Drivers now expect a range of functions in their cars, from in-vehicle entertainment to navigation systems. The displays, controls and mechanisms that facilitate access to these systems are collectively known as the Human-Machine Interface (HMI). HMIs are customer-facing features, so their design is important to vehicle manufacturers. However, HMIs have the potential for distraction – a growing problem cited in more than 60% of accidents.

Professor Gary Burnett and his Human Factors research team have been working closely with a major premium vehicle manufacturer for more than 10 years to design distraction-free HMIs. Over 1,000 people have been involved in more than 20 studies to understand how HMIs can improve safety, driving efficiency and driver comfort and engagement, using the Faculty of Engineering’s state-of-the-art driving simulator. Specific experiments focused on how people respond to natural language interfaces, depth perception of images, cultural variations, and how drivers pay attention to displays. Novel methodology has been developed to model driver distraction metrics, reducing the need for expensive and time-consuming user trials.

Studies have had a direct impact on the HMI design of mass production vehicles for a premium vehicle manufacturer. The work has also defined the optimum layout for digital mirrors, to replace traditional side mirrors, improving aerodynamics and removing the driver’s blind spot. The findings have been incorporated into an international standard and influenced European and North American policy enabling technologies, such as digital mirrors, to be legal on the road.

“Informing the choice of HMIs embedded in over a million vehicles sold worldwide”

Over 1,000 people have been involved in more than 20 studies