



Department of Automatic Control & Systems Engineering  
would like to announce the following seminar:

## **Improving Convergence, Diversity and Pertinency in Multiobjective Optimisation**

*Speaker: Mr. Salem Adra*

**Department of Automatic Control and Systems  
Engineering, University of Sheffield  
Wednesday 14th November 2007  
at 14:10**

**Location: Henry Stephenson Building LT1**

Coffee and Biscuits will be served afterwards.

**Abstract:** Real-world problems commonly require the simultaneous consideration of multiple, often conflicting, objectives. Solving a multiobjective optimisation problem (MOP) is concerned with finding an ideal set of tradeoff solutions which are close to and uniformly distributed across the optimal tradeoff surface. Convergence and diversity are thus essential requirements of multiobjective optimisers. In this work, new approaches are proposed for enhancing the convergence and diversification capacities of some of the best multiobjective evolutionary optimisers (MOEAs). The inclusion of quality metrics as indicators is implemented as an approach for solving the conflict between solutions' convergence and diversity in high-dimensional optimisation problems. Moreover, a convergence acceleration technique for MOEAs which exploits the objective space, where the goal and objectives lies, is devised and assessed. In the final part of the study, some established progressive preference articulation techniques are examined, and their utility for tackling MOPs is discussed from the viewpoint of the decision maker. Progressive preference articulation techniques are effective methods for supporting the decision maker in guiding the search into pertinent regions of interest and coping with the curse of dimensionality.