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

## **Robust model-based fault estimation and fault-tolerant control: Towards an integration**

**Dr Jianglin Lan**

*Research Associate, Department of Automatic Control and Systems Engineering,  
The University of Sheffield*

**Wednesday, 16 May 2018 at 13:00**  
Sir Henry Stephenson Building, LT02

### **Abstract**

In order to maintain robustly acceptable system performance, fault estimation (FE) is adopted to reconstruct fault signals and a fault-tolerant control (FTC) controller is employed to compensate for the fault effects. The inevitably existing system and estimation uncertainties result in the so-called bi-directional robustness interactions between the FE and FTC functions, which gives rise to an important and challenging integrated FE/FTC design problem concerned in this research. This talk gives an overview of its history and covers the two model-based integrated design strategies that we have developed, namely the single-step robust optimization approach and the decoupling approach. In the first approach, the integrated design is reformulated as the well-known observer-based robust control problem solved via robust optimization. The second approach uses a decoupling strategy which renders a recovery of the Separation Principle and allows more freedom for the FE/FTC designs. Brief theories with numerical examples are given to illustrate these two approaches.

### **Biography**

Jianglin Lan received the BEng degree from South China Agricultural University in 2011, the MSc degree from South China University of Technology in 2014, and the PhD degree from University of Hull in 2017.

Since 2017, he has been working as a core research associate on “multi-disciplinary modelling and control for gas turbine engine” at the University Technology Centre (UTC) supported by Rolls-Royce, in the Department of Automatic Control and Systems Engineering at University of Sheffield. His current research areas include: Fault estimation and fault-tolerant control for complex dynamical systems, optimal estimation and control, and modelling and control for gas turbine engine.