Verification and Validation Report: Mechatronics Engineering

Team #1, Back End Developers
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1 Revision History

Date	Version	Notes
Date 1	1.0	Notes
Date 2	1.1	Notes

2 Symbols, Abbreviations and Acronyms

symbol	description
T	Test

[symbols, abbreviations or acronyms – you can reference the SRS tables if needed —SS]

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3 Functional Requirements Evaluation

4 Nonfunctional Requirements Evaluation

4.1 Usability

4.2 Performance

4.3 etc.

5 Comparison to Existing Implementation

Current motion detecting smart watches, such as Apple watches or Samsung Galaxy watches, are desgined for healthy and active population. The EMAnator is specifically geared towards older adults who have chronical back pain. Therefore, it is desgined to capture minor and subtle movements accurately.

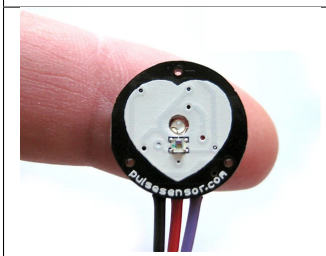
6 Unit Testing

1	Void bed_HR_setup()	Set-up function for heartrate module	RQ	User heart rate input from A0 s
2	name	desc	ref	input
3	name	desc	ref	input

7 Changes Due to Testing

After testing out each unit of the device system and failing unit test #2, the type of heartrate sensor has been changed. Now the ... (list out all the potential candidates that were ruled out).

Heart Rate Sensor Options:

Image	Model	Status	Reason for Status
	Chaney Electronics Inc. G21394	Rejected	Due to the Infrared LED's Placement and the photoelectic sensor's placement, it is impossible to integrate the module with a device sitting on the wrist.
	SparkFun Pulse Oximeter and Heart Rate Sensor - MAX30101 & MAX32664 (Qwiic)	Rejected	Chronically out of stock, and requires extra complexity to be built into the PCB in order for this to function.
	Grove - Finger-clip Heart Rate Sensor	Rejected	Size too large, and issues with skin contact to the sensor results in garbage data.
	Grove - Ear-clip/Finger-clip Heart Rate Sensor	Rejected	Sensor attachment to the ear was considered too disruptive to the participant's daily activities.
	Comimark 2Pcs Heart Rate Pulse Sensor Sensor Module for Arduino Raspberry pi	Rejected	Build quality was unacceptably bad. Ordered name-brand version of this product next.
	PulseSensor.com Pulse Sesnro	2 Accepted	Build quality was better than knock-offs from before. Skin contact issue still present, but attempts are being made to solve this issue using soft-

8 Automated Testing

N/A

9 Trace to Requirements

10 Trace to Modules

11 Code Coverage Metrics

Appendix — Reflection

The information in this section will be used to evaluate the team members on the graduate attribute of Reflection. Please answer the following question:

1. In what ways was the Verification and Validation (VnV) Plan different from the activities that were actually conducted for VnV? If there were differences, what changes required the modification in the plan? Why did these changes occur? Would you be able to anticipate these changes in future projects? If there weren't any differences, how was your team able to clearly predict a feasible amount of effort and the right tasks needed to build the evidence that demonstrates the required quality? (It is expected that most teams will have had to deviate from their original VnV Plan.)