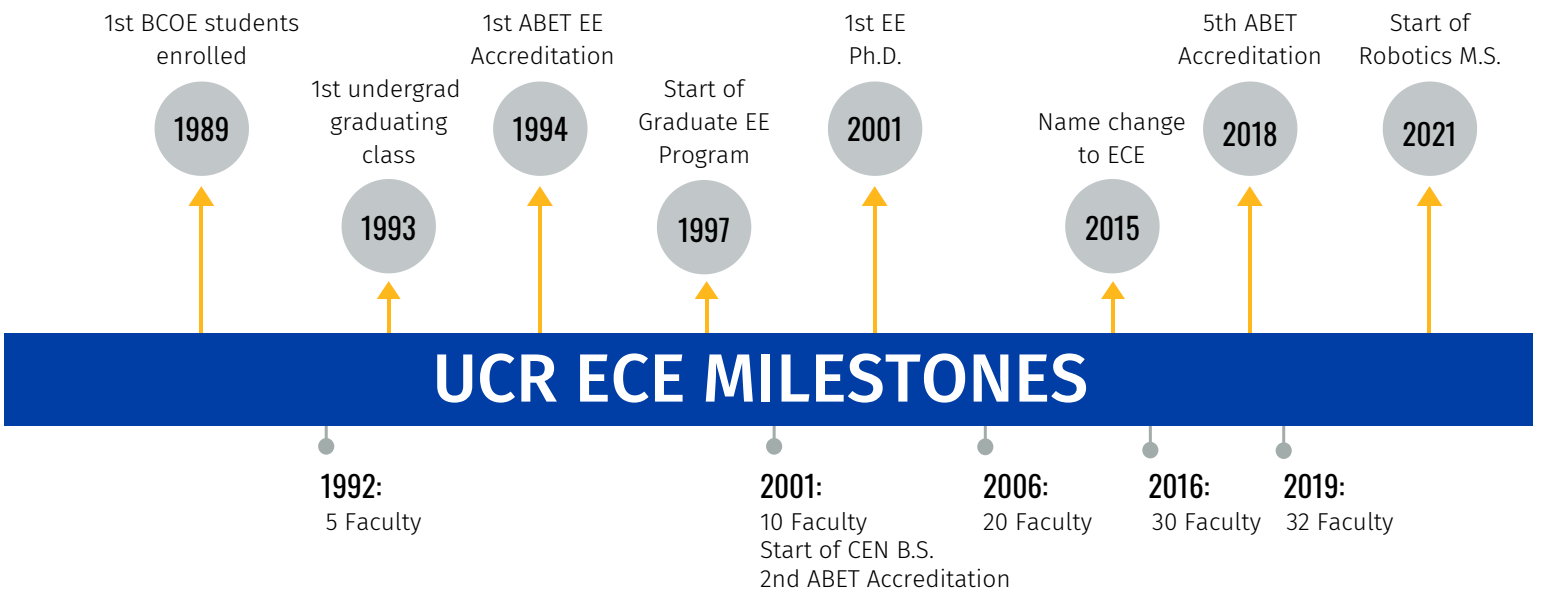
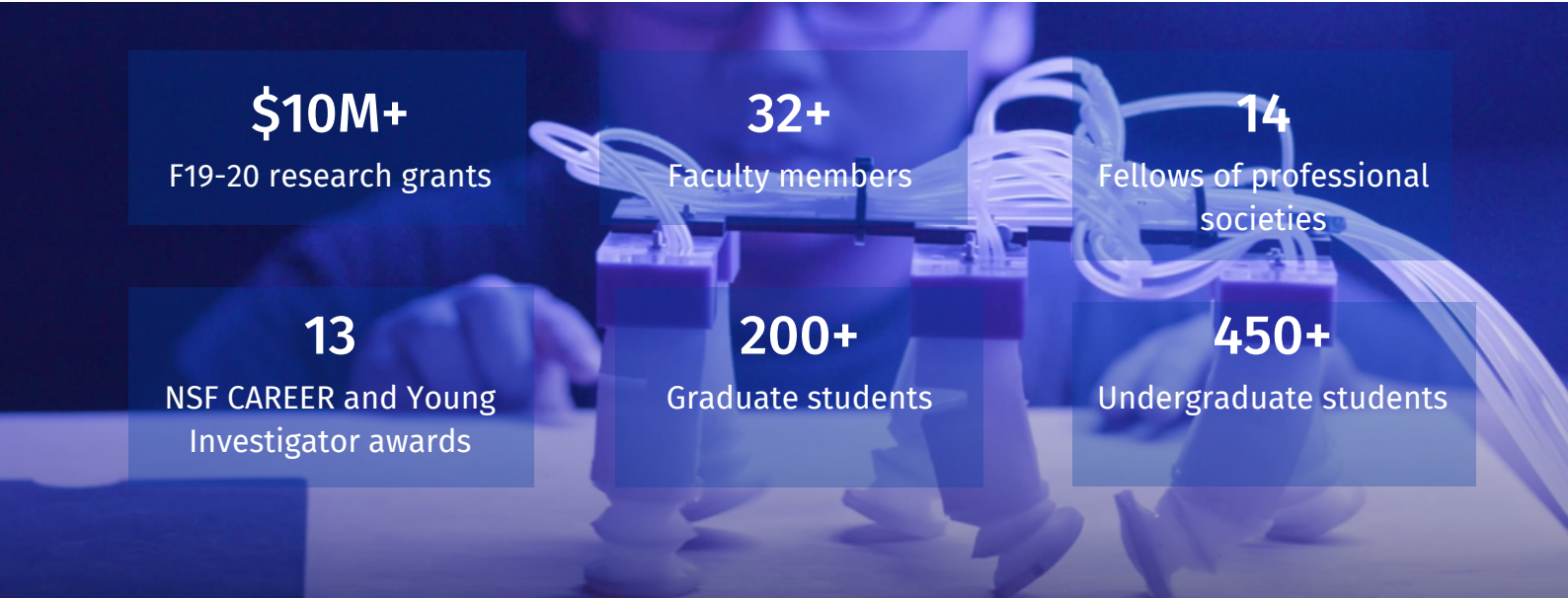




ELECTRICAL AND COMPUTER ENGINEERING AT UC RIVERSIDE

Leading innovation in electrical and computer engineering and training future leaders to solve the grand challenges of the 21st century



DEGREE PROGRAMS

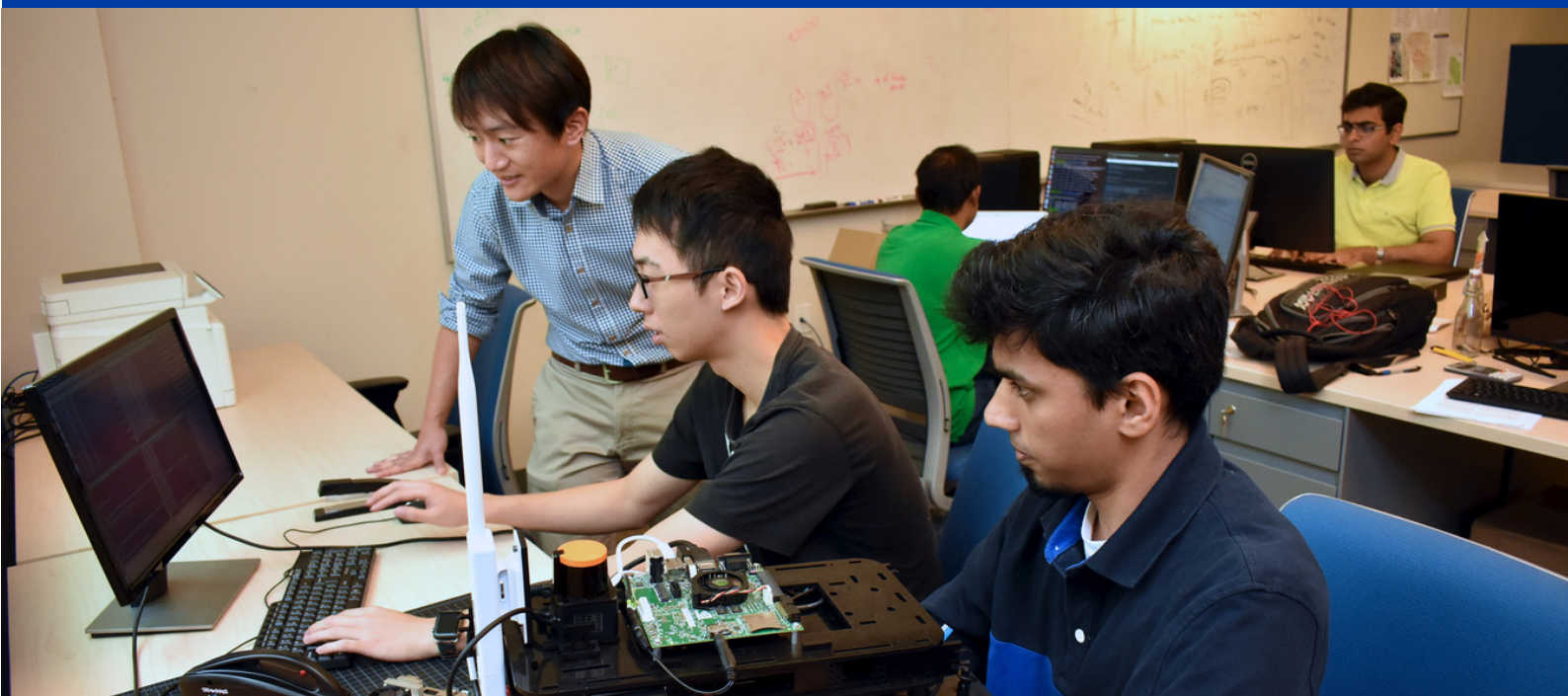
LINK TO: Degree programs page on this site

RESEARCH

LINK TO: Research page on this site

AWARDS & GRANTS

LINK TO: Featured Awards & page on this site



## DEGREE PROGRAMS

### B.S.

- Electrical Engineering
- Computer Engineering
- Materials Science and Engineering

LEARN MORE

<https://www.ece.ucr.edu/focus-areas>

### B.S. + M.S.

- Electrical Engineering
- Computer Engineering

LEARN MORE

<https://student.engr.ucr.edu/BS-MS-requirements>

### M.S.

- Electrical Engineering
- Computer Engineering
- Materials Science and Engineering
- M.S. Online
- **Robotics - NEW, Fall 2021!**

LEARN MORE

<https://www.ece.ucr.edu/graduate-overview>

### PH.D.

- Electrical Engineering
- Materials Science and Engineering

LEARN MORE

<https://www.ece.ucr.edu/graduate-overview>

## 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

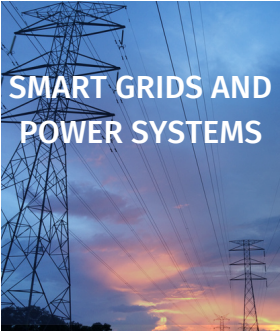
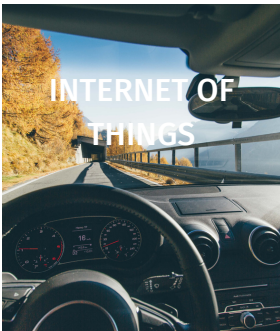
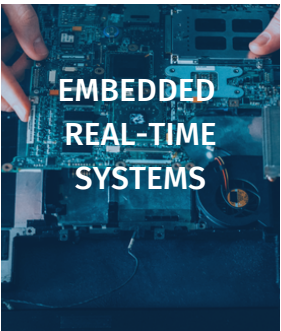


### COMPUTER ENGINEERING

- 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



NEW CHAIR



**ERTEM TUNCEL**  
 Chair, Department of Electrical and Computer Engineering  
 Research areas: Joint source-channel coding, fundamental tradeoffs in data identification systems, and zero-error information theory

[READ THE STORY](#)

<https://www.engr.ucr.edu/news/2021/06/30/five-engineering-faculty-bring-expertise-research-and-industry-new-leadership-roles>

NEW FACULTY



**JIA CHEN**  
 Assistant Teaching Professor  
 Research areas: Machine learning, signal processing, and data analytics

[VISIT CHEN'S WEBSITE](#)

<https://sites.google.com/view/jiachen-research/home>

PROMOTIONS, FELLOWS AND APPOINTMENTS



**HYOSEUNG KIM**  
 Associate Professor  
 Research areas: Real-time, embedded and cyber physical systems

[VISIT KIM'S WEBSITE](#)

<https://intra.ece.ucr.edu/~hyoseung/>



**ALEXANDER BALANDIN**  
 Department of Defense  
 Vannevar Bush Faculty Fellow  
 Research areas: Nanoscale materials, Devices and Circuits

[READ THE STORY](#)

<https://news.ucr.edu/articles/2021/05/07/3-million-award-create-new-field-research-one-dimensional-quantum-materials>



**JAY FARRELL**  
 KA Endowed Chair in Electrical and Computer Engineering  
 Research areas: Controls and robotics, intelligent systems

[READ THE STORY](#)

<https://insideucr.ucr.edu/stories/2021/04/23/jay-farrell-named-new-endowed-chair>



**AMIT ROY-CHOWDHURY**  
 Chair, Robotics Program  
 Research areas: Communications and Signal Processing, Intelligent Systems., Controls and Robotics

[LEARN ABOUT THE NEW ROBOTICS PROGRAM](#)

<https://news.ucr.edu/articles/2021/05/25/uc-riverside-offers-uc-systems-first-masters-degree-robotics>

VIEW ALL FACULTY

<https://www.ece.ucr.edu/Tenure-Track%20Faculty>



## AREAS OF RESEARCH

### Communications, Signal Process and Networking

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

MEET THE FACULTY

<https://www.ece.ucr.edu/research/communication-signalprocessing>

### 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)

MEET THE FACULTY

<https://www.ece.ucr.edu/research/computerengineering>

### 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

MEET THE FACULTY

<https://www.ece.ucr.edu/research/control-robotics>

### 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
- 

MEET THE FACULTY

<https://www.ece.ucr.edu/research/intelligentsystems>

### 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

MEET THE FACULTY

<https://www.ece.ucr.edu/research/nanoscalematerials-devices-circuits>


### 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

MEET THE FACULTY

<https://www.ece.ucr.edu/research/powersystems-smartgrid>


# MAJOR FACILITIES & RESEARCH CENTERS



**Autonomous Robots and Control Systems Lab**

Robust, adaptive, and resilient planning and control of legged and aerial robots in dynamic and uncertain situations

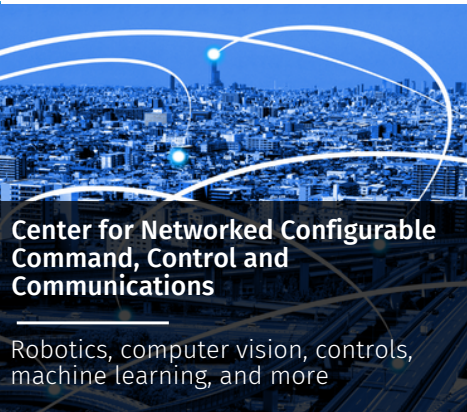
**VISIT ARCS LAB**



**Center for Environmental Research and Technology**

Improving air quality, transportation and energy for a sustainable future


**VISIT CE-CERT**



**Center for Networked Configurable Command, Control and Communications**

Robotics, computer vision, controls, machine learning, and more


**VISIT NC4**



**Center for Robotics and Intelligent Systems**

Robotics, computer vision, controls, machine learning, and more


**VISIT CRIS**



**Center for Ubiquitous Communication by Light**

Embedding signals into the light emitted by next-generation LEDs


**VISIT UC-LIGHT**



**Nanofabrication Facility**

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


**VISIT NANO**



**Phonon Optimized Engineered Materials Center**

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

**VISIT POEM**



**Winston Chung Global Energy Center**

Advanced solutions for today's energy storage demands

**VISIT WCSEC**

# NEW ELECTRICAL ENGINEERING MAKERSPACE

- Conventional soldering station
  - Hot-air/Touchless soldering station
  - PCB milling machine
  - Drillpress
  - 3D printers
  - High-end oscilloscope
  - LCR meter
  - function generator
  - Power supply
  - Digital multimeter
- Resistors
  - Capacitors
  - Inductors
  - Diodes
  - Transistors
  - LED
  - IC
  - Wire/cable
  - Connectors
  - Mechanical parts (nuts, bolts, screws, etc.)

## FEATURED AWARDS & GRANTS

### New \$7.5 Million Department of Defense Center of Excellence

Amit Roy-Chowdhury co-directs center to develop secure, fully networked command, control, and communications infrastructure that would enable integrated and optimal decision-making

[Learn about NC4:](#)

<https://news.ucr.edu/articles/2020/10/02/uc-riverside-receives-75-million-improve-large-scale-networked-systems>



### New \$12.4 Million Department of Energy Frontier Research Center with Arizona State University

Alexander Balandin co-leads the thermal thrust of project to create a more resilient and sustainable electricity grid by using next-generation materials

[Learn about ULTRA EFRC:](#)

<https://insideucr.ucr.edu/stories/2020/10/19/two-bcee-professors-join-doe-energy-frontier-research-center>



## Four ECE professors receive NSF CAREER Awards



**Salman Asif**

"Optimized Sensing and Recovery for Computational Imaging"

<https://www.ece.ucr.edu/news/2021/01/10/salman-asif-receives-nsf-career-award-computational-imaging>



**Konstantinos Karydis**

"Morphological Computation for Resilient Dynamic Locomotion of Compliant Legged Robots with Application to Precision Agriculture"

<https://www.ece.ucr.edu/news/2021/02/25/konstantinos-karydis-receives-nsf-career-award-resilient-dynamic-locomotion>



**Samet Oymak**

"Foundations of Resource Efficient Machine Learning"

<https://www.ece.ucr.edu/news/2021/01/15/samet-oymak-receives-nsf-career-award-resource-efficient-machine-learning>



**Daniel Wong**

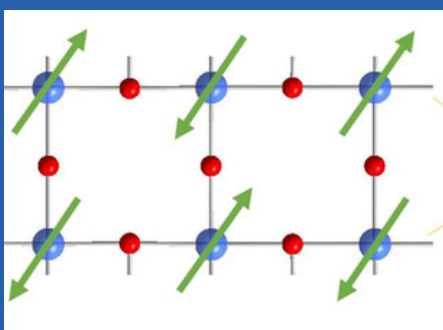
"Towards Efficient Accelerated Cloud Data Centers"

<https://www.ece.ucr.edu/news/2021/02/25/daniel-wong-receives-nsf-career-award-efficient-accelerated-cloud-data-centers>

### New state-of-the-art clean technology park being built in Southern California

Professor Matthew Barth joins UCR planning team for initiative that will leverage UCR's expertise in greenhouse gas emissions, air quality, clean energy, intelligent transportation, agriculture, natural resources management, community health and health disparity, and more

<https://news.ucr.edu/articles/2021/06/16/campus-community-gets-first-look-oasis>



### Spin-mediated thermal transport in quantum materials

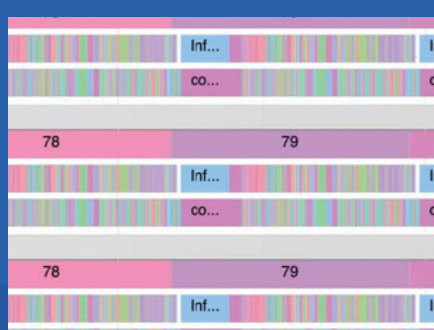
Professor Chen publishes in Advanced Functional Materials

<https://www.ece.ucr.edu/highlights/2021/06/02/spin-mediated-thermal-transport-quantum-materials>

### A robot that tells growers when to water crops

Professors Konstantinos Karydis and Amit Roy-Chowdhury work on project led by University of California Merced and funded by Department of Agriculture and the National Science Foundation's National Robotics Initiative

<https://news.ucr.edu/articles/2020/11/19/robot-tells-growers-when-water-crops-way>



### Exploring the full potential of emerging hardware technologies

Professor Hung-Wei Tseng's two new profiling tools fill the missing pieces of profiling in modern data center servers

<https://www.ece.ucr.edu/highlights/2021/06/04/exploring-full-potential-emerging-hardware-technologies>



### Increasing the storage capacity of capacitors using a compensatorial inductive field

Research engineer Alex Khitun publishes in Applied Physics Letters

<https://insideucr.ucr.edu/stories/2020/11/03/electro-magnetic-capacitors-could-eventually-rival-gasoline-energy-storage>



**Nael Abu-Ghazaleh**  
 Earns UCR Doctoral Dissertation Faculty Award for excellent mentorship and support of graduate students

<https://www.engr.ucr.edu/news/2021/06/22/computer-science-professor-earns-campus-wide-ucr-doctoral-dissertation-faculty>



**Hung-Wei Tseng**  
 Student team wins outstanding paper award in the 27th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2021)

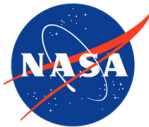
<https://www.ece.ucr.edu/news/2021/06/04/tsengs-team-received-outstanding-paper-award-rtas-2021>

Alexander Balandin breaks new record at the college with 50,000 research citations

READ THE STORY

<https://www.engr.ucr.edu/news/2020/11/19/two-bcoe-professors-rise-research-prestige-50000-citations>

MAJOR FUNDING AGENCIES



ALUMNI SUCCESS

