Common Ground:
A Mobile App to Help People Connect

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Abstract
Using the common smartphone, users are able to connect to others that are in the immediate vicinity with common interests. The application will allow an individual to gain common ground with the person they have just found based along these common interests. The application has immense privacy and safety controls built in granting the user the security over their life and who is included.

Author Keywords
Networking; social connection; Facebook; social matching; private matching; location-based; GPS; mobile app

CHI'13, April 27 – May 2, 2013, Paris, France.
ACM 978-1-XXXX-XXXX-X/XX/XX.

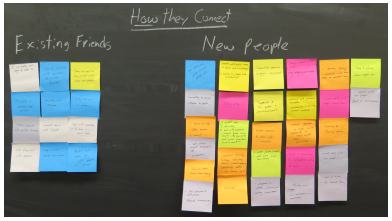
ACM Classification Keywords
H.5.2 User Interfaces—Graphical user interfaces, prototyping, user-centered design, H.5.3 Groups & Organization Interfaces—collaborative computing, computer-supported cooperative work.

General Terms
Human Factors

Introduction
The Common Ground mobile app is designed to bring nearby people together through shared common interests.

The overall aim of this application is to help people connect with new people, specifically by using common interests to give people at the same location a starting point for meeting. It attempts to further bridge the gap between virtual and real relationships by showing possible connections the users can choose to act upon in their real life. It is intended to be used by people who use smartphones and are looking for a way to easily meet new people that they have something in common with. In order for our idea to work, we need people who are active smartphone users and who are, or have a desire to be, outgoing and social, or who believe in socializing to a good extent - basically everyone except for perhaps the most private of people.

This app is designed to work along with Facebook, providing the additional ability to see other users nearby



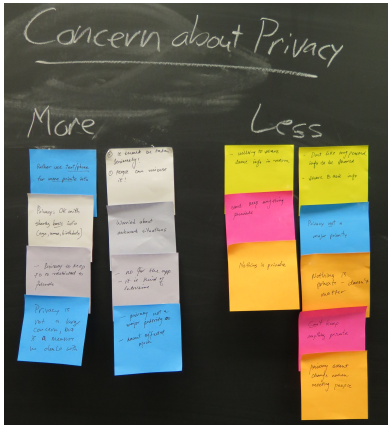


Figure 1. Affinity Diagram

who share common interests. It then allows them to notify the other user that they are nearby and interested in connecting with them in person. It allows the user to turn their visibility to others on or off at any time, as well as settings to turn on or off at certain times or at certain locations automatically, so that user effort is minimized.

The app addresses the theme of the CHI Student Design Competition in how it helps encourage an awareness of others around us through our shared online experience.

The rest of this report details the different processes we went through while designing this application, including conducting research interviews, making an affinity diagram, making low and mid fidelity designs, prototyping, usability testing, etc.

Literature Review

In regards to how social matching is implemented in our app, the concept of 'private matching' [1] plays a role in the design of our system, where only the common values of two users are visible to both. Our application of this principle is in how the common interests of two users are displayed to both, rather than all of their selected interests. This applies just to their interests, however, as other basic information consisting of first name, age, and photo are also shared in order to facilitate connections.

With the prevalence of the social networking site Facebook, we considered the possibility that providing a connection with it would streamline the setup and use of our app while also giving users a connection to something familiar. The concern, however, is whether it would support the goal of facilitating face-to-face connections. Existing research indicates [2] that people do consider Facebook to be the main social networking site, as well as thinking of it as a kind of 'official' space where they need to honestly portray themselves and where they expect that from others. These perceptions do align with what our app is trying to accomplish. Therefore, we decided to integrate Facebook into the design of our app as much as possible, as well as to avoid duplicating any of the existing functionality that Facebook provides.

Review of design literature also revealed the importance of not giving the user irrelevant and unhelpful match notifications [3]. Therefore, we designed a system where match notifications are generated by the users themselves, upon the conscious review of a list of matches. Once an active user decides that a match represents high potential, they can trigger a notification on the match's device. The match therefore only receives high-quality notifications when another user sees value in their connection. This could lead to missed potential connections when matched users are in proximity but neither is actively reviewing matches, but the value that active seeking adds in producing notifications is seen as vital in moving beyond simple match notifications that may otherwise be irrelevant.

Methods and Results

We decided that the most effective means of user research for the project would be to conduct semi-structured interviews. We wrote a set of pertinent open-ended questions to serve as an interview guide. Then we began collecting our data by individually going out and conducting interviews. We each interviewed one or two people, giving us total of seven interviews to work with in the end. We were taking notes as we were going along

Darrel Simmons

Margie Lane

Figure 2. Personas

with the interview, or made an audio recording of it (with the participant's permission) and then typed it up afterward. Most of our interviews were either conducted through video chat or meeting up at a specific place such as their home or a coffee shop. Our interviews were approximately 15-20 mins long, asking our interviewees some questions about how they connect with others in their daily life.

Once the interviews were completed and the recordings and notes were compiled, we conducted single-case analysis by each going through the information on the interviews individually and coding our impressions of them onto sets of sticky notes. Then we did cross-case analysis using an affinity diagram (Figure 1), placing all of those sticky notes on a wall and working together to organize them by topic. Several trends emerged that helped guide our design efforts. These included things like how all of the people tended to prefer to meet people face-to-face, they tended to use smartphones a lot, they tended to use Facebook, and they wanted to make friends.

There were also things that people were split on. These included whether they were concerned about privacy, how often they went out, and whether they tended to connect more with new people or existing friends.

In addition, the people we interviewed generally thought that the app would be helpful and had some ideas about what information they would like to see or share in the app. Some were also concerned that the app make it easy for the user to control what is shared and wanted to see user matching by common interests.

Personas and Scenarios

We created two personas (Figure 2) based on the results of our research data analysis. We saw three key differences between users that separated them into two groups. One group was more concerned about privacy issues, did not go out very often (not more than once every two weeks) and was more likely to connect with existing friends than new people. The other group was less concerned with privacy issues, went out at least once a week, and often connected with new people. There were also characteristics shared by both groups, such as preferring to meet people face-to-face, the use of smartphones and Facebook, and wanting to make good friends.

Our persona for the first group was Darrel, a 27 year old banker who meets new people every day for work but does not have very many good friends. He does enjoy doing things with the ones he has, and would like to make more friends to do things with but doesn't like to go out because he has a hard time finding things to talk about. He uses his smartphone all the time, but is concerned about online privacy. For Darrel, using this app would allow him to discover more things he has in common with the people around so that he could connect with others on a deeper level.

For the second group, our persona was Margie. She is a middle aged stay at home mom with two kids, who loves to meet new people and wants to get to know the other moms better at her kids' school. Margie has a smartphone but prefers apps that are more simple to use. She would also like a way to get a better idea of what things they have in common so that they could have things to do together when the kids are in school.

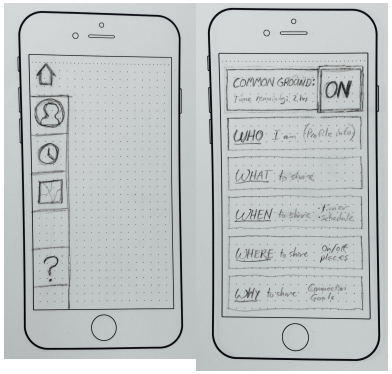


Figure 3. Sketches

These personas influenced our design choices in how the results are just presented as a list in the app, rather than having the app notify the user about matches. Both Darrel and Margie just want to be able to see what they have in common with those around them when they feel like it, and want the choice of whether to act on that information. Darrel is concerned about privacy and Margie doesn't want using the app to be a lot of work, so we tried to make when and where the app is turned on both customizable and automatic, by allowing the user to schedule times of the week for the app to turn on and select specific areas on a map where the app should either be on or off. Once those are set how the users wants them, the app will automatically turn itself on and off accordingly.

Prototyping

After conducting our research we came up with some conclusions that gave us a much better idea about how to proceed further with our low and mid fidelity designs. For this product we began our prototyping process by taking the data we received from the research of our potential clients and transferred our conclusions to the beginning stages of our prototype.

The initial prototype of this product began as 'low fidelity' sketches (Figure 3), made with pen and paper, that provided a general outline of the possible layouts that our application could take. Each team member individually created their own set of low fidelity sketches that expressed how they imagined this application would be be laid out and interacted with by the user.

Next, we compiled all of our low fidelity sketches and decided what features would best achieve the goals our application sets out to provide. Some of the features we found most important to implement were; an on/off switch, a list of people near by, a profile editing feature, an interests tab, a blocking feature, and a connection to Facebook. With this information compiled, we began the mid fidelity stage of this prototype. For this we used an online software called Balsamiq. This software enabled us to create a high quality layout that provided a more accurate reflection of our ideas for the final product. This software (figure 4) is very interactive, which results in a very accurate representation of how we imagined our final product to look and act like. This software allows the creation of buttons that link to other pages, therefore mimicking a functional application. Through this wireframe prototype we are able to get very close to a final product. This let us see what features work best, which need to be removed, and where they should be located within the application.

During the prototyping phase we preformed heuristic evaluations, which helped give us an idea of where our application ranked when it came to the usability of our design layout. Through preforming this evaluation we determined a help tab was necessary in order to provide the user with help and documentation information that allowed them to better understand how to use the product. We also elected to add a timer feature in order to help prevent errors such as the app running for longer than the user wants. This timer gives the user the option to set an amount of time for which they are actively looking to meet new people. Through this feature, we are able to easily make sure that the users matched with new people are still active in their search, while giving users freedom and control over what the application is doing.

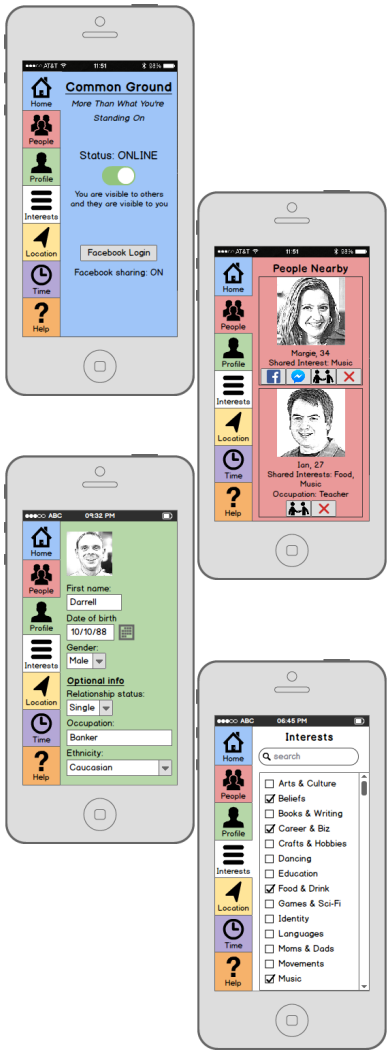


Figure 4. Wireframe prototype

We also used this mid fidelity design to preform cognitive walkthroughs. Through these walkthroughs we found our application made it difficult for users to contact each other. Originally we had it so that when users where nearby, they would connect through Facebook, and then get in contact with each other through such. We decided our application should have a feature that matched users and alerted each party of such an instance instead of having to go to Facebook to make contact.

The interface of the app has seven tabs with icons, including Home, People, Profile, Interests, Location, Time and Help. As mentioned above, the app is designed to help users connect with others around them, in whatever way they want to. If someone has smartphone this app would be easily accessible to a them, and they could easily meet new people nearby based on shared common interests. Each of the tab views allows a progressive disclosure of data associated with the user's mood expression, and creates a natural path of discovery through investigation of each view. The graphic display is an interface designed to create a more natural way of representing our data.

Home: The home tab is the main page that the user sees when loading the application. It has the online/offline switch to toggle the app discovery function, as well as the a Facebook login button to connect the app to the user's Facebook account.

People: The people icon is show how many people to share the same common interests as user do. After filling out profile and interests, the app will hopefully match the user with other people who the user might actually be interested in connecting with, based on the shared interests. But if the app is just turned off, there will be no results in terms of other profiles matching, as the app is off. Once the app is turned back on, the user is visible to other people as far as what his/her profile looks like and consists of.

Profile: Lets the user share basic info about oneself. The profile icon asks about the following info: Photo, first name, date of birth and gender. There is also some optional information they can provide, including relationship status, occupation and ethnicity. This information could help give other people a better idea about the user's profile and his/her personality.

Interests: Asks user to select and make a list of particular interests. Listing all the possible interests, and allowing the user to search through them and select which ones they want, can help the user connect with many more people on many different levels.

Location: The app doesn't necessarily have to be turned on everywhere. This tab allows user to select where he/she would want the app to automatically be turned on/off. For example: If the user is at some public gathering event, he/she has the option to completely turn off the app. The user is given a map and can select whatever areas they want that fit with their idea of how they want the app to work for them.

Time: This is where the time related settings for the app are. The timer function lets the user set the app to automatically turn off after a specified amount of time. The scheduling feature allows user to set a weekly time when they want the app to turn on, by choosing what day, time and duration.

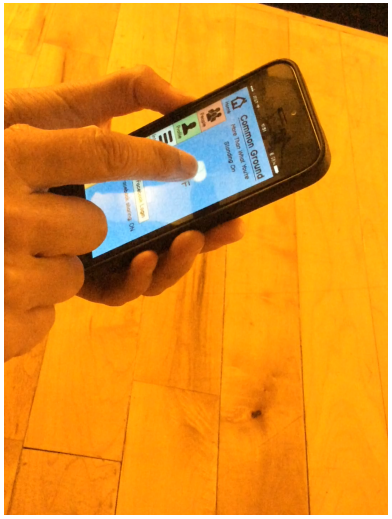


Figure 5. Usability Testing

Help: As mentioned above, the app is designed to help users connect with others around them, in whatever way they want to. The "Help" icon is just to give users a nice overview about what this app is meant to do, and a short description of what each of the navigation tabs are for.

Usability Testing

We conducted usability testing to get feedback on our design from outside of our design team. The prototype for the tests was a linked PDF file of our design exported from Balsamiq, and displayed on an iPhone 5s using a PDF viewer app that only allows the user to navigate with the inter-document links. Testing was conducted in a casual environment like a coffee shop or study area. Our data collection method was to make a video recording (Figure 5) of the users' interactions with the app, with the users' permission, in order to capture what they did and said at the same time.

From the testing, we learned that our controls for turning the app on and off were seen as confusing, as the user was unsure of exactly what function was being controlled by them. Also, some of the icons we were using on buttons for things like sending notifications to other users and blocking other users were not doing a good job of conveying their functions to the user.

As a result, we changed the label of the on/off control switch to Online/Offline, and added some brief descriptive text below it to clarify what it was for. Also, the icon for the user to sending a notification to other users that they are nearby and interested in meeting was changed to an icon of two people shaking hands, and the block user icon was changed to a large red X.

Conclusions

Our idea changed over the course of the UCD cycle as we gained a better understanding of how people interact. People prefer face-to-face interactions because they are more meaningful, but that also causes them to care about how they happen as they want to avoid any kind of awkwardness. So it takes more than just knowing that someone has something in common, there has to be a way to initiate the interaction. The use of online social networking allows for less stressful interactions, so the problem is how to use mobile online communications to facilitate the interactions in person.

Our research leads us to conclude that this can be done in a way that is acceptable and helpful to users through a combination of thoughtful interface design, user guidance and feature selection that fits with how people initiate their interactions in person. Further development of mobile technology in areas such as location-sensing and activity detection, which would enable things like the ability to tell what floor of a building the user is on and activity-based user matching, would also greatly enhance the functionality of this type of app.

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