Senior Design - Glucometer

Meeting Agenda

January 23, 2015

Glucometer Subsystem Requirements

**Casing - System Requirements (Ish Amegashie)**

**Overview of Objectives for February 20**

* Determine preliminary dimensions for pen-cap design using data available in the market place as a standard.
* Complete CAD outline for intended design of the prototype with included approximations for subsystems to be accommodated.
* Finalize choice of how pen-cap is expected to interface with pen with considerations for universality

**Schedule:**

**Week of Jan 25-31:**

**•** Propose preliminary dimensions for pen-cap design using data available in the market place as a standard

**•** Outline subsystems intended to be accommodated in final pen-cap design

**Week of Feb 1 – 7:**

**•** Outline the different subassemblies intended to make up final pen-cap design

• Clear preliminary design with team with input about subsystems to be housed

**Week of Feb 8 – 15:**

• Propose penultimate CAD design for pen-cap

• Determine shortlist of options available for interfacing pen-cap and pen

• Integrate design proposals from components developed by team members

**Week of Feb 16 – 20:**

• Produce final CAD design of components and subsystems

• Decide on final interface option between pen-cap and pen

**Online Database - System Requirements (Sofyan Saputra)**

**Overview of Objectives for February 20**

* Skeleton backend database available for both the web and mobile platform that will be able to be used to store basic glucometer data
* Create login interfaces for the web and mobile platforms and use that to access each user’s individual database
* Be able to display tables for the data (sample test data) on both the web and mobile platforms

**Planned Database Schema**

User(UID, FirstName, LastName, Weight, Age)

Measurement (UID, Timestamp, BloodSugar)

**Schedule:**

**Week of Jan 25-31: •** Evaluate database hosting sites (Amazon RDS, Scaled DB, Joyent)

• Select hosting site and set up account and tables

**Week of Feb 1 – 7: •** Connect to database on web interface using Python/Django or Ruby on Rails

• Create login interface that will identify each unique user

• Develop primitive tables for displaying the data

**Week of Feb 8 – 15:**

• Figure out how to connect to the same database on the Android and iPhone platforms or how to get a database connection working with HTML 5

• Create mobile login interface that will identify each unique user

• Develop primitive tables that conveniently displays the data on the mobile platform

**Week of Feb 16 – 20:**

• Ensure that data can be displayed in a convenient manner for the mobile portion

• Ensure integrity of data between the mobile and web platforms

**Glucometer – System Requirement (Mike Williams)**

**Overview**

* Measure current from testing strip
* Convert current to voltage
* Amplify voltage
* Analog to Digital Conversion interface on the microcontroller
* Convert digital voltage to associated glucose level
* Save last 20 glucose readings and associated timestamps using an EEPROM
* 3.3 V power line
* PIC microcontroller (PIC16LF1782-I/SS)

**Schedule:**

**Week of Jan 25-31:**

**•** Complete a final design for the glucometer

• Order parts as early as possible

**Week of Feb 1 – 7:**

**•** Implement design on a breadboard

• Be able to do a basic reading of blood

**Week of Feb 8 – 15:**

• Refine the blood reading and tune it for accuracy

• Work to show results through the LCD screen

**Week of Feb 16 – 20:**

• Fully implement the glucometer, microcontroller, and LCD screen

**LCD – Subsystem Requirement (Matthew Henne)**

**Overview**

* Display glucose level from glucometer
* Serial connection to microcontroller
* Buttons to interact with the glucometer

**Schedule:**

**Week of Jan 25-31:**

**•** Choose an LCD and complete a final design for the LCD

• Order parts as early as possible

**Week of Feb 1 – 7:**

**•** Implement design on a breadboard

• Be able to display messages on the screen

**Week of Feb 8 – 15:**

• Work with glucometer to integrate together

• Work to show results through the LCD screen

**Week of Feb 16 – 20:**

• Fully implement the glucometer, microcontroller, and LCD screen

• Have buttons that will interact and improve the user interface

**Bluetooth – Subsystem Requirement (Chris Homa)**

**Overview**

* Transfer glucose readings and associated timestamps to smartphone

**Schedule:**

**Week of Jan 25-31:**

* Establish bluetooth connection between smartphone and  
  nRF8001 Dev board

**By Week of Feb 16:**

* Transfer data between Board and smartphone. Data for this  
  will replicate expected glucose reading data.