**Abstract**

For the second laboratory assignment, the goal was to explore various sensors and actuators that could prove useful to the semester project. Experiments and test plans were designed and executed to be able to characterize and understand the sensors and actuators.

**Introduction**

The objective of this lab was to determine design requirements of various sensors and actuators and their operations. Through the characterization of the sensors and actuators the semester projects prototype schematic design was initiated. Open ended test scenarios were developed. Scenarios were created for different sensors and actuators which involved detailed testing setups and procedures.

**Results**

The various sensors and actuators were tested and the results agreed with the expected results from the test plans.

The RGB LED was wired to a bread board and connected to the ATMega328p microcontroller. By powering various variations of the R, G, and B pins different colors were lit. While the R, G and B pins were powered, a block of code was written to cycle through all the colors and that is what was seen in lab.

The servo motor was wired to a bread board and connected to the microcontroller. A simple block of code was taken from the Arduino library to cause the motor to do a sweeping function. Once the code was executed the motor was observed to sweep back and forth.

The temperature sensor was wired to the bread board and microcontroller along with a character LCD display. The display was to read data in from the temperature sensor and output the temperature reading. The display showed the correct temperature in the room. This was verified by looking at the set temperature for the room on the thermostat.

The infrared sensor was wired to the bread board and microcontroller. The IR sensor was to detect movement. Nothing else was used in collaboration with this because there is an LED along with the IR sensor package. When something was put in front of the sensor, the LED on the chip would turn on.