#FriendFinder

Tyler Allen, Karen Dana

August 29, 2014

1   Overview

Our goal is to create a social networking application for the Android mobile device platform tentatively called 'Friend Finder'. The users of this application will have profile information including their name, schedule, 'likes', 'dislikes', and other useful information; parts of this data will be hidden from other users, but will still be used in determining if a user should receive certain notifications or if a user should be flagged 'busy' or 'available'. The application will also use GPS location services to provide the location of events and students who wish to make their location public. This will provide students with a fun and easy-to-use service that will eliminate the hassle of individually inviting people to events, finding event locations, as well as locating a friend for coffee.

The primary deliverable of this project will be the Android application; we will be using the Android SDK and fundamental aspects of Android development pulled from the Android Development course in order to create this application. For this application to function, we will need users to be able to login to their profiles; this will require us to have an SQL-based back-end database that contains user credentials and profile information, as well as a database connector API such as JDBC. We will be using an external server to house and maintain the database. This project will require a full spectrum of software engineering and development tools and techniques. We will need to explore a variety of both Android technologies, such as GPS and Android 4.0 technologies, as well as software libraries for database connections and password encryption; it may also be necessary to explore algorithms for handling large data requests via the internet.

In addition, we are to write a Campus Emergency Application targeted at the Android Platform for Western Carolina University. This application will provide relevant Emergency Information for students,

such as contact information for 911, suicide hotlines, sexual assault hotlines, campus police, and campus medical facilities. This application is to be Western Carolina University themed with the campus police as our clients.

2   Problem Statement

The purpose of this project is to develop a social networking application targeted at the Android Mobile platform which will provide context- and location-based communication and event scheduling with other users backed by an external database, maintaining user profiles and other information, to simplify data processing. We are also to design a Campus Safety application targeted at the Android platform in order to provide public safety information, from both on-campus and off-campus sources, to students in an easily accessible manner.

3   Requirements Specification

3.1   Campus Police Application

- This application must provide phone numbers, web pages, and other pertinent contact information for on-campus and local emergency resources in a well-organized, functional manner.

- This application may provide the ability to call/contact these resources directly from the app if it can be done in such a way that is not intrusive and is not likely to happen by accident, but is still convenient enough to be usable.

3.2   Friend Finder Application

- The android application should provide the ability to create a persistent profile containing information, of which some will be publicly available and some will be private. We will investigate using facebook authentication for this app, as it seems to be both popular and reduce the complexity of building a login system [1].

- The android application should allow a user to join groups, add 'likes' to their profile, and broadcast/receive events based on these likes and groups. Users should be able to create likes/groups if a reasonable protocol for doing so becomes apparent while maintaining security and without overcomplicating the app.

- The android application should provide the ability for users to search/query for other users, 'likes', and groups available within the app. The user should also be able to upload their schedule; this will allow the application to deactivate itself or take other action when the user is 'busy' according to their schedule.

- The user should be able to have a 'friends' list, a special group which allows viewing of additional profile information such as the user's class/work schedule. This will also allow the user to broadcast their location to their friends, making meetups easier. GPS is notoriously known for using large amounts of power, draining the battery in a short amount of time. We will be investigating methods for efficiently making use of the GPS transmitter as well as using other technologies in place of GPS in order to conserve power [2] [3].

- The application should provide different levels of events and determine if events warrant a push notification versus a log under their respective page. The server should provide a stable, consistent database of user credentials, profiles, and other information.

- The server should be able to provide information about a user without revealing personal information (i.e. extract 'busy' status from a user's schedule and deliver it to other users, without revealing the actual details of the schedule).

- The server should provide user authentication; this user authentication will be encrypted if it is feasible to include this within the scope of this project.

4   Testing Plan

Testing will be completed as the application is developed. We will create Regression/Integration tests using the Android TestSuite - a derivative of JUnit. An adequate server-side unit testing framework will be selected based on the final language decision; presently, there is no concrete language decision for the server while we weigh our concerns about performance, usability, and database and API availability. Testing will also include an evaluation of the user experience on Android devices of multiple sizes, and conceivably performance concerns. Ideally, we will be able to generate and/or simulate a large number of registered users as well as simulated users to test usability. Our server will be the server Polaris. Our test android devices will be a Samsung Galaxy Neo, an LG G2, a Google Nexus 7 (2012), and any other devices we can allocate during the course of this project. We will be targeting Android Version 2.3 for the Campus Police

application and Android Version 4.0 for the 'Friend Finder' application.

5   Schedule of Completion

Tuesday, September 16, 2014

We will have completed the emergency application for the Western Carolina campus police. The planning stage for the second part of our capstone will also be finished; this includes the layouts for the Android application and UML diagrams for the entire 'Friend Finder' project.

Tuesday, September 30, 2014

At this meeting, we will have the skeleton of the Android application finished. This contains the screens that will be used, including the graphics, layouts, styling, and non event-driven buttons. The options to enter text, change forms, and making sure the user enters valid input will have been implemented as well. We will have the normalized database schema completed, setting the layout for the information stored in the database by the application.

Tuesday, October 21, 2014

By this time, there will be user authentication and encryption. The information for all the user profiles will also be uploaded into the database. We will also have created several different 'likes' and 'dislikes' that users can choose to add to their profile, which will then be updated in the database.

Tuesday, November 4, 2014

At this point, all the information from the users stored in the database can now be queried for 'likes' and 'dislikes'; a user can choose a 'like' or 'dislike', and the database will return a list of the current users who also have that same interest or disinterest. The user will also be able to create groups of different people, called 'circles', that will be saved into a group database. There will also be standard groups created by us that will be gathered from users based on their location, schedule, and other information.

Tuesday, November 18, 2014

The user will now be able to create meetings and invite either one of his own custom groups or one of the standard groups to the event. There will also be the option to input their course schedule. When the user is in class, it will display that they are busy on the user's profile.

Tuesday, December 2, 2014

Whenever a user is invited to an event, they will get a notification sent to their phone. If the user has entered the schedule and is currently in class, their notification will be delayed until they are free; if they have their options set to not receive invitations, no notification will be sent. We will also have implemented a map which shows nearby users who have the hidden mode disabled in their settings; hidden mode allows a user to accept invites and create events without being visible on the map to other users.

References

[1] Konstantinos Mourtzoukos and Ioannis T. Christou. Experiences running a prototype location-aware mobile social networking system. In *Proceedings of the 8th International Conference on Advances in Mobile Computing and Multimedia*, MoMM '10, pages 362–365, New York, NY, USA, 2010. ACM.

[2] Wolfgang Narzt. A generic context-based architecture for energy-efficient localization on mobile devices. In *Proceedings of International Conference on Advances in Mobile Computing & Multimedia*, MoMM '13, pages 33:33–33:42, New York, NY, USA, 2013. ACM.

[3] Zhenyun Zhuang, Kyu-Han Kim, and Jatinder Pal Singh. Improving energy efficiency of location sensing on smartphones. In *Proceedings of the 8th International Conference on Mobile Systems, Applications, and Services*, MobiSys '10, pages 315–330, New York, NY, USA, 2010. ACM.