Friendlee: A Mobile Application for Your Social Life

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Abstract. We have designed and implemented Friendlee, a mobile social networking application for close relationships. Friendlee analyzes the user's call and messaging activity to form an intimate network of the user's closest social contacts while providing ambient awareness of the user' social network in a compelling, yet non-intrusive manner.

1   Introduction

The viral growth of online social networking applications in the past few years has facilitated, like never before, forming new friends online and keeping in touch with old friends and past colleagues. These sites typically make it easy to declare friends, or add like-minded people as friends, and then follow their activities or posts online. While these declared networks appear large and thriving, it has been recently shown [2] [4] that much of the activity in these networks is driven by a more intimate group of users. Twitter networks of friends and followers, for example, are sustained [2] by an underlying sparse network of friends who interact frequently and reciprocate each other's attention. Even in the social networks formed through mobile phone calls and text messages--these overlap substantially with a user's 'real' social network [3]--an analysis of phone communication logs [4] reveals that people interact with only a small fraction of the people actually present in their phonebook.

These kinds of intimate social networks with the closest, most meaningful ties, such as between close friends, family, relatives and even close colleagues, are characterized by high frequency of interaction, but also by a great need to feel connected, to be in touch [6], and a need for sharing detailed activity and context information [5]. However, scarcely any of the online social networking applications[1] support users adequately in staying connected with this core group of people [7]. To address this problem, we have developed Friendlee, an application that analyzes the user's call and messaging activity to identify the user's closest social contacts. Friendlee enhances the mobile phone, providing the user with an ambient awareness of her intimate network.

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[1] Even beyond social networking applications, there are no applications that support intimate networks, with a few notable exceptions, e.g.7.

Since Friendlee also keeps track of the businesses the user has called frequently, we are able to automatically identify the user's preferred services, which can then be used as recommendations to their social network. Close friends and colleagues remain among our most influential sources of practical advice and recommendations about services, such as health insurance and restaurants, as well as about people, in both social and professional settings[9]. Several studies [1] have shown that people find recommendations generated by their social networks in taste-related domains to be as useful and interesting as the ones generated through traditional collaborative filtering approaches.

In addition, like most social networking applications, Friendlee allows users to browse the connections (and preferred services) of people in their intimate network. People in close relationships are often already peripherally aware of each other's contacts: the high degree of clustering (forming cliques) in social networks makes it very likely that friends of friends are friends or at least partially know about each other [8].

(a)   (b)

Fig. 1. Friendlee's user interface, showing (a) the screen with the list of contacts and (b) a profile screen

2   Design

2.1   Behavior-Based Intimate Social Network

Friendlee analyzes the user's call and messaging history to identify the people she is closest to, based on phone conversation frequency, recency and duration. Using these variables, the connections of a user are assigned a relative weight that determines the 'closeness' of that contact to the user with respect to other contacts. The strongest connections (the ones with the largest weights) are displayed prominently, allowing the user to have instant access to them without wading through a large phonebook. By using phone conversations as an indicator of close social interaction, Friendlee trims the user's large casual social network into a core intimate one.

The contact list screen (shown in Fig. 1(a)) is the primary screen of Friendlee and displays the user's intimate social network in reverse order of relationship strength. In design, the screen is similar to a mobile phonebook or instant messaging contact list.

2.2   Ambient Awareness of Intimate Social Network

The user can easily share key aspects of her context, namely her location at different granularities (country, city or GPS-based street address), her status message and her phone status (on/off/available/ringer/silent/vibrate), local time and weather as well as who her other family, friends and colleagues are. Such ambient awareness of people's closest connections helps them feel emotionally close and also facilitates communication (e.g., knowing whether this is a good time to call). To protect privacy, people have access to this context-sharing functionality only for connections made by mutual consent.

2.3   Browse Connections of Close Contacts

A key differentiator of this application from existing ones is the ability to browse the connections of close friends. This allows users to reach out and be aware of their social network beyond their immediate relatives and friends. A significant proportion of these connections will already be known to the user; however, the user may not have any means to contact them herself. To safeguard privacy, users can always restrict visibility of chosen contacts to specific categories of people.

2.4   Search and Get Recommendations for Businesses from Social Network

Favored businesses also constitute part of a user's true daily social network, from the local take-out to the user's cable company. While browsing a friend's connections, people also see their preferred businesses, getting implicit recommendations about e.g. the dentist their friend likes to go to. In addition, Friendlee allows users to search their social network for people and businesses. Search results are ranked by social distance from the user.

2.5   Category-Based Privacy Model for Sharing Context Information with Contacts

Friendlee allows users to classify their contacts into categories, such as 'Colleague' or 'Family', which helps the user both navigate quickly to a desired contact, as well as define privacy settings for various categories, e.g. sharing location information only with family. Categories are also used to define privacy settings for which of the user's contacts are visible, e.g. my colleagues may view my other colleagues, but not my family.

3   Implementation

Friendlee consists of three components: (1) a phone-based client that represents Friendlee's user interface and gathers user information, such as personal status, call and messaging history, (2) a Web-based interface where users can access and change the same information as on the client, and (3) a backend server that stores a centralized copy of all user information within a large database. The client synchronizes several times a minute with the server, providing it with up-to-date information about

the user's call history and context, such as location, phone status, etc. The server propagates context information of users (including current local time and weather conditions) through the user's social network taking into account her privacy policies. The server is also responsible for calculating the strength of relationships in the social network based on communication history and thus the 'social distance' between any two people.

We have developed a prototype of Friendlee for the Android and Windows Mobile operating systems. In addition, we have developed a Web-based interface that users can access on a desktop. We plan to develop a simplified mobile Web browser so that restricted functionality is available on phones that support Web browsing. The server is implemented in Perl and uses a MySQL database for storage. The client-server connections are currently 'stateful' (TCP/IP), but we could also support stateless connections using HTTP and SMS. In next steps, these prototypes will be used as part of a field study to assess the usability and usefulness of Friendlee's user interface and recommendation algorithms.

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