

## **Prof. Brian Anderson**

**Distinguished Professor  
 Australian National University  
 Canberra, Australia**



**Date: Monday, September 29, 2008**

**Time: 4:00PM—5:00PM**

**Place: ESB 1001**

### **Control and information architectures for formations**

Formations of robots, underwater vehicles and autonomous airborne vehicles are progressively being deployed to tackle problems of surveillance, bush fire control, and the like. Much formation behaviour mimics the behaviour of formations of living organisms, such as birds and fish.

A number of prototypical problems will be considered, starting with rendezvous and consensus. The presentation will consider the types of control, communications and sensing architecture that allow scalability for formations with many individual agents, and allow preservation of the formation shape, as well as merging, splitting, or closing ranks in the event of loss of one or more agents. The scalability requirement imposes a need for significant decentralization of information and control structures, and, just as in a formation of birds or fish, no one bird or fish can be expected to sense all other birds or fish and compute its own trajectory using even partial knowledge of the trajectories of all other individual birds or fish, so the amount of sensing, communication and control computation by any one agent has to be limited.

**Professor Anderson** has Published 10 books and over 800 papers. He holds honorary degrees from Catholic University of Louvain in Belgium, the Swiss Federal Institute of Technology, and the Universities of Sydney, Melbourne, New South Wales and Newcastle. Prof. Anderson is a Fellow of IEEE, the National Academy, London Royal Society, International Federation for Automatic Control, and three Australian Academies. He is also a former President of the Australian Academy of Science, Australian Foundation for Science, and International Federation for Automatic Control. He is a member of the Australian Science and Technology Council and the Prime Minister's Science, Engineering and Innovation Council. Prof. Anderson is also the lead PI, CEO and founder of "National Information and Communications Technology Research Centre" (\$130M, 2002-2006, <http://www.nicta.com.au>).



**Come on over at 3:45 for some refreshments before the seminar.**