

## sdmay18-12: Pilot Biometrics - ECG waveform captures

Week 5 Report

September 29 - October 13

### Team Members

Zachary Glanz — *Driver Design Lead*

Andrew Jones — *Algorithm Design Lead*

David Kirpes — *Circuit Design Lead*

Justin Bader — *PCB Design Lead*

Kory Gray — *Operating Systems Lead*

Ryan Gallus — *Team Lead*

### Summary of Progress this Report

For the past two weeks, our team has focused on researching and testing various design elements of our ECG sensor harness device. We have been researching how to efficiently store ECG waveform data in a form that we can analyze on a microcontroller, and also exploring various standards that apply to storing medical information. We are also considering how to encrypt the data for storage. For data storage, we are researching storage and performance requirements to determine what kind of memory our PCB will need. We are also researching our software filter design, looking for similar waveform filters in high vibration environments. Outside of this research, team members are continuing work on installing micro C linux onto the microcontroller board and testing the ADC with various waveform inputs.

### Pending Issues

Without access to the ECG sensors, it is difficult to make progress on the software filter. We can continue to do research and write some of the software, but it will require significant testing and reevaluation once the sensors arrive. We have our license for micro C linux now, but limited memory on the board is making it difficult to install. We are exploring using a board support package.

### Plans for Upcoming Reporting Period

Continue researching storage requirements and standards. Begin researching methods of inducing stress for testing the ECG sensors (look at studies on cognitive workload). Begin interfacing the ADC with the microcontroller to read in an arbitrary waveform. Begin designing the algorithm to store and analyze waveform data.

### Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Zachary Glanz	Getting to finalizing whether we decide on an existing BSP or porting a specific version of linux.	6	19
Andrew Jones	Started researching coding language Octave for use in the main algorithm. Also started researching best way to get resting ECG	6	19

	readings of an individual.		
David Kirpes	Worked on testing the ADC evaluation board. Continued research of ECG capture methods and implementation.	6	20
Justin Bader	Worked on testing the ADC evaluation board. Looked into the standards toward storing medical data in a military environment. Researched algorithms/Software filtering strategies to allow us to filter the ECG waveform in a high vibration environment.	8	21
Kory Gray	I looked into package managers to potentially install micro c linux. Also researched possible methods to handle storage, possible external storage methods. Researched more into ECG storage standards.	6	19
Ryan Gallus	Researched data storage requirements for 4-5 hours of ECG waveform data, as well as memory options for PCB. Researched standards for storing medical data and other applicable military standards that may apply. Started looking at algorithm design for storing, processing, and transmitting waveform data.	8	23