

Understanding User Interactions with Emerging Technologies: Medical Dispatch and Driving

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Abstract: The pervasive use of automation and ubiquitous computing has increased our exposure to technology-mediated information. However, the interaction strategies that users choose when provided with these novel information sources may not be appropriate and can lead to detrimental or unsafe behaviour. The overarching goal of my research is to design systems that minimize inappropriate use of new and emerging technologies in safety critical systems. Specifically, this talk will highlight my research into understanding and addressing these concerns in two domains: medical dispatch and driving.

Medical dispatch refers to the allocation and triaging of ambulance and paramedic resources in response to requests for assistance. Dispatch decisions are characterized by high time-pressure, uncertainty, and complexity. Currently, dispatchers rely on personal experience and a variety of non-standardized tools to make patient triage and transport mode decisions. Based on extensive observational studies and experimental work, I have designed a decision aid that helps dispatchers produce more accurate estimates of transfer times using visualizations of historical transfer data. My research examines the types of strategies users adopt in interpreting visualizations of uncertainty. This decision-aid is currently being implemented by the Ontario provincial air ambulance service to improve medical dispatch decisions throughout the province.

The dangers of distracted driving are well established. However, a new category of consumer electronics, smartwatches, are gaining popularity with users and is a potential source of distraction in the driving environment. Using driving simulator studies, I found that smartwatch use while driving can indeed lead to driving behaviours that are similarly dangerous to smartphone use, even though users often perceive these devices to be less dangerous. Implications for driver training, policy, and interface design will be discussed.

Bio: *Wayne Giang* is a Ph.D. candidate in the Human Factors and Applied Statistics Lab within the department of Mechanical and Industrial Engineering at the University of Toronto. Previously, he received his Bachelors and Masters degrees in Systems Design Engineering from the University of Waterloo with a focus on human factors engineering. His research focuses on using mixed-methods approaches to support the design and introduction of new and emerging technologies into safety critical domains. His past and present research examines how various new methods of information presentation (e.g., decision-aids, wearable technologies, and multimodal interfaces) change user interaction strategies in a variety of contexts including healthcare, surface transportation, and defence. He has developed research partnerships with the air medical transport system in Ontario, the Canadian Department of National Defence, local community organizations, and start-up companies.

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