**WNR (Wireless Neural Recorder)**

Rice University

Weekly Progress Report 8

10/23/2015 - 10/29/2015

**Agenda for meetings**

Mentor Meeting:

1. Go over power consumption and bandwidth feasibility with Dr. Tandon
2. CC2650 wireless transmission updates
3. Discuss how to pay for the Intan Chip using funds from two different sources
4. Discuss how to obtain intracranial EEG data

**Activities this week**

1. Continue development of wireless transmission scheme using CC2650 and Nordic Labs boards

**Problems encountered**

1. Working on CC2650 is still slow; still trying to understand code and documentation
2. Nordic Labs SDK still not set up

**Time devoted to project this week**

|  |  |  |
| --- | --- | --- |
| **Name** | **Tasks Accomplished** | **Hours Spent** |
| Stephen Xia | * CC2650 BLE development | 5 |
| Tingkai Liu | * Confirm Intan Chip specifications and costs * CC2650 BLE development | 5 |
| Xin Huang | * Finish battery research * Nordic Board BLE development | 5 |
| Yuan Gao | * Nordic Board BLE development | 5 |
|  | **Team Total** | 20 |

**Meetings Minutes**

Mentor Meeting – 10/29/2015, 12:30PM - 1:30 PM

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

Completed objectives:

1. Dr. Tandon did not show up, so we did not present our power and bandwidth feasibility
2. Buying the Intan Chip:
   1. Require funding from two sources (ECE department and OEDK)
      1. We can place the order in one department and transfer funds between departments
3. CC2650:
   1. Figured out the general framework of CC2650
   2. Aim to have something custom transmitting next week
   3. Probably has enough memory to run a compression algorithm
4. EEG Data:
   1. No response from Dr. Tandon or Behnaam
      1. Talk to them directly or their graduate students, who should have data
5. Compile a list of questions to ask Dr. Tandon
   1. How low can we sample the data?
      1. Most papers only display up to 30 Hz on the spectrum
      2. If we lower the sampling rate to around 250 Hz, we can get the data rate to around 0.5 Mb/s, which is supported by BLE.
         1. Otherwise, we may have to heavily compress the data
   2. Can we get physical needle?
6. FOSS II Goals:
   1. Characterize maybe only one environment
   2. Possibly require an error correction mechanism (TCP or error correction code)
7. For Next Time:
   1. Order the Intan AFE Chip
   2. Create Slides for Dr. Tandon next week
   3. Obtain EEG data and run compression algorithms to test efficiency
   4. Get transmission and incorporate Intan Chip

**Expenditures**

* N/A

**Action items list**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action item** | **Owner** | **Due date** | **Status** |
| Survey analog front-end chips for neural recording | Tingkai Liu | 10/29/2015 | 100% |
| Research analog front-end circuits for high SNR amplification | Stephen Xia | 10/29/2015 | 100% |
| Battery module research/survey | Xin Huang | 10/23/2015 | 100% |
| Intan Chip/Analog front-end power consumption research | Tingkai Liu | 10/23/2015 | 50% |
| Wireless transmission power consumption research | Stephen Xia | 10/23/2015 | 50% |
| Research compression algorithms | Yuan Gao | 10/23/2015 | 30% |
| CC2650/CC2640 BLE Development | Xin Huang | 10/23/2015 | 40% |
| Nordic Labs BLE Development | Tingkai Liu | 11/04/2015 | 10% |

**Additional Comments/Questions for Mentors**