Analysis and Redesign of Police Vehicle Mobile Computer Terminal for Minimizing Officer Driving Distraction

**Abstract:** Although the effect of in-vehicle distraction on driver performance and safety has been documented in many studies, few investigations have focused on distraction in emergency vehicles. However, crash reports from various states in the U.S. have shown high numbers of crashes, especially in law enforcement situations. Such crashes have not only been attributed to the need for officers to drive at high speeds in emergencies, but to make use of in-vehicle technologies especially mobile computer terminals (MCTs) while driving. Although previous studies found that MCTs are not designed for use while a vehicle is in motion, many officers confirm the use of these technologies while driving. The objectives of this study were to identify the perceived importance and frequency of police MCT tasks, quantify the visual and cognitive demands of high importance and high frequency tasks, propose an enhanced MCT interface design, and validate the design in a driving simulation study. Results showed that even basic usability changes of MCT interfaces could reduce driver distraction and increase officer safety during police operations.

Maryam Zahabi

Effect of Physical Workload and Modality of Information Presentation on Pattern Recognition and Navigation Task Performance by High-Fit Young Males

**Abstract:** Many occupations require both physical exertion and cognitive task performance. Knowledge of any interaction between physical demands and modalities of cognitive task information presentation can provide a basis for optimizing performance. This study examined the effect of physical exertion and modality of information presentation on pattern recognition and navigation-related information processing. Results indicated males of equivalent high fitness, between the ages of 18 and 34, rely more on visual cues vs. auditory or haptic for pattern recognition when exertion level is high. We also found that navigation response time increased with physical exertion level. Navigation accuracy was lower under high level exertion compared to medium and low levels. In general, findings indicated that use of the haptic modality for cognitive task cueing decreased accuracy in pattern recognition responses.

Wenjuan Zhang

Refreshments will be served in 428 Daniels Hall from 10:30 - 10:50 AM

* ARRIVE IN THE ROOM AT LEAST 10 MINUTES PRIOR TO THE SEMINAR