**WNR (Wireless Neural Recorder)**

Rice University

Weekly Progress Report 12

11/25/2015 - 12/3/2015

**Agenda for meetings**

Mentor Meeting:

1. Analog front-end updates with Intan Chip and LVDS converter.
2. Issues with MSP430F5438A in wireless communications.
3. Compression Updates

**Activities this week**

1. The wires on the Intan Adapter did not have pinouts, so we returned the adapter to Intan, who then shipped out the pinout adapter board.
2. Intan Chip power issue discovered and resolved.
   1. The Intan Chip + LVDS was pulling the voltage rail on the FreeScale Freedom board to ground.
      1. We are temporarily using the Freedom board for AFE development due to a lack of TI components and ease of use.
   2. For now, we will power the LVDS and Intan Chip from an external power supply
3. TI MSP430F5438 + TI CC2564 development is continuing.
   1. Changing IDE environments and re-downloading the SDK allows the code to compile and be loaded on the MCU
4. Received ECoG data from Rakesh; can test compression on live data.

**Problems encountered**

1. SPI communication with Intan Chip is still not working.
   1. Although the power issue is resolved, 0s are still only being read out.
2. TI CC2564 + TI MSP430F5438 Bluetopia Bluetooth SDK cannot be initialized on the MSP
   1. The error seems to stem from the fact that the MSP430F5438 does not seem to see the CC2564; however there are no leads as to why this is the case
   2. Will have to keep debugging and looking around.
   3. If this issue cannot be resolved in a timely manner, then we can switch to a simpler board for prototyping purposes.
3. ECoG data from Rakesh is very confusing and has many variables; we do not know which variable or file contains the actual data.

**Time devoted to project this week**

|  |  |  |
| --- | --- | --- |
| **Name** | **Tasks Accomplished** | **Hours Spent** |
| Stephen Xia | * TI MSP430F5438 + TI CC2564 Bluetooth development | 9 |
| Tingkai Liu | * Intan RHD2000 series analog front-end development | 9 |
| Xin Huang | * TI MSP430F5438 + TI CC2564 Bluetooth development | 4 |
| Yuan Gao | * Huffman Encoding/Compression test and effectiveness characterization | 4 |
|  | **Team Total** | 26 |

**Meetings Minutes**

Mentor Meeting – 12/3/2015, 12:30PM - 1:30 PM

Attendees: Stephen Xia, Tingkai Liu, Xin Huang, Yuan Gao, Gary Woods, Hamed Rahmani, Nitin Tandon

Location: OEDK Big Classroom

Completed objectives:

1. Analog Front-End:
   1. Voltage rail issue resolved:
      1. The addition of the RHD2000 + LVDS converter was pulling the voltage supplied from the FreeScale Freedom board’s voltage to 0.
         1. Will power from an external power source
   2. 0s are still being read out
      1. SPI communication does not seem to be working still.
      2. Will try writing to the chip and observing what happens
2. Wireless Transmission
   1. Downgrading the IDE seems to have solved the issue of not being able to compile and load the demo code onto the boards.
   2. However, the demos don’t work because the MSP430F5438 cannot initialize the Bluetopia Bluetooth stack.
      1. upon further inspection, the MSP5438 does not seem to see the CC2564
   3. Will have to keep debugging; will have updates for the final design review.
3. Compression:
   1. The data received from Rakesh is very confusing
   2. Dr. Tandon looked at data and concludes that Rakesh has already processed the data.
      1. Dr. Tandon says he will get raw data to us in the next few days
4. Items requested by Dr. Nitin Tandon
   1. Document of all the specifications, problems, and constraints.
      1. Include the calculation of power for all different specifications (e.g. what is power if we use Bluetooth, transmitting at 1 Mbps, etc.)
      2. Create an equation of power based on different frequency parameters
      3. Include a dream list or ideal list of specifications and parts

**Expenditures**

* 1 x C3420 RHD2000 wire adapter for 36-pin connector (Returned): -$190
* 1 x C3410 RHD2000 electrode adapter board for 36-pin connector: $255
* Total: **$65**

**Action items list**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action item** | **Owner** | **Due date** | **Status** |
| Research compression algorithms | Yuan Gao | 12/11/2015 | 70% |
| TI MSP430F5438 + TI CC2564 Bluetooth Development | Stephen Xia | 12/11/2015 | 5% |
| Intan RHD2000 series development | Tingkai liu | 12/11/2015 | 10% |

**Additional Comments/Questions for Mentors**

* Dr. Tandon mentions that he will not be able to attend the fall design review scheduled for next week.