ECE Senior Design Weekly Report

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Team Name: The Globetrotters Lab Section: 4

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Week’s Task: Test the coils from the levitating speaker and other model. Measure the DC resistance in the coils. Start to wind our own coils, test and measure the DC resistance. Test sensors and components when they arrive.

Results: I measured the DC resistance of the small-scale model, it measured approximately 1.5k ohm. It has an inductance of 138 Henrys and a small capacitance of 0.012 nF. This capacitance is so small compared to the rest of the circuit; therefore, it can be neglected. Over the weekend, I was able to wind my own electromagnet from Chris’s magnetic wire, 24 AWG. I wound it around a 0.25-inch diameter by 2 inches length iron bolt. It has 475 turns and has a DC resistance around the same as the small scale, approximately 1.78k ohms. Like the small-scale, the capacitance was very small, in the pico-farads, and therefore the capacitance will be neglected. The inductance was around 1.2 Henrys. In addition, I helped Chris set up and test the H-bridge. We were able to produce the desired output when the H-bridge was hooked up to 12V. Furthermore, I continued to look into designing the PID controller using Simulink. By using Matlab we are able to find the transfer function for our control system by testing the model that we have. From this we can find the error constants and adjust the values accordingly.