



Oreste S. Bursi

Oreste S. Bursi graduated in Mechanical Engineering at the University of Padua in 1984, and achieved his PhD. in Mechanical Engineering at the University of Bristol. He worked as a visiting professor at the University of Boulder, Colorado, in the period 1989-1990 and at the University of Bristol in the year 2005. He is Full Professor of Structural Dynamics and Control at the University of Trento, teaching Seismic Engineering and Theory and Design of Bridges. The research activity is mainly devoted to the pseudo-dynamic test method, non-linear dynamics, control and structural identification. He is co-ordinator of EU and national research projects. He is author of over 150 technical publications. For further information, please refer to the URL: www.ing.unitn.it/~bursi



Iker Elorza Pinedo

Iker Elorza Pinedo is a visiting scholar from the University of Bristol who graduated in Industrial Engineering at the University of the Basque Country and in Mechanical Engineering at the University of Bristol. His research activities are related to numerical modeling and control of mechanical and structural systems with dynamic substructuring. He is author of some papers dealing with model reference adaptive control.

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University of Trento

Doctoral School in Engineering of Civil and Mechanical Structural Systems



Modelling and Control of Dynamical Systems

Course offered by Oreste S. Bursi and
Iker Elorza

June 15-19, 2009

Department of Mechanical
and Structural Engineering
University of Trento

Course objective

The primary purpose of this course is to provide an introductory treatment of translational dynamical systems and structural control. The bases of classical control theory and some modern control techniques will also be presented.

Who should attend

Graduate students in mechanical and structural engineering, researchers, professional interested in modelling and control of dynamical systems

Course outline

Translational mechanical systems and standard forms for system models. Interconnection laws. System models. State-variable equations. Input-output equations. Matrix formulation of state variables.

Transfer function analysis. The Laplace transform and solving of linear ODEs. The transfer function. Block diagrams. Time and frequency-domain analysis of system response. Absolute and relative stability analysis. Output feedback stability.

Single input and single output (SISO) system control. Control system design. Specifications. PID control. Sensitivity to perturbances and parameter variation.

Complex control structures. Discrete-time control system design.

Multivariable system control. Linear dynamics of multivariable systems. State-space representations. State feedback control. State observers. Reference-model control design. Model reference adaptive control.

Structural control. Active, hybrid and semi-active structural control. Response mitigation of civil engineering structures. Demonstration in the lab on the active control of Single- and Multiple-DoF systems.

Course schedule

Monday, June 15, 2009
DIMS Room
10.00-13.00
14.30-18.30

Tuesday, June 16, 2009
DIMS Room
9.00-13.00
14.30-18.30

Wednesday, June 17, 2009
DIMS Room
9.00-13.00
14.30-18.30

Thursday, June 18, 2009
DIMS Room
9.00-13.00
14.30-18.30

Friday, June 19, 2009
DIMS Room
9.00-13.00
14.30-17.00

Information

The course is free of charge.

For further information, please contact
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