DEPARTMENT OF

ELECTRICAL &
COMPUTER ENGINEERING

2020-2021

UC RIVERSIDE | Electrical and Computer Engineering

10M+
F19-20
RESEARCH GRANTS

32+
FACULTY MEMBERS

14
FELLOWS OF
PROFESSIONAL SOCIETIES

13
NSF CAREER & YOUNG
INVESTIGATOR AWARDS

200+
GRADUATE STUDENTS

450+
UNDERGRADUATE
STUDENTS

1st BCOE students
enrolled
1989

1st undergrad
graduating
class
1993

1st ABET EE
Accreditation
1994

Start of
Graduate EE
Program
1997

1st EE
Ph.D.
2001

Name change
to ECE
2015

5th ABET
Accreditation
2018

UCR ECE MILESTONES

1992:
5 Faculty

2001:
10 Faculty
Start of CEN B.S.
2nd ABET Accreditation

2006:
20 Faculty

2016:
30 Faculty

2019:
32 Faculty

DEGREES OFFERED

B.S.
- Electrical Engineering
- Computer Engineering
- Materials Science and Engineering

M.S.
- Electrical Engineering
- Computer Engineering
- Materials Science and Engineering
- M.S. Online

B.S. + M.S.
- Electrical Engineering
- Computer Engineering

PH.D.
- Electrical Engineering
- Materials Science and Engineering

UNDERGRADUATE FOCUS AREAS

ELECTRICAL ENGINEERING

COMMUNICATIONS, SIGNAL PROCESSING, AND NETWORKING

CONTROL AND ROBOTICS

EMBEDDED SYSTEMS AND VLSI

INTELLIGENT SYSTEMS

NANOTECHNOLOGY, ADVANCED MATERIALS, AND DEVICES

POWER SYSTEMS AND SMART GRID

COMPUTER ENGINEERING

COMPILERS AND OPERATING SYSTEMS

COMPUTER ARCHITECTURE AND CPU DESIGN

HIGH-PERFORMANCE COMPUTING

REAL-TIME AND EMBEDDED SYSTEMS

VLSI AND ELECTRONIC DESIGN AUTOMATION

M.S. THEMES

ADVANCED MATERIALS AND DEVICES

COMMUNICATIONS AND SIGNAL PROCESSING

EMBEDDED REAL-TIME SYSTEMS

INTERNET OF THINGS

NANOSCIENCE AND NANOTECHNOLOGY

ROBOTICS AND COMPUTER VISION

SMART GRIDS AND POWER SYSTEMS

AREAS OF RESEARCH

COMMUNICATIONS, SIGNAL PROCESSING, AND NETWORKING

- Investigation and development of communication and signal processing theories
- Algorithms and systems for wireless and network communications
- Video and multimedia technologies

COMPUTER ENGINEERING

- Design and implementation of hardware and software systems
- Computer architecture, VLSI design, real-time and embedded systems
- Networked systems from small scales (e.g. Internet of Things) to large scales (e.g. data centers)

CONTROL AND ROBOTICS

- Theories and methods of modeling, identification and design of highly complex control systems
- Planning and analysis of motion, navigation and control of autonomous vehicles and robotic systems

INTELLIGENT SYSTEMS

- Theoretical foundations and applications of computer vision, machine learning, and pattern recognition
- Cyber-physical and autonomous systems
- Intelligent transportation systems, multimedia technologies, and image/video bioinformatics

NANOTECHNOLOGY, ADVANCED MATERIALS, AND DEVICES

- Theoretical, computational, and experimental investigation of nanostructures
- Development of new bio- and opto-electronic materials, devices and circuits
- MEMS and photonics

POWER SYSTEMS AND SMART GRID

- Development and demonstration of smart grid applications
- Power system analysis and optimization
- Electricity market design
- Renewable energy integration
- Power system security

FACULTY NEWS

NEW FACULTY

BASAK GULER
Assistant Professor

- Postdoc, University of Southern California
- Ph.D., Pennsylvania State University
- Research: developing scalable, privacy-preserving, and context-aware communication and information processing frameworks for large-scale distributed networks.

IEEE FELLOW

HAMED MOHSENIAN-RAD
Professor
Bourns Family Faculty Fellow

- Research: developing optimization-based and data-driven techniques for power systems and smart grid applications with focus on sensing, controls, and operations.

PROMOTIONS

Professor Hamed Mohsenian-Rad
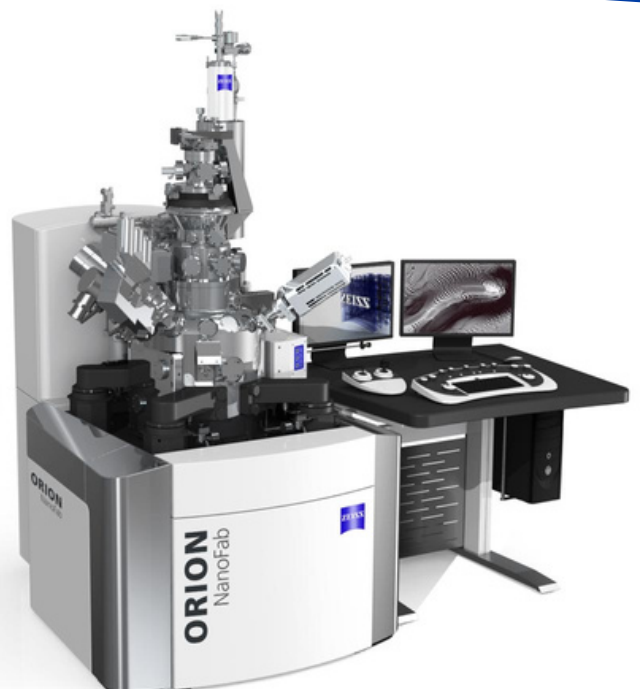Smart grids

Assoc. Professor Shane Cybart
Superconductivity

Assoc. Professor Ming Liu
Super-resolution imaging

NEW EQUIPMENT

ZEISS

ORION NANO-FAB

- Helium Ion Microscope (HIM)
- Capable of biological detection at the single-molecule level

MAJOR FACILITIES AND RESEARCH CENTERS

AUTONOMOUS ROBOTS AND CONTROL SYSTEMS (ARCS) LAB

Fundamental robotics research enabling robust, adaptive, and resilient planning and control of teams of legged and aerial robots in dynamic and uncertain environments.

CENTER FOR ROBOTICS AND INTELLIGENT SYSTEMS (CRIS)

Conducts cutting-edge research on the foundations and applications of intelligent and autonomous systems, including robotics, computer vision, machine learning, real-time systems, and biomedical systems, among others.

CENTER FOR UBIQUITOUS COMMUNICATION BY LIGHT (UC-LIGHT)

UC-light is a UC system-wide research program focused on developing LED-based optical wireless communications technologies and systems.

CENTER FOR ENVIRONMENTAL RESEARCH AND TECHNOLOGY (CE-CERT)

CE-CERT is a world-leading research center focused on improving air quality, transportation, and energy for a sustainable future.

NANO-FABRICATION FACILITY

Class 100/1000 cleanroom facility, fully equipped for advanced nanofabrication and characterization.

PHONON OPTIMIZED ENGINEERED MATERIALS (POEM) CENTER

Materials characterization research focused on phonon and thermal properties of advanced materials.

WINSTON CHUNG GLOBAL ENERGY CENTER (WCGEC)

Renewable energy center focused on developing emerging energy solutions related to storage, generation and distribution.

FEATURED AWARDS AND GRANTS

Elaine Haberer awarded NSF-funded research grant for self-propelled nanomaterials

Nanpeng Yu receives a DOE grant on power grids

Sheldon Tan awarded NSF-funded research for VLSI reliability study

ECE faculty receive NSF grant on machine learning in computer vision

ECE faculty lead team awarded $1M from DARPA to study adversarial machine learning

Hung-Wei Tseng awarded NSF grant to better utilize tensor processors

Hyoseung Kim receives NSF CAREER Award

Wei Ren receives NSF grant on distributed multi-robot joint localization and tracking

ECE faculty team receives an NSF grant on embedded auto-systems

Bir Bhanu leads an NSF-funded interdisciplinary team on human-machine synergy

ECE faculty team receives an NSF grant to improve Cyber-Phyical System safety

Shane Cybart receives three grants from AFOSR to develop superconducting quantum electronics

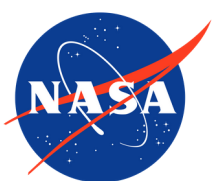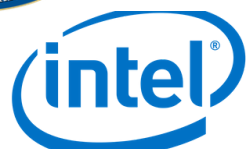Aleksandr Khitun awarded NSF-funded research grant for magnetic memory

Shaolei Ren receives NSF grant to automate design of deep neural networks

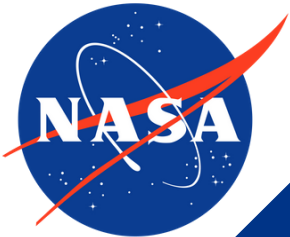Alexander Balandin receives a DOE grant for quantum materials

MAJOR FUNDING AGENCIES

Google

IBM

FHWA

NSF

CISCO

ARL
DISCOVER INNOVATE TRANSITION

Office of Naval Research
ONR
Science & Technology

NASA

NIST

DARPA

intel

Raytheon

ECE ALUMNI

VMware · Google · IBM · NASA · intel · Raytheon · AeroVironment · GM · Apple · Deloitte · Collins Aerospace · LADWP · ORACLE · Southern California Edison · NAVAIR · SAMSUNG · Tesla · BROADCOM · amazon

LEARN MORE

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