Electrical and Computer Engineering

impact report 2013-2014

Cockrell School of Engineering

THE UNIVERSITY OF TEXAS AT AUSTIN

From the Chair

DR. AHMED TEWFIK

I am pleased to share this Impact Report highlighting recent activity in Electrical and Computer Engineering at the University of Texas Austin (UT ECE). Impressive awards, remarkable student achievements, highly competitive admission to our undergraduate and graduate programs, innovative start-up oriented and industry funded senior design projects and beginning of the construction of a showcase building for the department are clear signs of an elite department known for innovation that is making its mark on Texas, the nation and the world.

The department continues to lead innovation in the college by launching a popular integrated BS/MSEE degree this year. It surpassed its goal of 10 Founding Partners in its industrial affiliates program by achieving 13 industrial partners within 18 months. And hardly a week passes by without the innovation created by our students and faculty being featured in the mainstream national and international media. All in all, a very exciting year for UT ECE!

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And our future is even brighter. We are launching the first ever multi-million dollar ECE endowment campaign to support the people and programs in the EERC. The University is making a large investment in the expansion of our faculty, guaranteeing us a large number of faculty positions over the next 3 to 4 years.

We are building more entrepreneurial infrastructure including a new internship program in startup companies; supporting an thriving entrepreneurial version of our senior design course; and bringing on board our first entrepreneur-in-residence. We are launching an undergraduate student recruitment and retention success program, funded entirely by industry, to increase diversity and enhance the retention and graduation rates of our underrepresented student population. We are also working with industry to explore how technology can enhance the effectiveness of our teaching.

Next time you are in Austin, I invite you to stop by UT ECE to see the future of electrical and computer engineering and teaching.

Regards,

Engineering Education and Research Center Begins Construction

The EERC will be the center of the Cockrell School's Culture of Innovation offering more than 430,000 sq. ft. of interdisciplinary teaching, research and student project space. The collaborative environment will dramatically expand the "teaching by doing" curriculum, fuel ground-breaking discoveries and drive lasting economic impact. The EERC is scheduled to open by Fall 2017.

DEPARTMENT RANKINGS

U.S. News & World Report

GRADUATE

#12	#9
Electrical Engineering	Computer Engineering

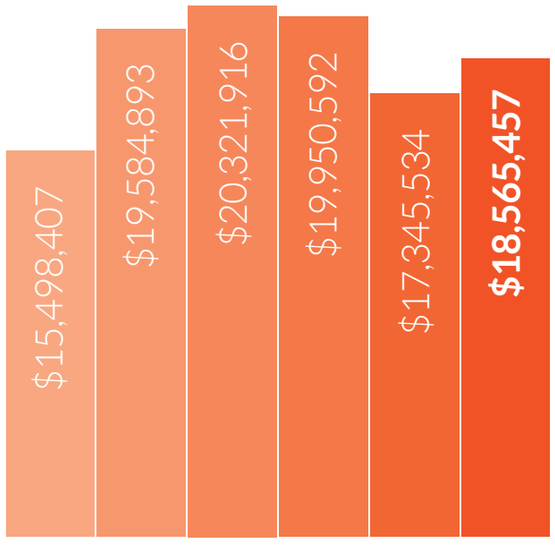
UNDERGRADUATE

#10	#8
Electrical Engineering	Computer Engineering

TOTAL RESEARCH EXPENDITURES

7% IN PAST YEAR

20% IN PAST 5 YEARS



CURRENT FACULTY INCLUDES

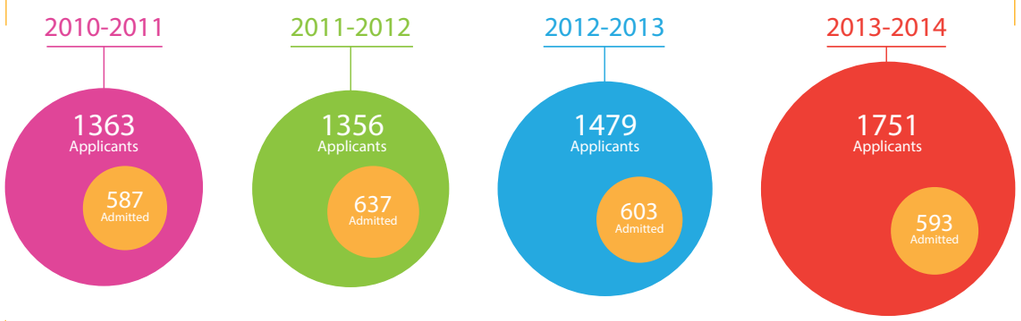
13	19	11
ENDOWED CHAIRS	ENDOWED FELLOWSHIPS	ENDOWED PROFESSORSHIPS
24	2	2
IEEE FELLOWS	ACM FELLOWS	NSF PECASE
3	14	26
NAE MEMBERS	DOD/ONR YOUNG INVESTIGATOR	NSF CAREER

Prof. Yale Patt was inducted into the National Academy of Engineering in 2014

UT ECE Faculty have been recognized with 10 NSF CAREER awards in the past 5 years

UNDERGRADUATE PROGRAM *in* NUMBERS

ADMISSIONS



UNDERGRADUATE APPLICATIONS ⬆28% IN PAST THREE YEARS

STUDENTS

1374 TOTAL

Concentration of students who have declared

310 ELEC ENGR

371 COMP ENGR

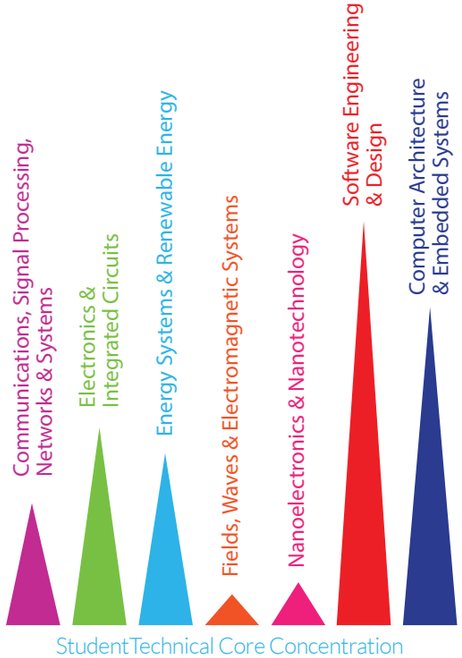
URP

17%

Percentage of underrepresented minorities

14%

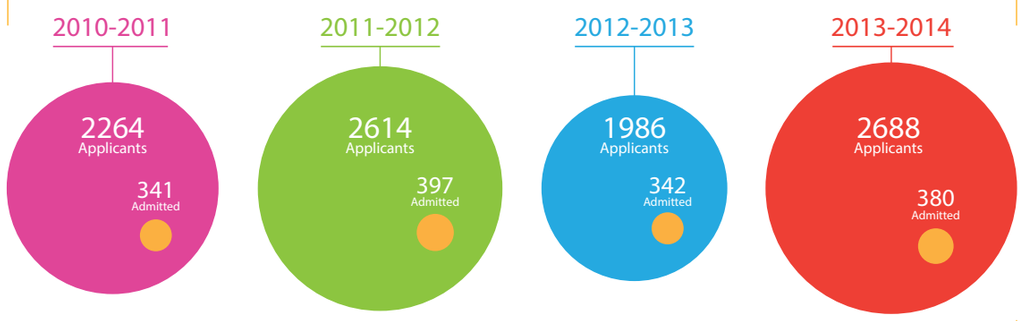
Percentage of female students



Student Technical Core Concentration

GRADUATE PROGRAM *in* NUMBERS

ADMISSIONS



GRADUATE APPLICATIONS ⬆14% IN PAST THREE YEARS

STUDENTS

202 MS

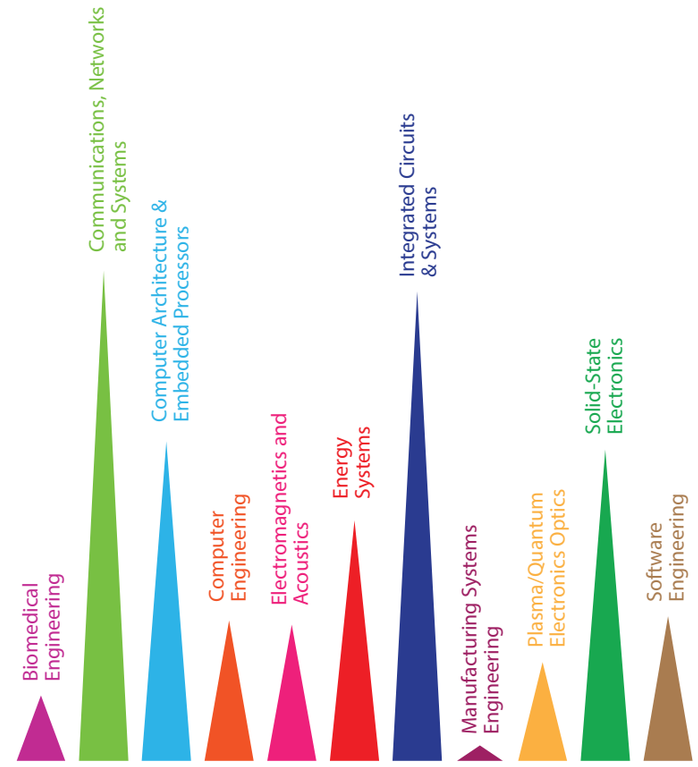
380 PhD

65%

Percentage of international students

16%

Percentage of female students



Student Research Area Concentration

Going International with Study Abroad

"So much of what is happening in the world takes place in a global marketplace. If one can experience what is occurring on the other side, you can begin to have a cultural sensitivity to your counterparts around the world," said Yerraballi.

Summer 2014 marked a new chapter in interdisciplinary global engagement for UT ECE students and faculty. Dr. Ramesh Yerraballi led a group of 16 first-year students on a study abroad program to Hyderabad, India.

The 10-week program combined cultural experiences, research, and industry projects for electrical and computer engineering and biomedical engineering majors.

The UT Austin students were paired in a lab course with students at the Indian Institute of Technology Hyderabad, and also completed industry projects sponsored by Broadcom, Xilinx, and start-up companies.

"Embedded Systems and Industry Experience" is the first study abroad program in India for the Cockrell School of Engineering and will run again in summer 2016.

Lab-based Approach to Online Learning

"We believe in learning by doing, and a lab-based approach is the best way to accomplish this."

Taught by ECE faculty members **Jonathan Valvano** and **Ramesh Yerraballi**, "Embedded Systems" is UT ECE's first massive open online course, and is based off a required course for electrical engineering students.

Students will learn, through a lab-based approach, how a variety of simple gadgets work by completing tasks on their own microcontroller kits. At the end of the course, students will program an arcade-style video game. The course includes videos, assignments and interactive learning resources. The microcontroller kits allow students to fully experience the concept of embedded systems by building and debugging these systems first-hand.

"We are hoping we will pique the interest of young kids and steer them toward engineering," Yerraballi said, "and give a wide range of professionals and enthusiasts a foundation and resource that they can use as a launch pad to opportunities in embedded systems."

Four UT ECE faculty were included in the Thomson Reuters list of Highly Cited Researchers for 2014

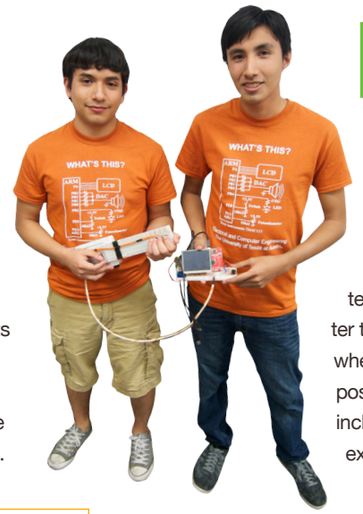
Dr. Jeffrey Andrews
Dr. Alan Bovik
Dr. Robert Heath
Dr. Sriram Vishwanath

Fly's Super-Hearing Power Could Aid Humans

Using the fly's ear structure as a model, Prof. Neal Hall and his graduate students built a miniature pressure-sensitive device out of silicon that replicates the fly's super-evolved hearing structure.

Senior Design

As part of the curriculum, undergraduate seniors participate in a two-semester capstone design course. The project concepts are generated by faculty and industry collaborators, and students work together in small groups. UT ECE currently offers projects that are interdisciplinary and honors based. Plans are underway to create a junior level capstone project experience with industry collaboration and support.



Since 2011, nearly 30 industry partners have supported senior design projects by submitting project concepts, providing financial and material contributions, and offering mentorship to student teams. At the conclusion of the two-semester term, an Open House is held for the public where students demonstrate their work with posters, presentations, a working prototype, including a system design report and an executive summary.

UT ECE is committed to building strong industrial and alumni partnerships with a focus on technology innovation, world-class education and talent, academic excellence, and STEM and diversity initiatives. We work together for the advancement of business and economic goals, department goals, and for the advancement of the electrical and computer engineering fields.

Partners in Industry

3M
Adobe Systems Incorporated
Advanced Micro Devices Inc.
Alfred P. Sloan Foundation
Alpha Natural Resources
Apple Inc.
Applied Materials Inc.
AT&T Inc.
Avvasi Inc.
Ayco Charitable Foundation
Baker Hughes
Barclays Capital
BP America Inc.
BP Foundation Inc.
Broadcom Corporation
Cameron
Caterpillar Foundation
Centerpoint Energy
Chevron Corporation
CHiP Semiconductor
Chrysler Group LLC
Circuit Of The Americas LLC
Cirrus Logic Inc.
Cisco Systems Inc.
Cognitive Scale Inc.
CommScope Inc.
ConocoPhillips Company
Create Technologies, Inc.
CSIdentity Corporation
David and Lucile Packard Foundation
Dell Inc.
Design Verification Trade Association
Digiclaim Inc.
DTE Energy Foundation
Dun & Bradstreet
Electric Power Research Institute Inc.
Entropic Communications Inc.
Environmental Defense Fund
ExxonMobil Foundation
Fluor Enterprises Inc.
Freescale Semiconductor Inc.
Fujitsu Laboratories of America Inc.
Futurewei Technologies Inc.
General Motors Foundation
Google Inc.
Halliburton Energy Services Inc.
Halliburton Foundation Inc.
IBM Corporation
Intel Corporation
Intel Foundation
Keste LLC
Lockheed Martin
Maxtena Inc
Mentor Graphics
Microsoft Corporation
Minnesota Mining & Manufacturing Company
National Instruments Corporation
Nissan
Nokia Telecommunications Inc.
Nuvoton Technology Corporation America
OAS Design Group Inc.
Oracle Corporation
PayPal
Pecan Street Project Inc.
Pestorius
Phillips 66
Plantronics
Qualcomm Incorporated
Quorum Business Solutions
Salesforce.com
Samsung Austin Semiconductor LLC
Sandia National Laboratories
Schlumberger Technology Corporation
Scisense Inc.
SEMATECH Inc.
Semiconductor Research Corporation
Silicon Audio Inc
Silicon Laboratories
Silicon Valley Community Foundation
Sunpower Corporation
Texas Instruments Foundation
Texas Instruments Incorporated
Texas Motor Sports
Texas Solar Energy Society
TLi Inc.
TransCanada Pipeline USA Ltd.
Transonic Scisense Inc.
Union Pacific Railroad Company
United States Air Force
University Co-operative Society
Welch Foundation
Williams Companies Foundation Inc.
Xilinx
Yokogawa Electric Corporation

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THE UNIVERSITY OF TEXAS AT AUSTIN
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1616 Guadalupe St Austin, TX 78701

www.ece.utexas.edu