

Sound Pryer: truly mobile joint music listening

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ABSTRACT

Following the widespread adoption of music media sharing applications for the Internet a growing number of research projects have explored sharing in a mobile context. Insofar these projects have mainly addressed face-to-face co-presence situations. The Sound Pryer prototype, on the other hand, is designed to provide joint music listening experiences among drivers in traffic. Through field trials with a prototype application we have learned the importance of including awareness information but not necessarily distributing complete music media content in order to provide meaningful experiences.

Keywords

In-car entertainment, ad hoc networking, joint music listening

INTRODUCTION

The advent of peer-to-peer technology allowed sharing music media files over the Internet. Such sharing mostly concerns the exchange of files between stationary computers [2]. The user's context in terms of co-presence is irrelevant. To this date a growing number of research projects has set out to explore sharing in mobile context and aiming at augmenting face-to-face interaction. Such interaction may take place for instance when meeting at plaza or sitting in a bus. For instance, Gerd Kortuem et al describe three such scenarios of MP3 file sharing facilitated by their Proem platform [4]. Mikael Wiberg's FolkMusic project enables leaving traces of your music listening by associating music files with geographical places [5]. Whenever somebody else coincides with such trace he or she is able to access the corresponding music. Recently, Arianna Basoli et al and their TunA project investigates and a slightly more immediate take on music sharing in face-to-face situations. It allows co-present people "tune in" each other's players and hear the music currently played [2]. Co-presence is an important and interesting factor in the usage experience of these applications. Still, we argue, as face-to-face situations are by large semi-stationary the design of these applications still bear much resemblance to the file sharing applications of the Internet. In the Sound Pryer project we set out to explore truly mobile [6] activities and the impact it has on design of music sharing applications. Driving in traffic is a truly mobile activity and is extreme in comparison to face-to-face interaction: first it is a situation where a large number

of encounters take place. Second, the duration of these encounters are extremely varied: most of them are very short for instance, when overtaking, yet some are more persistent, such as in queues. Third, people in traffic engage in interaction practically anonymous to each other. Finally, people are preoccupied with doing mobile work i.e. driving. In essence Sound Pryer [1, 7] provides joint music listening experiences in traffic encounters. It works like a shared car-stereo, you can hear your own music, but also overhear what other people currently play as long as they stay within proximity. Sound Pryer also gives a shallow graphical impression of other users. It is not obvious that joint music listening while driving is beneficial or even possible technically. However, we show through restricted field trials with 13 users that it is both doable and enjoyable. Particularly, although only hearing snippets of music, users were amused when they could interpret the awareness information and determine from where the music was coming. Thus, we argue that mobile music sharing applications should be designed to reflect the social context and particularly illustrate awareness of other co-present users and be less focused on distributing music media files in their whole.

SOUND PRYER PROTOTYPE

Sound Pryer supports two forms of music playback. In *local play*, Sound Pryer may plays one item at the time of a play list, like a regular MP3 player. More interestingly, the music also simultaneously broadcasted. In *remote play*, the broadcast of any other Sound Pryer in local play within a certain range may be captured for playback. These two functionalities are then combined into *auto* mode, which automatically arbitrates local play and remote play among a group of interconnected peers so that one peer will remain in local play and all others will enter remote play.

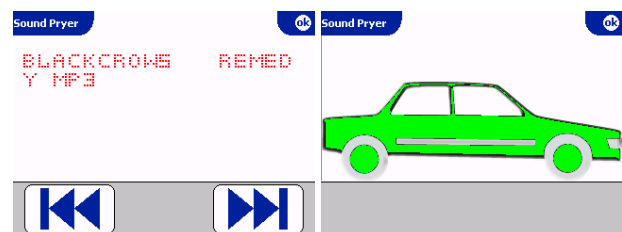


Figure 1. Auto mode in local (left) and remote play (right).

The design of Sound Pryer draws wireless mobile ad hoc networking, which allows connection setup without any

further infrastructure than contained within the PDAs. Ad hoc networking only allows connections within a limited range, which is used to approximate the encounter as perceived by the driver, i.e. when two peers come within wireless range they are deemed close physically. We have also developed an interface for auto mode particularly suitable for in-vehicle use that highlights users awareness and backs interpretation of the source of music. Whenever remote play is activated Sound Pryer shows a stylized shape and color of the vehicle where the other peer is (Figure 1).

FIELD TRIAL

It is not obvious that Sound Pryer would be successful in providing meaningful music sharing experiences or making the driver's apprehension of traffic more interesting. To learn more we organized a field trial. As we designed Sound Pryer to be used on roads among unacquainted drivers, most use situations will be brief and could take place anywhere along the vast road network. The likeliness for an encounter among a small set of unconstrained users is low. These factors constitute a methodological challenge to acquiring realistic feedback of users' experience of Sound Pryer. Thus, we decided to conduct a field trial where the subjects use the prototype during a limited period of time in on a particular route. Naturally, using a constrained approach we cannot receive exhaustive feedback but nevertheless collect initiated opinions valuable in the re-design of Sound Pryer. We conducted three separate trials, which engaged thirteen test subjects in all. All drivers were video recorded under the trial in order to pursue a careful analysis of their visible behavior and as such increased our ability to understand their reactions as they take place. The drivers were also interviewed directly following the trial.

Results

On the conceptual level we have found that joint listening among cars moving in traffic is clearly doable. First, wireless ad hoc networking is a promising technology for streaming MP3 music files with such intent. Second, we have good support in that users understood and appreciated hearing music from others. In line with this, we have found that giving an impression of the source of music through vehicle shape and color gives is satisfying. Many users did understand and use the hints in their attempts to identify the source. Also, many users enjoyed this aspect. Although entertaining Sound Pryer does not seem dangerously distracting. The video analysis showed that drivers could attend it whenever the context allowed. Finally concerning the concept, it does not seem that Sound Pryer invades privacy. No users found it particularly intimidating to reveal the shape and the color of the car and a majority of

the users agreed to distribute music in this manner. The prototype we used in the test needs some improvements in order to better implement the Sound Pryer concept. First and foremost its audio reproduction must be improved. Although the shape and color hints of auto mode GUI were adequate in determine the source of music, some users also wanted some sort of help when looking out. Finally, in some events the range of the wireless ad hoc network did not really reflect users being in the immediate proximity. This happened for instance when it was dark or the source being obscured for some other reason.

CONCLUSION

Despite a non-exhaustive field trial evaluation of the Sound Pryer prototype we have collected convincing evidence that joint music listening in traffic is an interesting and promising application of mobile music sharing technology. Particularly, we argue that music sharing has the potential of being more than the mere exchange of complete music media content. Sharing snippets of content in conjunction with awareness of co-located users is and enjoyable experience in its own right.

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