



**Applied Control Technology Consortium  
and the  
University of Strathclyde**

**ACTC/IEE/IEEE Workshop**

**3<sup>rd</sup> November – 4<sup>th</sup> November 2004**

**Introduction to Nonlinear Control Techniques  
for Industrial Processes**

A two-day workshop is to be held at the University of Strathclyde in Glasgow supported by the Institution of Electrical Engineers and the Applied Control Technology Consortium (ACTC Club). The workshop will be a two-day event with the first day involving simple introductory material aimed at engineers in industry that have control problems on nonlinear applications. The material will include both an intuitive introduction to nonlinear control design and an overview of tuning techniques for commissioning and improving systems.

The second day will look to the future and cover advances in industrial control for severely nonlinear applications. Recent advances in nonlinear control systems design, which can provide real improvements in the quality of control or economic performance of systems, will be covered. Each of the two days will be self contained so that those wishing a simple introduction can attend the first day but those requiring a look to the future can also include the second day.

The workshop will run under the auspices of both the ACTC and the IEE and support from the EPSRC is also acknowledged, provided through a Platform Grant, covering advances in nonlinear control applications.



## Day One: Introduction to Nonlinear Control for Industrial Processes

Summary:

The aim of this day is to provide a tutorial Introduction to the basics of nonlinear control techniques for industrial applications. The emphasis will be on the provision of practical design tools and methods.

**VENUE:** The University of Strathclyde, Court Senate, Collins Suite, Collins Building, Richmond Street, Glasgow, G1 1XQ

09:00-09:30	REGISTRATION AND COFFEE	Committee Room 1
09:30-10:00	Modelling and identification of nonlinear systems and types of nonlinearities	Dr Reza Katebi
10:00-10:45	An introduction to control design methods for nonlinear applications	Prof Derek Atherton
10:45-11:00	<i>Tea and Coffee</i>	<i>Committee Room 1</i>
11:00-11:45	Introduction to nonlinear generalized minimum variance control	Prof Mike Grimble and Mr Pawel Majecki
11:45-12:30	An introduction to predictive control for nonlinear processes	Dr Andrzej Ordys and Dr Leonardo Giovanini
12:30-13:30	<i>LUNCH</i>	<i>Committee Room 1</i>
13:30-14:15	Practical control design for nonlinear systems with application studies	Professor Bill Leithead
14:15-15:15	Implementation and a simple MatLAB design facility for nonlinear applications: demonstration	Professor Mike Grimble and Mr Pawel Majecki
15:15-15:30	<i>Tea and Coffee</i>	<i>Committee Room 1</i>
15:30-16:00	Application of Nonlinear Predictive Control	Dr M Cannon
16:00-16:45	Nonlinear control applications: problems and solutions	Professor Bill Leithead, Dr Reza Katebi, Dr Andrzej Ordys, Dr Leonardo Giovanini, and Mr Arek Dutka
16:45-17:00	Discussions and Close	



## Day Two: Future Developments in Nonlinear Industrial Control

**VENUE:** University of Strathclyde, 204 George Street, Royal College Building,  
Chalmers Suite, Montrose Room 2.15, Glasgow, G1 1XW

Summary:

The aim of this one-day event is to consider a number of different new control techniques for systems with severe nonlinearities that might provide practical industrial controllers for the future. The focus will be on demonstrating the properties and advantages of these new solutions, with a number of industrial application examples to illustrate their benefits.

<b>09:00-09:30</b>	<b>REGISTRATION AND COFFEE</b>	<b>Montrose Room 2.15</b>
09:30-10:15	An introduction to advances in nonlinear control	Prof W E Leithead and Prof D Leith
10:15-11:00	New developments in nonlinear predictive control	Prof B Kouvaritakis and Dr M Cannon
<i>11:00-11:15</i>	<i>Coffee</i>	<i>Killearn Room 2.13</i>
11:15-12 noon	Nonlinear generalised minimum variance state-space control	Prof M J Grimble and Mr Pawel Majecki
12 noon-12:45	Algorithms and computational issues in nonlinear predictive control	Dr A Ordys and Mr J Balderud
<i>12:45 –13:30</i>	<i>LUNCH</i>	<i>Killearn Room 2.13</i>
13:30-14:15	Applications of nonlinear predictive control	Dr L Giovanini and Mr A Dutka
14:15-15:00	Nonlinear controller tuning and benchmarking demonstration	Mr Pawel Majecki and Prof M J Grimble
<i>15:00-15:15</i>	<i>Coffee</i>	<i>Killearn Room 2.13</i>
15:15-15:45	Servo system control with severe nonlinearities	Dr M MacDonald and Mr Peter Martin
15:45-16:15	Neural methods of nonlinear control and system identification	Dr A Hussain and Mr A Sayed
16:15-16:45	Introduction to fuzzy neural modelling and identification for nonlinear systems	Dr R Katebi and Mr Sergio Enrique Pinto-Castillo
16:45-17:15	Round Table with industrial views	
17:15	CLOSE	





## Terms and Conditions

Course fees are payable in advance and must be received two weeks prior to the commencement of the course. Full payment, or proof of payment, must accompany all registrations. Your registration is not confirmed until payment is received.

Cancellation: Fees will be refunded, less 10% handling charge, for any cancellation received in writing 14 days prior to the course. For cancellations after this date and no shows, ISC reserve the right to charge the full rate. Substitute delegates are welcome at any time. ISC also reserve the right to modify or cancel training courses, giving adequate notice and refunds to registrants.

VAT: Companies from other EC countries pay the amount excluding VAT only when the company VAT ID No has been provided. If this is not provided then the amount including VAT will be charged at the current UK rate of 17.5%. Companies from outside the EC pay the amount excluding VAT.

### **For further Information:**

[http://www.strath.ac.uk/maps/campus\\_ja.htm](http://www.strath.ac.uk/maps/campus_ja.htm)

<http://www.strath.ac.uk/maps/travel.htm>

<http://www.strath.ac.uk/maps/collins.htm>

<http://www.strath.ac.uk/maps/royal.htm>

### **Accommodation**

[Nearby hotels](#) offer a wide range of accommodation.