**Systems & Control Seminar**

**22nd October Wednesday: 13.00-14.00, Room: A108**

**Title: “***Optimal Control of Formula One Car Energy Recovery Systems”*

**Speaker: Professor D.J.N. Limebeer,** FREng, FIEEE

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**Abstract**

The use of orthogonal collocation methods in the solution of optimal control problems relating to Formula One racing will be discussed. These methods can be used to optimise driver controls such as the steering, brakes and throttle, and optimise vehicle setup parameters such as the aerodynamic down force distributions, and the engine maps. Of particular interest is the optimal usage of on-board energy recovery systems. The talk will focus on the control of the hybrid kinetic-thermal energy recovery systems known as (ERS-K) and (ERS-H) that have been introduced into Formula One racing for the 2014 season. We will also consider the interactions between the suspension system and the vehicle’s aerodynamics. It is demonstrated that these systems, when properly controlled, can produce contemporary lap time using approximately two thirds of the fuel required by last year’s vehicles.