Introduction

- Problem
 - Over 2000 infants die from Sudden Infant Death Syndrome (SIDS), every year
 - The underlying causes of SIDS are unknown Ο
- Solution
 - In order to further research, and investigate possible causes, more data is needed Ο
 - This data collection method needs to provide some benefits to users as well as researchers 0
 - Current infant monitoring solutions can be expanded to record and upload biometric data 0

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Adaptive Wireless Neuro-Stimulator

Team Members

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Faculty Advisor



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Design Requirements

- Functional requirements
 - Wearable: 0
 - Biometric sensors (temperature, heart rate, accelerometer)
 - Vibration motor for feedback
 - Has Bluetooth capability
 - Vibrates according to internal algorithms based on read data
 - Ability to store 3-7 days worth of data
 - Android Application:
 - Connects to wearable via Bluetooth



Design Approach

- Project split into 3 main components
 - Wearable
 - Prototype hardware
 - Records biometrics over time
 - Sends the recorded data to Android App over Bluetooth
 - Android App
 - Mobile app for monitoring the current state of device
 - Uploads data to web server through REST endpoints
- Website
 - Provides interface for researchers to view historical data • Can specify data constraints for what you want to view Visualizes historic data in graphs

- Uploads data to database from wearable
- User must login
- Information displayed in real-time
- Web Application
 - Requires login
 - Data is pulled from database
- Non-functional requirements
 - Data is focused on needs of researcher
 - Secure 0
 - All applications are user friendly
- Operating environment
 - Research environment oriented 0
- Engineering Constraints
 - Low power
 - Minimal storage allowed
 - Single threaded scheduling 0
 - Targeted low cost





Relevant Standards

• HIPPA - as we are dealing with personal medical data • IEEE 802.15.1 - WPAN/Bluetooth



June

Submit

Northern Hemisphere Southern Hemisphere



- Wearable
 - Environment testing was not necessary due to being proof of concept
 - Manual system testing to verify part functionality
 - All code testing was automated by supplying parameters to functions and checking return
- Android Application
 - Manual testing of each successive iteration of the UI
 - Dummy data used to test Bluetooth and data posting
- Website
 - Automated script for functional endpoint tests
 - Manual usability testing of the input form