



# Hamilton Institute

## **An Approach to the Analysis and Control of Nonlinear/Uncertain Systems**

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### *Abstract*

Several issues in the analysis and control of systems which are nonlinear and/or contain uncertainty in their description are considered. These issues include stability, rejection of constant and periodic disturbances, and disturbance attenuation in the presence of unknown but bounded disturbances.

We consider an approach in which the nonlinear/uncertain terms in the system description are characterized by symmetric matrices called multiplier matrices; we also show that many commonly encountered nonlinear/uncertain terms can be characterized in this fashion. By employing quadratic Lyapunov functions to guarantee desired system behavior, we reduce many analysis and control design problems to that of solving a bunch of linear matrix inequalities; such inequalities can readily be solved using commercially available software.

**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](http://www.hamilton.ie)



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