

# Department of Electronic Engineering

Vincent Galea

BAppSc (Hons), MSc

Suite 19, TEC 2, Technology Enterprise Centre Melbourne Campus

Phone: +61 3 9479 3210

Email: [vgalea@students.latrobe.edu.au](mailto:vgalea@students.latrobe.edu.au)

## Research

The Human Machine Interface (HMI) for In Vehicle Information Systems (IVIS) is a critical part of future Intelligent Transport System (ITS) design as a probably increasing, and potentially overwhelming, amount of information will be available to the driver as the executive decision-maker. Uncontrolled presentation (typically through the visual sensory channel) has been shown to induce distraction from the prime driving task, which, coupled with cognitive overload, may increase driver error and accident rates.

The tactile modality may provide another channel for information flow to the driver whilst reducing overload of other sensory modalities. Depending on factors such as congruence and temporal presentation, the three sensory modalities primarily affecting driving skill (visual, auditory and tactile/haptic) may interact to improve perceptual capture of an important event or to reduce response time, with driver state and attention level also as factors. The linkage of these three senses at very early sub-cortical and cortical levels signal that they interact in a far more integrated way than previously believed. Such interrelation may determine the optimal HMI for IVIS for varying scenarios, with multi-modal methods preferable to the primarily uni-modal representations currently utilised.

In addition, given the vehicle-vehicle (V2V) and vehicle to infrastructure (V2I) communication networks planned for ITS, there may be benefit in communicating individual driver perception and intention through IVIS HMI in order to improve V2V and V2I interaction in an overall ITS framework.

