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CS491
Literature Review
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Literature Review – Annotated Bibliography

For my project I will be implementing an iPhone and iPod Touch application for Professor Tesman. I have changed projects from my previously proposed topic to this one. The application will be a cross between a game and a GPS directional tool in which the user will input a location that he or she wishes to travel to. Once the location is found the screen will turn black, indicating only to the user whether or not he is getting closer or further away from the destination. Obviously, there are many applications for the iPhone that utilize its GPS and navigational features, however, there do not seem to be any that do so in this manner.

For this project to be successful I will require Apple's iPhone Software Development Kit (SDK). It uses a version of Objective-C which will require some tutorials or practice in. Although it is not necessary, access to an iPhone would be useful. The SDK does have a simulator for the hardware so lack of an iPhone would not prevent the project from being feasible.

-"iPhone OS Reference Library". Apple, 2009.
***http://developer.apple.com/iphone/library/navigation/index.html*.**

Apple's own Reference Library has a comprehensive API including examples of how to use all of the functions featured in the SDK. It also provides tutorials for learning Objective-C.

Most importantly, the library contains references for all of the functions relating to interfacing with the GPS hardware and location tracking abilities of the iPhone, including how to obtain the user's current location as well as the location of their

destination, and how to integrate the locations with the Google Maps iPhone application to calculate routes.

-"iPhone Application Programming Guide". Apple, 2009. ***http://developer.apple.com/iphone/library/documentation/iPhone/Conceptual/iPhoneOSProgrammingGuide/Introduction/Introduction.html*****.**

This page by Apple features not only guidelines and tips for making user friendly applications but also includes basic rules for what every application should take care of. Topics in this article include event handling, graphics, networking and more.

I expect that the most useful topics here will be event handling, graphics, and networking as they will all be related to each other in the context of this application. The iPhone SDK also supports GDB for debugging, which will come in useful and is explained in various sections throughout the Reference guide.

-Fisher, Richard. "Appland: how smartphones are transforming our lives". ***The New Scientist*** **203 (2009): 32-36.**

Fisher writes about how pervasive iPhone apps can be in our daily lives, at least for those of us who own one. In the article, he quotes philosopher David Chalmiers as saying, "cellphones are allowing cognition to creep beyond our skulls in entirely new ways…[they] are becoming a repository for our memory, desires, and beliefs." This is precisely the way in which this app would change the user's perception of "getting directions" from an iPhone. When using the app, it would not actually give directions, but would inform the user if he is going to right way.

-Gamma, Erich. Design Patterns: elements of reusable object-oriented software. Reading, Mass: Addison-Wesley, 1995.

A significant part of the iPhone OS involves specific design patterns which are the same as those used in Cocoa for Mac OS X. Through reading this book I will hopefully learn some more about the purpose of design patterns and better understand the ones that I will need for programming for the iPhone.

-Kochan, Stephen. Programming in Objective-C. Indianapolis, Ind: Sams, 2004.

This book gives instruction on programming in Objective-C and Cocoa, both of which are the frameworks for the iPhone operating system. It supports a variety of operating systems and is written for both novice and experienced programmers.

I expect to use this book along with the iPhone OS Reference Library, which is undoubtedly more specific to the iPhone software that I will be working with.

-Ramirez, J. Raul. "Advances in multimedia mapping". *Land Information Science* 66 (2006): 55-63.

This article attempts to define the ways in which mapping and geography should be portrayed by current geographical systems. It goes into detail about our conceptual understanding of maps and how they are interpreted.

Although this is an explanation of how mapping systems should represent information it is interesting to think that the application I will be making technically breaks all of the rules and requirements established by the author of this article.

-Wu, Shiow-Yang and Kun-Ta Wu. "Effective Location Based Services with Dynamic Data Management in Mobile Environments". *Wireless Networks* 12 (2006): 369-81.

The authors of this paper discuss location-based systems in relation to their applications in mobile environments. They come up with a system using Internet networks that connect to a central server that can provide mapping data to devices.

As the iPhone's location-awareness is already implemented and I will only need to deal with connecting it to my application, their concept does not apply here. However, it is interesting to note that the authors also use an object-based environment as the framework for their system.

-Zandenbergen, Paul A. "Accuracy of iPhone locations: a comparison of assisted GPS, WiFi and cellular positioning". Blackwell Publishing. ***Transactions in GIS*** **13 (2009): 5-26.**

This article elaborates on the system used by the iPhone in acquiring its position. The author explains that a combination of cellular signals, Assisted GPS (A-GPS) and WiFi signals work individually, or together if all signals are available at once, to triangulate the position of the device. He highlights the advantages and disadvantages of all three methods (for example, A-GPS does not work indoors) and mentions some of the types of algorithms used to determine locations.

By using these methods, the iPhone is able to be fairly accurate in determining approximate positioning, although not as accurate as stand-alone GPS devices. The article also includes statistical data about the accuracy and reliability of each of the three methods.