ECE496 Weekly Status Report
Team GA-5
2016-03-07

Meeting Leader: N/A (Milestone 2)

Previous Goals and Progress Toward Those Goals

- Get guitar signal into the Raspberry Pi [Ryan, Jules] – Completed (Finally!) using the C ALSA library via USB.
- Design code which interprets guitar signal and tells the user which way to turn the knob [Ryan, Jules] – Completed.
- Begin solder work on perf board for motor control and amplifier/filter circuits [Shane/Duke/Michael] – Design work begun
- Built frame for motors [Duke/Michael] – Completed for three motors
- Re-solder bridge pickup to switch [Shane/Michael] – Re-soldered, but still doesn't work. Tried multiple ways, still having issues. Going to get a third opinion.

Goals for the Next Week (After Spring Break)

- Integrate motor control code to work with frequency control software [Ryan, Jules].
- Completely solder motor control circuit [Duke].
- Fix amplifier clipping issues [Michael, Shane].
- Software modifications and tunings where necessary [Ryan, Jules].

Unresolved Problems

- There is significant audio clipping and noise coming in via USB from sample audio to the Pi. This is causing dramatic inaccuracy in the software F.F.T. and is currently being investigated. The clipping is suspected to be caused by the amp's DC bias being too high or incorrect capacitances in the circuit. The cause of the noise has not been found, but may be related to the amp gain being too low. We are working to resolve these issues, but any comments on suspicions you have (which we will inquire about during the milestone) are welcome.
- The DC offset for the amplifier is measuring above the intended values for the amplifier circuit. The voltage divider on the positive rail voltage could be adjusted with a higher resistance to lower the DC component.
- The guitar is now being input through the USB port of the raspberry pi, which could have different operable voltages than the original design, which was optimized for use with the TIVA. The design may need to be changed. Below, we have listed an option of just buying an audio amplifier. This must be cost-evaluated to see if our budget can allow it.
- Since we have a different input that the TIVA, it is possible that we could now lower the center voltage of the amplifier while also increasing the gain, to improve the distinction of the signal.

Questions

Would it be more preferable to fix the analog amplifier we've designed or buy a dedicated audio amplifier like other groups have?

Other information

None.