ECE496 Weekly Status Report
Team GA-5
2016-02-29

Meeting Leader: Ryan Barker

Previous Goals and Progress Toward Those Goals

- Implement and test communication between the Tiva ADC and Raspberry Pi [Jules, Ryan] – See unresolved problems. Considering a design overhaul at the input of the circuit.
- Use new capacitors to test the amplifier circuit [Shane, Michael] – Amplifier works!
- Measure voltage output from strings 2 and 3 and design amplifiers for those strings [Shane, Michael] – Amplifiers designed for all strings
- Start designing PCB [Duke, Shane, Michael] – Decided to go with perf board for milestone 2
- Start building motor frame [Duke, Michael] – Waiting on motors to arrive
- Set up new motors with stepper drivers [Duke] – Motors have not arrived yet due to a postal service error. They will be integrated as soon as we have them.
- Update motor control code for new motor step values and multiplexers [Ryan] – Completed. Multiplexers have been successfully tested on each multiplex channel of the circuit, and the code now handles them. Additionally, the code was converted to a function with motor number, degrees, and direction inputs for use in the final design.

Goals for the Next Week

- Get guitar signal into the Raspberry Pi [Ryan, Jules]
- Design code which interprets guitar signal and tells the user which way to turn the knob [Ryan, Jules]
- Begin solder work on perf board for motor control and amplifier/filter circuits [Duke/Michael]
- Build frame for motors [Duke/Michael]
- Re-solder pickup bridge pickup to switch [Shane/Michael]

Unresolved Problems

- We have discovered some solder connections inside the guitar were loose and the pickups no longer work. This should be an easy and quick fix.
- I2C woes: Jules has met with two different TAs to try and figure out how to get signal out from the Tiva to the Raspberry Pi. Ryan and Jules have both downloaded Code Composer Studio and have been pointed to tutorial videos on how it works, but in becoming familiar with the interface, we haven't seen a ton of information related to I2C, which we need to use for communication. Neither of us are particularly comfortable with the bit-masking heavy programming style, and designing our own custom Simulink block is beginning to feel like a dead end. We are also concerned with meeting Milestone 2 with our current approach, so we are considering switching to using a USB-based input.

  Reasons to do this:
  - Reading from USB will be more straightforward.
  - Design simplicity and therefore design compactness. This means we only need one amplifier circuit and don't need the Tiva at all. The only thing taking significant space on the guitar itself would be the motor control circuit.
  - We have found when I2C communications on the Pi are enabled through the config menu, it causes the F.F.T. library we are using to break and hang indefinitely. Apparently I2C does something bad to the Pi's GPU, but this means we cannot use I2C and do F.F.T.'s at the same time.

  Disadvantages:
  - One input from the guitar into the system means the hexaphonic pickup is useless. This means we are (very reluctantly) losing the ability to utilize polyphonic tuning in the design.

Questions

None.

Other information

- Michael is sick and unable to attend the meeting on 2/29/2016