SoBot: Facilitating Conversation Using Social Media Data and a Social Agent

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Abstract

With the rising popularity of online social media, people generate a lot of data in social media applications like Facebook and Twitter. We present a communication facilitating system called SoBot, which demonstrates to obtain and utilize this data and works as a facilitating introduction system to help users conduct conversations with other users in offline social activities. We explain our research questions and some design choices around SoBot, with discussions on next step developments.

Author Keywords

Online to offline; introduction system; social media

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction and Background

Meeting people and having a good first conversation is not easy for many people. According to Berger's uncertainty reduction theory [1], the lack of knowledge of the other person's background, intentions, and values causes unpleasant uncertainties in their initial interactions, and sometimes makes it difficult to seek the best strategies to reduce such uncertainties. We want to develop systems to help people overcome such
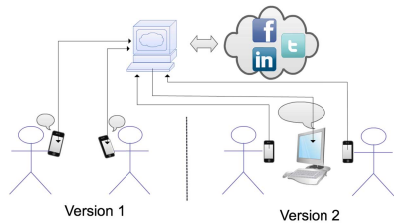
Figure 1: Demonstrations of two versions of SoBot. In version 1, Independent agents work on each user's mobile client and hide from each other; while in version 2, a mutual third party agent work on a shared stationary computer
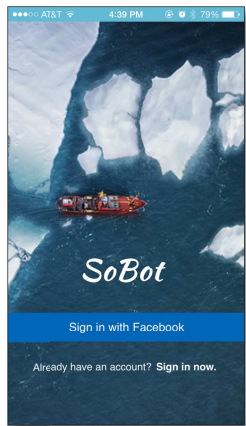
Figure 2: Screenshot of the login page for the SoBot mobile client. Users are asked to login with their Facebook account, so that system can parse their Facebook profile and activities.

difficulty, and we have observed that many times, there is a third person introducing two persons, helping them to conduct and continue an initial conversation, working as a facilitator. Such observations directed us to design a system simulating such a facilitating process and to investigate its functionality.

Both Berger's uncertainty reduction theory [1] and Terveen's social matching framework [7] highlight information-seeking behaviors in interpersonal interactions and initial relationship development. Thus, such a system might offer users their peers' information users want to share and acquire. To obtain such information, we turn to online social network sites. Although they are more used to keep up with current contacts rather than making new ones [5] and offer little support for offline real-time conversations, they do capture information about people. We want to explore online data's utility for offline social interactions by providing information to reduce uncertainty and help make interactions smoother.

Most social networking systems have recommendation or social matching features, but there are still cases where social networking or conversations are inevitable between two people who may not be recommended, but these systems have so far not served well in facilitating conversations. Therefore in the next section, we will first present system design choices and research questions around such a system, and then show our prototypical interfaces to probe the choices.

Design Choices and Research Questions
Our first research question is what role a facilitator system should play in users' initial interactions. It can work as an independent agent for each user separately,

like some social matching systems do 0; or it could work as a third party for both users at a shared physical space, like some collaboration facilitator systems [6]. Particularly for design, it relates to the visibility of information: an independent agent reveals its actions only to the user it serves, while a third party usually shares information mutually to both sides.

The second question is what information to use. At one extreme, the system might show all fields of information that it can acquire from one user's social media data and let the other user analyze and use that data, similar to browsing a user's profile and activities. At the other extreme, the system might compute summary information such as overall similarity, similar to most recommendation systems [1]. Middle points are also possible; for instance, the system could highlight pieces of information that indicate similarity or difference. In all cases, it is not clear which information people find useful and acceptable for introductions.

The third question is whether the system steers users' interactions or conversations or neutrally provides information, for instance, by suggesting topics that both sides could be interested in [3]; or leaves this exploration to users. This question influences the introduction compositions from the system to users, and also relates to the above two questions on the system's role and selection of information.

Most existing work focuses on social matching and recommendation, and it is unclear which of these choices make sense in our context because our system's task is not to match or recommend people, but to facilitate their conversations no matter how well or badly they match. This is the novelty of our system
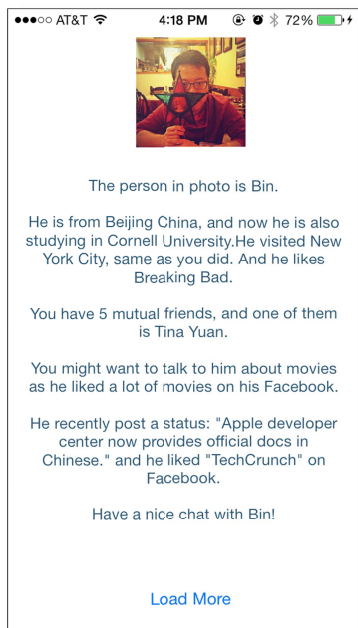
Figure 3: Screenshot of introduction page on SoBot version 1. The introduction composes with basic information of the other person, homophily/similarity information between users, some conversation steering texts, and some activities on social media, with an option to browser all available data.

design and thus we probe the above choices with our system. In following section, we introduce our prototypical system SoBot and describe its interfaces.

System Interfaces

We name our prototypical system as SoBot because it is a software agent, and it uses users' social media data to help their social interaction. SoBot follows a client-server structure, with the server doing data parsing and computation and a client interacting with usersTo probe our first question on the role of such a system, we have two version of SoBot, overviewed in in Figure 1.

In version 1, as shown in Figure 2, people use the iOS or Android SoBot mobile client to log into SoBot using their Facebook account and fill other social media account information. The server will then call Facebook Graph API and other social media API to get access to all information users permit the system to use, including their profiles, such as location, gender, and other information that people chose to provide for these accounts, along with online activities like posts, comments and likes, which are saved as a copy on the server. Social media data is saved on our sever and updated every time users login, to be used later in computing data and generating instructions, in order to speed up the performance of the system.

The server also detects the interactions between users' mobile phones (right now, the server monitors whether two phones bump with each other though our mobile app on the phones), compares these two users' profile and activities, computes an introduction for each user based on similarity between the two users, and shows a brief introduction of their partner on their mobile

clients. Figure 3 shows the introduction on one user John's client (on iOS 7) about his partner Bin.

In version 2, it follows same logic on login and data parsing, but the server computes one single introduction for both users and shows it on a stationary computer screen shared by both users. In version 1, each user has their own agent working on their mobile phones, and they cannot see what is shown by his/her partner's mobile agent; while in version 2, they have a mutual agent working on the shared computer screen, and their mobile phone only serve as a login window and interaction sensor. Figure 4 shows one example of the introduction on stationary computer screen. You can see that in version 2, the client is trying to play a host/facilitator role.

To probe the second question on what information should be used, and following the framework on social matching [7], in version 1 SoBot sever composites the introduction with basic information, following users' homophily information to help users easily identify similarity between them, and with option to browse all available information, which is illustrated in Figure 3. In version 2 with a shared display, we did not add the option of letting users browse information because it needs a mutual action for both users to decide whether these information should be shown, and we don't investigate people's common actions with third party in current stage.

For the third question, SoBot will steer the conversation by giving suggestions on topics two users could start to talk with: "*…Maybe you two can talk about Paris because you both went there*". Moreover, we also hypothesize showing homophily information could also
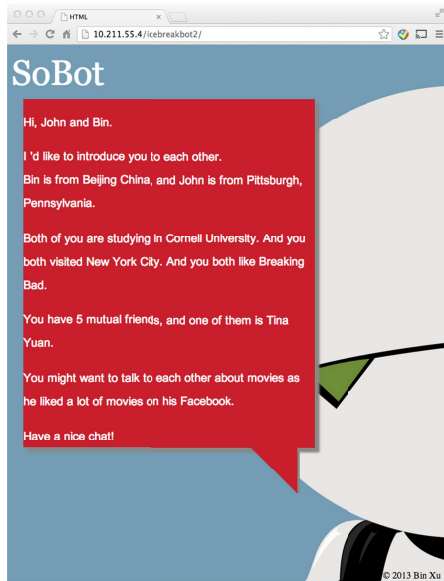
Figure 4: Demonstrations of how introduction is shown on the shared stationary computer screen (in Google Chrome) in SoBot version 2. The introduction composes with basic information of two users, similarity information between them, and some steering text like topic suggestion from the system.

prime their conversation implicitly. As shown in Figures 3 and 4, showing they both like "Breaking Bad" may direct their conversation to this TV show. Steering is included in both version of SoBot because we want to investigate whether steering correlates with the roles of the system.

As October 2013, we have finished both prototypes, which are fully functional in collecting data and presenting introductions, to demonstrate how it serves two roles in facilitating its users' initial conversations.

Future Work

Several works will be done around SoBot system. First, we will run experiments to understand how people use the kind of information SoBot can acquire to compose introductions of their own, and how effective people think those introductions can be. We will use insights from that study to shape SoBot's introduction strategies, then investigate how people evaluate introductions presented by a system rather than a human. Then, at CSCW and in other venues, we will demonstrate SoBot in real social settings and observe people's reaction and usage, where we can investigate the influences of different design choices described above.

There are still technical issues in the current design. For example, we use "bump" to represent the interactions between users, which is not a natural way in real social interaction, and we are exploring other technical solutions like proximity sensing or indoor location sensing. Demonstrating the idea of a conversation facilitator system using social media is the main contribution of our prototype. SoBot works in a domain current social matching and recommender

systems overlook, that is, rather than recommending the "right" people to talk to, it helps people (regardless of "right" or "wrong") to have a better conversation.

Acknowledgements

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