BME 484 Biomedical Engineering Capstone Design
Project Proposal

Project Title: EOG circuit which will detect movement in the eye to communicate by controlling an app

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Abstract: The problem that we are addressing is trying to get people who do not have the normal, moving functions of their body to be able to communicate effectively and to be able to perform some functions that they normally would not be able to do. This is a common problem for people with paralysis. We will be building upon a project that had been started a few years back. In order to try and solve this problem, we have to try and make improvements to a circuit which was made to measure the dipole moments given off by blinking and movements of the eye. We have to try and make the signals stronger and more distinguishable to allow a simple appliance to be able to read them separately.

Innovation: Our idea for this project is to be able to apply different filters than what were previously used in order to create a stronger signal which will be easier to read. The goal is to be able to set it up with bluetooth to be able to get the information given on a wireless device. With the information collected on the device, we want to create an app that displays certain words or phrases based on the sequence of the signals.

Materials: -Electrodes
-Bluetooth modem

Subtasks: - Build/Understand the circuit from previous years
-Test circuit and gather data.
-Improve and build upon previous circuit to get more precise results
- Add bluetooth and write code to get data displayed on wireless device

Timeline: Use the template from the course webpage. Add additional
                 subtasks for your project and construct the timeline accordingly.

References:

[1] A. B. Usakli, et al. "On the Use of Electrooculogram for Efficient Human Computer
                 Interfaces" Rome, Italy: Hindawi Publishing Corporation, 2010.
[2] Bulling, Andreas, et al. "Wearable EOG Goggles: Seamless Sensing and
                 Context-Awareness in Everyday Environments."Journal of Ambient
                 Intelligence and Smart Environments, IOS Press, 1 Jan. 2009.
[3] Aritra Chaudhuri, et al. "A Low-Cost, Wearable, Portable EOG Recording System."
 Kharagpur, India: Systems in Medicine and Biology (ICSMB), 2016.
[4] Jeong Heo, et al. "A Novel Wearable Forehead EOG Measurement System for Human
Computer Interfaces" Seoul, Korea: MPDI Sensors Journal, 2017.
[5] Mark Plugovoy, Matthew Forde, Tanya Wang, Eugene Chabot and Ying Sun
"Integrated EOG and EMG Front-End for Differentiating Intentional and Unintentional
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