

ECE Distinguished Seminar Series

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Boundary Control of PDEs and Applications to Flows and Flexible Structures

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Tuesday, May 1st, 2:00pm
Dreese Laboratory 260

Abstract:

I will present new methods for designing feedback controllers for infinite-dimensional systems controlled from the boundary. Such problems arise in turbulent flow control, chemical process control, fusion, nanotechnology applications such as control of cantilever beams in atomic force microscopes, etc. Due to the inherent high dimensionality and unbounded input and output operators, control methods that emulate standard finite-dimensional techniques and require the solution of operator Riccati equations are hard to apply to these problems. I will present a set of novel controller and observer design techniques inspired by geometric nonlinear control tools and “backstepping,” which employ only symbolic computation.

Biographical Information:

Miroslav Krstic is the Sorenson Professor of Mechanical and Aerospace Engineering and the Director of the newly formed Center for Control, Systems, and Dynamics (CCSD) at UCSD. Krstic is a coauthor of the books *Nonlinear and Adaptive Control Design* (1995), *Stabilization of Nonlinear Uncertain Systems* (1998), *Flow Control by Feedback* (2002), and *Real Time Optimization by Extremum Seeking Control* (2003). He received the NSF Career, ONR YI, and PECASE Awards, as well as the Axelby and the Schuck paper prizes. In 2005 he was the first engineering professor to receive the UCSD Award for Research. Krstic is a Fellow of IEEE, a Distinguished Lecturer of the Control Systems Society, and a former CSS VP for Technical Activities. He has served as AE for several journals and is currently Editor for Adaptive and Distributed Parameter Systems in *Automatica*.