ECE Senior Design Weekly Report

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Week’s Task: This week I worked on adapting the rotation script I had previously written so that it can be controlled through voice commands and gesture control commands. Also, I did further research on inductive power transfer to power up the DC motor for the physical rotation, as well as exploring other options to achieve this. Finally, the rest of my allotted time was spent preparing for the group presentation.

Results: After this week’s work, we have an integrated rotation scripts that allows inputs from voice commands and gesture controls. This task was particularly tricky because the rotation script is running on an infinite loop, so a function injecting the commands must be an external function that can somehow interact with the running script. To overcome this challenge, I designed the main rotation script to read commands through a text file. This text file can be changed from an external python function that allows an easy interaction with the rotation script. Extending the interaction for the rotation also meant adding logic to handle different commands. This was implemented as a finite state machine, where some commands behave differently depending on the current state of the globe. Some of the commands include: stop, west, east, fast, faster, slow, slower. As well as giving the globe a longitude value as float, and rotating the globe towards the closest frame, and then stopping. I am currently still doing research on inductive power transfer, and I have begun the design of the physical rotation system, which will be implemented using a PIC24EP microcontroller as well as an H-bridge. To drive the motor we will need a power source that is able to provide 6 – 12v and around 200mA. Since we cannot use the microcontroller to drive the motor, we need our power source (inductive power vs battery) to power the whole system. We will need to include a Pulse Width Modulator to regulate the speed of rotation, and to be able to rotate the globe at different speeds. Further research and design will be my focus for the coming week.