



The
University
Of
Sheffield.

The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

Improving Situational Awareness for Autonomous Vehicles

Speaker: Professor Wen-Hua Chen

*Department of Aeronautical and Automotive Engineering,
Loughborough University*

Wednesday, 20 March 2013 at 14:00

Location: Sir Henry Stephenson Building, Lecture Theatre LT02

ABSTRACT

Situational awareness plays a significant role in improving the level of autonomy and fulfilling safety requirements for operating unmanned vehicles particularly in a public environment. Starting with an overview of the three levels of situational awareness, the decrease of the situational awareness of a remotely located human operator and the need of artificial situation awareness for unmanned vehicles are discussed. The challenges in developing artificial situation awareness in the presence of various types of uncertainty are highlighted. It is argued that incorporating world models into situational awareness may provide a promising approach to reduce the level of uncertainty. As a case study, unmanned aircraft operating in a terminal region is discussed in detail where the Rules of the Air and the layout of the airfield are used to help comprehension and projection of the behaviours of other aircraft operating in the airfield. Recognising the fact that transitions between flight modes of the aircraft are governed by physical constraints and the Rules of Air, a state dependent transition hybrid estimation algorithm is adopted to improve situational awareness of the unmanned aircraft. With an improved situational awareness, safe separation between the unmanned aircraft and other airspace users may be respected.