ELECTRICAL ENGINEERING AND COMPUTER SCIENCE (EECS)

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RESEARCH ACTIVITIES

The Electrical Engineering and Computer Science Department offers degree programs in Electrical Engineering, Computer Engineering, Computer Science, and Systems & Control Engineering.

Both the Computer Science and Computer Engineering programs give students a firm background in computing fundamentals: data structures, logic design, systems programming, operating systems and computer architecture.

Computer Engineering provides a solid engineering basis and perspective to the fundamentals of computing by a number of courses in hardware and software.

The Computer Science program teaches the formal, mathematical basis of computing with classes such as algorithms and databases.

Electrical Engineering provides a fundamental background in computer hardware and programming, analog and digital circuits, signals & systems, electromagnetic fields, and semiconductor electronic devices.

Systems and Control provides education in fundamental areas which include but are not limited to engineering optimization, computer simulation, systems modeling, control systems design and analysis, signal analysis, decision theory and engineering economics, as well as advanced mathematics and statistics courses.

All EECS engineering students participate in 1-2 semesters of Senior Project which may have a strong research and/or design component. Computer Science students may also take senior project as a technical elective.

RESEARCH COURSES (Require consent of supervising faculty member)

EECS 290 SPECIAL TOPICS
EECS 396L SPECIAL TOPICS
EECS 396M SPEC TOP: COMPUTER SCIENCE
EECS 396N SPECIAL TOPICS
EECS 397L SPECIAL TOPICS IN ELECTRICAL ENGINEERING

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Sample Department Research Topics:

Computer algorithms, bioinformatics
Database systems
Distributed computing, computer networks, high speed digital communications
Industrial control, manufacturing systems, automation, robotics
Intelligent systems, biorobotics, computational neuroscience
Robustness and simulation
Large-scale systems, world modeling for environmental policy
Micro-electromechanical systems, mixed-signal integrated circuits,
Mixed-signal integrated circuits
Software engineering, software specifications and testing, program verification and design environments for software
VLSI CAD/embedded systems, design methodologies and design automation

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Department Research (by faculty)

Professor B. Ross Barmish
407 Olin Building, 368-2802
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Control systems, robustness, probabilistic methods, Monte Carlo simulation

Professor Randall D. Beer
Olin 512, 368-2816
E-mail: rxb9@po.cwru.edu
Computational neuroscience, autonomous robotics

Assistant Professor Michael Branicky
515B Glennan Bldg., 368-6268
E-mail: msb11@po.cwru.edu
Intelligent systems and control; hybrid systems; learning; real-time and distributed control over networks; applications to robotics and flexible manufacturing

Associate Professor Marc Buchner
707 Olin Bldg., 368-4096
E-mail: mxb11@po.cwru.edu
Computer simulation of complex systems; control of industrial systems; analysis of discrete event and combined systems

Associate Professor Vira Chankong
708 Olin Bldg., 368-4054
E-mail: vxc2@po.cwru.edu
Large-scale and multi-objective optimization and its application to engineering problems; manufacturing and production systems; improvement of magnetic resonance imaging, decision theory; and risk analysis

Assistant Professor Ayse F. Ergun
Olin 509, 368-0356
E-mail: afe@po.cwru.edu
Program testing/verification, networking protocols, randomized algorithms,learning theory, cryptography

Associate Professor George W. Ernst
508 Olin, 368-2839
E-mail: gwe@po.cwru.edu
Learning problem solving strategies; artificial intelligence; expert systems; program verification

Associate Professor Steven L. Garverick

Glennan Building, 368-6435
E-mail: slg9@po.cwru.edu
Mixed-signal integrated circuit design, microelectromechanical system integration, sensor/actuator interfacing, data conversion, wireless communication, analog neural network circuits, medical instrumentation

Professor Dov Hazony
710A Glennan Building, 368-3937
E-mail: dxb2@po.cwru.edu
Network syntheses, ultrasonics, communications

Assistant Professor Vincenzo Liberatore
Glennan 516, 368-4089
E-mail: vxl11@po.cwru.edu
Distributed systems, Internet computing, randomized algorithms

Associate Professor Wei Lin
607 Olin Bldg., 368-4493
E-mail: wxl4@po.cwru.edu
Nonlinear dynamic systems and geometric control theory, discrete-time control systems; H-infinity and mixed H-2/H-infinity and robust control, adaptive control; system parameter estimation; adaptive and nonlinear control for robotics manipulators and induction motors; fault diagnosis and detection; control of nonholonomic mechanical systems and biomedical systems

Professor Kenneth A. Loparo
705 Olin Bldg., 368-4115
E-mail: kal4@po.cwru.edu
Stability and control of nonlinear and stochastic systems, analysis and control of discrete event systems, intelligent control systems and failure detection. Recent applications work focuses on the control and failure detection of rotating machines

Professor Behnam Malakooti
611 Olin Bldg., 368-4462
E-mail: bxm4@po.cwru.edu
Industrial systems, manufacturing, production, management, and operational engineering. Multiple objective, decision making, and interactive optimization. AI, neural networks, clustering. Facility layout, group technology, machining

Professor Mehran Mehregany
118 Bingham Building, 368-0755
E-mail: mxm31@po.cwru.edu
Silicon and silicon carbide microelectromechanical systems (MEMS), micromachining and microfabrication and related integrated circuits, materials,

and modeling issues

Associate Professor Frank L. Merat
516 Glennan Building, 368-4572
E-mail: flm@po.cwru.edu
Wireless networks; rf communications; optical MEMS devices; computer vision and image processing; neural networks

Professor Mike D. Mesarovic
605 Olin Bldg., 368-4466
E-mail: mdm5@po.cwru.edu
Complex systems theory; global issues and sustainable development

Professor Wyatt Newman
51OB Glennan Building, 368-6432
E-mail: wsn@po.cwru.edu
Mechatronics; high-speed robot design; force and vision-based machine control; artificial reflexes for autonomous machines; rapid prototyping; agile manufacturing

Professor Gultekin Ozsoyoglu
506 Olin, 368-5029
E-mail: gxo3@po.cwru.edu
Databases; multimedia computing, digital libraries

Professor Z. Meral Ozsoyoglu
511 Olin, 368-2818
E-mail: mxo2@po.cwru.edu
Database theory; logic databases; database query and optimization

Professor C. A. Papachristou
502 Olin, 368-5277
E-mail: cap2@po.cwru.edu
VLSI design and CAD; computer architecture and parallel processing; design automation; embedded system design

Associate Professor Stephen M. Phillips
517A Glennan Building, 368-6248
E-mail: smp2@po.cwru.edu
Applications of control and signal processing to robotics and automation

Assistant Professor Andy Podgurski
510 Olin, 368-6884
E-mail: hap@po.cwru.edu

Software architecture and design; software engineering; distributed and real-time systems; flexible manufacturing systems; software testing and reliability assessment

Associate Professor Daniel G. Saab
Olin 516, 368-2494
E-mail: dgs3@po.cwru.edu
Computer architecture; VLSI system design and test; CAD design automation

Assistant Professor Cenk Sahinalp
Olin 515, 368-6197
E-mail: scs12@po.cwru.edu
Design, analysis and experimental evaluation of algorithms for pattern matching and indexing, data compression, communication networks and computational molecular biology

Associate Professor N. Sreenath
608 Olin Bldg., 368-6219
E-mail: nxs6@po.cwru.edu
Large scale systems; policy analysis; sustainable development; integrated assessment, global and environmental issues (water resources and global climate change) ; control theory applications and medical informatics

Associate Professor Massood Tabib-Azar
517B Glennan Building, 368-6431
E-mail: mxt7@po.cwru.edu
Semiconductor material and device characterizations; optical signal processing; novel high-frequency and high-power devices and circuits; spectroscopy and low temperature measurement; novel super-resolution near-field imaging probes; quantum computing

Professor Lee J. White
402 Olin Hall, 368-39 19
E-mail: jlw@po.cwru.edu
Software testing; current projects include regression testing, study of domain testing, specification-based testing and testing of object-oriented software

Assistant Professor Darrin J. Young
516 Glennan Bldg., 368-8945
E-mail: djy@po.cwru.edu
Micromachined sensors, high-Q passive components and integrated low power analog circuits for wireless communications

Guo-Qiang Zhang
Associate Professor

Olin 610, 368-0382
E-mail: gxz11@po.cwru.edu
Programming languages, theory of computation, logic and topology in computer science.