491 Weekly Status Report 6

3/15 - 4/5

Group 15

Project: Cryen

Client: Dr. Randall Geigar

Advisor: Dr. Chen Degang

Team:
- Justin Shaver - Meeting Facilitator
- Thomas Frye - Scribe
- Will Pigg - Lead Hardware
- Chandler Davis - Lead Software
- Daniel Bohlke - Test Engineer
- Caleb Hendrickson - Test Engineer

Weekly Summary

During this iteration each team member was responsible for a section of the design document along with their own individual tasks. We finally acquired the microcontroller that we plan to use in our design which will allow our software engineers to focus on the specifics of interfacing with the device. Moving forward the team will start putting the system together. We have also improved our documentation and presentation for the faculty meetings so our client and advisor have a better idea of the project status.

Past Week Accomplishments

- **Justin Shaver**
  - Conducted further research into pre-existing C libraries used to manipulate sound waves.
  - Tested various different data types to determine what is best for interacting with the ADC buffer.
- **Thomas Frye**
  - Loaded operating system onto RockPro.
  - Researched the RockPro hardware interfacing libraries focused on the GPIO headers and ADC/DAC functionality.

- ○ Built simple program and circuit as a proof of concept showing the functionality of the RockPro.
- **Will Pigg**
  - ○ Developed proof of concept showing the functionality of the stomp switches with the microcontroller.
  - ○ Sent out the second order of components including the LCD screens.
  - ○ Researched rotary encoders.
  - ○ Conducted initial power consumption tests with the hardware components that we plan to use in our design.
  - ○ Began CAD drawing of the prototype enclosure.
- **Chandler Davis**
  - ○ Created physical interface specifications for our device.
  - ○ Continued work for the UI that will be used in our design.
  - ○ Research the advantages and disadvantages of the operating systems compatible with the RockPro.
  - ○ Added an OS to microcontroller to test previous GUI work on the correct hardware.
- **Daniel Bohlke**
  - ○ Created new design implementation flowchart.
  - ○ Created design testing flowchart.
  - ○ Created many other documents for design document.
  - ○ Updated project flow chart for our client.
- **Caleb Hendrickson**
  - ○ Completed sections the design document (Software, Software Design Specifications, Proposed Design.
  - ○ Researched various aspects of digital signal processing (Fourier Transform, Floating-Point vs. Fixed-Point Processing).

Pending Issues

- **Justin Shaver**
  - ○ Need the RockPro to transfer current proof of concept ideas.
- **Thomas Frye**
  - ○ Need to spend more time researching ADC/DAC functionality on RockPro.
- **Will Pigg**
  - ○ Need to gain access to workshop for enclosure.
  - ○ Need to research GPIO pins and I/O to the RockPro64.
  - ○ Need to confirm ADC functions properly for RockPro64 I/O (RockPro has ADC and DAC pins).
- **Chandler Davis**
  - ○ Need to research accessing GPIO pins and I/O devices through back-end code.
  - ○ Need to research how the knobs function with the microcontroller.

Individual Contributions

Name	Individual Contributions	Hours	Total
Justin Shaver	● Research in existing C libraries for audio manipulation ● Testing ADC buffers	8	29
Thomas Frye	● Loaded OS on RockPro ● Researched RockPro libraries for interfacing with hardware ● Built program and circuit for demo	16	38
Will Pigg	● Developed PoC showing stomp switch functionality ● Ordered more components ● Tested power consumption of current hardware ● Initial CAD drawings for enclosure	20	43
Chandler Davis	● Physical interface specifications ● Worked on UI ● Researched OS for RockPro ● Tested current UI design on RockPro	17	40
Daniel Bohlke	● Created testing flow charts ● Created project plan flow chart	16	35
Caleb Hendrickson	● Worked on design document ● Extensive research in digital signal processing	19	42

Plans for Upcoming Week

- **Justin Shaver**
  - Implement current C studies on the actual Rock Pro.
- **Thomas Frye**
  - Use RockPro to interface with other hardware components - audio inputs/outputs, buttons, knobs.
  - Research ADC/DAC functionality on RockPro
  - Develop proof of concept comparing the RockPro onboard ADC/DAC and a dedicated ADC.
- **Will Pigg**
  - Complete the CAD drawings for the enclosure

- ○ Develop proof of concept for rotary encoders, stomp switches, and analog input.
- ○ Further research the RockPro64 input and output requirements to have our system function.
- ○ Make a fully functioning guitar circuit that would simply adjust and turn off the guitar signal.
- ○ Learn MultiSim drawing.
- **Chandler Davis**
  - ○ Need to get hardware (knobs, etc.) to affect the elements of the GUI, like scrolling through menus, etc.
  - ○ Need to get GUI selectable options to adjust some aspect of hardware.
- **Daniel Bohlke**
  - ○ Start working with others on the Block Diagram that our client wants.
  - ○ Help out wherever needed in setting up RockPro connections.
- **Caleb Hendrickson**
  - ○ Make significant progress on proof of concept for our audio processing.
  - ○ Create flowchart/block diagram for dataflow.

Summary of Weekly Advisor Meeting

The faculty meeting was focused on documentation practices to insure that our client and advisor have a good idea of our project status. We presented detailed project flow diagram detailing our design process steps and goals and milestones. Our advisor gave us suggestions on testing the hardware components we currently have selected for our design. He also emphasized that we need to have a firm grasp on audio signal processing before we can move forward in the project.