Hamilton Institute

Control and information architectures for formations

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Abstract:
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.

Bio:
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Venue: Seminar Room, Hamilton Institute, Rye Hall,
         NUI Maynooth

Time: 2.00 - 3.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

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