Hamilton Institute

**A Differential Dynamic Games Approach
to Flow Control**

**Professor Richard Vinter
Electrical and Electronic Engineering Department
Imperial College, London, UK**

Friday, January 21st, 2005

Abstract

Surge tanks are flow control devices, whose purpose is to smooth out the rate of change of flow of fluids passing from one process unit to another. Classical surge tanks controllers, such as PID controllers, focus on regulating the volume of fluid in the surge tank at some 'safe' intermediate value, between overflow and emptying of the surge tank.

There is interest, however, in other kinds of controllers, which address more directly the important problem of avoiding excessive rates of change of output flow rate. It turns out that a differential games formulation of the surge tank control problem is very well suited to dealing with constraints of this nature. This talk is about a differential games approach to the design of controllers for systems subject to disturbances, illustrated by application to the surge take control design problem.

Links with stochastic control are developed. Comparisons are made with other non-classical approaches to surge tank control that have been proposed, notably variable structure controllers and controllers based on the application of optimal control.

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

Time: 1.00 - 2.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

IEEE
CC Ireland Chapter