

SocialButton - Mobile Technology Enhancing Social Interaction

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Abstract

We developed a concept to enhance social interaction via mobile technology. After investigating the fast expanding sector of existing technology and projects relevant to our subject we designed a wearable mobile device, the SocialButton, that displays aspects of friend-of-a-friend networks. To verify the potential of this device to influence a social environment, a group study was set up and further developments proceeded.

1. Introduction

In everyday life one is permanently confronted with random encounters. A mutual glance while walking on the street or the discreet observation of a stranger on the bus on the way to work. While most of the time these encounters are intentionally kept vague and anonymous we believe that oftentimes a spontaneous interaction with non-acquaintances or simply more awareness of one's random environment might be favored. The reason to abandon these opportunities derive for a great part from missing points to start from. In these cases, information on the persons involved might having something in common could help to overcome the barrier of the first contact. We committed part of our concept to engagement with this incident.

Since we seeked to not only develop a theoretical concept, but also a concrete technological device, another point of investigation was its outer appearance and its underlying interaction methods. Coming back to our starting-scenarios of everyday encounters with random strangers we quickly held the fact that being in public spaces always involves seeing and being seen. According to Goffman [3] when an individual enters the presence of others, they commonly seek to acquire information about this person or to bring into play information about him already possessed. In this process visual aspects and fashion signs have significant influence. They contribute to the image people automatically construct around other individuals by e.g. trying

to localize them within a social group. The SocialButton makes use of this incident. We created this device to be used as a technological fashion accessory.

There are two ways of social interaction that can be distinguished: Focused and Unfocused. The first requires acknowledgment of each others presence involving not only face-to-face conversation but also non-verbal interchanges (flirting). The second doesn't involve this acknowledgment: one checks the other through an asymmetrical relation, which means without being noticed [6] While most distance based social applications explore the active transformation of unfocused into focused interaction (see Section 1) we developed the SocialButton to passively aim the users peripheral attention without imposing a focused interaction (in Section 2.1). As an ambient display the SocialButton fades its information into the users environment offering the choice of focusing their attention on the system or not. We also propose a new approach to effectively display personal information without revealing private details (Section 2.3). At the end of this paper we describe a field study analyzing the potential of the SocialButton to influence social behaviours (Section 3).

2. Related Work

2.1. Distance independent applications

Applications and projects enhancing digital interaction or interchange of information are widespread. Weblogs, social networking websites or internet forums are just a few examples that can be found in the world wide web today. However, these applications are bound to personal-pcs, laptops or other technological devices designed to perform a big variety of tasks and therefore limit all applications to a certain conformaty. Also since communicating over the internet, these applications don't depend on distance and therefore avoid face-to-face contact. The sector of proximity-based mobile technology dealing with interpersonal interaction can still be considered an emerging field.

2.2. Mobile technology based projects

The Nokia Sensor [7] application allows mobile phone users to communicate within short-range distance via Bluetooth. The users discover the profile of each other and exchange messages in order to meet in person. During our research we realized that most initiatives of looking for a person whose profile corresponds to ones own derive from flirting intentions. Flirting provides the necessary motivation to exchange messages in order to track down the location of the other person, which cannot be provided by the system, because of the omnidirectional broadcasting characteristics of Bluetooth. Although Nokia Sensor is intended to be used in any situation, its use is limited by the prerequisite of matching profiles and the necessary effort to find the other person.

Another system based on comparing profiles is LoveGety [2], a mobile device intended to help users in their search for a partner. It secretly signals the users' romantic availability to other users through vibration and conveys notifications when matching profiles are found. Different from Nokia Sensor, LoveGety works autonomously meaning information is sent and compared without the users taking action.

A project called Damage [9] involves a bracelet displaying the activity of a message application (Slam) running on mobile phones. The bracelet contains six LEDs, five representing individuals, and one representing the whole-group activity. The LEDs pulse indicating messages received or other incidents determined by members of a defined group. The bracelet helps to be aware of the communication activity of ones friends. It is, however, restricted to a small group of people and only functions as a visual output interface of the Slam system, hence the mobile phone.

3. SocialButton

3.1. Friend-of-a-friend Information

During our research on how to establish person-to-person interaction by technologically distributing information, we came across Stanley Milgram's "Small World Phenomenon", which suggests that in society two randomly picked citizens can be connected via six acquaintances. Visualizing these connections between people is a service already provided by online-platforms like "open-BC" and "facebook". This sort of information bears the potential to also contribute a connection and trigger a face-to-face conversation between non-acquaintances that happen to be in the same place. In order to do so, mobile technology is needed. Several other kinds of information could have been shared and displayed by the SocialButton. Enhancing social interaction by showing already existing accordances

of social networks, speaking showing common friends to non-acquainted individuals, was appealing to us. It also avoids the constraint of directly talking about oneself.

3.1.1 Positive aspects of using friend-of-a-friend information

In former projects like LoveGety the user had to manually set up his personal profile in order to allow the device to find similarities to other users. Nowadays, most people already have the necessary data to compare contacts, stored on their mobile phones. This data can easily be converted to or accessed by the SocialButton device. In this sense using existing data allows users to save annoying set-up time. Another advantage is about privacy issues. Sharing information about ones contacts is an indirect way of showing personal information. The SocialButton does not reveal concrete details about ones habits, affectations or belongings, which is likely to reduce scepticism, looking at todays widespread concerns on revealing private data.

3.2. Hardware and technology

3.2.1 Social Wearable Display

We defined the term Wearable Social Display as a display carried by an individual, transmitting information to be received by the individual's surroundings. In an example-scenario the Wearable Social Displays is worn by all persons present at a relevant place. Once the devices mutually notice the presence of others, they automatically communicate exchanging their information, comparing it and displaying an interpretation of the current situation at hand.

3.2.2 Wireless Technologies

Two different wireless technologies were analyzed and tested in the context of this project: Infrared and Radio Frequency. The Infrared did not result in a natural behavior of the test persons: The users had to slightly point the devices at each other in order to ensure the data exchange. Radio Frequency turned out to be the better technology. It allows the devices to scan and communicate within a range of up to 10 meters, independent what direction the devices are pointed.

3.2.3 Collected data

There are several ways of collecting data defining the social network: electronic address books, mobile phone, social networking websites, buddy lists, just to cite some. We decided to develop the SocialButton as an add-on-device for mobile phones using the phones address book as contact database.

3.3. Information Visualization

The SocialButton is an example of Wearable Social Displays. It fits within the palm of the hand, and once attached to the clothes of a user, it scans the environment for other SocialButtons. In order to find common friends, it compares the contacts data bank of users mobile phones. Once a common contact is found, the buttons communicate and exchange a personal symbol previously defined by each user. Afterwards each button displays the newly received symbol via a LCD Display. Tracking his personal symbol on another device (conscious or subconscious), the user understands he has a contact in common with that device's owner.

We chose for graphical output in form of symbols instead of text in order to abstract the information communicated. Since every user gets the opportunity to create or download his own individual symbol as kind of signature and upload it via Bluetooth, he theoretically gets to be the only one to recognize it, once it is displayed by other SocialButtons around him. The symbols operates as a privacy system encoding personal identities. A final advantage of using symbols as visual output is that they are easier and faster to read than words, especially considering the small size of the displays. The system contains preconfigured symbols for those not familiar with the technology.

3.4. Ambient information

Unlike most mobile technologies, the SocialButton doesnt aim at capturing the users primary focus but at the periphery of their attention. That way it doesnt influence their authentic and intuitive social behaviour. According to Weiser and Brown, placing information in the periphery enables the user to attune to more things than he could if everything were at the centre. They affirm that by recentering something formerly in the periphery we take control of it [8]. In practical terms the SocialButton doesnt interrupt current actions by suddenly vibrating or showing new information, instead, it ambiently fades information into it's surroundings. No information will be displayed if the users' encounter too rapid in order to could have started a conversation.

3.5. Scenarios

First scenario: Two strangers A and B are waiting at a bus stop. A and B's devices browse the area for other SocialButton users. As device detects B's device and vice-versa. They check their databases looking for common friends. As symbol is displayed on B's device and vice-versa. After a while A recognizes his symbol on B's device and waves to him. A Focused social interaction is established. A and B start a

conversation in order to find out who the common contact is.

Second scenario (Figure 1): A and B, C and B, D and B are friends. A, C and D have been invited to the same party. A, C and D do not know each other. A is the first to arrive. C arrives second. As device is detected by C's device and vice-versa. As device displays C's symbol and vice-versa. D arrives. D's device is detected by A's and C's device and vice-versa. Each device displays two symbols fading alternately. C's device displays A's and D's symbols. D's device displays A's and C's symbols. A's device displays C's and D's symbols.

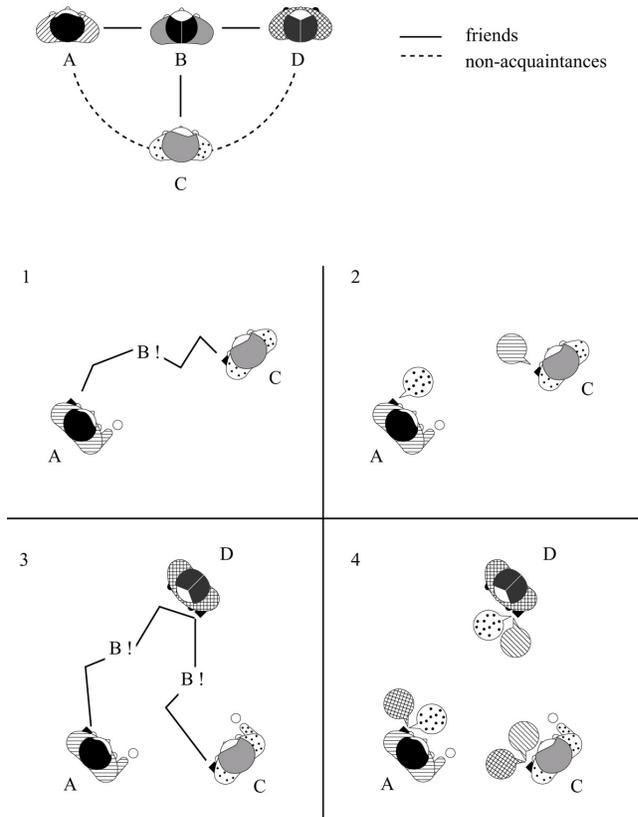


Figure 1. Use scenario: party

4. Field Study

The system was tested with a Java application developed in the Mobile Processing environment [5] running on the users' mobile phones. The mobile phones were attached to their clothes simulating the use of the SocialButton.

Two test sessions were accomplished. 18 students from our university's Department of Design took part in the first

one. The personal symbols were taken from their profiles on the online communication platform of the university [1]. Before a given lecture not related to our topic they were asked to wear the displays/phones keeping them visible to the other participants. The aim was to evaluate the use of the SocialButton as an ambient display as well as the capacity of recognizing personal symbols while focusing on something else. The test demonstrated that all students were able to follow the lecture, meaning their attention was not distracted by the devices. 11 stated they saw their symbols on other test persons' Social- Buttons, and 9 admitted having recognized the symbol of somebody else on another display. The second session was a qualitative test with four graduate students focusing on practical aspects. We tested the highest possible distance from which the symbols could still be recognized on the SocialButton's display, the different bodyparts onto which the device could be attached, and the experience and perceptions during the direct interaction with the device. Other possible outputs were discussed, but graphical symbols were still considered to be most recognizable. The friend-of-a-friend information also turned out to be a good starting point for a conversation, since anyone has a social network and usually is interested in it's possible relations.

5. Further Development

After the user interviews of the second test session, further different developments of the Social Button were considered and tested, such as the classification of friends by categories (university, sports, night clubs, etc.) and ways to directly reveal the identity of the common friend if both users consent it. These features, however, will be further studied and developed in the future.

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