

IEEE CIS Seminar

Professor Chris Manzie

The University of Melbourne

Venue: LT05 (LT South), UNSW Canberra

Date/Time: 30th September 2016, 2:30-3:30pm

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School of Engineering and Information Technology

Optimal design of controlled aerodynamic systems

Abstract: The overall design of aerodynamic systems has many interacting components to consider, from the structural geometry of the hardware to the computational platforms and eventually the controller architecture and gains. The traditional development cycles typically involve hardware iterations followed sequentially by controller development, leading to the potential for more design iterations than necessary or over-specification of the components within the final complete system. Advances in simulation capability potentially enable the use of optimization techniques within the design process to address these potential issues, ideally leading to better overall designs and shorter development cycles. However, evaluation of performance at each design point for a dynamic system may involve lengthy computation times, thus the overall optimization becomes non-trivial and necessitate the use of targeted approaches. In this talk I will (attempt to) briefly discuss three problems in this regard: global optimization of structural design parameters in the aerodynamic system; locally optimal co-design of structural and controller parameters; and optimal design of model based controllers in aerodynamic systems.



Chris Manzie is a Professor in the Department of Mechanical Engineering at The University of Melbourne. He is also an Assistant Dean (Research Training) and the Mechatronics Discipline coordinator in the Melbourne School of Engineering. His research interests are in model-based and model-free control and optimisation, with applications in a range of autonomous systems related to energy, transportation and mechatronics. Currently, he is an Associate Editor for Elsevier Control Engineering Practice; IEEE/ASME Transactions on Mechatronics; IEEE Transactions on Control Systems Technology and Elsevier Mechatronics. In his spare time, he enjoys trail running and making excuses for being slower, whilst for his sins he supports the Collingwood football club.