CECS 491A - Sec 6 - Project Proposal

Project Name: ArrowNav

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Overview

            Our project is a mobile application for download on Android, specifically a type of campus companion, that provides useful information and assistance to both new and current students at California State University Long Beach.  The application will be free to download, and its primary function will be to display locations, provide foot traffic updates, integrate student schedules into their accounts for the application, and increase student productivity while on campus through a variety of features.  Initially, our plan is to code this application in C#, but are willing/capable of switching languages should it become necessary.

Vision

The final vision for the application will be to have a map of campus capable of displaying and locating all buildings, shops, and restaurants to all university campuses in the state of California.  Furthermore, the application will be able to integrate student schedules and display traffic flow for all campuses based on the university.  The application will make it easier for students to navigate campus and increase their productivity on campus while still making it an interactive and enjoyable application to use on a semi-regular basis through convenience, incentives, and usability.  In the future we hope the application will be able to have up to date traffic monitoring and building capacity through traffic data monitoring and also be able to run advertisements for on-campus activities, shops, restaurants, and clubs.

Competitors

            A majority of our competitors, with regard to this mobile application, are indirect.  Theme Park applications have a similar UI in comparison to our application, but those applications only show wait times for rides specifically for that theme park.  Our application, although similar in their UI, will display the foot traffic on walkways and routes specific to the California State University Long Beach campus.

            Another indirect competitor is any application with navigation features (Google Maps, Waze, etc.).  These applications are more geared towards providing directions and traffic times along roads that allow for automobiles to traverse.  Although it can be argued that these applications also account for other modes of transportation (walking, biking, etc.), they only provide directions to the overall location.  Our application is more focused on foot traffic and all buildings and routes of the campus.  In a sense, our application is more condensed and specific to the area.

            The CSULB app is another indirect competitor.  This app provides information for those on campus but does not have the other unique features that our application provides.  The common factor between the CSULB app and our application is the audience they appeal to.  Both applications are more geared towards both new and returning students and provide useful information that could benefit students.

    Fitness apps will be another indirect competitor as our app promotes physical fitness for the user through our feature that focuses on maintaining physical well being such as setting fitness goals, having a stepper tracker and having a water intake tracker. In our application however these functions are specifically tailored to the campus, with the water intake tracker being linked to a location feature that will tell the user where on campus they can refill on water and the function of setting fitness goals having schedule integration so that it will fit into the busy schedule of an on campus student.

            Lastly, apps that provide geocaching features are an indirect competitor.  Our application’s primary function is to provide foot traffic updates on campus routes.  The geocaching feature on our application is to help incentivize students to visit parts of campus.  General geocaching apps encompass an extremely large area, whereas our application is specifically geared towards the California State University Long Beach’s campus.

Unique Features

**Display locations and traffic on campus**

* There will be an interactive map of campus that allows the user to scroll through the campus and select and highlight buildings such as classroom buildings, administrative buildings, parking structures, designated recreational areas, restaurants, cafeterias, shops, theaters, auditoriums and water refill stations on campus as well as all routes within the campus and significant landmarks such as statues and water fountains. The virtual interactive map will be limited to only show routes and streets within and immediately around the perimeter of the campus but will not model any streets beyond that. Furthermore, the app will not model the location of each and every classroom and special offering but would rather show a user the buildings these places are located in.
* Show how long it would take to travel from the current location, to an available entrance to all buildings on campus by taking several elements into account such as mode of transportation, traffic, and route used. Only modes of transportation that will be considered are the ones allowed by the university such as skateboards and bikes. Students using skateboards and bikes will only be allowed to take routes where such vehicles are allowed to be in use.(i.e. bicycle and skate paths designated by the university) Additionally the location of bike racks would be available to users.
* Account for the direction the student is walking (uphill or downhill) and account for different modes of transportation (walking and skating) which will promote safe travels and avoid collisions between pedestrians and people using more convenient forms of transportation. This would be done by showing a user with a skateboard or bicycle whether a downhill path, which would be harder to maneuver and quickly brake, is more congested than another allowing them to know ahead of time which route would be safer to navigate and avoid collisions.
* Show foot traffic during different times of the day on campus. This will affect the estimated time of travel between locations based on foot traffic at the time. Overall volume of traffic will be denoted on an incremental level system i.e ("Peak Times","Off-Peak Hours","Medium-Peak Hours").
* Due to the limit of the project's current resources this foot traffic will not be able to provide up to date information but would rather be using a rudimentary predictive system based on observations of foot traffic during a day.
* We will observe traffic on various routes on a regular week day(Monday - Thursday) and on a weekend date (Friday - Sunday) as well as what time of day they are busy then based on date, time of day we will determine the foot traffic on a route. For example foot traffic on campus at noon from Monday to Thursday would be much busier than foot traffic on campus at noon from Friday to Sunday. Our team will only alter this system when we know an out of the ordinary event will take place on campus which will affect foot traffic significantly such as protest demonstrations, special events such as a club rush, etc and make changes accordingly.
* Locations and highlighted points of interest as stated in previous bullet points will be determined by the developers and implemented accordingly.  The interface will be developed with C# being the primary language of choice, but can change should it become necessary.  References for the interactive map will be based on physical input (visiting locations on-campus) and referencing previous renditions of the campus layout (maps and diagrams).  Resources needed for this portion of the application are determined and provided by the time allocated by the developers to work on the application.

**Quick Find Feature**

* If a user has a specific location in mind the Quick Find feature can help them find it in a more efficient manner than scrolling and looking for it in the virtual map.
* There will be a drop down menu in the app that will provide the user with a list with all the locations modeled in the virtual map in alphabetical order.
* The user can then scroll through the list to find the specific location they had in mind and click on it which will then automatically scroll to the location on the virtual map and put a pin to it generating a route to this location.
* The quick find feature also has a function that will allow the user to "favorite" certain locations so they can immediately access one of their favorite locations on the map.
* This feature makes it easier for users to find specific locations on campus without wasting time scrolling through the map trying to find said location.

**Availability in capacity buildings**

* The app will show availability in the capacity buildings of the campus. Due to limited resources we will limit this to only the three most important capacity buildings on campus: the USU, library, and gym.  This feature is meant to save users the potential time wasted should they arrive at a location (such as the gym or library) and not be able to use the resources they offer.  Time is a nonrenewable resource and therefore is crucial in optimizing its use.
* This function of the application will not consider every single individual within these buildings but would rather consider the general availability of these capacity buildings using the same way foot traffic is determined.  Availability will be determined through a rudimentary predictive system based on observation of a regular week day and regular weekend day.
* We will observe how full these buildings get on a regular week day(Monday - Thursday) and on a weekend date (Friday - Sunday) as well as what time of day they get full. The traffic is then graded on a scale of 1-3 to represent completely empty (1), medium filled (2), or completely full (3). We will use these two days of observations and use it as a base to predict the fullness of the buildings for the rest of the semester and will only be adjusted due to out of the ordinary events such as finals weeks which would change the normal fullness of the library and weather events such as rain which would change the normal fullness of the USU.
* The fullness of a building will be based on specific criteria for each rating so it is not opinion based. This criteria will include if they can walk freely without bumping into other students, if all the seats in a building are taken, if there are seats available, if there are more than 10 seats available, and if there are at least 10 computer or gym equipment available.

**Schedule integration in user account**

* The main functionality of this feature will allow students to input their schedules into their accounts so that students can recall their schedule easily.  The application will only allow for current students of the university to input their schedules, as well as only be allowed to input classes that are approved by the university.  These allowed classes would be dictated by the official class schedule provided by the university.
* Provides features for editing, deleting, and viewing schedule(s) on application.  Students can complete different semesters with different schedules, and therefore need a means to alter their schedules on their accounts based on what classes they are currently taking.  Furthermore, students can either drop, swap, or add classes during the semester, and as such would require the schedule on the application to change accordingly.
* Display class locations for different days throughout the week to help with student time management by functioning as a sort of itinerary for a student for each day. The display of class locations will only show the building a certain class is located on the virtual map along with information pertaining to the course associated with the class.

**Geocache Reward/Achievement system**

* When certain requirements on the app are met, such as distance the user has traveled, the user account is awarded points. These requirements will be preset challenges made by the developers that will balance out the “economy” of the rewards program
* The points will act as a form of substitutional nonofficial currency.  These points are only specific to the application and not applicable anywhere else.
* Rewards for using the app consistently, creates an incentive to use the application.
* Rewards that can be purchased with these points will be decided on by the developers and will be limited to on-campus offerings. For example, these points can then be used to acquire deals and/or discounts to on-campus shops and restaurants. Weekly campus scavenger hunt where students are given a clue and search for hidden “treasure” located on campus.
* Incentivizes students to visit certain locations on campus through this fun game mode.
* Clues for the geocache are provided on the application by the developers.
* Users who find the geocache are awarded points on the application which can be redeemed for deals/discounts through the rewards system.
* Multiple easter eggs will be hidden in the app as well to provide more unpredictable and amusing rewards (i.e., you went to the library at 2:00 PM on a Friday).
* This function will be updated on a weekly basis and rewards and challenges will be set by the developers of the app. The developers will be limited to locations already on the virtual map which in itself is limited to the modeled locations of the campus.

**Student hydration reminder**

* This feature is aiming to solve the problem of students neglecting their water intake during their busy schedule.
* Their intake function will give the user periodic reminders during the day to promote hydration. It takes into account the users daily recommended amount of water they should drink which will be determined by information input by the user.
  + The formula takes the user's weight in pounds and multiplies it by 2/3 (0.66) to get their daily amount of water in fluid ounces. This amount is just a base amount and the user may add ounces of water to that amount to take into account any dehydration caused by physical activity.
* This feature has a notification function where the user may customize the amount of times per day and at what time intervals they would like to be reminded to drink water. (For example if the user will be on campus for 8 hours and would like to be reminded four times during the day the amount of water they would need will be split into four portions and be reminded to drink a portion in two hour intervals)
* When the user gets a reminder, the student will be shown the closest water fountain or water bottle refill station on the map relative to his/her location and generate a route towards it.
* The user may log the amount of water they drank and the app will take it into account until they reach their set daily intake.

Thank you for taking the time to look over the project proposal.  On behalf of everyone here on Team Longhorn, we hope you have a nice day.