilized in the system, provide control for all heating elements, interface with the DC motors in the injection molder, and assist with the integration of all the parts. My work was focused around developing a GUI on a Raspberry Pi that interfaced with a lower-level microcontroller. I also wrote code for the microcontroller to process and distribute the necessary signals received from the HMI. This includes distributing PWM (Pulse Width Modulated) signals to h-bridge circuits and heating elements, interfacing with temperature sensors, packaging this all in a way that is accessible for the end-user and providing methods to troubleshoot the system.