**WNR (Wireless Neural Recorder)**

Rice University

Weekly Progress Report 10

11/06/2015 - 11/12/2015

**Agenda for meetings**

Mentor Meeting:

1. FOSS II Evaluations
2. Discuss next steps for wireless transmission

**Activities this week**

1. Continue Nordic nRF development
2. Still waiting on Intan Chip to arrive

**Problems encountered**

1. The data rate for BLE is too low. This is going based off of the Nordic board. We will have to switch to a higher bandwidth protocol

**Time devoted to project this week**

|  |  |  |
| --- | --- | --- |
| **Name** | **Tasks Accomplished** | **Hours Spent** |
| Stephen Xia | * Nordic nRF52 BLE development * Wireless transmission power consumption research | 11 |
| Tingkai Liu | * Nordic nRF52 BLE development * Analog front-end power consumption research | 11 |
| Xin Huang | * Exploration into alternative wireless protocols * Look into TCP and other error control mechanisms | 3 |
| Yuan Gao | * Huffman Encoding/Compression test and effectiveness characterization | 5 |
|  | **Team Total** | 30 |

**Meetings Minutes**

Mentor Meeting – 11/12/2015, 12:30PM - 1:30 PM

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

Location: OEDK big classroom

Completed objectives:

1. FOSS II Evaluation:
   1. Wireless Transmission:
      1. BLE does not have enough bandwidth:
         1. Nordic nRF52 are limited to the connection interval, which is every 7.5 ms; max packet = 20 MB; overall the maximum throughput is only 128 kbps, which is only ¼ of the 500 kbps target after compression.
         2. Abandoning Nordic nRF52 development.
         3. Will look into more options (Wi-Fi and Bluetooth Classic)
   2. Analog Front-End:
      1. Purchases were made last week; still waiting for the parts to arrive.
   3. Live ECoG Data:
      1. The CITI training was completed and we have been added onto the IRB
      2. Requested data from Dr. Tandon and Dr. Aazhang; still waiting
   4. Compression:
      1. Huffman Encoding only seems to compress by 50% on sorted data; will have to test on live data
      2. However, if we use a higher bandwidth protocol, there may be no need for compression.

**Expenditures**

**Action items list**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action item** | **Owner** | **Due date** | **Status** |
| Research Wi-Fi Protocol and Components | Xin Huang | 12/11/2015 | 10% |
| Intan Chip/Analog front-end power consumption research | Tingkai Liu | 11/12/2015 | 100% |
| Wireless transmission power consumption research | Stephen Xia | 11/12/2015 | 100% |
| Research compression algorithms | Yuan Gao | 12/11/2015 | 70% |
| CC2650/CC2640 BLE Development | Xin Huang | 11/12/2015 | 100% |
| Nordic Labs BLE Development | Tingkai Liu | 11/12/2015 | 100% |
| TCP/UDP and other error control mechanisms | Xin Huang | 11/12/2015 | 100% |

**Additional Comments/Questions for Mentors**