CampuSeek

Critical Design Review

Persuasive Social Games

Steve Hanson

Scott Lee

Prince Woodrow

Fernando Salazar

Department of Computer Science and Engineering
Texas A&M University

March 7, 2011

Table of Contents

1 Introduction

1.1 Problem Background

In a culture proliferated with media and high-tech gadgets, many people have become familiar with the armchair and lost the motivation to exercise. Forty percent of United States adults are now obese – a 14% increase since 1988. This growing trend is a concern in today's society and needs to be addressed. Our proposed project will attempt to reduce obesity through an interactive game that encourages users to be active. The fact that the game will be *fun* will give students the motivation to get the exercise they need.

1.2 Need Statement

There is a need to promote healthy activity among students in a way that is fun, so that participants are more motivated to continue a workout regimen.

1.3 Goals and Objectives

The main goal of our project is to promote fitness by providing an exciting way for people to be active. Since many people lack motivation to be active, if people have a way to enjoy being active, they will likely do so more often and achieve better results.

Here is a list of objectives that our team has taken into consideration:

- The system should track user workout data to encourage and motivate users
- The system should display workout data in a graphical, intuitive format
- The system should allow users to collaborate with others for motivation
- They system should have a game aspect to provide a fun environment for being active
- The system must be fairly easy to set up (less than 10 minutes)
- The mobile application developed should be different than those work out applications that already exist

1.4 Design Constraints

The largest constraint on our project will be the battery life provided by the phone while users are playing the game. The distance traveled by the user will be calculated by interpolating the users location based off of the GPS coordinates that are obtained frequently by the Android-based phone. While GPS is known to drain the battery life, it has been tested getting repeated updates for 3 hours of continuous use while only draining 23% of the battery.

A physical constraint that users may encounter is holding the phone in the process of playing CampuSeek. One of the goals of our game is to encourage people to get out and run, walk, and explore their campus. The user may not want to hold the phone in hand while running or walking. We propose (and have included in our budget) to have phone clips that would attach to the users waste to hold the phone. This also leads to an economic restraint that would require the user to purchase a phone clip if they don't already have one and feel that it would be beneficial.

Some phones have GPS and accelerometers, while other phones do not. This will have to be taken into account during the design of the system, as some users' phones may not be compatible with all of the sensors used in the project.

Another constraint is availability of sensors on the phones that are used. Some phones have GPS and accelerometers, while other phones do not. This will have to be taken into account during the design of the system, as some users' phones may not be compatible with all of the sensors used in the project.

Overall, the CampuSeek idea based on our current preliminary design seems to be feasible, pending tests on the battery life of Android phones using GPS. The system will be fairly complex, however, and may be challenging to complete in time. Our team is confident that most of the features will be able to be completed in the allotted time. Three of the features: the hotter/colder feature, the hints feature and route mapping will only be implemented if there is enough extra time during the semester.

1.5 Validation and Testing Procedures

The validation and testing procedures of our application will include a GPS test, intuitiveness test, a sanity test and a health statistics test. The GPS test will ensure that user current location gathering is accurate and can be stored locally within the phone for further data manipulation (distance traveled ,calories burned). The intuitiveness test will simply test the ease of the Android application for users to ensure there the learning curve is not steep. The sanity test will prohibit users from using unintended forms of transportation to get from location to location. The health statistics test will ensure that the application is achieving its goal or properly documenting a users' progress as they play the game.

2 Proposed design

2.1 Updates to the proposal design

No changes have been made to the originally proposed design. Only small changes regarding the actual implementation of the system have been made. For example, an external MySQL database has been set up for data interaction rather than using an FQL database within Facebook, as this turns out not to be feasible. Also, the *hotter/colder* and *hints* incentive features have been lowered in priority and will only be implemented if there is time. This is because research and design has revealed that the system is more complex and may take more time than we predicted when the proposal was written. Consequently, the Gantt chart and division of tasks have been modified slightly since the original proposal.

2.2 System description

The design of our system is broken into two main components: a Facebook application and an Android application. These serve as the two mediums through which the user accesses the system. Both of these platforms interface with a central database that stores user and challenge information. GPS on the mobile phone is leveraged in this system from within the Android environment to provide challenge and workout statistics. Finally, Facebook provides detailed health statistics for users to use to examine their performance. A graphical representation of this system can be seen below in Figure 1, below.

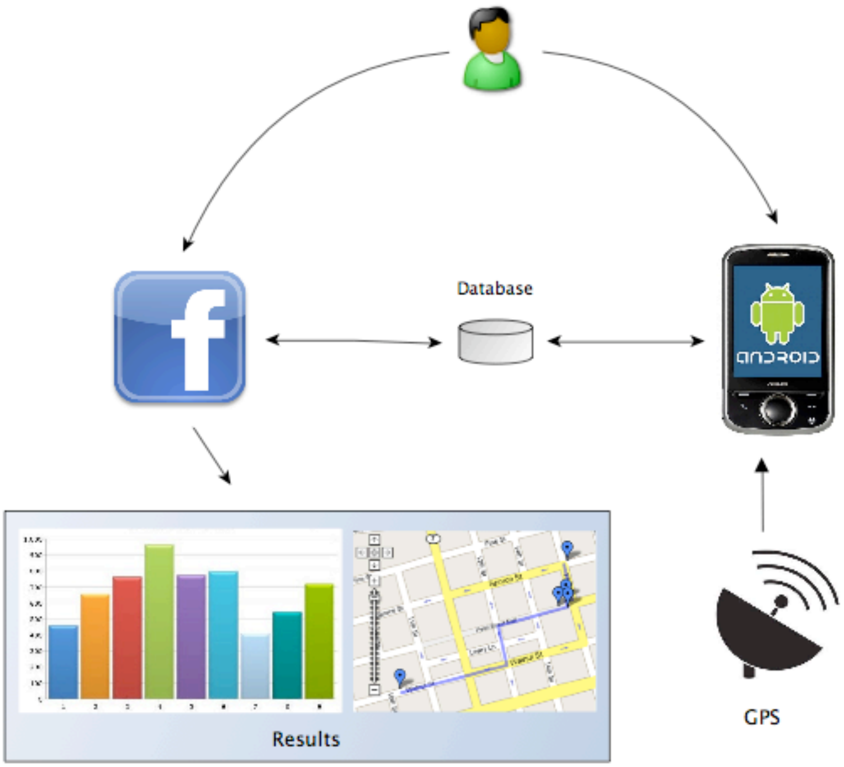


Figure 1: modular description of system

As seen in Figure 6, the design of our mobile Android application relies upon the GPS hardware that is incorporated with the Android-based mobile phone that we will be using. Users will access various scavenger challenges through the CampuSeek application on their phone and venture out throughout their college campus to find the desired objects. Once at the location, the GPS will confirm they are in the correct place and award the user with a predetermined number of points. The Android application is being developed in the Java programming language using an Android emulator and programming API.

The second module, the Facebook web application, will be a “home base” for users to view progress and compare their results to their friends. Users can choose to “follow” their Facebook friends, which results in their progress being displayed in easily accessible ways, so that others may compare their progress to that of their friends. The user will also have the option to view their activity statistics through the Facebook web application to further motivate and promote an active lifestyle. These statistics will consist of information on how many calories the user is burning, in addition to distance travelled. These data will be displayed graphically so that users can view trends in their workout performance and compare it with their friends. Each of the modules that make up the system will now be described.

2.3 Complete module-wise specifications

As mentioned previously, the system is composed of two main modules: Facebook application and the Android application. The Facebook application module includes health charting features as well as organized challenge viewing. The Android application module incorporates GPS and gameplay features. Both modules coordinate with a centralized database to store and access information about the users and challenges.

Android Application

Android offers a custom plug-in, Android Development Tools (ADT), for the Eclipse IDE that is designed to give a powerful integrated environment in which developers can build android applications. ADT allows you to quickly set up new Android projects using Eclipse, create an application UI, and debug android applications using the Android SDK tools. ADT also allows developers to export versions of their Android application in the easily shared APK Android format. A virtual mobile device emulator is also included within the Android SDK. This emulator allows developers to develop, test, and prototype android applications without using a physical device. The emulator is very useful because it mimics all of the hardware and software features of a typical mobile device. The emulator cannot make phone calls, but that is not a downside in our case because our application does not use that feature. The emulator provides a variety of navigation and control keys that you press by using your mouse or keyboard. To model and test applications more easily, the emulator utilizes Android Virtual Device configurations, which allow you to define certain hardware aspects of your emulated phone and allow you to create many different configurations to test many Android platforms and hardware modifications. The emulator also allows the developer to simulate application interrupts such as SMS messages or phone calls.

The main purpose of the Android application is to provide the game aspect functionality of the CampuSeek experience. Users will be allowed to view their current challenge as well as the challenges they have remaining and ones they have already done. Along with this aspect, they will be able to pull up both their rank in the game and a chart of their distance traveled over a number of days. The user interfaces is illustrated below in Figure 2.

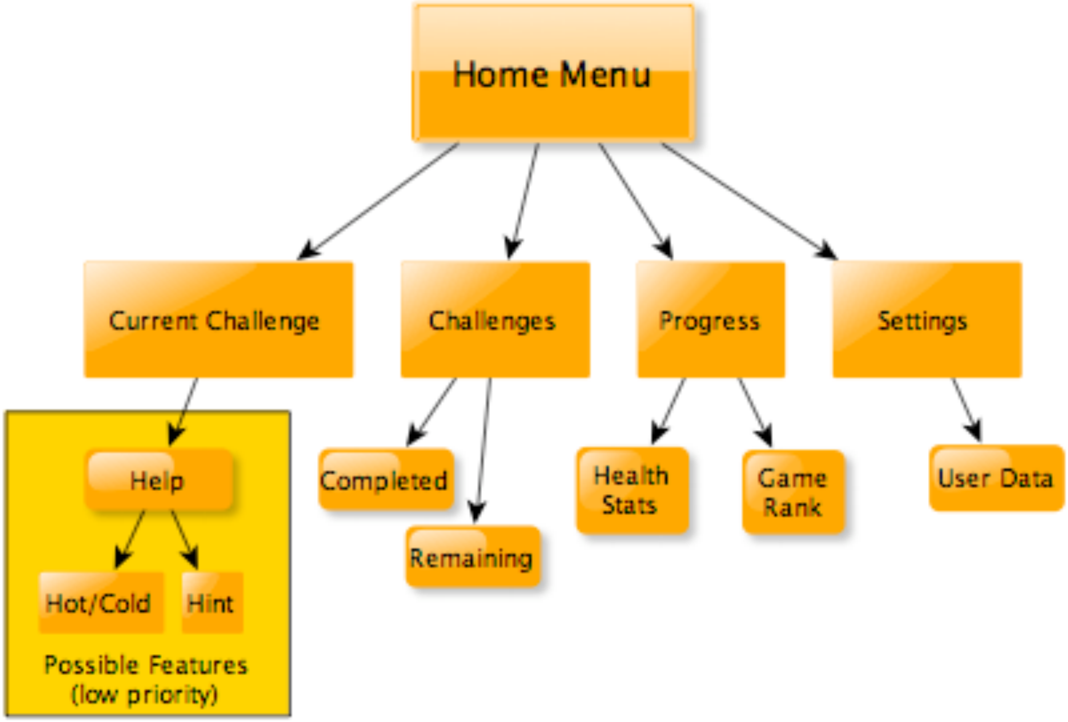


Figure 2: Android user interface

For the GUI, we implemented a Tab Layout. The tab layout allows the screen to be switched quickly by the pressing of tab buttons. The tab content can be implemented in one of two ways: using tabs to change views within the same Activity (code operation), or use the tabs to change between entirely separate Activities. In our application, separate Activities are used for each tab. We currently have 4 tabs in our layout: Challenges, Current Challenges, Progress, and Settings. Each tab has its own class, which extends the Android Activity class. Each tab page also consists of buttons, which link that page to another page. Here we incorporated a screen switching method. When a button that exists within a tab is pressed, a new screen is opened. Each new screen is also implemented as its own class.

Getting the user's current location is handled within the CurrentChallenge class. The "Current Challenge" tab will contain an image (using the ImageView module) of the object they are trying to find on Texas A&M's campus. This picture will match the one that is displayed on their Facebook Application challenges page. Users will then also have a graphical button that will be pressed when they believe they are at their current location. The code behind this uses a function setOnClickListener to determine whether the user has clicked it or not. For now, when the button is clicked, the phone passes in data provided by the network provider. This reads in a geo-location based on either a cellphone tower or wireless router (whichever one is broadcasting a stronger signal at the time). A pop-up notification appears displaying the users longitude and latitude values at that given instance. Ultimately, a simple check function will be implemented once the longitude/latitude values for the challenges are achieved and stored. Users will click the button to confirm their location and the GPS will compare their current location values with those stored in the database corresponding to the current challenge. Another class will be created to store the user's coordinates at set time intervals to calculate the distance they have traveled since using the app.

Integrating the Android application with the data that is used by the Facebook application has proven difficult. Initially, we simply required the Android user to click a button to open the link on our Facebook application. The Facebook application does not display well, however, within the Android application and is not an acceptable solution. We instead decided to integrate user login into the application itself. When the user first runs the application, their Facebook user ID will be stored which will allow interaction with the database in conjunction with their secret password. Using an HTTP post, the Android application can connect to PHP scripts that are on our server that hosts the Facebook application. The PHP scripts that have been written provide the queries that we need and all that we have to feed into the HTTP post are the attributes and values that we need. In our case, we pass in the users Facebook ID number and all of their corresponding game data is returned to be utilized by the application. Data management will be handled according to the flow illustrated below in Figure 3.

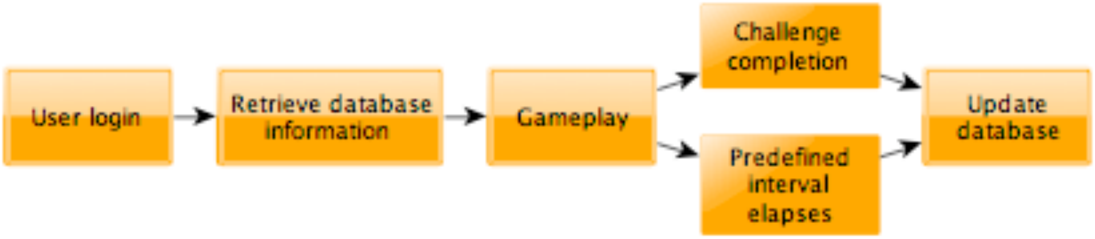


Figure 3: Android data handling

User and challenge data will be initially retrieved from the central MySQL database at application startup. When the user completes a challenge or when a predefined time interval elapses (e.g. every 5 minutes), new data is uploaded back to the server.

Facebook-interface

Whereas the Android interface is used mostly for game-play features, the Facebook interface is primarily for collaborating, competing, organizing challenges and reviewing statistics *outside* of the game-play environment. The Facebook application provides an environment where players can see the big picture of which challenges they have left to complete and organize their various goals. Users can also compete with their friends. The Facebook application has an option for users to "follow" their friends. The performance of friends can then be compared in a competitive environment. Friends who are "followed" will show up in the user's feed, and statistics will be displayed ranking the user against their followed friends and charting their performances next to each other. Friends can also help each other reach their goals by comparing performance toward set goals.

Finally, the Facebook application will be the primary interface where users will access health statistics to chart their progress. The "Health View" on the Facebook application will give users access to all of their caloric consumption and distances travelled in a detailed graph format that shows changes over time. Users will be able to plan weight-loss goals and compare their performance with their goals as they progress through the game. The specifics on the health aspect will now be discussed.

As users travel on campus to complete challenges, their phone is constantly collecting data, which is updated to the central database. This information is used to display statistics on the user's performance. The Google Chart API [8] will be used to display data in an informative and readable fashion. This API has tools for displaying many types of charts that will be useful for our statistics.

The mobile application will also compute the calories burned with regards to the distance traveled by the user. The algorithm we are using for this is based off of US Army Fitness Manual [8**]**. When you register to use the mobile application you will be asked to enter your weight. The GPS will be able to monitor and provide the Facebook web application with the average speed at which the user has traveled throughout the course of the game. The time played will also be taken into account and the following algorithm will be applied:

Calories Burned = 0.64 calories / # of minutes / body weight (in lbs.)

The above algorithm is based off of the idea that the user traveled 5 MPH. The actual algorithm used will be able to scale this formula in a more robust fashion if the user travels faster or slower.

The web application is hosted on a separate server, which was purchased and set up for this project. It is embedded into the Facebook environment using an iFrame, per Facebook's specifications. The web application is written using PHP and JavaScript for programming, CSS for layout and styling, and HTML for content display. The interplay of the various web languages is illustrated below in Figure 4.

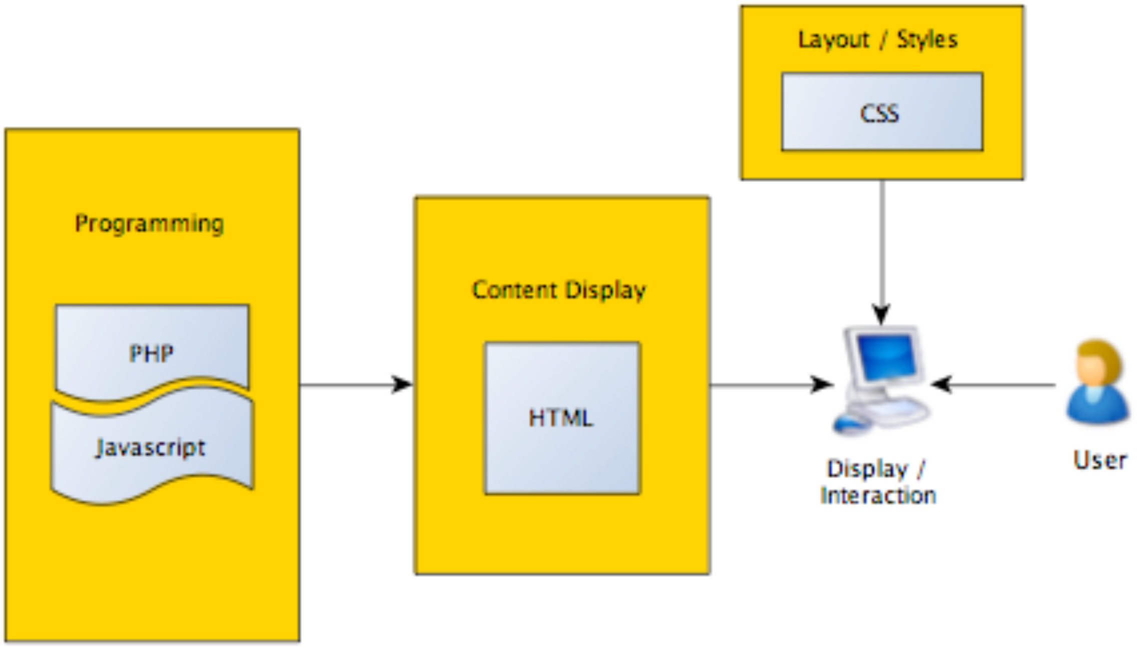


Figure 4: Web language interplay

PHP is used for almost all of the web programming, with the exception of some JavaScript and JQuery used for some page height auto-sizing callbacks. The Facebook API is made available for PHP and JavaScript, though the PHP API is used for most of this system. All pages used in the system are PHP pages, with some content of each page generated dynamically through the support of the auxiliary database. The database is implemented using MySQL with two tables to store User and Challenges information, respectively. The schemas for the two tables are described below:

Users		**Challenges**	
Attributes	Data Types	Attributes	Data Types
id	long	id	long
name	varchar	level	integer
android	boolean	description	varchar
level	integer (1,2,3)	image URL	varchar
challenges completed	list	latitude	double
current challenge	integer	longitude	double
calorie goal	integer		
calories burned	integer		
weight	integer		
height	integer		
distance travelled	integer		
following (list of ids)	list		

Table 1: Database table schemas

For the Users table, the ID stored is the same as the user's Facebook ID (which is the only Facebook user data that can be persistently stored and still comply with Facebook's privacy policy). This is used to match Facebook users when logged-in with their CampuSeek information. Also, the database keeps track of whether the user has registered their phone on the Android application. The 'level' attribute stores the user's level of 1, 2 or 3, corresponding to beginner, intermediate or advance, respectively. Also, the "following" attribute stores a list of the user IDs of the other CampuSeek users that each user is following.

The Challenges table stores information about each challenge so that the information can be dynamically generated in the Facebook application and so that the challenge completion can be confirmed within the Android app (latitude and longitude). The Facebook application uses information from the database on most of its pages. The navigation for the Facebook application can be seen below in Figure 5.

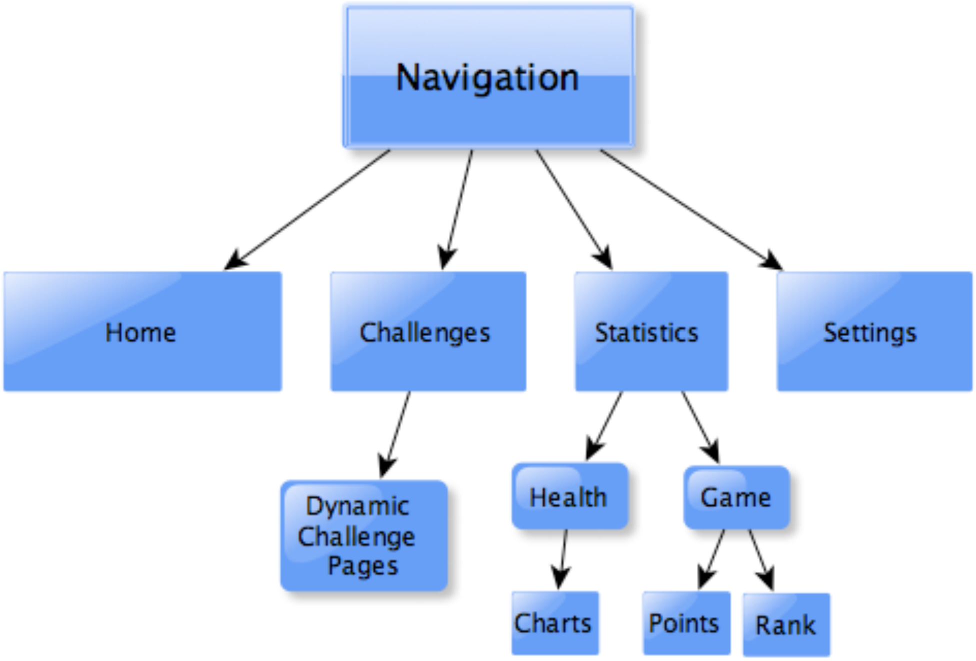


Figure 5: Facebook navigation

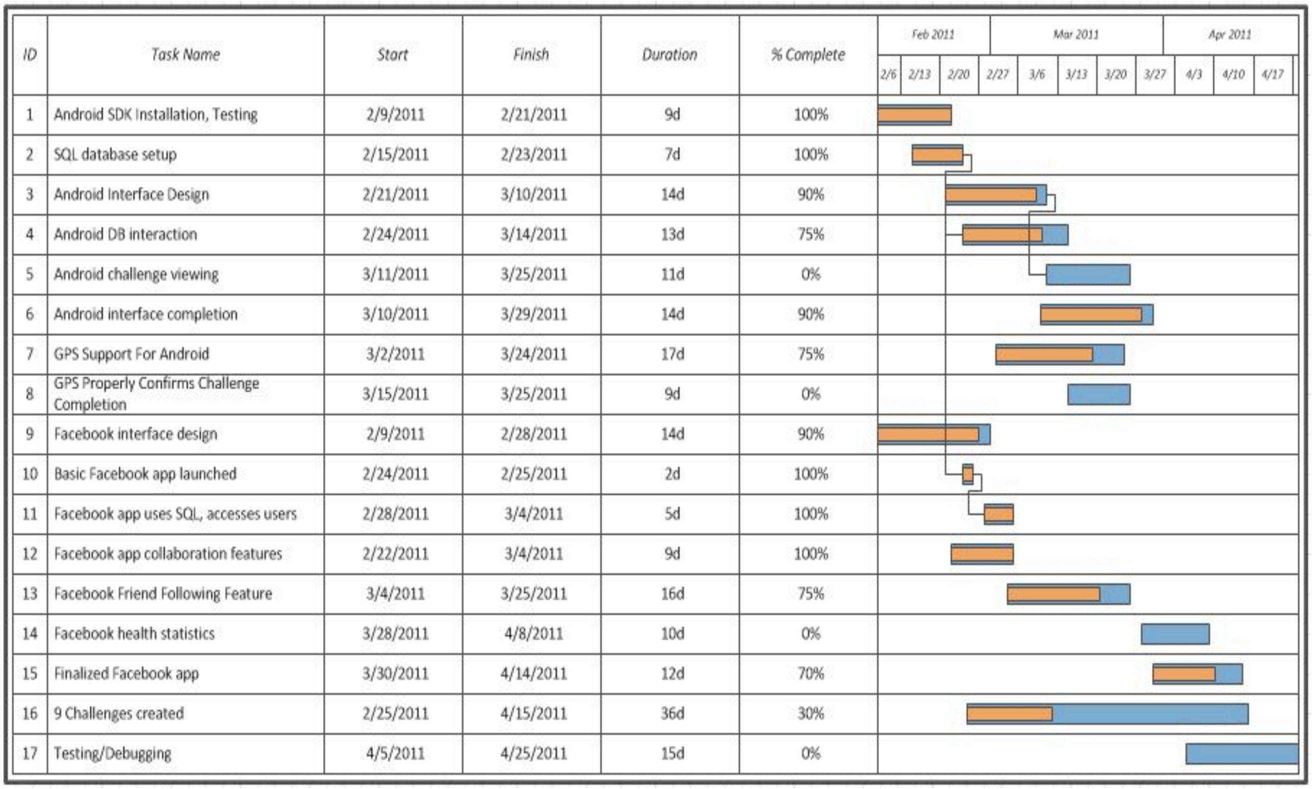
On the Challenge page, all of the challenges are loaded dynamically and displayed from the MySQL database. They are presented according to their difficulty level (beginner, intermediate and hard) in the form of a clickable image. Because the challenges are loaded and presented dynamically from the database, the web application is built to support the later addition of more challenges. With the creation of a simple form, CampuSeek users would be able to create and submit their own challenges, which would then be displayed to other users. Additionally, when each challenge is clicked on from the Challenges page, a new page is loaded dynamically that shows the challenge image along with a short description of what the challenge entails. At this point, most aspects of the web application are dynamic, enabling future expansion.

PHP is the primary language used for the web programming. Facebook provides PHP and JavaScript API's to access their modules and authentication functionalities. Because of its facility of interacting with MySQL databases along with its Facebook API support, PHP was an obvious choice as the main programming language for the system.

3 Project management

3.1 Updated implementation schedule

Our design implementation consists of two components: a Facebook application and an Android application. The team was broken up into two groups one devoting there time to the launch and functionalities of the Android application while the other dealt with the Facebook application. One major dependency in the schedule was the delay in getting the Android phones. To date we have received two android phones. Only one of the android phones has data service available giving us access to GPS. Even though there was delay in getting the Android phones both teams have made tremendous progress and are on schedule. An updated Gantt chart is shown below in Figure 6. Completion percentages have been added (orange) to give an idea on the progress made.



ID	Task Name	Start	Finish	Duration	% Complete
1	Android SDK Installation, Testing	2/9/2011	2/21/2011	9d	100%
2	SQL database setup	2/15/2011	2/23/2011	7d	100%
3	Android Interface Design	2/21/2011	3/10/2011	14d	90%
4	Android DB interaction	2/24/2011	3/14/2011	13d	75%
5	Android challenge viewing	3/11/2011	3/25/2011	11d	0%
6	Android interface completion	3/10/2011	3/29/2011	14d	90%
7	GPS Support For Android	3/2/2011	3/24/2011	17d	75%
8	GPS Properly Confirms Challenge Completion	3/15/2011	3/25/2011	9d	0%
9	Facebook interface design	2/9/2011	2/28/2011	14d	90%
10	Basic Facebook app launched	2/24/2011	2/25/2011	2d	100%
11	Facebook app uses SQL, accesses users	2/28/2011	3/4/2011	5d	100%
12	Facebook app collaboration features	2/22/2011	3/4/2011	9d	100%
13	Facebook Friend Following Feature	3/4/2011	3/25/2011	16d	75%
14	Facebook health statistics	3/28/2011	4/8/2011	10d	0%
15	Finalized Facebook app	3/30/2011	4/14/2011	12d	70%
16	9 Challenges created	2/25/2011	4/15/2011	36d	30%
17	Testing/Debugging	4/5/2011	4/25/2011	15d	0%

Figure 6: Updated Gantt chart

It can be seen that the project is currently on schedule. The Android SDK has been configured for programming. Additionally, the Android interface has been 90% implemented, pending some minor features that will be implemented when the functionality is addressed. The Android application can now interact with the central database, but this functionality has not been completely incorporated into the application, as it is pending some code completion and is also waiting on finalized PHP scripts for access to the database. Basic GPS functionality has been implemented and is on track for late March completion.

The next phase for Android development is GPS integration and challenge viewing/selecting. The Facebook application is ahead of schedule. The central database was set up before the February deadline. This was completely integrated with Facebook. The Facebook interface was completed on time. Also, collaboration features were set up, including a comments feed on the main page and a "like" button. The "friend following" feature is currently being worked on, and has been set up so that users can select which friends they would like to follow. Friend data is yet to be incorporated into the Facebook challenge environment and the homepage, but is easily on-track to be completed by the March 25 deadline. Several challenges have been set up on Facebook and are operational from within the application. We are on-track for completing the goal of having nine challenges by April 15.

3.2 Updated validation and testing procedures

We believe the most efficient way of testing our application is to break it up into specific modules. This will help ensure functionality problems are solved before full system integration.

GPS Test

The GPS testing itself is comprised of different components. The first of which is to ensure that the GPS provides an accurate current location. This is vital to ensure the user is indeed at the location of their current challenge. This will be tested by comparing the longitude and latitude values from the phone and a car GPS. Also, the degree of accuracy of the GPS will be tested by measuring the GPS' responsiveness to changes of location. We would prefer the GPS to be accurate to at least up to twenty feet and are expecting results well within that range. The next iteration of testing the GPS is to ensure that the user location is obtained and stored at a set time interval. We will use this data to interpolate the distance traveled by the user as they move from challenge to challenge. The time interval will be spread out to ensure better battery life for the phone as obtaining coordinates puts a damper on the usage of the phone.

Intuitiveness Test

The intuitive test is simply to ensure that the Android application itself is relatively easy to use. One of our main goals is to make an application that has little to no learning curve this way the user cannot have another factor to push them away from working out. We will have several participants user our applications. They will self-identify their level of technological competency. If the application is easy to use, the participant will be able to jump into the game and have a good time. We will collect survey data from the participants in which they rank the intuitive factor of the game.

Sanity Test

During our discussions with our sponsors, it was brought to the attention we should keep the users honest in obtaining data. Future releases of CampuSeek could reward users with different benefits based on predefined workout achievements. To prohibit users from simply getting into a car or using a bicycle to travel around campus, there will be a cap on the speed that a user can travel before being considered invalid data. This will be performed by obtaining user speed by interpolating the location of the user between periodic GPS queries. We will prohibit speeds faster than is possible for a human to run (~17 miles per hour). This speed will be determined through research of world record running speeds.

Health Statistics Test

The health statistic test will be run to ensure that users are meeting their goals while accurately displaying their progress. Their distance traveled will be charted by interpolating data from the GPS and will be plotted on a graph that represents days vs. distance traveled. Also, their calories burned will be based off of user height, distance traveled and speed. GPS data acquisition will not provide an exactly accurate calorie-burn estimation. It has been decided, however, that if the calorie algorithm that we use correctly calculates calories burned within15-20% error, this would be sufficient for our uses. This will be determined by having the user compare results with known results for a walk over a specified distance at a specified speed. To test the health statistics presentation intuitiveness, in the preliminary testing stage, users will view their statistics and provide feedback as to whether it was easy to read and reflected the effort they put into working out and enjoying CampuSeek. This will be performed in the same survey as the Intuitiveness test for the Android application.

Demonstration Procedure

To demonstrate a final working system, a video will be created demonstrating the Android application being used during real gameplay on campus. The video will show that users can select and complete challenges from within the phone environment, and correctly confirm challenge completion via GPS. An in-class demonstration of the Facebook interface will show that user challenge data is displayed in an intuitive fashion alongside competitive friend statistics. Health statistics will also be shown along with test data confirming that the application results in health-promoting activity.

3.3 Updated division of labor and responsibilities

Each team member is assigned to one of the two modules of the system: Facebook or Android. Currently, Steve and Fernando are working on the Facebook application, while Scott and Prince are working on the Android application. The tasks will now be listed for each module.

Facebook

- Steve
  - Complete friend-following feature (3/25)
  - Determine final database schema for storing workout information (3/30)
  - Home page finalized with all desired content and styling (4/10)
  - Robust user management and querying. Database cleanup features (4/10)
  - Hotter/Colder and Hints features (extra feature, if time) (4/20)
- Fernando
  - Finalize graph and chart formats for displaying health statistics (3/30)
  - Basic charting or graphing of health statistics (4/10)
  - Completion of 5 challenges (4/2)
  - Final completion of challenges (4/15)

Android

- Scott
  - Working with minimal UI features and robustness (3/30)
    - Generate challenge selection screen (3/25)
    - Challenge confirmation using GPS (3/30)
  - Complete challenge selection page. Robust (4/15)
  - Make simple health statistics page – may just point to Facebook (4/20)

  - Hotter/Colder functionality (this is an extra feature, if time) (4/20)
- Prince
  - Facebook/Android integration using Facebook id (3/25)
  - GPS speed sanity test (3/25)
  - Determine GPS accuracy level (3/25)
  - Determine GPS polling intervals, data flow to/from server (4/10)
  - Hints incentive feature (extra feature, if time) (4/20)

Steve will be primarily working on the Facebook application. He will first finish the "friend-following" feature so that users can see their friends' progress on the home page, individual challenge pages and health statistics page. Steve has already completed the friend-following preference page that finds all of a user's friends who are using CampuSeek and displays them in a format where the user can choose to follow individual friends. These results are stored in the database and accessible for use in the other pages. Steve will also finalize the database schema for storing workout information. The granularity of data intervals for health statistic graphing has yet to be determined. Steve will determine a system for recording all of the required workout data to provide detailed graphs. Steve will also finalize the Facebook homepage with all of the social modules and finalized look that it will have. Finally, he will ensure robustness of the system and devote his extra time toward overseeing other team members' work and filling in the unforeseen areas.

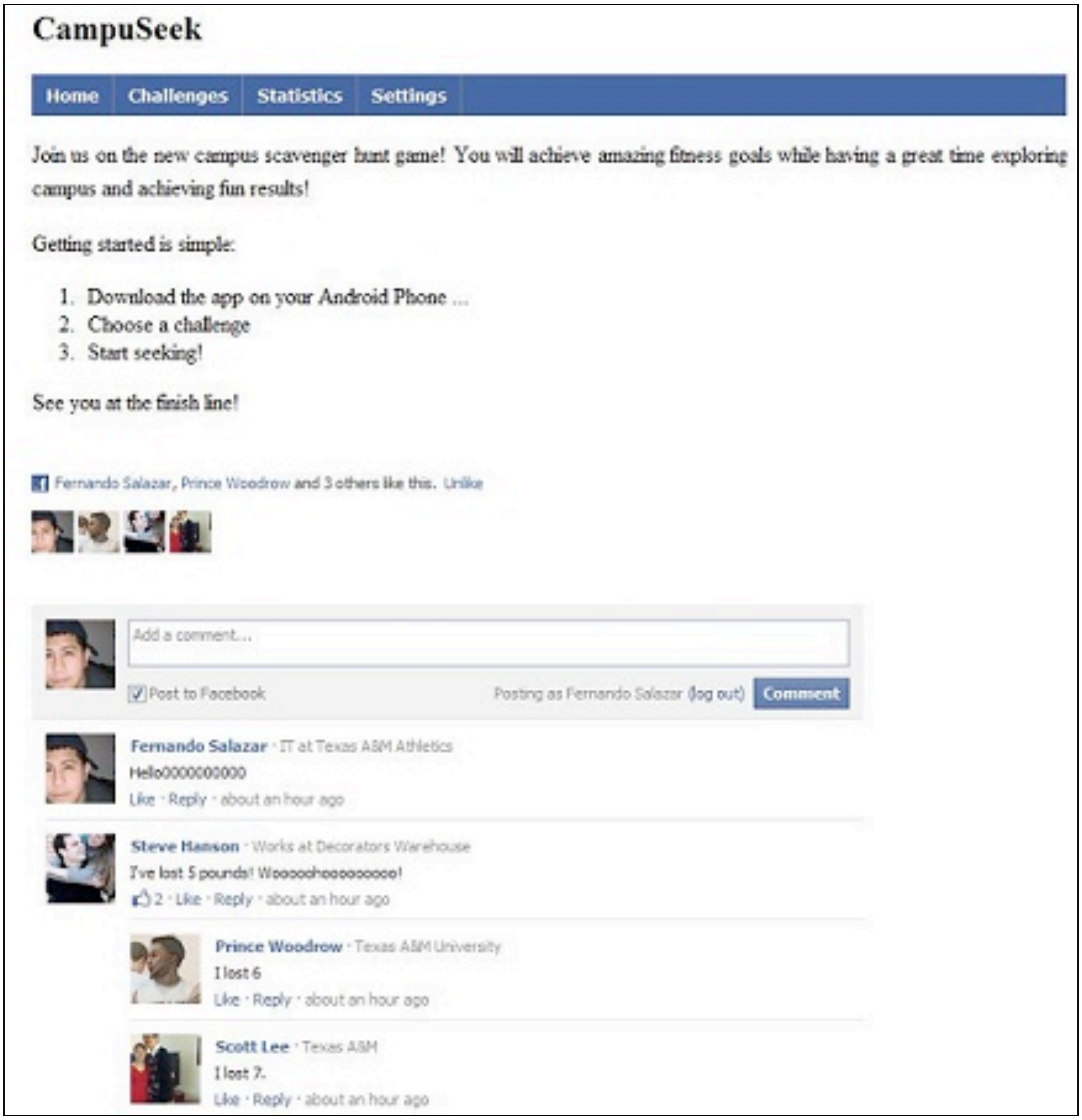
Fernando will also be working with the Facebook application. He will work on finalizing the graph and chart formats for displaying health statistics. He will research the available charting APIs to determine the most efficient and meaningful chart presentation formats for the user. He will construct a design of which statistics are important to be charted on the health page of the application to promote activity and weight loss. Finally, he will complete all of the remaining challenges to be stored in the central database for use in the game.

Scott will be working primarily on the Android application. He will first be implementing features related to challenge accessibility on the Android system. He will create the screen that displays all challenges and allows the user to select one to complete. This screen will query the central database and dynamically display challenges. He will also work on challenge confirmation from within the phone, using GPS. Next, Scott will finish all challenge-related functionality, including the "current challenge" screen view. Finally, he will determine an intuitive way to display basic health statistics from within the phone. The main health-charting functionality is reserved for the Facebook application, but the Android application will give the user basic health feedback.

Prince will also be working on the Android application. He will first complete integration with the Facebook application and central database. This involves obtaining the user's Facebook ID and ensuring privacy and security of communications to/from the central database. He will next perform the GPS speed sanity test and implement a check into the application to ensure that users are indeed running or walking, and not cheating during gameplay. He will also perform other GPS tests to determine the accuracy level of the GPS and the necessary polling intervals to/from the server.

4 Preliminary results

The Facebook application has been launched and is operational with most of the functionality in place. User and application authentication have been completed, so users are properly registered with the application. During authentication, users must confirm which information they would like to allow our application to access, in accordance with Facebook's privacy policy and user rights. The database is completed integrated with the Facebook application. The dynamic challenges page determines the user's level and displays the appropriate challenge, correctly indicating which are completed. The friend "following" feature has also been implemented, so users can select which of their friends playing CampuSeek they want to follow. Figure 7, below, shows the CampuSeek home page on Facebook. It includes a comments feed, as well as a Facebook "like" button and includes instructions for getting started with the app. Futures plans include a feed that shows information pertaining to the friends of the user that he/she is following.



Join us on the new campus scavenger hunt game! You will achieve amazing fitness goals while having a great time exploring campus and achieving fun results!

Getting started is simple:

1. Download the app on your Android Phone ...
2. Choose a challenge
3. Start seeking!

See you at the finish line!

Fernando Salazar, Prince Woodrow and 3 others like this.

☑ Post to Facebook — Posting as Fernando Salazar (log out)

Fernando Salazar · IT at Texas A&M Athletics
Hello000000000
Like · Reply · about an hour ago

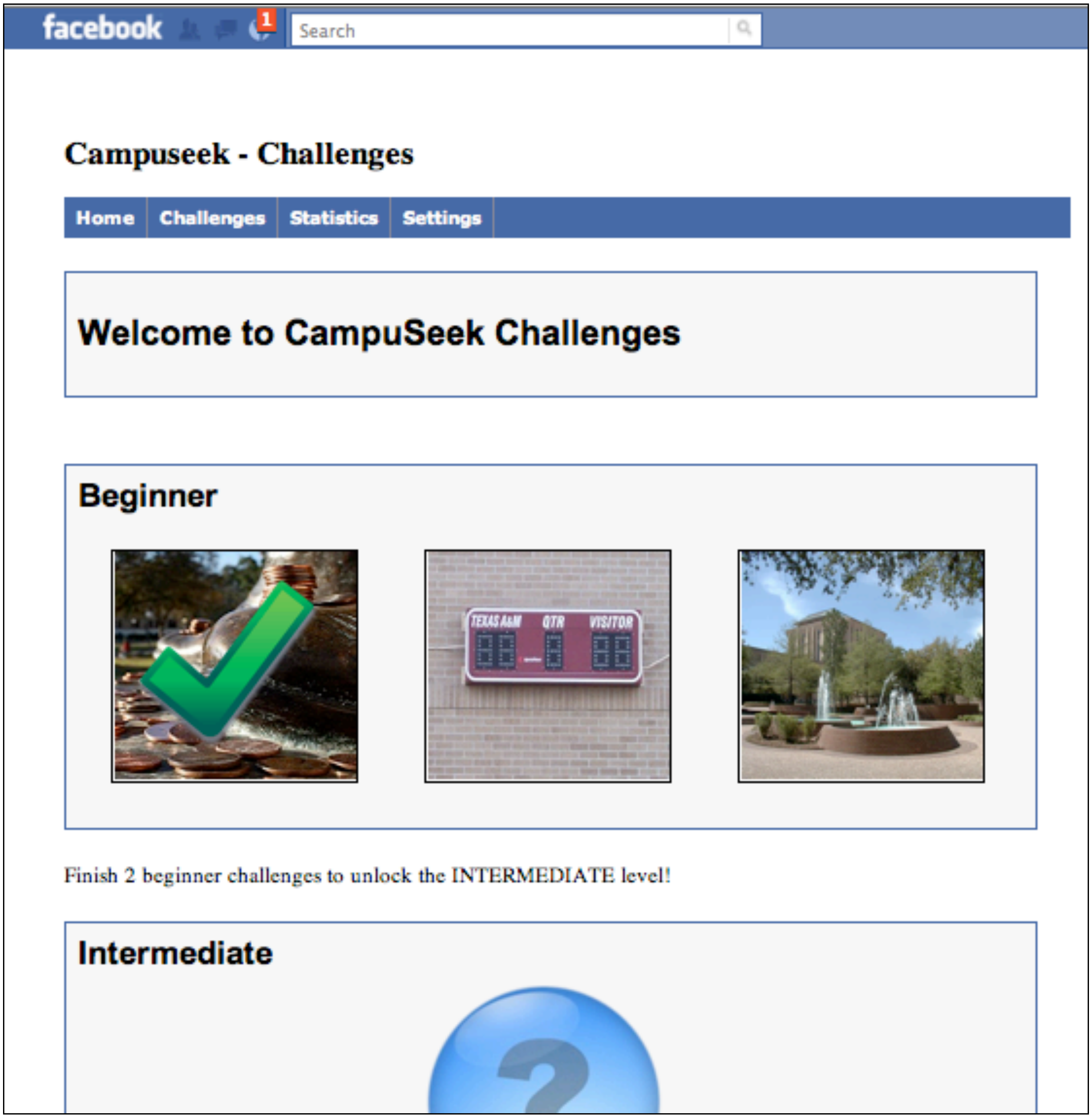
Steve Hanson · Works at Decorators Warehouse
I've lost 5 pounds! Wooooohoooooooooo!
2 · Like · Reply · about an hour ago

Prince Woodrow · Texas A&M University
I lost 6
Like · Reply · about an hour ago

Scott Lee · Texas A&M
I lost 7.
Like · Reply · about an hour ago

Figure 7: Home page

Figure 8 illustrates the Challenges page of the Facebook application. This page dynamically lists all challenges that exist in the game. Challenges that have been completed are superimposed with a checkmark (as can be seen on the first challenge). The Intermediate and Advanced challenges are not displayed until they are unlocked by the user.



Campuseek - Challenges

Welcome to CampuSeek Challenges

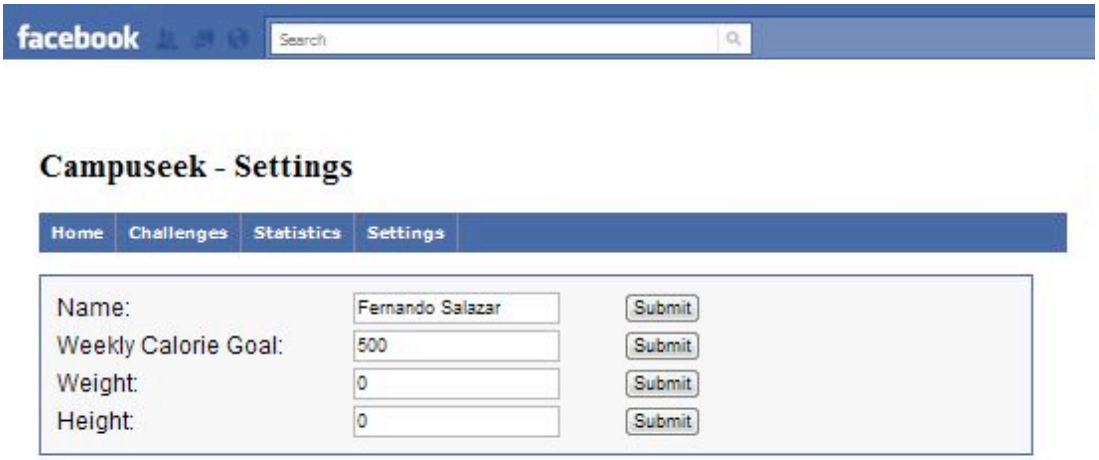
Beginner

Finish 2 beginner challenges to unlock the INTERMEDIATE level!

Intermediate

Figure 8: Challenges page

The settings page queries the database for user information and displays it in a form for the user to edit. When the form is submitted, data is rewritten to the database. This page can be seen below in Figure 9.



Campuseek - Settings

Name:	Fernando Salazar	Submit
Weekly Calorie Goal:	500	Submit
Weight:	0	Submit
Height:	0	Submit

Figure 9: Settings

The Android application is demonstrated in the images below. In Figure 10, the “Challenges” tab can be seen, with options to view completed or remaining challenges. In Figure 11, the “Current Challenge” tab can be seen, with the option to confirm challenge completion. This option uses the GPS to determine the user’s coordinates. Once complete, it will verify that the user is within an acceptable radius from the challenge destination. This screen will also show the challenge description and clues while the user hunts for the destination.

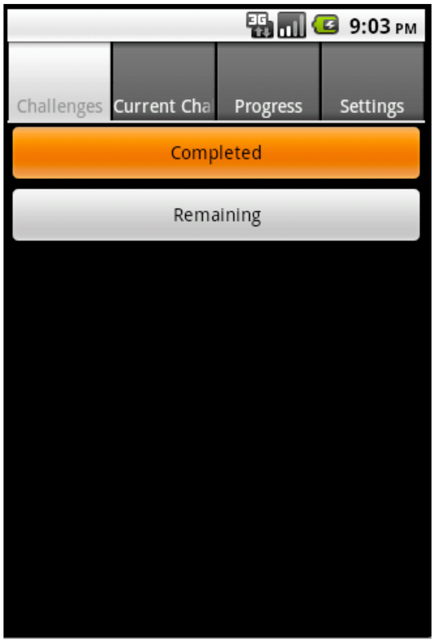


Figure 10: "Challenges" tab

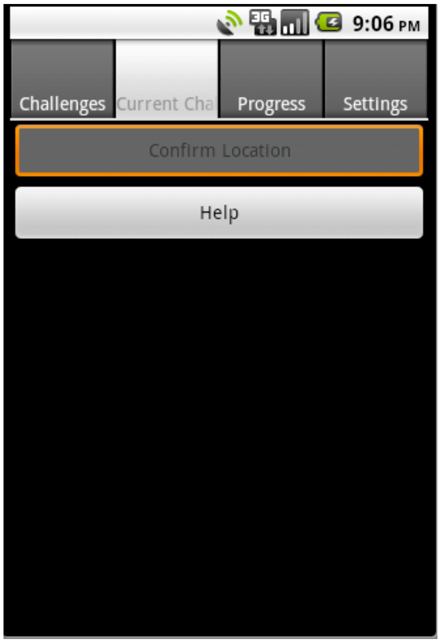
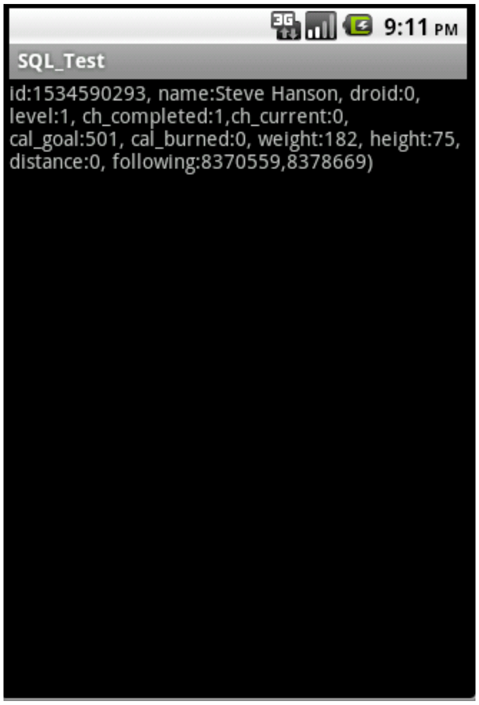


Figure 11: "Current Challenge" tab

Figure 12, below, shows a proof-of-concept of the application accessing the central database and retrieving user data. The figure shows information retrieved. Figure 13 below shows the “Progress” tab, in which users will be able to view their statistics.



```
id:1534590293, name:Steve Hanson, droid:0,
level:1, ch_completed:1,ch_current:0,
cal_goal:501, cal_burned:0, weight:182, height:75,
distance:0, following:8370559,8378669)
```

Figure 12: Database access proof-of-concept

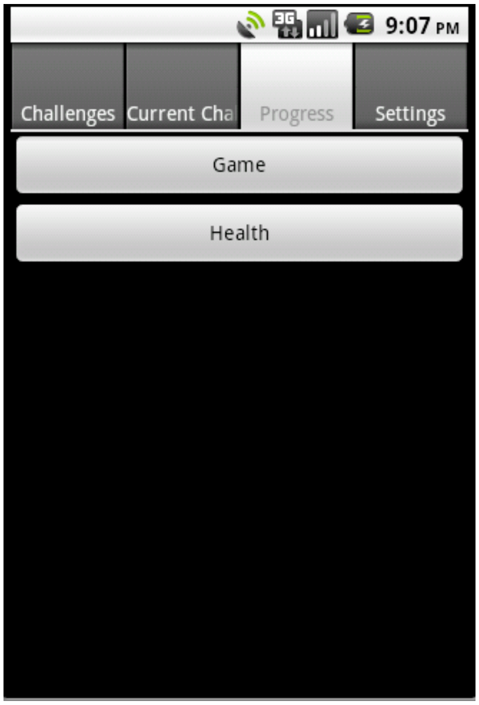
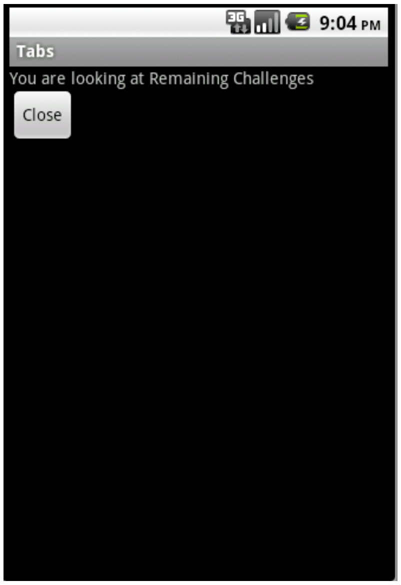


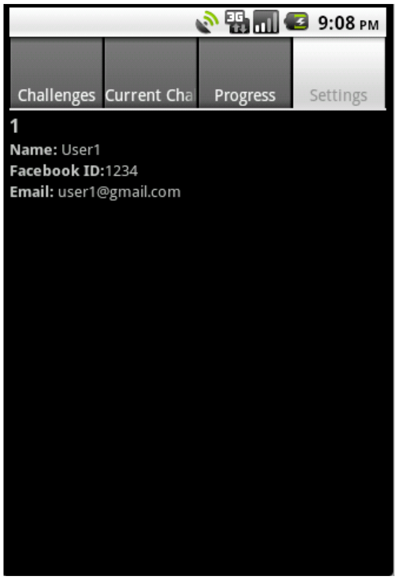
Figure 13: "Progress" tab

Figure 14 below shows the “remaining challenges” screen. Figure 15 below shows the user “Settings” screen, in which users have the option to update their information for the game.



You are looking at Remaining Challenges

Figure 14: "Remaining Challenges"



1
Name: User1
Facebook ID:1234
Email: user1@gmail.com

Figure 15: "Settings" tab