BME 484 Biomedical Engineering Capstone Design **Project Proposal**

Project Title: Balance Board with Intelligent Feedback Team: Daniel Salazar Herrera, Project Manager

Matt Brass, Hardware Engineer

ThankGod Ugochukwu, Software Engineer

Abstract:

The focus of our project is to further develop an intelligent balance board that can be used during rehabilitation for athletes with ankle injuries. The board currently uses a gyroscope, magnetometer, accelerometer, bluetooth adapter, and an Arduino to compare the proprioceptive movement of the left and right ankle. We plan on doing human trials for the current state of the balance board. Furthermore we wish to install 4 pressure pads that will be used to show visual data regarding the pressure distribution on the athlete's ankle before and after injury.

Innovation: Adding four pressure sensors into the board in order to track the progress of the patient's

ankle rehabilitation. .

Materials: 1. Pressure Pads - 10\$ x 8

Subtasks: 1. Build multiple working prototype of the previous project

2. Meet with physical therapist Craig Simpson

3. Begin human trials on the balance board

4. Acquire pressure pads

5. Outfit the pressure pads to the balance board

6. Program application to display the reading from the pressure pad

Timeline:

BME Capstone Design General Timeline	09/11/17	09/18/17	09/25/17	10/02/17	10/16/17	10/23/17	10/30/17	11/06/17	11/13/17	11/20/17	11/27/17	12/04/17	12/11/17	12/18/17	12/25/17	01/01/18	01/08/18	01/15/18	01/22/18	01/29/18	02/05/18	81/21/20	02/19/18	02/26/18	03/05/18	03/12/18	03/19/18	03/26/18	04/02/18	04/09/18	04/16/18	04/23/18	04/30/18
1. Team & topic			1																														
2. Design							8																										
3. IRB application (if applicable)					All sections		1 8																										
4. Mid-year progress report																																	
5. Project prototype				11.0	7.00																												
6. Testing & improvement														1	188		A - 100	- 10	125	- 0	9 111	1			***								
7. NEBEC Conference paper																																	
8. Grant proposal (TBA)							1																		37								
NEBEC Conference (TBA)													9. 3																				
10. Final Report			<u>†</u>				1	İ					× :							"													

References:

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< Mattacola, C. G., & Dwyer, M. K. (2002). Rehabilitation of the Ankle After Acute Sprain or Chronic Instability. Journal of Athletic Training, 37(4), 413–429. >

< Fu, A. S., & Hui-Chan, C. W. (2005). Ankle joint proprioception and postural control in basketball players with bilateral ankle sprains. The American journal of sports medicine, 33(8), 1174-1182. >