



The
University
Of
Sheffield.

Faculty
Of
Engineering.

Sheffield Engineering Scholarships

PhD full-fees scholarship for China Scholarships Council scholars from Zhejiang University

Project: *Handling of criterion uncertainty in multi-criteria decision making (MCDM)*

A major work programme within the Rolls-Royce UTC in Control and Systems Engineering is addressing the Design of Future Gas Turbine Engine Control System Architectures. This PhD programme will contribute to that programme by developing a methodology to enable the handling of varying degrees of uncertainty in criterion evaluation within a structured MCDM approach.

The design of a gas turbine engine control system architecture is critical to the safety, performance and commercial competitiveness of the product. Design requirements embrace safety and certification criteria, functional requirements, project-specific goals and through-life costs of the engine. The use of MCDM relies on the availability of ways of evaluating architectures against these requirements.

Any decision-making approach is dependent on the quality of measurements available to it. Some criteria measures will be obtained from deterministic or stochastic modelling tools, others will be derived from scoring tables and yet others from expert assessment. This research programme will be devoted to maximising the utility of information derived from whatever source.

Sources of uncertainty in MCDM may be classified as follows:

(i) Noisy criterion measurements (ii) Approximated criterion values, (ii) Robustness and (iv) Dynamic criterion functions.

This programme will build on world-leading expertise in multicriteria decision-making (MCDM) at the University of Sheffield and apply it to this important and complex real-world problem. Interdisciplinary collaborations will involve colleagues in mathematics, psychology and management.

Supervisors: Dr R Purshouse (Automatic Control and Systems Engineering) and Professor P J Flemming (Automatic Control and Systems Engineering)

Scholarship: Sheffield Engineering scholarships cover the full cost of PhD registration fees for 3 years

Eligibility: Sheffield Engineering scholarships are available to students who secure a CSC scholarship. Applicants must meet the University of Sheffield English Language requirements, full details of which are available at:

<http://www.shef.ac.uk/postgraduate/info/englang.html>

Applications: Please send a CV together with a brief covering letter to Dr Catherine Biggs, Faculty of Engineering Head of Research Studies at c.biggs@sheffield.ac.uk by **17th Feb 2010**. Include the title of the project in your covering letter and any English language test results.