

Keeping drivers focused on the road

May 10 2011

Technology might someday succeed in an area where laws, public service campaigns, and common sense have generally failed: getting drivers to stop gabbing and focus on the road.

For years [Microsoft](#) Research (MSR) scientists have been exploring safety issues that arise when people have phone conversations while driving. Numerous states have tried to enhance safe driving by banning the use of handheld cellphones while driving. However, Microsoft researchers identified problems with driving safety that can crop up even in hands-free calls.

In a new study, they have found that computers might one day improve safety by steering a driver's attention away from a phone call and back on the road when conditions demand it. The MSR team is presenting its paper, [Hang on a Sec! Effects of Proactive Mediation of Phone Conversations While Driving](#), this week at the 2011 ACM CHI Conference on Human Factors in Computing Systems.

The research is rooted in the fact that multitasking behind the wheel, whether texting or talking on the phone, will likely continue, said study co-author Shamsi Iqbal, an MSR researcher who studies human attention and multitasking.

“If we can't stop phone conversations during driving, we need to take the behavior into consideration when making design decisions to improve safety,” Iqbal said. “We know about human cognitive abilities and their limitations, so we should leverage that knowledge to develop solutions to

make driving safer.”

Cognitive psychologists have long recognized the limits of human cognition, she said. We’re able to do a few tasks simultaneously, like walking and talking, for example. But technology has dramatically increased how and where we multitask, and we often push up against the limits of our ability to pay attention. Driving is now a prime example.

That’s why efforts that encourage drivers to make hands-free calls are unlikely to solve key safety problems, said Eric Horvitz, a Distinguished Scientist at MSR and co-author of the study. “The challenges are largely cognitive,” he said. “Fundamentally, your cognitive resources are being split across several different tasks.”

The team set out to explore ways to help drivers better manage their attention when they’re on the phone. They designed a simulated mediation system that used auditory messages to interrupt phone conversations and alert drivers of upcoming stretches of road that were demanding or potentially dangerous. Volunteers participated in pairs. One person would be driving in a high-fidelity simulator on a virtual route with varying levels of complexity including construction zones, heavy traffic and residential areas. The other person would ask questions that forced drivers to solve problems and recall information, like when was the last time they bought gas. Whenever road conditions turned tricky and required the driver’s attention, the mediation system would cut in and alert both the driver and the caller, and at times even temporarily place the conversation on hold.

The result: the system significantly cut down on the rate of missed turns and (virtual) accidents. The researchers also studied how people responded to the automatic mediator interrupting their conversations. In general, drivers thought the system was helpful. “The prompts to pay attention were surprisingly useful. Wish I had them in my current auto

system,” one volunteer told the researchers.

People on the other end of the line, though, also need to weigh into the way the system works. “One person found the hold being “an annoyance,” but also commented that “but it gave me a few seconds to collect my thoughts.” Overall, both drivers and callers seemed to see value in the interventions, the team said,

More research can be done to improve users’ experience of these interruptions, the team said. The important point is that mediation can help manage drivers’ attention and keep them safe behind the wheel.

Iqbal said that intervention has long been a focus of researchers investigating ways to help people multitask on the PC more efficiently. Say a user is waiting for an important email, for example. Currently email clients such as Microsoft Outlook can notify them when an email arrives – through a sound or a visual cue – so the user can work in Word or PowerPoint without having to switch their attention back and forth between their current application and their inbox. However, the team at MSR has developed methods that provide automated mediation. These technologies take into account the pros and cons of removing communications and delivering cues to the user at different times, for example, deferring the delivery if the user is deeply engaged in a task and shouldn’t be interrupted, or delivering the cue right away if the information is urgent. “That mediation can help us multitask efficiently without having to bear the extra burden of managing multiple tasks ourselves,” she said.

The team’s current research shows that technology can do the same in cars, she said. Mediation systems could push important information, like road conditions or traffic, to the driver so they can fully focus on the road.

This falls into a broader area of research that Horvitz calls complementary computing, which refers to research on building computational systems that are designed explicitly to understand the nature and limits of human cognition and that complement the abilities of people to help them to achieve their goals. Research in this area could lead to systems that understand if, when and how to step in and help us when we need it. He's optimistic that one day computers in our cars may be able to access data – weather, traffic, road conditions, and even histories of fender benders and more serious accidents at different points in the road network – to enhance the safety of people who engage in phone conversations while driving.

“I believe that computing technologies will one day drastically reduce the nearly 40,000 driving-related fatalities we have each year in the U.S. alone,” Horvitz said. “We see this research as contributing to that dream.”

Provided by Microsoft Corporation

Citation: Keeping drivers focused on the road (2011, May 10) retrieved 24 April 2024 from <https://phys.org/news/2011-05-drivers-focused-road.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--