

**Institute for Mathematics and its Applications and SMART Infrastructure
Facility
Joint seminar
University of Wollongong**

Title: Minimising Propagated Delay in an Integrated Aircraft Routing and Crew Pairing Framework

Speaker: Michelle Dunbar (University of New South Wales)

Time and Date: 3:30pm, Monday 12 March 2012

Location: Room 6.105

Abstract: To retain a degree of tractability, the airline scheduling problem has traditionally been sequentially decomposed into various stages (e.g. schedule generation, fleet assignment, aircraft routing, and crew pairing), with the decisions from one stage imposed upon the decision making process in subsequent stages. Whilst this approach greatly simplifies the solution process, it unfortunately fails to capture the many dependencies between the various stages, most notably between those of aircraft routing and crew pairing, and how these dependencies affect the propagation of delays through the flight network. As delays are commonly transferred between late running aircraft and crew, it is important that aircraft routing and crew pairing decisions are made together. The propagated delay may then be accurately estimated to minimise the overall propagated delay for the network and produce a robust solution for both aircraft and crew.

In this seminar I will outline a new approach to accurately calculate and minimise the cost of propagated delay, in an integrated aircraft routing and crewing pairing framework. Additionally, I will demonstrate how one may extend this approach to incorporate scheduling decisions. Numerical results on a number of test instances for a real-world airline network will be provided.