

CS486C – Senior Capstone Design in Computer Science

Project Description



Project Title: Lightweight group geolocation/communication mobile app	
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Project Overview:

With the booming development of smart phones in the last decade, the utility of phones has increased far beyond mere talk and text to include an infinite range of other on-demand information access functionalities. Some of these apps have fundamentally changed the way that society functions, based on the provision of up-to-the-second information from others; good examples include Facebook, Twitter and Snapchat.

Although a huge variety of existing apps are centered around communication with social groups, most of these focus on “persistent” groups or networks that are built up, and communicate using a variety of models. We are interested in a very special purpose app aimed at supporting communication and coordination of small (usually <10 person) social groups that are “lightweight,” meaning that they form quickly and casually on-demand, last for a short period of time (one activity), then dissolve afterwards; we call these “temporary virtual groups.”

The core scenario for this app is centered on a small group coming together during a limited (usually <1 day) event, with the need to communicate and track each other during that time. Once a group is formed, the members of that group can see where each other are geographically, and also communicate via in-app text messages to individuals, or to the entire group.

Use Case Example: Five friends are going skiing/snowboarding. People in the group range from beginner to expert level - meaning they’ll want to choose different runs, and travel at different speeds. Using this application you’ll be able to (A) see where each person is on the mountain, (B) have a localized place to message each other (“meet for beers at 12:00!” or “Oh crap, Joe broke his leg. Meet at the car asap!”), and (C) potentially use the application for emergency purposes by being able to communicate their position to emergency personal.

Mike, one of the expert skiers, gets to the bottom of a run and doesn’t know where the rest of his friends are, he wants to get back on the lift but decides to check his app to see if one of his friends might be getting close to his location. He see’s that Bob and Jane are just about to finish their runs too so he waits so they can all get on the lift together. On their way up the lift Bob checks his app and sees that their friend Joe is getting to the top of the lift so he sends Joe a message, “Hey, we’re right behind you on the lift. Wait at the top for us!”

Other applicable group activities/events might include:

- Outdoor concerts
- Sporting events
- Fair
- Mountain/Road biking
- Conventions
- Motorcycle Clubs
- Themepark
- Zoo

- Traveling in a foreign country (it's easier to see where your people are than ask for directions)
- Kids at the mall

The goal of this project is to build a proof of concept mobile app that supports this lightweight group coordination. While design and argumentation for specific features will be left to the team, so specific thoughts include:

- ✓ Groups must be super-easy to form/dissolve. The whole idea is that this has to be faster/simpler than using Facebook, manually sending Google Maps coordinates, and texting. Think of the (now retired) Bump app: <https://www.youtube.com/watch?v=0b19BwZ6O7M>
- ✓ Should be easy to enter new people into your “pool” of people that are available to form lightweight groups. Maybe one could allow “quick import” from Google or Facebook. Or leverage NFC, or similar, technology.
- ✓ The basic shared information is map/location information and easy text chat with all or specific group members. The design should be extensible to support further exchanges, e.g., documents, pictures, video.
- ✓ The emphasis will be on early implementation of a working prototype to allow extensive refinement and improvement of the interface. All of the key functionalities already exist separately in other apps; this app will succeed only if it brings them together in a fast, easy, and highly intuitive interface.
- ✓ The team will be able to choose between iOS and Android implementation, based on their early analysis of what platform would allow fastest and most complete exploration of the concept.

Knowledge, skills, and expertise required for this project:

As with all Capstone projects (and real life), the team will be expected to learn the knowledge and skills required for this project early on in the game. Beyond standard senior-level capabilities in programming and software design, helpful skills will include:

- ✓ Familiarity with mobile application development in either Android or iOS.
- ✓ Familiarity with GPS and mapping functionalities/packages in mobile app SDKs.
- ✓ Skills in interface design, testing and refinement.

Equipment Requirements:

- ✓ In most cases, teams developing mobile apps prefer to use their personal devices for development and testing. If no such devices are available, the department will make available an appropriate device for testing.

Software and other Deliverables:

Basic deliverables include:

- ✓ A fully-functioning mobile application for either Android or iOS platform.
- ✓ Complete users manual, brief and well-written users manual, written for non-technical users. Could be done as web-based document if desired.
- ✓ As-built report (required of all CS capstones), that carefully documents requirements, design decisions, and implementation details. Should allow future team to easily pick up where left off.
- ✓ Professionally documented source code.