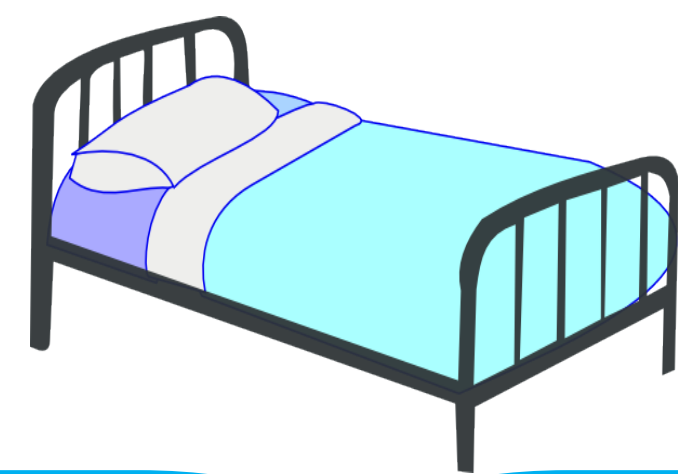# The Dream Team
A Restless Leg Syndrome Monitoring System
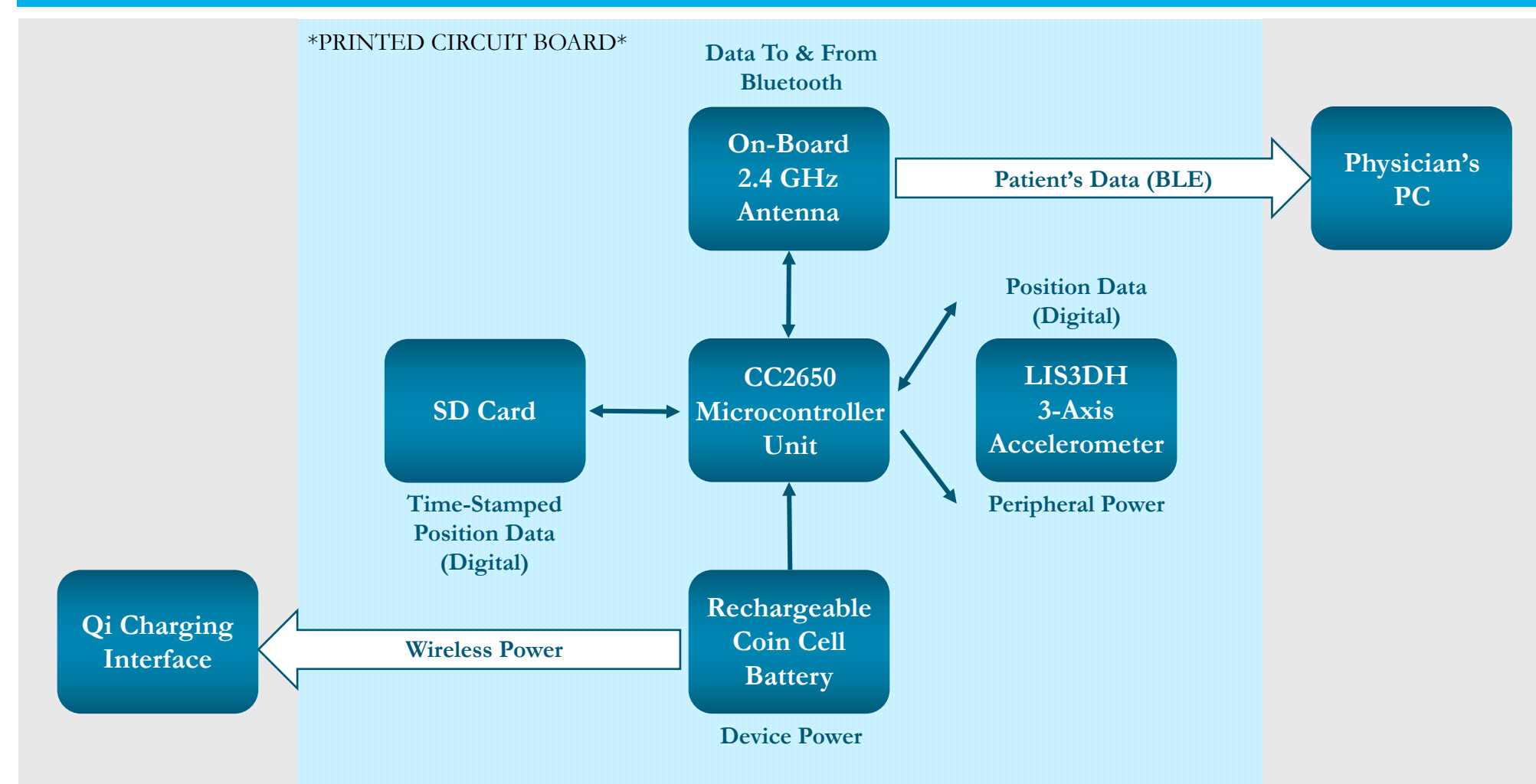
Isabel Anderson, Mauricio Builes, James Grusy, Xavier Williams | Emory Sleep Clinic
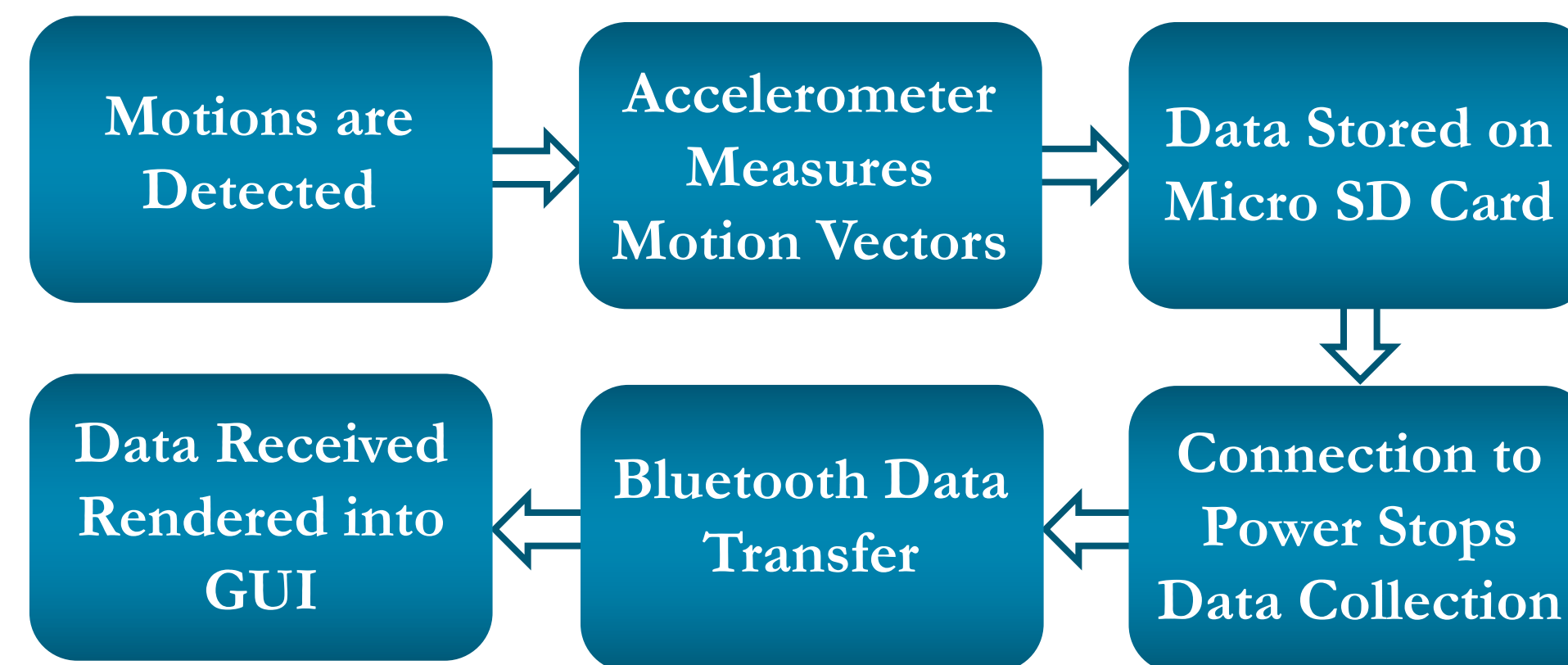
Proposal from Emory

To develop a patient worn sensor package to measure patient limb accelerations in the context of Restless Leg Syndrome or Periodic Limb Movements, send the data back to the Sleep Center, and render it in a fashion useful to clinicians. The current hardware used at the Emory Sleep Clinic is cumbersome as well as expensive for the patient.

Project Overview

Procedure

- Motions are Detected
- Accelerometer Measures Motion Vectors
- Data Stored on Micro SD Card
- Connection to Power Stops Data Collection
- Bluetooth Data Transfer
- Data Received Rendered into GUI

Project Requirements

- Data Collection of limb acceleration
- Data rendering and identification on PC
- Wirelessly transmitted data
- Sealed enclosure
- Cleanable device
- No user interface for patient
- Battery life of at least 5 days

Rendered GUI
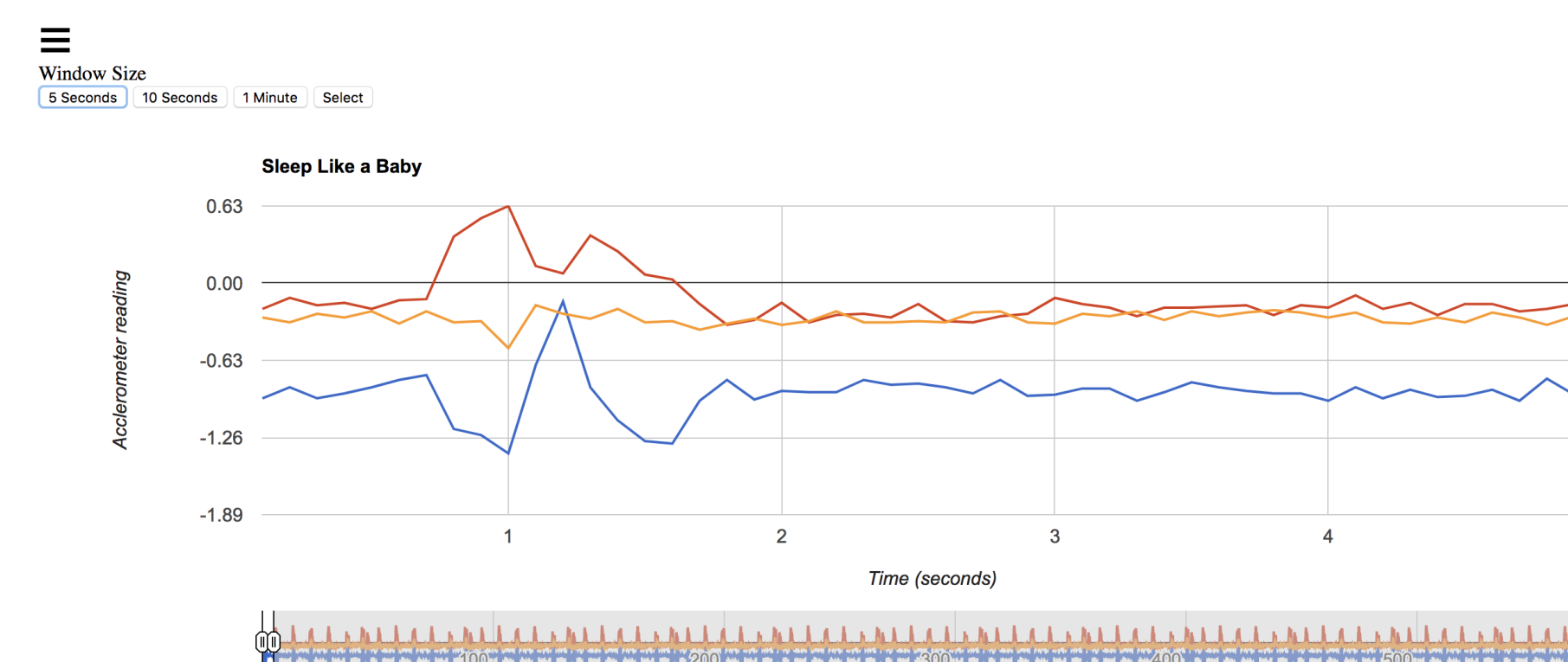
Achieved

- Designed and Soldered Components on to Custom Printed Circuit Board (PCB)
- GUI renderings of full data duration as well as smaller durations selected graphically
- Qi Wireless Charging
- GUI can be annotated with points
- Rendering in a browser as a JavaScript application served locally via Node.js

Issues & Difficulties

- The Debugging/Flashing of the uC
- The CC2650 proves difficult to program "over the air"
- Accessing Bluetooth from the TI CC2560 microcontroller environment
- Communication with the accelerometer, SD card, and external Bluetooth node

Contact

- Sponsor: Emory Sleep Clinic
- Advisor: Dr. Whit Smith
- Website: http://ece4012y2017.ece.gatech.edu/fall/sd17f22/

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