The University of Sheffield
Department of Automatic Control and Systems Engineering
PhD Studentship in Control of Cyber-Physical Systems

Applications are invited for a fully funded PhD studentship starting in January 2014 (or soon after) to investigate the formal design of control policies for cyber-physical systems. Cyber-physical systems (CPS) are physical and engineered systems whose operations are monitored, coordinated, controlled, and integrated by a computing and communication core. CPS research has attracted increasing attention worldwide for its potential impact on a variety of industrial sectors, including aerospace, automotive, chemical production, civil infrastructure, energy, finance, healthcare, manufacturing, materials, and transportation.

The project lies at the exciting interface of control engineering, computer science, and applied mathematics. It seeks to develop reactive control policies for cyber-physical systems that operate in dynamic, uncertain and possibly adversarial environments. The overarching goal is to specify a rich class of properties pertinent to the safe and autonomous operation of cyber-physical systems and develop scalable algorithms for the automated, formal synthesis of control policies for cyber-physical systems to meet these high-level specifications. The project will encompass the following areas:

- Specification, design and verification of networked control systems.
- Formal synthesis of control policies for hybrid dynamical systems.
- Applications in networked cyber-physical systems (e.g., autonomous systems, robotics, and smart power grids).

The successful candidate will become part of the department’s Autonomous Systems and Robotics Group and have an opportunity to participate in international collaborations with researchers at Caltech, University of Michigan, and IMDEA Software Institute. The project will also be part of an EU FP7 Marie Curie project on control of cyber-physical systems (Control-CPS).

Candidate Requirements:
The student should be self-motivated and have a strong mathematical background in control theory and/or dynamical systems. Programming experience (e.g., in Matlab, C, Python) would be a plus. Prospective candidates must have (or be expecting) a good 4-year or MSc degree (preferably 1st class or equivalent) in a related subject (e.g., Engineering, Maths, Computer Science) and should enjoy theoretical work. Excellent written and oral communication skills, including the ability to publish and present scientific results, are essential.

Funding and Eligibility:
Both UK/EU and overseas students are encouraged to apply. For UK/EU students, this studentship covers full UK/EU PhD tuition fees (£3,900 p.a.) and an annual, tax-free stipend of £13,726 (RCUK rate) for a duration of 3.5 years. For non-EU students, this studentship will cover full overseas PhD tuition fees (£16,640 p.a.) and an annual, tax-free maintenance stipend of £9,000.
How to apply:
To apply please submit a PhD application using our online application system via the Apply link at the following: http://www.shef.ac.uk/acse/prospectivepg/phd/applyphd

You should indicate this project and enter Dr Jun Liu as your proposed supervisor in your application. If you wish to discuss any details of the project informally, please contact Dr Jun Liu, Autonomous Systems and Robotics Group, Email: j.liu@sheffield.ac.uk

Deadline: 7th October 2013