

Impedance Cardiography

Clients:

Prof. John Webster

Elena S. Bezrukova

Team Members:

Kim Safarik (Leader)

Jacob Meyer (Communicator)

Terra Gahlman (BSAC)

David Schreier (BWIG)

Nov 20th to Dec 3rd

Project Statement:

Impedance cardiography is a medical procedure utilized in order to noninvasively analyze and depict the flow of blood through the body. Traditionally, four electrodes are attached to the body, two on the neck and two on the chest, which take beat by beat measurements of blood volume and velocity changes in the aorta. However, this system suffers from degrees of inaccuracy, possibly due to the fact that the electrodes are placed too far from the heart. As a result, it is our collective goal to design an accurate, reusable, and spatially specific impedance cardiograph system that ensures accurate and reliable readings.

Current Design Goals:

- Finalize Poster
- Discuss and recap on the project with Professor Webster

Project Status Summary:

During these final two weeks of design our team has advanced the project a great amount. We have perfected our amplifier and built a filter on it in order to filter out the EKG in our signal in accordance with our client's specifications. Also, we have perfected our prototype to better fit the needs of the project. We have soldered wire onto the electrode leads and then threaded this wire through our silicone base, tying it in a knot in order to better secure the electrode placement. Also we have attached nylon plastic to the edges of the silicone base in order to reinforce the strength of the otherwise compromised slits made in the silicone. When

testing the initial prototype we had discovered that some of the electrodes had been permanently damaged during the soldering process, thus we had to test and check all the leads. Also, we attempted to filter out the EKG and discovered our created filter filters out most of the entire output signal instead of just the EKG. We have finalized the project for this semester however we have already begun to discuss possible project paths for next semester.

Future Design Expectations:

- Begin working on ventricle detection aspect of the project
- Begin looking into better filter options
- Rethink elastic strap attachment

Work Hours:

Name	Work Performed	No. of Hours/Task	Total Hours
Kim Safarik	Poster Assembly	6 hrs	12 ¾ hrs
	Prototype construction (11/20)	5 hrs	
	Prototype construction (11/30)	¾ hrs	
	Progress Report	1hr	
Terra Gahlman	Prototype consideration	1 hr	1 hrs
Jacob Meyer	Communication	½ hr	3 hrs
	Prototype construction (11/20)	1 ½ hr	
	Poster Updates	1 hr	
David Schreier	Website updates	½ hr	1 ½ hr
	Protoype Consideration	1 hr	
Team	Prototype assembly (11/20)	1 hr	29 ¼ hrs
	Project Work (11/29)	3 hrs	
	Project Work (11/30)	4 hrs	
	Project Work (12/2)	4 hrs	