

Mitigating Mobile Phone Distractions While Driving

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ABSTRACT

Operating mobile phones while driving has been cited [4] as a factor in crashes that have led to 995 deaths and 24,000 injuries in the US alone during the year 2009. We propose context-aware extensions that reduce the need to use a mobile phone while driving. For example, when drivers are on their way to picking up somebody, their phones will automatically notify the person to be picked up that the driver is approaching, and will soon be at the pickup location.

Categories and Subject Descriptors

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

General Terms

Design, Human Factors

Keywords

context-aware communications, driving, mobile phones

1. MITIGATING DISTRACTIONS

Research has repeatedly shown the dangers of using a mobile phone while driving, be it texting, dialing, or talking on the phone. A meta-analysis found that using a mobile phone while driving is distracting even if drivers are using hands-free interfaces [1]. While there have been proposals and implemented systems, for example, for mitigating the problem by informing the non-driving call participant about the traffic situation [2] or projecting voice from headphones [3], the fact remains that drivers will not be completely concentrating on their main task of driving when they are using the mobile phone in any way. This observation lead us to investigate techniques that could help drivers to perform tasks, which require a mobile phone, without operating the mobile phone *while driving* at all.

We have surveyed people who use their mobile phones while driving and we found that some of the reasons for

talking on the phone are meetings, timing a pickup, and notifying if they are late. To enable relaying necessary information for these scenarios without operating the mobile phone while driving, we decided to facilitate easy location-sharing and automatic notification of arrival times.

We offer two novel approaches for establishing these goals: *time-shifting* and *burden-shifting*. To illustrate time-shifting in our proposed system, we discuss next how users can configure an automatic notification for pickups. Alice has just finished a call where she agreed to pick up Bob from the airport. She is presented with an *after-call interface*. In addition to setting the date and time for the pickup, Alice can choose to share her location with Bob when the time is near the pickup time. When Alice is nearby the pickup place, the mobile phone automatically calls Bob that “Alice is 5 minutes from your location”, so Alice doesn’t need to interact with her phone. Further, this approach helps to preserve the users’ location privacy, because location information is only shared when drivers are near the meeting place, but not otherwise. An example of burden-shifting is sharing contextual information about the user while they are driving. Trusted contacts in the contact list are given information that the user is driving and are nudged towards not calling the driver unless there is an emergency. Instead the system suggests alternative contact methods such as sending a text message, which delivery is delayed until the mobile phone has noticed that the user has stopped driving. Untrusted people (e.g. people not in the contact list at all) are automatically directed to voicemail while the user is driving. We believe these example designs are a good first-step for providing mobile phone distraction-free driving.

2. REFERENCES

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