Eyes off the Road: How Autonomous Vehicles Will Change In-Car Activities

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Motivation

For the past 100 years, cars have allowed people to travel with ease and convenience within a comfortable private space. It changed the way that we live. But there are costs to driving, ranging from the environmental impact of pollution and frustration of traffic congestion, to the demands on the driver of maintaining constant vigilance and attention for a prolonged period of time.

Just as the arrival of the car 100 years ago changed the way that we lived in the past, the arrival of autonomous vehicles will have a profound impact on the way that we live in the future. In the short-term autonomous vehicles hold the potential to alleviate some of the problems currently associated with driving: allowing greater packing of vehicles on highways to ease congestion and freeing the driver from mundane control activities to engage in more rewarding work and leisure activities. In the longer-term there will be further, as yet unimagined, opportunities that will emerge following the mass release of autonomous vehicles on to our roads.

My interest in attending this workshop is to learn about the current state-of-the-art in autonomous vehicles. My interests and background are in multitasking and driver distraction (see **Author Bio**). I am particularly

interested in the handover situation between drivers and automated cars and how this is to be managed effectively when the driver is immersed in an unrelated activity (i.e., watching a movie, working on a document, having a video chat, etc.).

Author Bio

Duncan Brumby is a Senior Lecturer at University College London (UCL) and directs the MSc program in Human-Computer Interaction. He received his doctorate in Psychology from Cardiff University in 2005, after which he was a post-doc in Computer Science at Drexel University before joining UCL in 2007. He has published 60+ papers on how people interact with computers, receiving numerous Best Paper-like awards. He has been an Associate Chair for the CHI conference since 2012 and will be the workshop chair at CHI 2017.

In collaboration with colleagues at UCL and beyond, Brumby has published a body of research on in-car multitasking and driver distraction. This work has involved driving simulator studies designed to demonstrate the problems caused by interacting with mobile devices while driving [8,9]. The results of these studies have informed the development of a rigorous computational cognitive modeling framework to better understand and explain in-car multitasking behavior and driver distraction effects [2-4,6,7]. The insights gained from this work have then been applied to explore ways to improve the design of mobile devices for in-car use [1,5,10].

Brumby is currently leading UCL's contribution to a major EIT-funded project that aims to make driving safer and healthier. Working with partners from across industry and academia, the project is exploring how unobtrusive wearable sensors can be used to monitor a driver's fitness-to-drive, allowing them to drive as long as they are fit. A particular focus in this project is given to promoting the wellbeing and safety of professional drivers (i.e., bus and truck drivers).

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