Electrical and Computer Engineering
MSE Track in Control Systems

Introduction
The focused MSE track in Control Systems provides students with broad and rigorous training in control system analysis and design, covering linear, nonlinear and hybrid systems, as well as feedback control mechanisms in biological systems. Additionally, it offers the students multi-departmental exposure to robotic control systems, optimization, signal processing, information theory, and relevant branches of applied mathematics.

General Requirements
1. Satisfactory completion of eight one-semester graduate courses. All require advisor approval. These courses may not include primarily research/independent study courses (e.g.520.700, 520.800, 520.801, etc.) Seminar courses (e.g. 520.601) and special studies courses may not be used.
   - Five courses must come from the full-time ECE department (520.XXX), and be 600 level or above.
   - Three Additional courses must be level 600 (WSE) / 400 (KSAS) or above.
2. Completion of either (Option 1) two additional graduate courses, or (Option 2) a master’s essay, or (Option 3) a special research project approved by an ECE faculty member.

List of Courses Relevant to the Track (based on current course schedule)

List A: Core classes in ECE
520.654 Control Systems Design
520.601 Introduction to Linear Systems Theory
520.621 Introduction to Nonlinear Systems
520.629 Networked Dynamical Systems
520.636 Feedback Control in Biological Signaling Pathways

List B: Complementary classes in ECE
520.647 Information Theory
520.622 Principles of Complex Networked Systems
520.635 Digital Signal Processing
520.646 Wavelets & Filter Banks
520.651 Random Signal Analysis
520.648 Compressed Sensing and Sparse Recovery
520.652 Filtering and Smoothing

List C: Relevant classes in other departments
Mechanical Engineering
530.420 Robot Sensors and Actuators
530.485 Physics and Feedback in Living Systems
530.646 Robot Devices, Kinematics, Dynamics and Control
530.647 Adaptive Systems
530.649 System Identification
530.678 Nonlinear Control and Planning in Robotics

Applied Mathematics and Statistics
553.653 Mathematical Game Theory
Core Faculty
- Pablo Iglesias
- Enrique Mallada
- Noah Cowan (Secondary appointment in ECE)
- René Vidal (Secondary appointment in ECE)

Research Areas
- Systems and control theory
- Mathematical and computational biology
- Control of cyber-physical systems
- Feedback control in biological signal transduction
- Control of logistic networks
- Model complexity reduction
- Sensorimotor control and sensor-based robot control systems
- Computer vision and vision based control

Contact Information
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