

Senior Project Proposal

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Problem Statement

San Luis Obispo has the benefit of an exceedingly efficient and useful public transportation system. San Luis Obispo Transit buses run very often and do so without deterring too much from their original scheduled stops. This bus system has become a necessity for many residents in the city who use it to go to school, work, shop, and relax throughout the city.

The problem with our bus system is that, beyond usage of one or two buses, it becomes a hassle to determine what the most efficient route is to travel to a destination. It can become so bothersome that, in fact, many would choose personal transportation, such as a car. With such a beneficial public transportation system available, it is a waste not to encourage its usage by the community.

There should be a simpler way of producing plans for a trip. The timetables shown in the available transit map pamphlet shows all necessary information, however it is complex to create an effective travel plan without risking missing a critical connection; one may also be forced to wait for a long period of time for a bus because of ineffective planning.

Solution

The solution is nicely solved by way of a mobile application. Specifically, this project will be developed with the Android platform in as its target.

With the available transit map obtainable on any SLO Transit bus, the timetables for each route will be input into a database. From this database will a route be extrapolated between two stops which will minimize the time one would wait based on criteria given by the user such as start and end times.

Using the geographic location of each spot as accurately as possible, given in the degree-minute-second format, each stop for each route will be placed into the database. The user will then select the source and destination, (though the source may be automatically selected based on the user's current position, as given by the mobile device's GPS) then by giving constraints on start and/or end times of the desired trip, the program will output a list of buses the user should take to finish the trip.

Schedule

Initial requirements gathering and interface design will take place during the first quarter of development. The goal is to have a set of criteria upon which to program can be built by the beginning of the Fall 2010 quarter.

During the Fall quarter, programming will begin. An algorithm for defining the best path the user will take will also be implemented and tested during the Fall quarter. Given time and proof of the effectiveness of the program, I may also implement a database of shops or other such locations in order

to simplify scheduling trips to popular destinations.

Meeting Minimum Criteria

Independence

I will be the single maintainer and developer of this project. I may seek the assistance of Dr. Dekhtyar and other instructors in order to develop the main algorithm for the trip scheduler. Given that Dr. Dekhtyar is the main visionary of what this project will culminate in, I will refer to him for assistance in designing the user interface.

Ownership

As a student of this school and a supporter of open source development on the Android platform, I will endeavor to create a quality application that will prove a benefit to its users. I will provide a public interface for following development of this project on the web, using services such as SourceForge to host it. It will be an open source application with a license permitting other developers to modify the project in the future in order to continue to provide a free interface for bus scheduling.

Background Research

Research in this project will include studying how to program for the Android. Although the programming language is Java, there are certain special requirements with programming in order to make it compatible with Android systems. It is also necessary to learn how to interface with the different pieces of hardware available in standard Android phones, such as GPS and the touch-screen interface, in order to effectively use them in the program.

Outside of Android programming-related research, it will also be necessary to find the geographic coordinates of each bus stop which are to be put into the database. If this information is available from the San Luis Obispo Transit Authority, that would be my main source; otherwise, I would use the GPS capabilities of my Android device in order to calculate those locations myself.

Creativity

Creativity in this project will be expressed through user interface design, algorithm development, database design, and other aspects of the coding process. For example, there are many ways to query someone for one's source and destination in conjunction with when they want to leave and/or arrive. Deciding how to display the query and what particular combinations will be valid and which will trigger errors are sources of great creativity on my part in this project. The many aspects of this project will allow decisions which will exercise the greatest levels of creativity.