**WNR (Wireless Neural Recorder)**

Rice University

Weekly Progress Report 20

2/19/2016 - 2/25/2016

**Agenda for meetings**

Cycle III Design Review:

1. Go over Cycle III objectives with advisor

**Activities this week**

1. Wireless Transmission:
   1. Nordic nRF52 transmission from multiple peripherals to one central is achieved and data rate is characterized
2. Compression:
   1. A new algorithm, Heatshrink, was found and implemented on Nordic nRF52; Compression results are comparable, if not slightly better than MiniLZO results.

**Problems encountered**

1. Wireless Transmission
   1. Multi-link was much harder to get working because it required us to analyze and write code at a much lower level
2. Compression
   1. Although the MiniLZO code could fit on the Nordic nRF52 ROM, it required way more RAM than the nRF52 board could supply

**Time devoted to project this week**

|  |  |  |
| --- | --- | --- |
| **Name** | **Tasks Accomplished** | **Hours Spent** |
| Stephen Xia | * Continuously transmit data over BLE from at least two peripheral devices to a central device * Characterize data rate while transmitting continuously over BLE from at least two peripheral devices to a central device * Implement a compression algorithm (like LZO) on Nordic nRF52 * Documentation | 61 |
| Tingkai Liu | * Continuously transmit data over BLE from at least two peripheral devices to a central device * Characterize data rate while transmitting continuously over BLE from at least two peripheral devices to a central device * Implement a compression algorithm (like LZO) on Nordic nRF52 * Documentation | 61 |
| Xin Huang | * Continuously transmit data over BLE from at least two peripheral devices to a central device * Characterize data rate while transmitting continuously over BLE from at least two peripheral devices to a central device * Documentation | 36 |
| Yuan Gao | * Implement a compression algorithm (like LZO) on Nordic nRF52 * Documentation | 39 |
|  | **Team Total** | 197 |

**Meetings Minutes**

Cycle III Design Review – 2/25/2016, 12:00PM - 1:00 PM

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

Location: OEDK 104

Completed objectives:

1. Wireless Transmission
   1. 128 kbps achieved for one connection
   2. Seems to draw 6.0 mA while running at this rate, which is close to the datasheet value
   3. Multiple peripherals to one central was implemented
      1. No matter how many things devices are connected, throughput plateaued at around 60 kbps (we used the old firmware, not the firmware that enabled 128 kbps for one connection)
2. Analog Front-End
   1. Data is confirmed to have the correct spectral components, though the waveform is still very noisy
   2. Power is also very much constant (~20 mA) no matter at what frequency you sample at
3. Compression
   1. Can achieve up to 50 - 60% compression using the heatshrink algorithm
   2. Implemented on Nordic nRF52 board

**Expenditures**

* N/A

**Action items list**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action item** | **Owner** | **Due date** | **Status** |
| Continuously transmit data over BLE from at least two peripheral devices to a central device | Stephen Xia | 2/25/2016 | 100% |
| Characterize data rate while transmitting continuously over BLE from at least two peripheral devices to a central device | Stephen Xia | 2/25/2016 | 100% |
| Implement a compression algorithm (like LZO) on Nordic nRF52 | Yuan Gao | 2/25/2016 | 100% |
| Documentation | Xin Huang | 2/26/2016 | 100% |

**Additional Comments/Questions for Mentors**