Project Proposal

Persuasive Social Games

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1 Executive summary

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 [1]. 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. The main goals of our project are to

- Encourage calorie-burning activity
- Provide a fun environment to sustain user excitement and results
- Chart user progress to motivate continued results
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Secondary goals are to

- Familiarize students with their college campus
- Build friendships through collaborative campus environment
- Help students have a FUN time!

Our proposed project is a collaborative game, called CampuSeek that promotes exercise and active lifestyles by encouraging students to explore campus. The game is a campus scavenger-hunt that utilizes an Android phone's GPS in conjunction with Facebook. A series of challenges are posted in the form of a picture of a location on campus or a clue or riddle leading the user to a place on campus. Players earn points when they find the desired location, confirmed by their phone's GPS that detects when they are there. We believe this game will have appeal to college students as a way to have fun and compete with their friends while exploring campus. This serves our goal of providing a fun environment to motivate users toward their weight-loss goals.

CampuSeek achieves the weight loss goal in several ways. First of all, the nature of the game encourages weight loss by requiring users to explore and be active on campus. Second, as the user explores campus, caloric consumption and distance travelled are recorded. Users can then analyze charts of this data and compare them with their weight loss goals, which will encourage continued perseverance toward goals. Finally, several features/incentives are unlocked when the user completes certain exercise challenges (e.g. walk for 10 minutes, run ¼ of a mile, etc.). The desire of users to unlock these incentives will push them toward being active. The entertainment factor of the game coupled with the user's desire to achieve results in the collaborative game environment make CampuSeek a viable means to help college students achieve weight loss goals.

The game will be written for the Android and Facebook platforms. Most of the features will be accessible from both platforms, however each has a different focus. Facebook will be the primary medium for collaboration, competition and detailed charts, graphs and summaries. The phone platform will be used primarily during the challenges. Users use the phone to confirm completion of challenges (via GPS) and to access new challenges and use other features during challenges. There will be limited functionality on the phone platform for browsing completed challenges and comparing friend scores.

The expected results are that people who play this game become active, meet new people and are encouraged to live healthier lifestyles.

2 Introduction

In this section, the background, need statement and goals and objectives will be discussed, along with the design constraints and feasibility of the proposed solution.

2.1 Problem background

Walking through the streets of any American suburban city, one cannot help but notice that just about every other person is carrying around more than a healthy amount of body weight. The true statistics show this is not far off from truth as 40% of Americans are classified as obese [1]. One reason why obesity is so prevalent in the United States is because many people lack the drive and motivation to commit to regular exercise. Working out can be difficult and tiring and may feel like a chore. To promote healthy activities among those who are not motivated, we plan on developing a mobile application that serves as a competitive game in the form of search challenges that will also monitor participants distance traveled as well as how many calories they have burned. The GPS functionality of the Android phone will be used to track movement and upload it to a Facebook application where the user can collaborate and compete with their friends in both the game and work out activity.

2.2 Needs 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.

2.3 Goal and objectives

The main goal of CampuSeek is that users feel like they are playing a game rather than working out, so that they will want to continue being active without it feeling like an obligation.

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

- The mobile application should provide a fun experience for users so that they will want to continue healthy activity
- The application should be fairly easy to use and self-explanatory. We want the users to be able to jump right into the game rather than teach themselves how to use the application
- The mobile application developed should be different than those work out applications that already exist
- The GPS data that is utilized by the application to track and monitor user activity should be relatively accurate
- The recorded data should be presented in a manner that the user understands without having to study the graph to great extent

- The algorithms used should correctly calculate an estimate of calories burned based on the distance traveled by the user
- The mobile application should flawlessly be able to communicate back and forth with the corresponding Facebook application

2.4 Design constraints and feasibility

The first constraint is the battery life of the cell phone. The current design uses GPS to track distance traveled by the user. GPS is known to drain battery life when being used, especially for an extended period of time. As a possible solution to the battery life issue, the GPS could only be used when necessary, and the accelerometer could be used instead in normal situations to track the number of steps the user has taken. This would result in less accurate distance calculations and no route-mapping feature, but could dramatically increase battery life. When the GPS is necessary (e.g. for the *hotter/colder* and *hints* features and challenge completion verification), it could be turned on for those relatively short time periods. One possible issue with having to turn the GPS on and off repeatedly is that there is a delay as the GPS must acquire a signal each time it is activated.

A physical constraint that users may encounter is having to hold 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.

A technical restraint is having to use a specific Android SDK. All of the current latest Android SDKs are compatible with GPS, which is one of our main features. If we use Android 2.3, we could be using features that are not available in the earlier versions of Android. We decided to use Android 2.1 because later versions of Android are compatible and earlier versions of Android OS capture only about 10% of the market share [2] (see Figure 1 below). Overall, the CampuSeek idea based on our current preliminary design is feasible, pending tests on the battery life of Android phones using GPS.

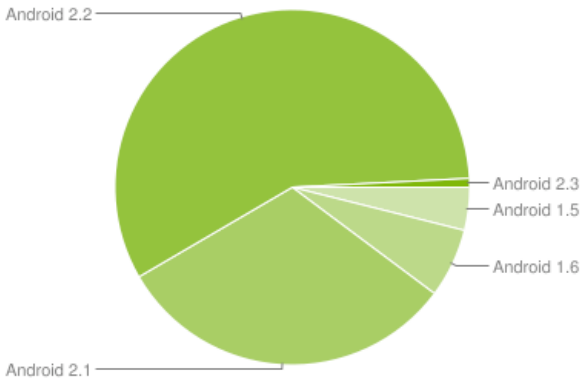

Figure 1: current Android distribution [2]

3 Literature and technical survey

While CampuSeek seems to be a unique idea as a whole, there are several other products that implement some functionality that is similar. Nike+ GPS is an iOS (iPod/iPhone) system that uses workout-tracking. SCVNGER, Tourality, and MoLo are Android applications that use geocaching/GPS scavenger hunt ideas that are similar to some of CampuSeek's. SportsTracker Pro and Endomondo is a social Android application that tracks workouts. None of these related products use the game medium along with health-promoting functionality. Each of these products will now be discussed.

Nike+ GPS [3]

The Nike+ GPS application uses the iOS platform in conjunction with GPS to time, track routes and record distance of mobile workouts (e.g. walking, cycling, skiing, etc.). Data is recorded by the phone's GPS and sent to Nike's own collaborative environment, nikeplus.com, where users can join challenges, set goals and connect with other athletes. Screenshots of the app in action are shown below in Figure 2.

Figure 2: (left) Nike+ GPS application on iPhone., with workout features including collaboration, timing and calorie calculator. (right) GPS workout charting feature shows route taken using Google Maps.

The GPS workout-tracking functionality is similar to and slightly more robust than what will be provided by CampuSeek. The two applications are very different though. CampuSeek is primarily a scavenger-hunt game with health-promoting activity-charting features. Its target audience is people who have trouble finding the motivation to just go outside to workout. The focus of the Nike+ GPS system is entirely on workout charting and is intended for individuals who are already motivated to workout. For this reason, the Nike+ system does not provide workout incentives as the CampuSeek product does. Users looking solely for workout functionalities should consider Nike+ GPS.

Endomondo [4]

Endomondo is a mobile application that provides workout-tracking features similar to Nike+ GPS. Endomondo also features real-time route tracking from external computers and optional heart-rate integration using Bluetooth heart-rate monitors. Endomondo runs on most mobile platforms including iOS, Android and Windows 7 Mobile and also features a collaborative web interface. Like the Nike+ GPS application, Endomondo is a good choice for workout-charting functionality, but lacks the key gaming feature of CampuSeek that provides the fun atmosphere for those lacking motivation.

Tourality

Tourality is a mobile-based scavenger-hunt game that uses phone's GPS in a similar manner as CampuSeek. In this game, challenges are posted for nearby areas and users compete with others to find the destination. Time is important, and users are encouraged to use vehicles to get to their destinations. This veers away from the health focus that CampuSeek aims to have. There is no specific health focus. The incentives for physical activity in the CampuSeek application are what make it unique from other scavenger-hunting games.

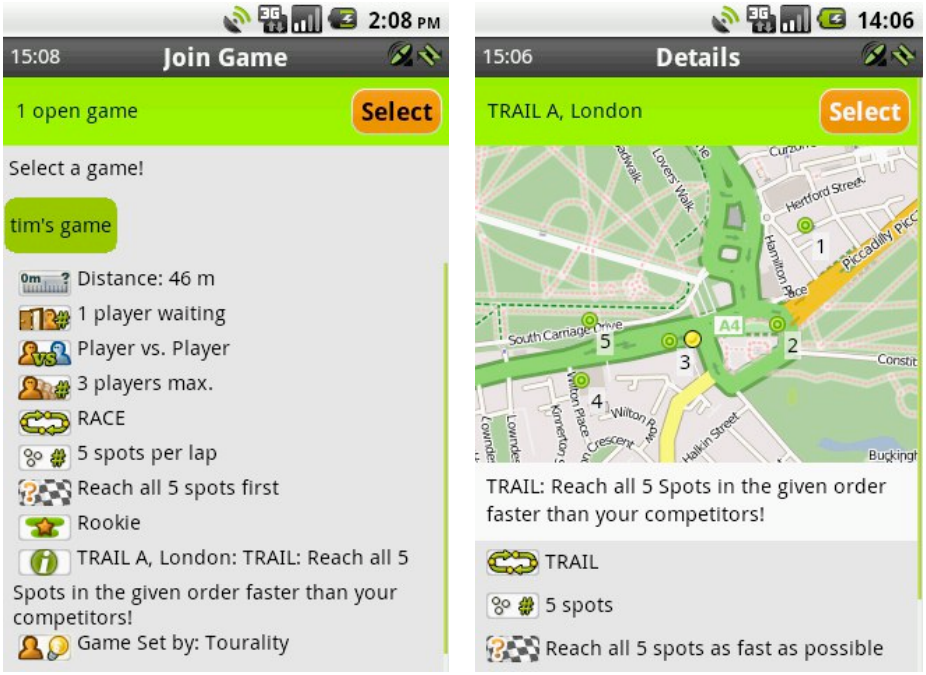

Figure 3: Tourality interface

SCVNGR [5]

SCVNGR is a mobile application for Android that allows the user to engage in Scavenger Hunts using GPS. This application can take pictures and videos with the camera on the device being used. SCVNGR accesses coarse location sources like the cellular network database and the device's GPS to approximate a

location for the device. SCVNGR is a game that encourages the user to go out to different stores, restaurants, parks, and other places, while doing challenges and earning points.

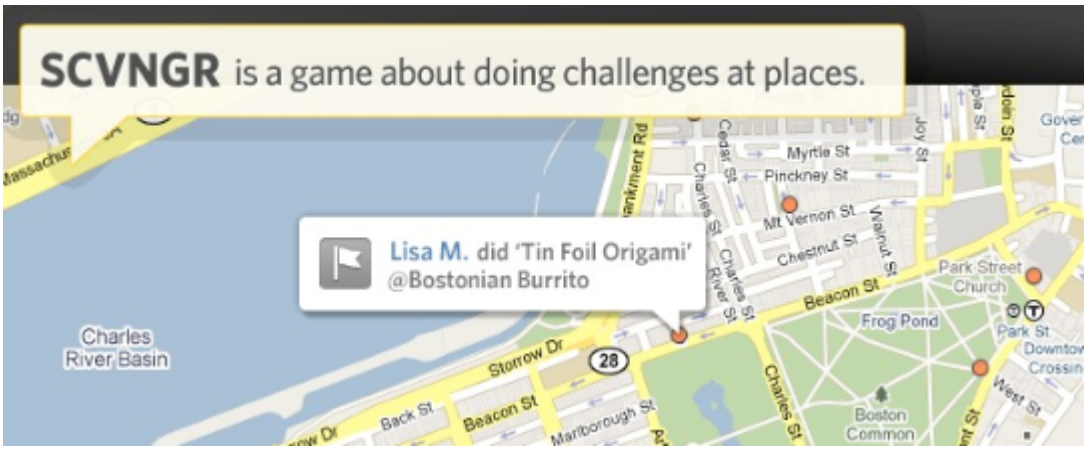

Figure 4: Screenshot of the SCVNGR Android Application [5]

SCVNGR's main purpose is to provide a check-in service for users while allowing them to be a part of a worldwide scavenger hunt. There are currently over 12,000 places that offer rewards for playing this game. The challenges are either user created or created by the businesses. Like some of the other applications discussed, the focus of SCVNGR and CampuSeek are different. While we do encourage the user to go out and explore various places with CampuSeek, our main focus is exhorting the user to be active. SCVNGR does not provide the health incentives or the workout-tracking features that CampuSeek does. Additionally, CampuSeek has a college campus focus, while SCVNGR is worldwide.

SportsTracker Pro [6]

SportsTracker Pro is similar to the NIKE+ GPS application for Android. SportsTracker Pro allows users to compare, train, share and compete in your sport with friends anywhere worldwide. This application offers detailed analysis of pace, altitude, ascents, descents and speed. Users can share their progress on Facebook, Twitter and via email. SportsTracker Pro is predominantly geared toward those who play outdoors sports such as running, cycling, mountain biking, snowboarding, motorcycling, sailing, kayaking, and windsurfing. Its main purpose is to allow those that are participate in outdoor activities to track their course. As with the other workout products discussed previously, SportsTracker Pro lacks the game feature that is the key to making CampuSeek a fun way to become active.

Figure 5: SportsTracker Pro screenshots [6]

Conclusion

None of these related products incorporates the health, gaming, and social combination that CampuSeek does. The goal of CampuSeek is to provide a fun experience for the user so that they will continue healthy activity. Not only will the user be able to track how far they have traveled and how many calories burned, they will also be able to go on a scavenger hunt and compete with friends in the process.

4 Proposed work

4.1 Evaluation of alternative solutions

After receiving feedback from the professor and several classmates on this project and surveying other technologies, several alternative solutions have come to mind:

- Use accelerometer to record workout information rather than GPS
- Fast-paced challenges where time is a factor
- Weight lifting focus application
- Weight-Watchers type calorie counting application
- Racing style game

The first alternative solution that has been heavily considered is to base CampuSeek's core workout recording functionality off of an accelerometer rather than using the GPS hardware. The participant would then wear the phone on their waist and the accelerometer would measure the amount of movement coming from the hip and translate this to a number of steps walked. Essentially, this works in the same fashion as a pedometer. The advantage of this solution compared to the main design is that it could potentially save a large amount of battery life since it will not have to be consistently updating via satellites. A goal of ours is to make this mobile application as energy efficient as possible to ensure the users can spend a decent amount of time playing the game and being active. However, if we were to limit the application to strictly using an accelerometer to track the number of steps taking, it would be difficult

to measure the distance the user has traveled and the amount of calories they have burned. We believe this will not encourage a continuation of activity since the users will not have a meaningful representation of the results they have worked hard to achieve. Whether or not this alternative will be used is contingent on battery-life testing that will be performed using the GPS on Android phones.

Another alternative approach to our gaming application would be to create the challenges in the style similar to that of the show, "The Amazing Race". Right now our game is a scavenger hunt that users can complete at their own discretion and when they have time. Alternatively, challenges could begin at specific starting times and users or teams would race to complete them first. This is the approach taken by the Tourality application discussed above. One advantage of this style of game is that it could create a more exciting atmosphere as users race in real-time. Also, if users are forced to go quickly, they may engage in more productive activity (e.g. running instead of walking). One disadvantage to this idea is that users may opt to travel by vehicle or other motorized means rather than engage in calorie burning activity, since time is the most important factor. Also, those walking or running would be at a disadvantage to those riding bicycles or in motorized vehicles, creating an unfair environment to those without extra equipment. It would also be less convenient for some users to only be able to complete challenges at specific times. Ultimately we want to promote and help maintain an active lifestyle through gaming applications.

Doing research, it can be seen that a lot of apps have been developed that keep track of the distance traveled by its users. One possible solution would be to have a mobile application that has different weight lifting exercises for users to try out. It would be available to view on the mobile application, with step-by-step instructions. To incorporate the social aspect, users could upload their own work out regimens to a Facebook application that would display this on the mobile application. The advantage is that it is something different and not common and helps users learn workouts they might have never known about. The disadvantage is that it is not very user interactive and the excitement level that is incorporated with a game just is not there.

Along the lines of changing the intentions of the mobile application, a weight-watchers application could be implemented that allows users to input the meals they eat throughout the day and calculate the number of calories consumed. The Facebook aspect would create a game that awards users points for consuming fewer calories throughout the day (within a healthy boundary). The advantage to this is that it adds a gaming twist to the weight-watchers concept while awarding users for eating fewer calories. The disadvantage is that users might consume less than the healthy number of calories to consume a day just to receive more points and be ranked higher than their peers. Also, users could enter fraudulent caloric consumption to achieve higher scores. This would lead to an inverse effect of what we are striving for.

The final alternative design would potentially be to have a racing style game. Two users could set up a "match" via Facebook and then at an agreed upon time, they could start a race for a set distance. The winner would be whoever completed this task first. The GPS on the phone would verify the distance they have run and notify the user when they have reached the set distance. The advantage of this game is that it promotes an active lifestyle with a competitive edge and is something that is not currently in any mobile platform market, however this would be geared more toward those who already work out and not target newcomers who need motivation as much as the current CampuSeek design.

Overall, we feel very confident that the CampuSeek idea will best perform the goals that we seek to address, primarily that we develop a fun way for users to achieve weight loss goals while maintaining motivation.

4.2 Design specifications

The design of our system is broken into several components. The user accesses the game system through the Facebook and Android interfaces. 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 6:

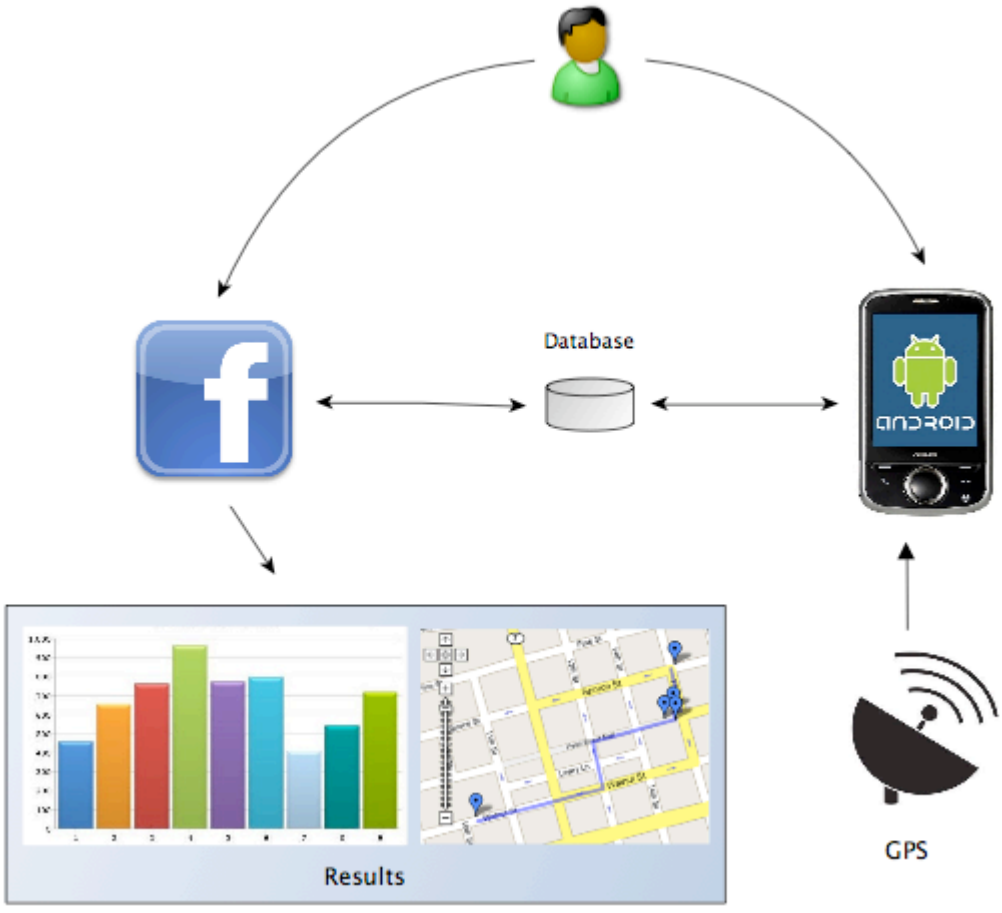

Figure 6: Complete system design

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 amount of points. This will then be reflected on the Facebook web application 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. Each of the modules that make up the system will now be described.

GPS

The GPS module is an important aspect of our project. The main use of the GPS is to obtain the user's location (and store the data as they are on the move) so that health statistics can be gathered and challenge completion can be verified. To get the user's location using GPS, the base Android XML file must be edited to allow the mobile application permissions to access data obtained by the phone's GPS hardware. Once this has been done the mobile application will have access to the data from the GPS and allow the mobile application to utilize this in tracking user movement. To accurately track the distance traveled by the user, the GPS coordinates should be consistently updated. To do this, the code will have to use a series of callback functions every time the GPS switches satellites and senses that a new location has been reached. While there are numerous options on how to transmit this data to the Facebook web application that will be developed, the option we are currently investigating is a simple HTTP Post, which will allow the application to send the data to a specified web server (most likely an FQL database built into the Facebook web application). This will allow the web application to receive the data and properly handle it achieve the desired results. These results include verifying user location as well as storing the distance traveled based on GPS coordinates and properly displaying this information in an easily readable graph. It will also compute the number of calories burned by the user.

Android-Interface

The android interface will handle much of the functionality that takes place during game-play. Users will be able to access challenges and indicate that they are starting a challenge from within the Android application. Once a challenge is started, the application begins recording data about the user's location to use for health and fitness charting. The user can use the "extras" that are available during game-play from within the phone interface. These include special functions that utilize GPS to help the player complete the challenge (e.g. Hotter/Colder feature, Hints). When the user reaches the destination of a particular challenge, the phone's GPS confirms that the challenge is complete and route and distance information is sent to the online database that stores user information. The navigation for the phone interface is shown below in Figure 7.

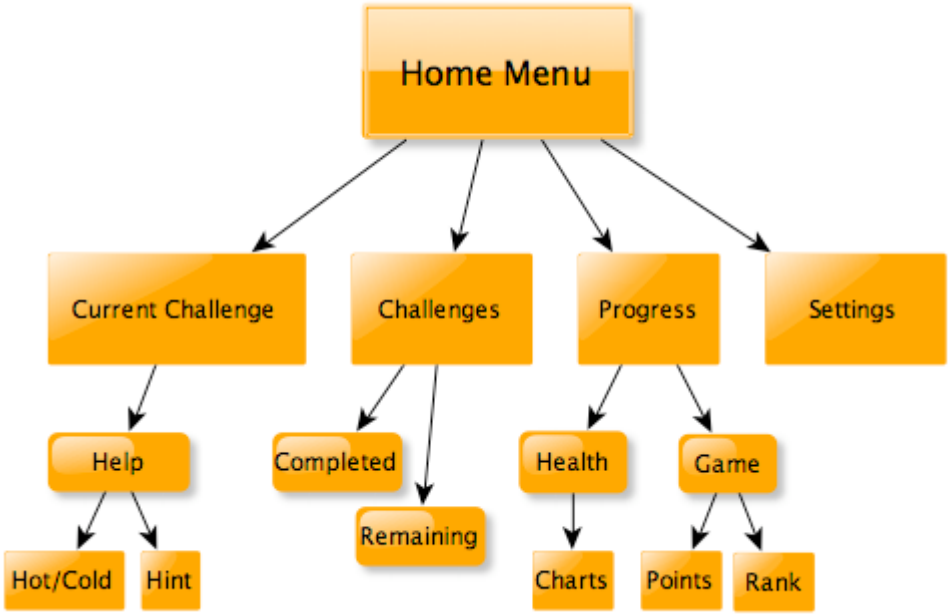

Figure 7: Android menu design

The Android API is freely available and is written in the Java programming language. Version 2.1 will be used, as that is the expected version of the phones that will be made available by Verizon and for compatibility issues regarding newer releases of the Android API. The API provides functionality for accessing most of the phone's features, including robust graphics control and GPS data. We will use the data plan on the phones to send information back to the central server that hosts the database and is connected to Facebook.

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 *oustide* of the game-play environment. The Facebook application will provide 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 will have 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.

Facebook Query Language, or FQL, allows the use of a SQL-style interface to query data exposed by Facebook's Graph API. The Graph API is Facebook's interface to people, photos, events and pages that are part of the Facebook system. It presents a view of the Facebook social graph, which includes people and the connections they provide on their profile. Every object in the social graph has a unique ID. FQL provides helpful features like batching multiple queries into a single call and many others that are not available in the Graph API. FQL can handle basic Boolean operators, simple math, ORDER BY and

LIMIT clauses, and AND or NOT logical operators. Below is an example of a sub-query that fetches all user information for the active user and friends:

```
SELECT uid, name, pic_square FROM user WHERE uid = me()
        OR uid IN (SELECT uid2 FROM friend WHERE uid = me()
```

Code Snippet 1: FQL example

FQL will be used to connect friends in the Facebook application for competition and collaboration.

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.

Workout Statistics

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.

4.3 Approach for design validation

To validate the design aspect of CampuSeek, the overall application will be broken up into numerous sections in order to field-test before product development is continued. This method is efficient in that it reduces the amount of time required to work on, identify and fix bugs that are in the different modules of the mobile and Facebook application. To verify that bugs are fixed, the current module will be field-tested again before proceeding to the next iteration of the project.

The most important module of the CampuSeek application revolves around utilizing the Android phone's GPS hardware to: determine the user's initial start location, track their movement as they explore their college's campus trying to locate the object they are looking for and then verifying that they are at the

correction location by comparing the user's coordinates with the pre-defined coordinates associated with that particular item's location. While GPS units are not 100% reliable in pinpointing an exact location, they are fairly accurate (up to 10ft. for certain phones). Initially, we will use one of the development phones and turn on the GPS and have it transmit the coordinates to a FQL database that will be used to store users as well their progress throughout the game. This will validate that the initial location is accurate and that our database is able to receive location data pertaining to the users. As the user travels, we will record their location by pulling data from the GPS every 15 seconds and will interpolate an accurate distance traveled by the user. A primary aspect of the application will be to graphically demonstrate a user's progress in terms of distance traveled or calories burned. The most efficient and reliable way to validate that this aspect of the GPS module works is to have a team member travel a predefined distance while equipped with the GPS turned on and then examine the data received. The readings should align with the predefined distance. Verifying that our validation aspect works is simply ensuring we can make a comparison between a predefined set of coordinates with ones generated by the GPS and having a proper outcome depending on if they matched or did not match.

The next module that will need to be implemented will be the level system. Testing this will require that the majority of the application has been developed. Initially, our thought is to have a user "level up" once they have completed 50% of their current levels challenges. Simulations would be run to compare hard-coded data to brute force that 50% of the challenges were completed and then an option to unlock the next level would appear on the GUI interface. As mentioned before the Facebook application will house the FQL database to store data gathered from the mobile app. It will be verified that a users level status can be displayed on their player's profile in the Facebook application.

Another module that will need to be tested will be our collaboration mode for the game itself. This mode allows users to have a private session of CampuSeek going on with their friends. This will be handled via the Facebook application, and so we will perform another field test and have a user add a few friends to his game and ensure that it is reflected on the synchronized Android mobile application.

Finally, and most importantly, we want to verify that our product achieves the desired goals: it is fun to use and motivates users to be active and lose weight. We will test if the product is fun by conducting a survey from a pool of testers that will come from our class and possibly others. Similarly, to verify that the game motivates weight loss, we will collect statistics from the testers of the game to determine if they burned a desirable number of calories using the game.

5 Engineering standards

5.1 Project management

Each team member has unique experience and skills that will contribute to the design and implementation of CampuSeek.

Scott Lee has recently begun experimenting with the mobile application interface for iOS and will continue learning about mobile application design by working on the user interface for the Android application. This will include working on a graphical user interface that is easy for the user to understand

and makes it quite self-explanatory. He will also contribute in the development of the Facebook application, in particular setting up the FQL database to obtain the data created by the GPS module of the phone. If needed, Scott can also handle working on technical documents.

Fernando Salazar has experience electronics and software implementation. In a previous CSCE 462 project Fernando was in charge of hardware implementation and assisted in the GUI for the software associated with the project. Fernando will contribute to the development of the Android application and assist with the collection of GPS coordinates needed in the development for the application.

Prince Woodrow has experience with developing mobile applications using Java MIDlets and will contribute to working on the interface for the Android application. Prince will also contribute to collecting, charting, and calculating workout statistics. Prince will also be assisting in testing and technical reporting.

Steve Hanson is the leader of the team. He will oversee each member's roles and verify that everyone is contributing and the team is moving along on schedule. He also has experience with Java and web programming and will help with the Android app as well as configuring the database that will store information. Steve will also be the final editor and be in charge of preparing and presenting technical documents.

Regular meetings will be held on Tuesdays and Thursdays during the class lab time. The team will also convene in lab during regular class time when class does not meet. Other meeting times will be scheduled on a weekly basis depending on when each member is free. Each meeting will start by discussing each objective that is in the schedule for the current week. We will make sure that the appropriate amount of progress is made in accordance with our weekly goals and adjust our future goals accordingly. When we are discussing new ideas, we will have collaborative brainstorming sessions where each member of the team is open to discussing innovative ideas. The goal of these sessions is to be creative and open to new ideas. If there are no new ideas to present, the members will go to work on their individual tasks with the oversight of the team leader and constant collaboration.

5.2 Schedule of tasks, Pert and Gantt charts

Our Gantt chart, shown below in Figure 8, visually lists the tasks associated with completing our Android application.

ID	Task Name	Start	Finish	Duration
1	Android Interface Draft	2/7/2011	2/15/2011	7d
2	Facebook Interface Draft	2/14/2011	2/22/2011	7d
3	Field Testing Device (battery life, OS compatability)	2/22/2011	2/23/2011	2d
4	Basic Android Functionality	2/21/2011	3/10/2011	14d
5	Basic Facebook Functionality	3/7/2011	3/24/2011	14d
6	GPS Functionality	3/15/2011	4/1/2011	14d
7	Testing/Debugging	3/29/2011	4/25/2011	20d

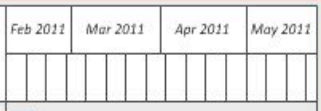

Figure 8: GANTT chart of tasks

The first step in our schedule of tasks is to design our Android application interface. This stage of the design process will mostly focus on determining which features will be provided in the Android Application and designing the visual interface of the application. This will be the first thing our users will be interacting with when using our application. Therefore, we would like it to be simple and easy to use as well as visually appealing. The second step in our task list will be to draft the interface for the Facebook portion of our application. This application will incorporate some functionality that will use the social networking aspect. Therefore, we want to make this portion visually appealing and easily functional for our users. The third step in our design process will be done in a short time period. During this portion of our task schedule we will be field-testing our devices for battery life and OS compatibility. Because we want to make this application accessible to as many people as possible we would like to extend compatibility among different Android versions.

The next portion of our process will be to begin incorporatig some of the functionalities that our Android application will provide to our users. These functionalities include:

- User Access
- Challenges
- Database integrations
- User Results/Progress

Each of these functionalities will be incorporated into our application providing the components that make up our application. After these components have been implemented in our application we will focus on incorporating the functionalities for the Facebook portion of this project. This includes the following:

- Facebook Application
- Linked to Android Application
- Challenges viewed online/Results
- Database integration with Android Application

The GPS on the phone devices will be an integral part in the implementation of our application. Therefore we must ensure that the functionalities of the GPS are accurate and precise when integrated with our application. Time will be spent researching and incorporating GPS components in order to receive the best results for our application.

The final step in our design process will be testing and debugging, because we want to provide a fully functional product that is robust and ready for use, we will spend a large portion of time testing and debugging issues that we may have with our application. This process will ensure that a finished product will be turned in on the due date.

5.3 Economic analysis

Analysis will be performed in this section pertaining to economic, sustainability and manufacturability concerns.

Economic

Our team believes that the potential marketability of our Android application will be substantial to the community outside of Texas A&M University. Our application provides two useful benefits, it provides a fun way to be active and also provides a utility for a student to familiarize themselves with the campus. Cost factors will be a concern as our application will only be useful to those who have an Android smart phone with version 2.1 or greater. With the increased popularity of smart phones and the Android OS's steady rise in market share this issue will hopefully not limit CampuSeek's popularity too much. Also, if this application becomes popular, it could be extended to the iPhone and Windows 7 Mobile platforms. Initial cost will be minimal as this application is software based not requiring any monetary resources other then the device itself, which is being donated.

Sustainability

There are several cell phone providers that offer the android OS platforms with their smart phone. Therefore, availability for these devices will not be a factor. Furthermore, with the increased popularity of smart phones, price is decreasing rapidly. The only maintenance our Android application will require is an upgrade in the software when new releases of Android OSes are available. We will also have to take into account the different hardware components each smart phone has (e.g. screen resolution, processor speed). If the Facebook platform becomes unavailable in the future, or if the social network loses popularity, it may become necessary to transfer the Facebook interface to a different social network or web site. This does not seem likely in the near future.

Manufacturability

Component tolerances are a huge concern for our team as our application will have to work for different types of phones running Android OS. Because Android runs on an array of phones with different hardware component and specifications, we have to make sure this application will always run and have a smooth interface on these different devices. Another concern our team is focusing on is the battery consumption used when running our application. The GPS will also be a vital piece in the implementation of our game. We will constantly be sending and receiving GPS coordinates in order to track distance walked and provide confirmation of a location found. Worst case analysis would be that battery consumption is significantly high resulting in a user only being able to play for small amount of time. Finally our team will be sure to comply with the Android application guidelines and regulations when making an application for Android devices.

5.4 Societal, safety and environmental analysis

The CampuSeek product is expected to have a positive societal impact by encouraging weight-loss, fun, campus exploration, friend connection and healthy activity. It is expected that users of this product achieve weight loss and feel better and more connected. Users will go from the couch playing traditional Internet games to the outdoors where they can explore campus, meet new friends and become fit. We foresee this having a large impact on campuses across the nation.

Safety is a huge concern for our team. This game will promote tons of active walking. Therefore we decided to keep this game solely on campus. This will minimize conflict between people playing our game and concerns with vehicle traffic. We also have decided to encourage using cell phone holsters in order to provide users with a means of safely transporting their devices and keeping them away from their attention unless necessary. Having a user aware of their surrounding when playing our game is extremely important as this will help the user avoid dangerous situations (e.g. bikers on campus).

Finally, our team does not see any environmental impact coming from our Android application.

5.5 Itemized budget

This project will not require much foreseeable funding because the software API's used are all provided free of charge. Also, the main hardware component of this project, the Android phones, are being donated by Verizon. Our team will likely seek to purchase phone holsters to increase safety and reliability in our system and testing. It is possible that our team will have to purchase a web hosting subscription if free database access cannot be found, but this is unlikely as one of the team members already has web hosting with database access. The itemized breakdown of costs is shown below:

Item	**Estimated Cost**
Android Phone (x10)	$0 (donated)
Phone Holster (x10)	$150
Possible Web Host Subscription	$30
Total	**$180**

6 References

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8. "Physical Fitness Training." Headquarters, Department of the Army. Web. 6 Feb. 2011. <http://www.hooah4health.com/4you/FM2021-20.pdf>.

7 Appendices

7.1 Product datasheets

TBD - will place mobile device specifications once device is determined

Facebook Web Application Documentation, Facebook Query Language, Graph API
http://developers.facebook.com/

Android Development Documentation
http://developer.android.com/index.html

7.2 Bios and CVs

Scott Lee is a senior Computer Engineering major at Texas A&M University who also minoring in Mathematics. Throughout his time at A&M he has learned the building blocks of how to create efficient and concrete databases using SQL as well as the essentials of programming (primarily in C/C++), all of which tie into system design. His recent projects have included a web application that served as a hospital interface that allowed patients, doctors and pharmacists interact with one another. He has also worked on a robot that would re-adjust itself to balance on a ball. This incorporated using stepper motors with an embedded system and interfacing multiple hardware components with one another to create a large scale system. After he hopefully graduates in May 2011, he plans on going into the network security field.

Fernando Salazar is a senior Computer Engineering undergraduate student at Texas A&M University. Fernando is originally from Rosenberg, TX, he attended B.F Terry High school and came to Texas A&m in the fall semester of 2006. Having come with no prior programing experience Fernando faced many obstacles learning and adapting. These skills were eventually developed as well as an increased interest in electronics and design.

Recent projects have included a Multi-input VGA selector that was designed and constructed by Fernando for his CSCE 462 final project. Fernando recently completed a course where he increased his knowledge in C# and the .NET framework. Fernando is in his second year of working for Texas A&M Athletics IT where he oversees the AIT helpdesk for over 500 users at an Enterprise level.

Fernando is now completing his final semester at Texas A&M and is looking forward to a career in IT Security.

Steve Hanson is a senior Computer Engineering major at Texas A&M University with a minor in Mathematics. After graduating second in his high school class at Mansfield High School, Steve came to Texas A&M where he has enjoyed learning about computers from the ground up. Steve primarily enjoys software programming and has skills in computer networking, web programming and general programming in C/C++. After his sophomore year at A&M, Steve interned with National Instruments, where he wrote a C library and LabVIEW API for sending messages over TCP/UDP using an application layer protocol. He has also written a program that crawls a file-sharing network and finds and records all peers online, written a parallel traceroute program, created a simple TCP-like protocol on top of the UDP protocol and made an arcade-style shooter game called Aggieland Invasion that uses servos and lasers to detect when zombies are shot. Steve has worked several jobs on the A&M campus. He has worked two semesters as a peer teacher for computer science classes and was a research assistant under Dr. Madsen of the Electrical Engineering department. Steve is currently the webmaster of the European and Classical Languages and Cultures department and tutors privately for computer science, math and Spanish courses at A&M. He plans to graduate in May of 2011 and will begin working for American Airlines in June as a software developer.

Prince Woodrow is a senior Computer Engineering major at Texas A&M University who is also in pursuit of a minor in Mathematics. Prince interned at Cisco Systems where he helped develop a video recording application for Cisco's IP Office Phones. Working with the Voice Technology Group (VTG),

Prince used XML, JSON, and Java MIDlets to help create the application. Recent projects at Texas A&M include a robot that would balance itself on a ball using gyroscopes, arduino boards, an accelerometer, and stepping motors. Throughout his time at Texas A&M, Prince has acquired essential programming and problem solving skills that will help him in his future career. Prince has taken courses in C, C++, Ruby, Java, and C# just to name a few. Prince plans on graduating in May 2011 and will begin working for Cisco Systems in June as a Software Engineer.

Please find the attached CVs.

Scott Lee

Slee2525@gmail.com

2704 Wilderness Dr. N
College Station, TX 77845
(214) 893-5045

2213 Lone Pecan Dr.
Garland, TX 75040
(972) 496-8973

Objective

Seeking either an entry level position that will lead to opportunities working in the field of, but not limited to, network security or database design.

Education

Texas A&M University, College Station, TX — May 2011
Bachelor of Science in Computer Engineering
Major GPR: 2.88
Overall GPR: 2.605

Awards

International Baccalaureate Diploma — May 2007

Activities

Beta Club	August 2005-May 2007
Key Club	August 2005-May 2007
National Honor Society	August 2006-May 2007

Work Experience

College Station Recreation and Park

Youth Basketball Scorekeeper

- Monitored and organized practices for the College Station Parks department
- Interacted with kids and helped them learn the fundamentals of basketball

Site Supervisor

- Monitor facilities to maintain a safe environment
- Interact with parents and management
- Help score keepers with questions or directions

Technical Skills

Programming Languages

- C, C++, Java, Python, Ruby, Matlab, Maple, Verilog

Operating Systems

- Windows XP, Windows Vista, Windows 7, Linux Ubuntu

Relevant Coursework

Introduction to Unix Systems, Digital Logic, Data Structures and Algorithms, Database Systems, Microcomputer Systems, Distributed Objects Programming, Communications and Cryptography

Fernando Salazar

1710 South Dexter Drive, College Station, TX

281-748-0839

Salazar@neo.tamu.edu

Summary/ Objective

- Comprehensive knowledge in MS Word, Excel, Power Point, Internet
- Basic knowledge in programming languages such as C++, Java, C# and currently taking courses to expand that knowledge
- Extensive computer training, including knowledge of system hardware and components
- Skilled at learning new concepts quickly, working well under pressure, working in groups, and communicating ideas clearly and effectively
- Enthusiastic and experienced when working with computers and software

Education

Bachelors of Science, Computer Engineering *2006-Present*

***Texas A&M University**, College Station, TX*

Regent Scholar, 2.75 GPR, Graduation May 2011

High School Diploma *2002-2006*

***B.F Terry High School**, Rosenberg, TX*

Top 10% Graduate

Work History

AIT Student Technician, *Athletic Dept. Information Technology, College Station, TX* *Present*

- Provide athletic staff and network users with assistance solving computer related problems, such as malfunctions and software issues
- Test and verify hardware and support peripherals to ensure that they meet specification requirements by recording and analyzing test data

Front Desk Clerk/Technical Support, *Hawthorn Suites, College Station, TX* *2008-2009*

- Worked directly with the guest in an effort to make their check-in/check-out experience as pleasant as possible
- Ran diagnostics monthly making sure that our operating systems and hotel management software (MSI) was running correctly

Diagnostic Specialist, *AutoZone, Houston, TX* *2007 Seasonal*

- Operated diagnostic equipment that determined if major components of an automobile were working properly
- Learned extensive information about electrical and mechanical components of a vehicle

Memberships & Affiliation

Society of Hispanic Professional Engineers, *(SHPE)*

- Member since 2006
- Mentor for incoming freshman engineers

Mexican American Engineers and Scientist, *(MAES)*

- Member since 2006
- Recruitment Officer in charge of recruiting members and socials

Texas A&M Sports Car Club

- Member since 2007
- Compete in autocross events

Stephen P. Hanson

stephen-hanson.com
s.hanson@tamu.edu • (817) 437-4155
201 N. Creekwood Dr. • Mansfield, TX 76063

OBJECTIVE

Seeking to provide technical experience summary for CSCE 483 class

EDUCATION

Texas A&M University, College Station, TX — Graduation: May 2011
Bachelor of Science in Computer Engineering, Minor in Mathematics
Cumulative GPA: **4.0 / 4.0**

RELEVANT COURSEWORK

C/C++ Language, Data Structures and Algorithms, UNIX Computer Systems Computer Architecture, Programming Design Studio. *Current/Future courses*: Info Storage and Retrieval, Database Systems

TECHNICAL SKILLS

C, C++, JAVA, Python, PHP, SQL, CSS, Maple, LabVIEW, Verilog, Network Programming, UNIX/POSIX, Quick Learner, People Oriented, Hard Worker

WORK EXPERIENCE

National Instruments, Austin, TX — May 2009 – Jul 2009
Software Engineer Intern
- Developed library and LabVIEW API to send and receive LXI hardware messages over TCP/IP and UDP

Texas A&M University, College Station, TX — Aug 2010 - Present,
Peer Teacher for Engineering Class — Feb 2008 - May 2008
- Provide help for students in a variety of engineering classes

Discount Distributors, College Station, TX — Jan 2008 – Mar 2009
Self Employed
- Sold and shipped goods online obtained through liquidation and other sources

Decorator's Warehouse, Arlington, TX — Jul 2008 – Present
Webmaster, http://decoratorswarehousearlington.com
- Created and Maintain Company website using HTML, CSS and PHP

Texas A&M Photonics Research Lab — Oct 2008 - May 2009
Research Assistant
- Utilized LabVIEW and specialized tools to assist researchers

ACTIVITIES & VOLUNTEER

Breakaway Ministries Media Team Leader — Fall 2010 – Present
Aggie School Volunteers — Fall 2008 – May 2010
Aided Church in Venezuela — Jun 2010 - Aug 2010
Habitat for Humanity — Fall 2007 - Fall 2009

HONORS

Engineering Scholars Program, University Honors Program
National Society of Collegiate Scholars, **Ella McFadden Scholar**
Lockheed Martin Scholar, A&M CS and Engineering Ambassador

Get more info about me, including contacts and transcript at: **stephen-hanson.com**

Prince Woodrow

18809 Lina st. apt. 3101
Dallas, TX 75287
469-877-3737

princewoodrow@gmail.com

Objective

I am in pursuit of a Full-Time Software or Hardware engineering position.

Education

B.S. Degree in Computer Engineering; Minor in Mathematics — May 2011
Texas A&M University, College Station, TX
Current GPR: 3.108

Diploma — May 2006
Newman Smith High School, Carrollton, TX

Work Experience

Summer 2010

Cisco Systems: Software Engineer Intern-
Worked with the Voice Technology Group (VTG) on a video recording application for Cisco's IP Office Phones. Worked with XML, JSON, and Java MIDlets.

Accomplishments

- Honors Challenge Scholarship Recipient: "awarded competitively on the basis of proven academic excellence and outstanding records of extracurricular activities, community service, and work experience." (Fall 2006- Spring 2010)
- Recipient of Lockheed Martin Computer Science Department Scholarship (Fall 2008- Spring 2009)
- Recipient of Aggie Spirit Scholarship (Fall 2008- Spring 2009)

Memberships & Affiliations

- Member, National Society of Black Engineers
- Member, ASPIRE- Aggie Scholars Promoting Incentives, Resources, and Encouragement
- CS Ambassadors- represent CS department on student panels at various events
- Men's Practice player for Texas A&M Women's Basketball team- Practice against the women's team to help make them better
- Captain, Club/Intramural Basketball- represent Texas A&M and play in tournaments held at different Universities
- Leader/Organizer, Dry Bones Bible Study
- Mentor, Newman Smith High School Basketball- give advice on how to excel in basketball and academics
- Big Event Community Service- painted fence for a family

Skills

C/C++, Java , C# , HTML , Visual Studio, XML, Photoshop
experience with MIPS, Verilog, SQL, Eclipse, Ruby, Python, Networking, Network Security, Digital Circuits, Signals and Systems, JSON