# Pelvic floor Biofeedback Design

**Client**: Dr. Patrick McKenna, UW Urology Department

**Advisor**: Dr. Amit Nimunkar

**Team**: Sam Lines (Leader)

Michael Simonson (Communicator)

Shawn Patel (BWIG)

Andrew Vamos (BSAC&BPAG)

**Date**: 11/3/2014-11/6/2014

## Problem Statement

Pelvic floor muscle biofeedback systems have been used to educate and train people how to correctly control the process of urination in children and elderly patients. As devices slowly fail or get outdated, a new device and interface system that can be used in conjecture with videogame like training programs is desired. With the completion of a basic EMG biofeedback system, our goal is to continue to improve the functionality of the software while simultaneously designing hardware with commercial standards in mind. This product will be designed and tested so that use in a hospital will be safe for both the hospital staff and the patients.

## Last Week's Goals

- Order the second set of parts that we forgot to order last time
- Finish the PCB and order that with the next parts
- Finish a testing protocol so that we can test the device as soon as it is made.

## Summary of Team Role Accomplishments

- Leader (Sam): Finalized the PCB with Shawn
- Communicator (Michael): Continued IRB work and finished work on lead fall off detection
- BWIG (Shawn): Finalized the PCB with Sam
- BPAG And BSAC(Andrew): Finished controllable gain work

## Summary of Design Accomplishments

- We have finished the PCB schematic and are ready to order it pending some final reviews and revisions
- We have decided to freeze our current work and pursue it as version one of the EMG system

- While we have frozen the design as is for version one, we have compiled a list of parts that will allow us to implement digitally controllable gain and lead fall off detection in version two.

## Project Difficulties

- With our research into controllable gain and lead off detection, we decided that in order to implement them into our first version it would significantly delay our ordering of the PCB.
- The remote access version of Altium provided through the university has limited libraries of parts provided, so it delayed our completion of the PCB a little more than we anticipated

## This Week's Goals

- Upon our final review of the PCB, we will order it along with the parts needed to start version two of the EMG system.
- We will continue to work on the IRB proposal to be able to submit it as soon as possible.
- Along with the IRB proposal submission, work in tandem with Dr. McKenna to ensure everyone has the proper training for human subject testing

## Activities

| Person(s) | Task | Time (hrs) | Week Total | Semester Total |
|---|---|---|---|---|
| Sam | PCB work<br>Team meeting | 2<br>1 | 3 | 28 |
| Michael | Lead fall off detection<br>IRB<br>Team meeting | 1<br>1<br>1 | 3 | 29 |
| Shawn | PCB Work<br>Team meeting | 2<br>1 | 3 | 28 |
| Andrew | Controllable gain work<br>Team meeting | 2<br>1 | 3 | 28 |

## Timetable

- Due to the large size of our timeline, I will attach the full excel spreadsheet

## Expenses

- After buying the parts, the current expense of the project is $41.22. A picture of the total expenses incurred is posted below.

| Index | Quantity | Image | Part Number | Description | Customer Reference | Available Quantity | Backorder Quantity | Unit Price | Extended Price |
|---|---|---|---|---|---|---|---|---|---|
| ☒ 1 | 2 |  | DCP010505DBP-ND | IC REG ISOLATED +/-5V 0.1A 7DIP | | 2 Immediate | 0 | 8.69000 | $17.38 |
| ☒ 2 | 8 |  | RMCF0805FT51K0CT-ND | RES 51K OHM 1/8W 1% 0805 | | 8 Immediate | 0 | 0.10000 | $0.80 |
| ☒ 3 | 8 |  | P9.09KCCT-ND | RES 9.09K OHM 1/8W 1% 0805 SMD | | 8 Immediate | 0 | 0.10000 | $0.80 |
| ☒ 4 | 16 |  | RMCF0805FT20K0CT-ND | RES 20K OHM 1/8W 1% 0805 | | 16 Immediate | 0 | 0.02900 | $0.46 |
| ☒ 5 | 16 |  | P180KCCT-ND | RES 180K OHM 1/8W 1% 0805 SMD | | 16 Immediate | 0 | 0.10000 | $1.60 |
| ☒ 6 | 8 |  | 490-8288-1-ND | CAP CER 4700PF 50V 1% NP0 0805 | | 8 Immediate | 0 | 0.43000 | $3.44 |
| ☒ 7 | 8 |  | 490-8309-1-ND | CAP CER 0.043UF 50V 5% U2J 0805 | | 8 Immediate | 0 | 0.45000 | $3.60 |
| ☒ 8 | 16 |  | 399-7342-1-ND | CAP CER 1UF 16V 5% X7R 0805 | | 16 Immediate | 0 | 0.28300 | $4.53 |
| ☒ 9 | 8 |  | 311-43.0KCRCT-ND | RES 43K OHM 1/8W 1% 0805 SMD | | 8 Immediate | 0 | 0.10000 | $0.80 |
| ☒ 10 | 4 |  | S7050-ND | CONN HEADER FMALE 17POS .1" GOLD | | 4 Immediate | 0 | 1.35000 | $5.40 |
| ☒ 11 | 4 |  | CR0805-FX-6201ELFCT-ND | RES 6.2K OHM 1/8W 1% 0805 SMD | | 4 Immediate | 0 | 0.10000 | $0.40 |
| ☒ 12 | 56 |  | P10.0KCCT-ND | RES 10K OHM 1/8W 1% 0805 SMD | | 56 Immediate | 0 | 0.02880 | $1.61 |
| ☒ 13 | 4 |  | P68.0KCCT-ND | RES 68K OHM 1/8W 1% 0805 SMD | | 4 Immediate | 0 | 0.10000 | $0.40 |
| | | | | | | | | Subtotal | $41.22 |
| | | | | | | | | Shipping | Estimate |
| | | | | | | | | Sales Tax | unknown |