**WNR (Wireless Neural Recorder)**

Rice University

Weekly Progress Report 16

1/23/2016 - 1/28/2016

**Agenda for meetings**

Mentor Meeting:

1. Updates on BLE
2. Updates on Analog Front-End
3. Updates on Compression

**Activities this week**

1. Wireless Transmission:
   1. Still attempting to get continuous transmission from one peripheral to central
2. Analog Front-End:
   1. Fatal error still not resolved
3. Compression:
   1. Begin implementation on Nordic nRF52

**Problems encountered**

1. Wireless Transmission
   1. Single link transmission just hangs most of the time when transmitting as fast as possible; have not found reason yet
2. Analog Front-End and SPI:
   1. Fatal error still not resolved and we are not sure what the reason behind this is.
3. Compression
   1. Memory errors
   2. We cannot flash to device, even though there should be enough RAM to store the code. There are currently no leads to resolving this issue

**Time devoted to project this week**

|  |  |  |
| --- | --- | --- |
| **Name** | **Tasks Accomplished** | **Hours Spent** |
| Stephen Xia | * Continuously transmit data over BLE from one peripheral to central device * Characterize data rate while transmitting continuously over BLE from one peripheral to central device | 10 |
| Tingkai Liu | * Run SPI test to read data off Intan Chip to read data and measure power consumption * Read “fake” data from Intan Chip through SPI and display to confirm the data is actually being received using Nordic nRF52 | 10 |
| Xin Huang | * Sign up for competitions | 3 |
| Yuan Gao | * Implement and characterize compression algorithm (like MiniLZO) * Implement a compression algorithm (like LZO) on Nordic nRF52 | 12 |
|  | **Team Total** | 35 |

**Meetings Minutes**

Mentor Meeting – 1/28/2016, 12:00PM - 1:00 PM

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

Location: OEDK 104

Completed objectives:

1. Wireless Transmission
   1. Still trying to get single link continuous transmission working
      1. Working off of the uart example currently.
      2. However, the EKG example seems to already have support for continuous data transmission; will look into this example
   2. Right now, it seems to just hang or hard fault whenever the devices connect and begin transmission
2. Analog Front-End
   1. The SPI still just hard faults; there is still no leads into solving this issue
3. Compression
   1. Memory issue with flashing data onto Nordic board
   2. We need to consider a few points
      1. What do you do if buffer is full?
      2. Memory should be enough.
      3. Can it compress interleaved channels of data, or would we have to de-tangle data before compression?
      4. There will probably be two buffers: an input buffer and a buffer for transmission after the data has been compressed
         1. What do you do if these two buffers overflow?
4. Competitions we are considering
   1. Global Health Devices
   2. IEEE EMBS
   3. Cannot do TI design challenge anymore since we are not using TI products

**Expenditures**

* 5 x nRF52 Nordic Development Kit: $356.25
* 2 x nRF51 Nordic Development Kit: $142.50
* 2 x Cypress CY5670 BLE Dongle: $33.76
* 2 x nRF51 Nordic BLE Dongle: $97.5
* Total Expenditures: **$630.01**

**Action items list**

|  |  |  |  |
| --- | --- | --- | --- |
| **Action item** | **Owner** | **Due date** | **Status** |
| Run SPI test to read data and measure power consumption | Tingkai Liu | 2/25/2016 | 30% |
| Implement and characterize compression algorithm (like miniLZO) | Yuan Gao | 2/25/2016 | 20% |
| Sign up for competitions | Xin Huang | 2/26/2016 | 100% |
| Continuously transmit data over BLE from one peripheral to central device | Stephen Xia | 2/25/2016 | 10% |
| Characterize data rate while transmitting continuously over BLE from one peripheral to central device | Stephen Xia | 2/25/2016 | 10% |
| Continuously transmit data over BLE from at least two peripheral devices to a central device | Stephen Xia | 2/25/2016 | 0% |
| Characterize data rate while transmitting continuously over BLE from at least two peripheral devices to a central device | Stephen Xia | 2/25/2016 | 0% |
| Characterize power consumption of Nordic nRF52 board | Xin Huang | 2/25/2016 | 0% |
| Read “fake” data from Intan Chip through SPI and display to confirm the data is actually being received using Nordic nRF52 | Tingkai Liu | 2/25/2016 | 10% |
| Characterize/confirm power consumption of the Intan Chip + accessory devices (like LVDS) | Stephen Xia | 2/25/2016 | 0% |
| Implement a compression algorithm (like LZO) on Nordic nRF52 | Yuan Gao | 2/25/2016 | 10% |
| Achieve at least 20% compression on raw data | Yuan Gao | 2/25/2016 | 0% |

**Additional Comments/Questions for Mentors**