ECE Senior Design Weekly Report

Engineer’s Name: Mark Luna Date: 4/27/17

Team Name: The Globetrotters Lab Section: 4, Thursday 12:30 PM

Week’s Task: Continue characterization of hall-effect sensors and devise methods to avoid electromagnets from interfering with the sensors when capturing data.

Results:

* Since the hall-effect sensors are not linear, we observed that for each pair in one direction of current flow, one of the sensors would increase faster than the other decreased and this would introduce errors when determining the difference between the two sensors of each pair, since the voltages would be the same at certain positions where the magnet would be placed above even though it was not centered. We attempted to correct for this error by finding a way to disable the electromagnets while sampling the sensors, and re-enable the electromagnets and turn off the ADC as soon as we have a result. This requires switching the ADC from auto-sample and auto-convert mode to manual mode so we can have control over when the sampling and conversions start in the code. One of the limitations so far is how long we are able to turn off the PWM signals while sampling and converting before we completely lose the PWM signal that we are trying to send to the electromagnets, and this will also depend on the amount of time it takes for the electromagnets to turn off completely and stop affecting the hall-effect sensors.