



The
University
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Automatic
Control and
Systems
Engineering

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

Verification of autonomous systems

Dr Alice Miller

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University of Glasgow*

Wednesday, 20 April 2016 at 14:00
LT02, Sir Henry Stephenson Building

Abstract

Autonomous systems have the ability to decide at run-time what to do and how to do it. A critical question is how this decision making process is implemented. Increasingly autonomous systems are being deployed within the public domain (e.g. driverless cars, delivery drones). Naturally there is concern that these systems are reliable, efficient and – most of all – safe. Although testing is a necessary part of this process, simulation and formal verification are key tools, especially at the early stages of design where experimental testing is both infeasible and dangerous. Simulation allows us to view the continuous dynamics and monitor behaviour of a system. On the other hand, model checking allows us to formally verify properties of a finite representation. Whereas the simulation model is close to an implementation, simulation runs are necessarily incomplete. Verification models, on the other hand, require us to abstract more coarsely. In this talk I will give an overview of a formal verification technique – model checking, including advanced techniques such as abstraction, induction and symmetry reduction and discuss some recent work (in collaboration with colleagues at the Universities of Glasgow and Sheffield) in which we combine simulation and model checking to verify the behaviour of a simple UAV system.

Biography

Dr Alice Miller is a Senior Lecturer in Computing Science at the University of Glasgow. She obtained a PhD in Number Theory at the University of East Anglia in 1989 and has since worked at the universities of Western Australia, East Anglia, Stirling and Glasgow. Alice's research is in Formal Verification, mainly Model Checking. In particular she is interested in state-space reduction techniques such as Symmetry Reduction and Abstraction. Applications in which Alice has been involved include telecommunications systems, robotics, sensor networks and satellite systems.

*Light refreshments will be served in the
foyer of the Sir Henry Stephenson Building following the seminar*