RESEARCH THEME: SAFETY AND INTELLIGENT VEHICLE SYSTEMS

PROACTIVE VEHICLE COMMUNICATIONS DEMONSTRATOR

The objective of this project is to demonstrate a server based system which allows fleet managers and maintenance staff to remotely monitor car fleets. Users can gather information from the car computer, i.e. Electronic Control Units or ECUs, and diagnose problems in their fleet vehicles.

Project Leader	Antony Tang Swinburne	**Project Participants**	Swinburne

DRIVER USE OF IN-VEHICLE INFOTAINMENT SYSTEMS

The objective of this project is to examine the usability and effects on driving and eye glances when using two existing input controls (rotary dials and steering wheel thumbwheel) to make music selections from scrollable lists. The study will use the modified scenarios developed a Naturalistic Driver Distraction Test. Data on drivers eye glance patterns will be collected using the FaceLab (4.0) eye tracking equipment. The usability of the two input controls will be measured using a standardised scale.

Project Leader	Dr Michael Lenne Monash	**Project Participants**	Monash

MODELLING DRIVER BEHAVIOUR TO INFORM TECHNOLOGY DESIGN

The main objective of this study is to inform the development of an effective in-vehicle train warning system to address level crossing crashes. The study would involve use of MUARC's On Road Test Vehcile (ORTeV) to measure naturalistic driving on approach to signalised level crossings, as well as approaches to regular signalised intersections. In addition to measures of driving performance, the FaceLab eye-tracking system would be used in this phase to collect data relating to drivers' visual behaviour.

Project Leader	Dr Michael Lenne Monash	**Project Participants**	Monash

DISSEMINATION OF AUTOCRC RESEARCH

The aim of this program is to publish AutoCRC sponsored research in peer-reviewed journal papers. This will ensure the research is archived in scholarly publications, while also providing research leadership to the international HMI community and ensuring that the research outcomes can benefit all industry stakeholders.

Project Leader	Dr Michael Lenne Monash	**Project Participants**	Monash

CROSS REGIONAL HMI DESIGN REQUIREMENTS

The increasing global distribution of automobiles designed in Australia to other countries necessitates that the HMI designed for these vehicles is appropriate for the regions to which they are exported.

Differences between regions such as environment, context and culture could potentially impact the safety, usability and acceptance of HMI. It is essential to understand the cross-regional factors between Australia, China and other regions, that influence usability, safety and acceptance in order to ensure that the HMI is appropriate for the target export market.

Project Leader	Dr Michael Lenne Monash	**Project Participants**	Monash GM Holden

DRIVER DROWSINESS DETECTION

The objective of this project is to investigate the feasibility of vehicle-based measures as an indicator of driver drowsiness. This type of measurement could potentially be more robust as it relies on a direct measurement of vehicle behaviour as opposed to estimating performance from a physiological measurement of the driver. Such a system could be used as a separate detection and warning system or integrated with other detection systems to provide more robust and appropriate feedback to the driver.

Project Leader	Dr Michael Lenne Monash	**Project Participants**	Monash GM Holden

LOOKING & SEEING

The Looking & Seeing project is based on a series of specific experiments to build our knowledge of physiological changes (brain activity, heart rate, eye movements, respiration and muscle activity) which may occur when visual targets change, and/or attention changes in the visual field. The study aims to find ways to minimise complexity and driver distraction from in-vehicle systems and road-related issues, but may have relevance to enhanced driver training.

Project Leader	Assoc Prof John Patterson Swinburne	**Project Participants**	GM Holden Swinburne

TRAFFIC PROBE

This project aims to determine the minimal percentage penetration of required probe vehicles in order to offer service improvement, while optimising the flow of transmitted data between probe vehicles and infrastructure. The use of GPS tracking to monitor a vehicles progression along various roads can greatly increase the TMC coverage area, while also serving as a real time verifier of inductive loop systems, and thus increasing the resolution of the existing urban traffic congestion reporting services.

Project Leader	Andry Rakotonirainy QUT	**Project Participants**	GM Holden QUT Intelematics Australia

WIRELESS COMMUNICATION STANDARDS FRAMEWORK

This project addreses the fragmentation within the communication industry as it affects automotive wireless application and will aim to follow world's best practice by, creating a cluster of manufacturers, similar to the "Bluetooth Special Interest Group" to develop standards.

Project Leader	Prof Mark Looi QUT	**Project Participants**	GM Holden QUT

FULLY EMBEDDED TELEMATICS DEMONSTRATOR

The Fully Embedded Telematics Demonstrator Project follows the success of the Internationally renowned "Australian Telematics Signature Vehicle" (AT-Signature) - debuting on such technology shows as "Beyond Tomorrow", "CeBIT", various USA Cable TV, and in numerous print media articles throughout 2005-2006. The project is to research and deliver a fully functional current production demonstrator vehicle with advanced telematics services, while complying with stringent HMI guidelines to minimise driver distraction.

Project Leader	David Colls VPAC	**Project Participants**	GM Holden VPAC

HUMAN MACHINE INTERFACE & DRIVER DISTRACTION

Encompasses theoretical and experimental studies of cognitive work load and driver distractions (real and simulated) and the development of guidelines and standards. A conjoint study will determine the relative benefits of crash avoidance technologies ranked against their roll in reducing harm.

Project Leader	Prof Brian Fildes Monash	**Project Participants**	Holden MUARC Monash Swinburne

VISION BASED COLLISION AVOIDANCE

A range of collision detection systems will be developed focusing on vision recognition of stationary and moving objects.

Project Leader	Jochen Heinzmann Seeing Machines	**Project Participants**	AAPL GM Holden La Trobe Seeing Machines

VOICE RECOGNITION RESEARCH

The development of natural language recognition technology for Australian conditions and accents, capable of operating in noisy motor vehicle environments. This natural voice recognition technology with robust noise filtering in a single chip is expected to have wide ranging commercial applications.

Project Leader	Prof Sridha Sridharan QUT	**Project Participants**	GM Holden La Trobe QUT

STANDARDISED APPROACH FOR EMERGENCY VEHICLES (SAFE)

Emergency vehicles such as Police, Fire and Ambulance are increasingly using sophisticated technologies and equipment to improve their operational effectiveness. This equipment, however, is typically bolted-on to existing vehicles without considering the safety, power and device integration implications. The purpose of this project is to gain an understanding of the emergency driver user-interface and ICT requirement issues, and to develop a standard interface platform for addressing ergonomic design, ICT power requirements and safety.

Project Leader	Chris Seeling VPAC	**Project Participants**	NSA MUARC Monash VPAC

OCCUPANT PROTECTION

A number of improvements to occupant protection are outcomes sought from this project. Improved tools for testing child safety systems and improved anchorages to improve child protection in front and side impacts. Validation of brain models using real life data will be used to improve occupant safety and new virtual engineering tools for vehicle design will be developed to reduce pedestrian impact injuries.

Project Leader	Dr Michael Lenne Monash	**Project Participants**	GM Holden MUARC Monash

CRASH INSPECTIONS

The purpose of the Crash Inspections project is to collect data from real-world crashes involving current generation vehicles to help better understand the safety performance of these vehicles. This retrospective study sources vehicles that have had one or more restraint systems deployed and towed from the crash.

Once consent has been obtained, comprehensive data is collected. The knowledge gained from this process will be used to enhance the safety performance of future vehicle designs.

Project Leader	David Logan MUARC	**Project Participants**	MUARC