Sensing your Social Net at Night

Martin Pielot, Niels Henze
OFFIS–Institute for Information Technology
Escherweg 2, 26121 Oldenburg, Germany
{Pielot, Henze}@offis.de

Susanne Boll
University of Oldenburg
Escherweg 2, 26121 Oldenburg, Germany
Susanne.Boll@informatik.uni-oldenburg.de

ABSTRACT
When we go out at night with a group of friends a good share of our attention is occupied with keeping the group close together, especially if we stroll in crowded and noisy environments such as city festivals. Established devices and interaction techniques do not address the special requirements of a nightly event sufficiently as it is too noisy to communicate by phone and looking at displays demands too much attention. Also the effort of keeping the group together should not keep you away from having fun with your friends. We envision *FriendSense*, a system displaying your social net at night. It uses a haptic display worn around the person's waist to display the relative direction, distance, and status of your friends. We started collecting data about the behavior of people attending nightly events that will be used to analyze how *FriendSense* changes their behavior.

Author Keywords
Social interaction, tactile display, remote interaction, intimacy, ubiquitous computing

ACM Classification Keywords
H5.2. Information interfaces and presentation (e.g., HCI): User Interfaces, Haptic I/O

INTRODUCTION
City fests, music festivals or Oktoberfest[1] bring friends together to spend a jolly night out. Let's imagine a group of friends visiting the annual city festival of Oldenburg. The festival (see Figure 1) spreads out all over the city center with many small booths that sell food and drinks in winding alleyways, which become very crowded at dusk. This makes it very difficult for the group to stay together. Since loud music is playing on every corner, conversations become increasingly difficult and mobile phone communication is almost impossible. The experience remains that one has to look out for the others in short intervals in order to keep the group together. Sometimes we actually lost one of our friends for that night. Keeping the group together is valuable, but since everyone constantly has to look out for the others and thus spends less attention to attractions and other people it decreases the fun factor of the city festival visit.

Figure 1: The annual city festival in the center of Oldenburg

To keep in touch in your night out together we propose *FriendSense* that allows you sensing your social net instead of having to actually see it.

MODALITIES FOR NIGHTLY EVENTS
The question of how such a nighttime companion could be designed raises the question of the actual modalities for information presentation and interaction. The functional requirements for such a nighttime companion would be to create and maintain a connection between a group of friends but at the same time be non intrusive and invisible. We consider location and status of the friends as the most important information to create a feeling of being connected all the time. Beside these functional requirements there are qualitative requirements on tools that are used while visiting crowded places at nighttime. The location and status of the social net has to be conveyed continuously so that the user does not have to fear loosing his or her peers. At the same time the information has to be mediated in an unobtrusive and gentle way, so that it does not require the user's attention. The system should not hamper the visual appeal and no clumsy computer equipment should affect the user's appearance, since nightly events are often used to make social contacts. The hands should not be needed to interact with the system, since this could disturb social interaction. In addition, the interaction must not be affected by noise since it is usually noisy in crowded public places.

These requirements exclude most modalities and traditional interaction techniques. Visual feedback needs either clumsy hardware like head-mounted displays or interrupts social interaction when looking at for example the mobile phone's

[1] This is a fest, which is not only internationally popular at this time of the year, but some of us actually went there recently.

screen. Auditory displays also disrupt social interaction and are affected by noisy environments. Our approach is using tactile feedback. The tactile feedback is transmitted via the human skin. Thus, the actuators can be hidden underneath the clothes. Projects like feelSpace showed that tactile feedback can be processed by the user intuitively at least after some training [4].

SENSING FRIENDS USING A TACTILE DISPLAY

FriendSense is inspired by our previous work, where we developed a non-intrusive navigation aid for blind users using tactile feedback [1]. The system consists of a tactile belt equipped with six vibrators and a compass. The compass enables the system to retrieve the user's orientation and thus allows computing absolute directions. The vibrators are arranged around the user's waist and are used to display cardinal directions (e.g., the direction of a subsequent waypoint or the direction of a friend). Connected to a PDA and a GPS receiver it serves as an aid for gross navigation. To create the feeling of being connected we want to mediate location and status of our friends. *FriendSense* mediates this information using position and intensity of the belt's vibrators. If a friend is north-west of the user the vibrator in that direction is activated. Smoothly interpolating several vibrators allows displaying more directions than the discrete number of vibrators. The vibration intensity is used to display the distance to the friend. We explore different methods for visualizing distance with different distance-intensity mappings. Figure 2 illustrates how *FriendSense* utilizes the tactile belt to display the location of friends.

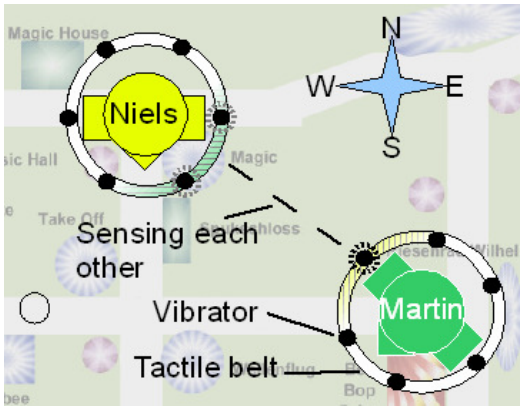

Figure 2: Vibration intensity for three users

The status of the sensed person is displayed using rhythms as we use them to display the type of objects using auditory feedback [2]. Vibration pattern will be used to display people's status and could possibly be used to distinguish several friends in the same direction. We still need to explore how to display the status of several friends at the same time.

EXPECTED IMPACT

We expect allowing a group of friends sensing where the others are to vastly improve their experience of nighttime events. Since you do not need to look out for the others anymore you could spend more attention on the festival itself. You can spontaneously stop or split from the group to for example have a conversation without the fear of loosing the others. We also hope that continuously sensing your friends creates a feeling of being safe and secure making you act more confident and providing a more intense experience. Since *FriendSense* is a virtual enhancement of the tactile sense its usage is independent from location and time. You could share your perception with other people at any location and any time. This allows to virtually including remote people into the group event allowing them to share a part of the nighttime experience even if they are at home or at work.

CURRENT STATUS AND FUTURE WORK

Our goal is to provide the user with *FriendSense*, an additional sense that connects us unobtrusively with our friends at night. A group of friends is then always aware of the location and presence of the others which we consider to improve the experience of nighttime events. To conduct evaluations of how *FriendSense* affects the experience we began a user study, observing people attending nightly events without a digital aid. We started collecting GPS tracks and photos about a group of people attending the "Kramermarkt" in Oldenburg, which we plan to bring to the workshop. This will enable us to compare the movement and behavior of the group as well as their personal experience. An important aspect that will be addressed in the future is the number of directions that a user is able to perceive in parallel. We will also look into the inclusion of remote friends or the echo of previous events at the same place. For the workshop we also plan to demonstrate a prototype of *FriendSense*.

PEOPLE

Susanne Boll is Professor for Media Informatics and Multimedia Systems and scientific head of the Multimedia and Internet Information Services Division at OFFIS. Together with Niels Henze and Martin Pielot, she works in the field of intelligent user interfaces, in particular in the field of non-visual user interfaces and the development of auditory and tactile displays as well as mobile interaction.

REFERENCES

1. Henze, N., Heuten, W., Boll, S., Non-intrusive somatosensory navigation support for blind pedestrians. In Proc. EuroHaptics 2006, pages 459-464.
2. Heuten, W., Wichmann, D., Boll, S., Interactive 3D Sonification for the Exploration of City Maps. In Proc. NordiCHI 2006, 155-164.
3. Krösche, J., Baldzer, J., Boll, S., MobiDENK - Mobile Multimedia in Monument Conservation. IEEE MultiMedia, 11(2), 72-77, 4/2004.
4. Nagel, S.K, Carl, C., Kringe, C., Märtin, R., König P. Beyond sensory substitution - learning the sixth sense. Journal of Neural Engineering (2005), 13-25.