



Electrical and Computer Engineering
Department

EE593 – Mobile Application Development

Final App Proposal

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Section 1. Introduction

Introduction

This document aims to provide information and design details for Final App Proposal, as a requirement of the course EE593 – Mobile Application Development, for the spring 2014, taught by the professor Dr. de Leon.

Section 2. Final App – Accelerometer Logger

2.1 Concept

The main objective of this Final App is to use the iPhone accelerometers to collect motion information on 3-axys (x, y and z), log this information on a text file and upload it to an FTP Server under administration of the Electrical Engineering Department.

The motivation for developing this application comes from the mutual interest of Dr. de Leon (from the ECE Department), Dr. Karmendinner (From the IE Department) and the ECE Graduate Student Andre Guerrero in developing a system capable of identify and quantify the likelihood of a person to fall.

The proposed system, when properly started and attached to a person subject to analysis, would be able to collect and store the values for the G-force in 3-axys vs Time, which can be latter used to reconstruct the gate pattern for that individual and compared to pre-defined parameters. The hope is that this comparison will be able to identify common patterns among faller people and allow them to engage in early treatment.

The application here proposed will perform the activities of collection user information such as Name, Age, Gender, Faller/No Faller indication and other comments, start logging the iPhone accelerometer raw information as soon as the user press the start button, and submit the User + Accelerometer data to a FTP server as soon as the user hits the buttons Stop and Upload.

The reconstruction of the gate pattern and its analysis are subject to a latter project.

2.2 Similar Available Apps

As of the time this document were written, we could find applications both for iOS and Android devices that can Plot on the Screen and/or log the Accelerometer information into a text file.

Although, none of these applications have the proposal of using the collected information in gate analysis and Medical Treatment.

Examples of similar applications can be found on the following links:

Accelerometer Pro – by Alexander Ponomarev

<https://play.google.com/store/apps/details?id=com.a10.acmeter.donate>

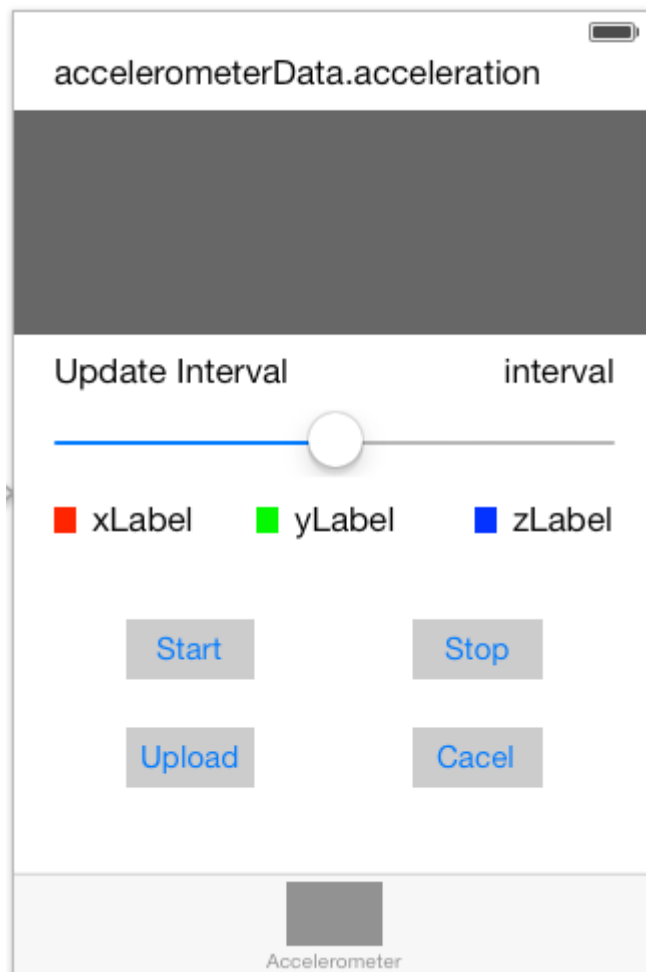
SensorLog - By Bernd Thomas

<https://itunes.apple.com/us/app/sensorlog/id388014573?mt=8>

2.3 How the App will work and User Interface

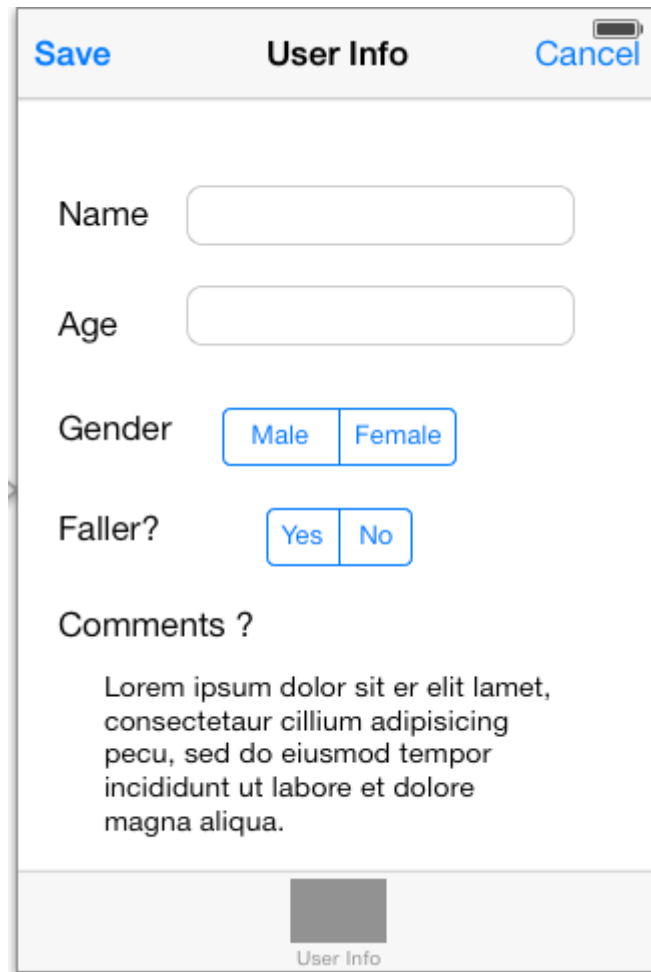
This will be an iPhone only application, which will basically consist of two view controllers. The initial view will show the user a canvas, and the buttons Start, Stop, Cancel and Submit. These buttons will allow the user to control when the application will start and stop logging accelerometer information, as well as if the logged information should be submitted to the server or discarded. The canvas will plot and present the user a 3-axys G-force real time information, which is not actually a necessary feature but helps the user to feel comfortable with the application and now that it is really working.

The following picture is an example of how this View Controller will look like:



The second View Controller will give the user the option to input his/her personal information, which will help us to categorize the information. As described before, this View will collect information such as Name, Age, Gender, Faller/No Faller indication and other comments.

The following picture is an example of how this View Controller will look like:



A mobile app form titled "User Info" with a status bar at the top showing "Save" and "Cancel" buttons. The form contains fields for Name, Age, Gender (Male/Female), and Faller? (Yes/No). Below these is a "Comments ?" section with placeholder text. At the bottom is a grey button labeled "User Info".

Save User Info Cancel

Name

Age

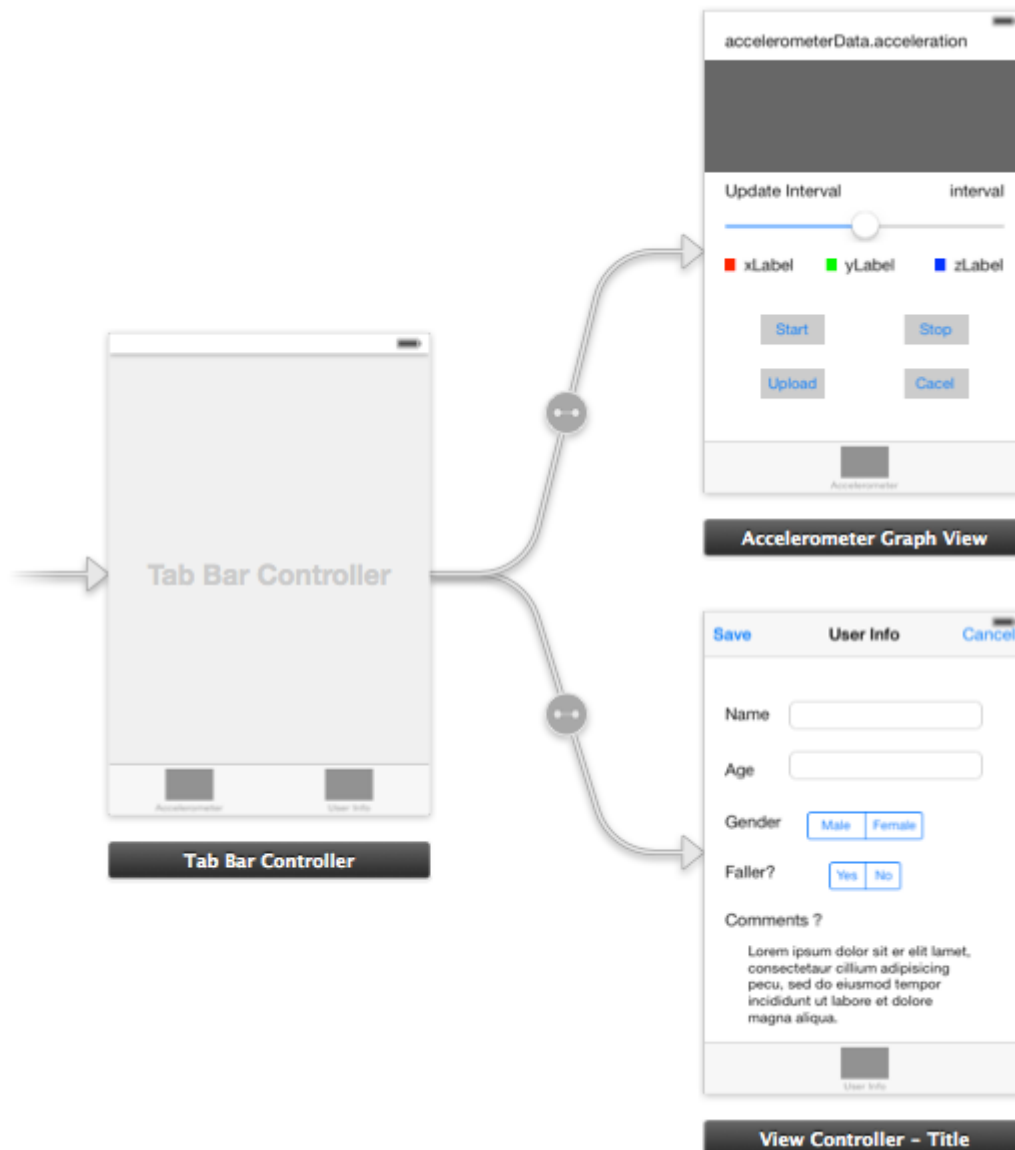
Gender

Faller?

Comments ?

Lorem ipsum dolor sit er elit lamet,
consectetur cillum adipisicing
pecu, sed do eiusmod tempor
incididunt ut labore et dolore
magna aliqua.

Both Views will be controlled by a TabBar Controller or similar feature.



A third View Controller will probably be added to this application, and it will consist of just an Image View, with user-friendly information about how to use this application and FAQ. This View Controller won't accept any interaction with users.

Finally, all the logged data will be saved on a file with CSV format and uploaded to the FTP Server. The following table is an example of how we expect the log file to look like.

Name:	Andre Guerrero		
Age:	26		
Gender:	Male		
Faller:	No		
Comments:	Lorem Ipsum		
Date:	Thursday, April 10, 2014	12:00:00 AM	
TIME	X	Y	Z
0.003	0.064431109	0.55742675	0.86201
0.012	0.064431109	0.55742675	0.86201
0.024	0.064431109	0.55742675	0.86201
0.033	0.031239327	0.58085626	0.8542
0.042	0.031239327	0.58085626	0.8542
0.052	0.031239327	0.58085626	0.8542
0.064	0.043930303	0.5632841	0.823937
0.074	0.043930303	0.5632841	0.823937
0.084	0.043930303	0.5632841	0.823937
0.094	0.043930303	0.55254561	0.845414
0.103	0.043930303	0.55254561	0.845414
0.114	0.043930303	0.55254561	0.845414
0.123	0.03904916	0.57695138	0.840533
0.134	0.03904916	0.57695138	0.840533
0.144	0.03904916	0.57695138	0.840533
0.154	0.03904916	0.57695138	0.840533
0.164	0.018548351	0.59257102	0.862986
0.173	0.018548351	0.59257102	0.862986
0.184	0.018548351	0.59257102	0.862986
0.194	0.034168016	0.61209553	0.81027
0.204	0.034168016	0.61209553	0.81027

2.4 Anticipated Risks

The major anticipated risks are due to the fact that we still don't know if the collected data will be enough for performing the gate analysis and pattern recognition.

In case that the information collected with this application does not suffice, we will have to rebuild the application or even abandon it.

2.5 Difficulty Level

Due to the complexity of the data model and the many frameworks that will be used on this application (Core Motion, Core Data, Connectivity) and also the extra work of setting up a FTP Server, we consider that this application have development difficult level of 5 on a 1-5 scale, where 5 is considered very difficult.

2.6 Concluding Thoughts

The problem this application aims to solve and the form it will work make us believe that it has a great potential to be improved at the point to be submitted for download on Apple Store. There is also a great chance that this application will result in a great tool for Gate Analysis and contribute to much more complex research projects on the Medicine and Engineering Fields.

Section 3. General Information and Annexes

3.1 General Information

Contact

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Versioning Control

Version	Date	Information
0	04/10/2014	Initial Version

3.2 Annexes

- None.