



Department of  
Mechanical Engineering  
The University of Hong Kong



## SEMINAR

### *What is the Role of Control Engineering in Robotics and Autonomous Systems?*

**Date:** 29 February, 2024 (Thursday)  
**Time:** 4:30 p.m.  
**Venue:** CPD-LG.34, Centennial Campus  
HKU

**Speaker:** Professor Wen-Hua Chen  
Department of Aeronautical and  
Automotive Engineering  
Loughborough University  
UK



#### *Abstract:*

Driven by the need of further increasing productivity and improving wellbeing and enabled by recent developments in AI and other digital technologies, we are moving into an era of highly automated society. Among others, autonomous driving, unmanned aviation, healthcare robots and automatic trading, are hot topics in media and daily discussion. Are we ready? Are they safe?

Control engineering plays the central role in our current automation. Will it still play a similar role in future high levels of automation, or be replaced by AI or other technologies?

This talk aims to trig more debates and discussion along these lines, particularly exploring the role of the control engineering in future automated economy. It argues feedback is fundamental to high levels of automation, and control theories are essential in understanding not only the interactions between key functions like perception and decision

making/planning in robotics and autonomous systems, but also on their interactions with system behaviours and environment. Examples are provided to illustrate undesirable behaviours caused by the coupling between optimisation and system dynamics, and interaction between perception and planning. It argues that the current control theories could not provide effective analysis and design tools for future highly automated automation empowered by embedded AI functions and much more research is required.

*Biography:*

Dr Wen-Hua Chen holds Professor in Autonomous Vehicles in the Department of Aeronautical and Automotive Engineering at Loughborough University, UK. Prof. Chen has a considerable experience in control, signal processing and artificial intelligence and their applications in aerospace, automotive and agriculture systems. In the last 20 years, he has been working on the development and application of unmanned aircraft system and intelligent vehicle technologies, spanning autopilots, situational awareness, decision making, verification, remote sensing for precision agriculture and environment monitoring. He is a Chartered Engineer, and a Fellow of IEEE, the Institution of Mechanical Engineers and the Institution of Engineering and Technology, UK. Recently Prof Chen was awarded a 5 years EPSRC (the Engineering and Physical Sciences Research Council) Established Career Fellowship in developing goal-oriented control systems for robotics and autonomous systems.

**ALL INTERESTED ARE WELCOME**

**For further information, please contact Prof. J. Lam at 3917 2805.**