**WNR (Wireless Neural Recorder)**

Rice University

Weekly Progress Report 14

1/18/2016 - 1/14/2016

**Agenda for meetings**

Undergraduate Meeting:

1. Logistics for the semester and namely Cycle III (weekly meetings, competitions, documents, etc.)
2. Reanalysis of wireless transmission scheme
3. Reanalysis of Analog Front-End
4. Reanalysis of Compression

**Activities this week**

1. First meeting of the week amongst undergraduates to set up logistics and goals for the semester.

**Problems encountered**

1. Difficult to set up meeting with new schedules for the semester to fit in with Dr. Tandon’s availability.

**Time devoted to project this week**

|  |  |  |
| --- | --- | --- |
| **Name** | **Tasks Accomplished** | **Hours Spent** |
| Stephen Xia | * Meetings and Logistics | 1 |
| Tingkai Liu | * Meetings and Logistics | 1 |
| Xin Huang | * Meetings and Logistics | 1 |
| Yuan Gao | * Meetings and Logistics | 1 |
|  | **Team Total** | 4 |

**Meetings Minutes**

Mentor Meeting – 1/13/2016, 4:00PM - 5:00PM

Attendees: Stephen Xia, Tingkai Liu, Xin Huang, Yuan Gao

Location: Brochstein Pavilion

Completed objectives:

1. Logistics
   1. Have to set up weekly meetings with faculty and Dr. Tandon; hopefully we will be able to get the same or a similar slot
   2. We have to register for competitions; Xin will be in charge
2. Reanalysis of BLE (Nordic nRF52): Stephen
   1. With a 7.5 ms connection interval, 6 packets per interval, 20 bytes per packet, we can achieve 128 kbps on the Nordic nRF52 board.
   2. For one probe we require 1000 samples per second per channel, 16 channels, 8-bit precision per channel, which is 128 kbps per probe.
   3. It seems as though one BLE connection will provide enough throughput (may require a little bit of compression) for one probe; we need to look more into the Nordic nRF52 framework because if we are able to move back to BLE, we will see significant improvements on all fronts.
3. Reanalysis of AFE (Intan Chip): Tingkai
   1. Last semester we were seeing a huge current draw (~20 mA) from the Intan Chip + LVDS; we need to replicate the tests, possibly using better equipment in Dr. Aydin Babakhani’s lab, to verify.
4. Reanalysis of Compression:
   1. Need to implement and test compression/mini LZO on a microcontroller (such as a Nordic nRF52 board) because this is the platform that we will be dealing with.

**Expenditures**

* N/A

**Action items list**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action item** | **Owner** | **Due date** | **Status** |
| Characterize/Verify BLE throughput on Nordic nRF52 theoretically | Stephen Xia | 1/21/2016 | 0% |
| Run SPI test to read data and measure power consumption | Tingkai Liu | 1/21/2016 | 0% |
| Implement and characterize compression algorithm (like miniLZO) | Yuan Gao | 1/21/2016 | 0% |
| Sign up for competitions | Xin Huang | 2/26/2016 | 0% |

**Additional Comments/Questions for Mentors**

* For the next coming weeks, we have to be extra careful in our analysis of wireless transmission schemes. We have already switched from Bluetooth to BLE and now we are thinking of switching back to BLE because we seem to have miscalculated the capacity of BLE.