



THE UNIVERSITY OF TENNESSEE CHATTANOOGA

**COLLEGE OF ENGINEERING  
& COMPUTER SCIENCE**

2016-2017

*Year in Review*

[www.utc.edu/CECS](http://www.utc.edu/CECS)



# UTC COLLEGE OF ENGINEERING & COMPUTER SCIENCE

## VISION

To be a preeminent college of engineering, engineering management, technology, and computer science in education and applied research.

## MISSION

- 1) Educate and train future technical & engineering management workforce for Tennessee, the nation, and beyond.
- 2) Discover new knowledge in engineering, management, technology and computer science.
- 3) Engage communities through scholarship, service and economic development.

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## MESSAGE FROM THE DEAN



**G**reetings from the beautiful campus of the University of Tennessee at Chattanooga! With the start of a new academic year, the campus is bustling with students and orientation activities. The energy our students bring to the campus is palpable. In the college, we welcomed and welcomed back over 1500 new and returning students for the Fall 2017 semester. All indications show that it will be another great year for us.

During the past year, the College made a great stride with the growth of its student enrollment, faculty strength and expertise, and community engagement through scholarship and service. Student enrollment grew 4% from the previous year, nine new faculty members were hired to strengthen the specialty areas in Materials, Water Management, Energy, Cyber Security, and Modeling and Simulation, and the number of community engagement activities grew significantly.

The establishment of college's own Student Success Center in March of 2017 was received enthusiastically by students, the university, and the Chattanooga community. Student teams in civil, chemical,

mechanical, and electrical engineering and engineering and construction management performed marvelously at regional, national and international student competitions. Through internships and partnerships with local government and non-profit organizations, students participated in outreach and service activities, including Science, Technology, Engineering, and Math (STEM) education of elementary, junior high, and high school students.

During the same period, the research productivity of the college grew by over 72% in awards received, by 63% in the number of individual principle investigators, and by 57% of the funds requested. Faculty and staff members were recognized for their academic, research, and service accomplishments in and outside the university, and foundational works for new academic programs in Bachelor of Applied Science in Mechatronics, Bachelor of Science in Computer Engineering, and Master of Science in Data Analytics (joint program with the College of Business) have been completed. You will find these and many more stories of the college's achievements in this review.

We are proud of the College's accomplishments of the previous year and are grateful for the opportunities we continue to have to educate students, discover new knowledge, and engage the community through the support and partnerships of our alumni and friends. I now invite you to read and learn more about the exciting works taking place at the UTC College of Engineering and Computer Science.

Gratefully,



CECS research team members Tony Ferguson, Dr. Zack Ruble, Artem Malashiy, and James Trimble investigate New Technical Applications for Unmanned Aerial Vehicles.

## GET ON BOARD DAY

**O**n September 14, the College hosted the 7th annual Get on Board Day, giving opportunities for current and potential students to learn more about CECS' academic and service societies, clubs, and organizations. Over 300 students met with faculty and student representatives of seventeen groups in the EMCS courtyard, where they were joined by one of the Baja racers and the MOC Train.

Get on Board Day has proven to be a great way to "kick start" the fall term by providing a "one-stop-shopping" location for students to sign up for more information and learn more about getting involved with the participating organizations. The event is also a welcome opportunity for casual conversation by students and faculty over free food and commemorative T-shirts.

“Educate and train future technical workforce for Tennessee, our nation, and beyond.”  
**ENRICHING THE STUDENT EXPERIENCE**



Concrete Canoe Team members Andy Lewis and Caleb Casey.

## STUDENT COMPETITIONS AND CAPSTONE EXPERIENCES

CECS Students get hands-on experience that prepares them for delivering transformative solutions to challenging engineering and societal problems. Each year, their experience culminates with competitions and senior capstone design projects, in which they often work with industry partners on specific real-world problems. Throughout the course of their team competitions and projects, our students develop design and engineering skills, leadership skills while also learning critical soft skills in communication and project management. 2016-17 was no different for our students and the College – a year when their applied knowledge, problem-solving abilities, and creativity were showcased.

- **Chem-E Car Team** captured regional competition honors at American Institute of Chemical Engineers Competition and headed to nationals in October, 2017.
- **CECS Racing Mocs Baja Team** finished in the top 25% of competitors in two international competitions as part of the Society of Automotive Engineers Collegiate Design Series.
- **IEEE Robotics Team's** Star Wars-themed robot garnered honors in a regional competition.
- **Capstone Design Team** of senior mechanical, electrical, and computer engineering students placed second in the national collegiate online division of the Rube Goldberg machine design competition.
- **Concrete Canoe Team** - Civil and mechanical engineering students' interdisciplinary design of a concrete canoe ranked in top 20% of regional collegiate competitors in events sponsored by the American Society of Civil Engineers.
- **CECS Cyber Competition Team and Cyber Scholars** participated in a collaborative project with students across the nation at CyberCorp Bootcamp with focus on information assurance and cybersecurity competency.
- **Interdisciplinary Team of Construction Management** and Civil Engineering students was recognized for the content and execution of their safety plan at a regional competition sponsored by Associated Schools in Construction.

## FOSTERING STUDENT LEADERSHIP

The College of Engineering and Computer Science **Student Ambassadors Program** is a new initiative designed to provide service to the College, the University, and the extended Chattanooga community by organizing student representatives of CECS as goodwill ambassadors. Students enrolled in each of the College's disciplines comprise the Ambassador Corp.

The College's recently launched **Community Service Internship Program**, sponsored by **Mr. James Steffner**, is further evidence of CECS' community service commitment. By partnering with community agencies, this internship program makes a difference in the lives of our student interns and in the life of our community. The CECS Community Service Internship pairs CECS undergraduate students with nonprofit organizations and government agencies to address community-identified projects in the Chattanooga region. This past year, Computer Science major Keith Hollingsworth worked with the Hamilton County Schools on several data analysis projects as well as assisting elementary and middle school students and educators with instruction in coding and the use of various computer software programs. The members of the newly established student organization, Girls in Computer Science, led by Grace McPherson and Ellie Peterson, are also serving as volunteers assisting Hamilton County elementary and middle school educators. The members are providing instructional support for teachers and individual assistance to students in grades K-8.



Four of the 2016-17 Student Ambassadors for the College of Engineering and Computer Science: Chantz Yanagida, Rachel Hendrix, Madison Chan and Keith Hollingsworth

This year, in response to student input, and recognizing that tutoring support in engineering and computer science courses was not available through the University-wide academic support programs, a group of student leaders started an effective, volunteer, **Peer-to-Peer Tutoring Program**. Serving students enrolled in courses in engineering and computer science and mathematics.

In support of the College's commitment to increasing opportunities for freshmen student engagement, the **CECS Living, Learning Community (LLC)** was expanded from eight to thirteen participants. Eleven men and two women moved into the CECS LLC in the Stophel Apartments on UTC's South Campus. The freshmen LLC participants are graduates of high schools from across Tennessee and other states. The activities of the LLC include enrollment in a special topics course taught by Associate Dean Dr. Neslihan Alp with assistance from Director of Student Success Julie David.

2017-18 CECS LLC Participants with Dr. Alp and Julie David at their first meeting of the special topics course



## INTERNSHIP EXPERIENCE

### Electrical Engineering Graduate Student Matt Joplin Working with SpaceX

When Matt Joplin dreamed of his future career, he let his mind wander to the highest of places: outer space.

He took one giant step closer to his dream by recently completing an eight-month internship at SpaceX, a California-based aerospace manufacturing and space exploration technologies company.

Founded in 2002 by serial entrepreneur Elon Musk, SpaceX was the first private company to successfully send and return a spacecraft from low orbit.

“I’ve been inspired by what SpaceX has been doing for years. They’re constantly pushing the envelope and pushing the space industry into the modern era,” says Joplin, an electrical engineering graduate student.

How Joplin landed his internship is a story of perfect timing. At a conference, Dr. Daniel Loveless, UTC assistant professor of electrical engineering, met a manager who worked at SpaceX.

Loveless recommended his student for an internship and, six weeks later, Joplin was on a plane headed to Seattle to start work.

“Matt’s inquisitive. He’s always approaching me with questions and coming up with his own ideas. I knew he would have the right skillset to succeed at SpaceX,” Loveless says.

Joplin worked 40 to 50 hours a week on a small team doing radiation testing for a satellite project.

“Working at SpaceX gave me more confidence in my engineering skills. Every day was a challenge,” he says. “There was so much work to be done, so many problems

that needed to be fixed. “Gaining the practical experience of putting theory into practice to solve problems was invaluable.”

His work at SpaceX complemented his UTC thesis project in which he’s studying how radiation affects complex electronic systems. Through his thesis, Joplin hopes to find ways to make these systems more reliable when they’re placed in harsh environments like space.

Joplin performed so well at SpaceX, he was asked to extend his internship after four months, an offer he readily accepted.

“Everyone there is passionate and brilliant. Why wouldn’t you want to stay and be around them?” he asks.

Joplin hopes to continue working in the space industry when he graduates with his master’s degree next year.

“Space is a big mystery. It captures the imagination. There’s still so much we don’t know,” he says.



Matt Joplin



Mr. Steve Douglas speaking at the CECS Awards Dinner held in the spring of 2017

## ACCOMPLISHMENTS AND AWARDS

During 2016-17, students from each of the engineering and computer science disciplines participated in a variety of experiences showcasing their applied knowledge and talents. The awards earned by the students at local, regional, and national levels brought recognition to CECS.

As a part of the College’s second annual **Awards Dinner** held on April 18, 2017, more than 50 students were recognized for their outstanding academic accomplishments. These students received 91 awards totaling \$83,937 from the CECS Scholarship Committee. The College is fortunate to have both endowed scholarships and annually-funded scholarships provided through the support of our corporate partners, alumni, individual donors, and bequests. The recruitment and retention of outstanding students is a primary goal of the CECS, and the generosity of the College’s scholarship donors is essential to accomplishing that goal. The Awards Dinner also provided an opportunity to thank those donors whose philanthropy is invaluable to the continued success of CECS. The CECS Awards Dinner featured speaker Mr. Steve Douglas, Vice President TVA’s Nuclear Division and member of the College’s Advisory Board Steering Committee, encouraged scholarship recipients to continue their journey with integrity and compassion.

*continued on next page*



Image courtesy of Newsweek.com

## Accomplishments and Awards (cont.)

In June, ChaTech, the Chattanooga Technology Council, awarded \$12,000 in scholarships to students enrolled in Chattanooga area post-secondary schools, with CECS students receiving six of the twelve awards. Volkswagen of North America's Conference Center hosted a luncheon honoring the students which was attended by members of the business community, college officials, in addition to the scholarship recipients and their families.

The UTC CECS ChaTech Scholars for the coming year are: **Steven Hullander, Elyse Janes, Jose Stovall, Connor McPherson, Grace McPherson,** and **Daniel Velasquez.** Congratulations to each of them!

**Startup Week Chattanooga** is a celebration of Chattanooga's entrepreneurial spirit and the community which it embodies. Because Chattanooga has such a diverse, rich entrepreneurial ecosystem, the annual Startup Week is organized around three tracks- Tech, Social, and Creative. Each track offers a variety of programming options with UTC's College of Engineering and Computer Science (CECS) keenly involved in the tech track.

One component of the week sponsored by CO. Lab, US Ignite, and the Mozilla Foundation was Launch48 – an entrepreneurship competition. Two CECS students, **Forrest Pruitt** and **Nicole Prebula**, co-founders of Viator VR, took top honors and “winnings” of \$1,200 cash plus thousands of dollars' worth of business assistance and donated office space. The students' award winning project is a foreign language training program using virtual reality equipment to immerse students in a foreign culture.

CECS Students also took top honors during the app development component of Startup week. InfoSystems and Skuid presented a \$10,000 scholarship to grand prize winners **Alay Patel, Jose Stovall, Steven Hullander,** and **Evan Grayson**, who are all juniors in the Department of Computer Science and Engineering. The fifteen teams in the competition were tasked with creating a mobile app that allows consumers to digitally keep track of their physical conditions. The first and second place teams excelled in creating an inviting and intuitive UX/UI design, but the UTC “Brogrammers” took it a step further by adding a mini-game to their app.



Dr. Daniel Pack, Cooper Thome and Mack McCarley



Left to Right: Evan Grayson, Jose Stovall, Steve Hullander, and Alay Patel

Several CECS students were selected for academic scholarships of regional and national note. Electrical Engineering majors **Alexander Lee, David Pitts,** and **Sarah Roberts** were selected by the Institute of Electrical and Electronic Engineers (IEEE) as Power and Energy Scholars for 2016. Chosen from more than 500 applicants, the three students were recognized for their academic ability, extracurricular activities, and commitment to advancing the power and energy field. With more than 400,000 members worldwide, IEEE is the premier technical professional organization dedicated to the advancement of technology for the benefit of humanity.

Civil Engineering Senior **Keith Schaal** is one of University's 2016-17 Mario and Grace Charles Foundation Scholars. Following an extensive application and interview process, Keith was chosen on the



Chemical Engineering major Reed Boeger (left) pictured here with Dr. Bradley Harris

basis of his academic record, involvement in community service initiatives, and work experience. The Charles Foundation is a regional philanthropic organization established by Mr. and Mrs. Mario Charles to support undergraduate students in the fields of elementary education and engineering.

Chemical Engineering sophomore **Reed Boeger** took first place in the Lightning Round Presentation Competition in UTC's Second Annual ReSEARCH Dialogues. The highly successful two-day long event held in April high-lighted the research initiatives of the University's students and faculty, showcasing the scholarship and creative accomplishments of more than 300 participants. With the support of his research advisor, Dr. Bradley Harris, Boeger shared his work entitled, “Studying Vibrio Cholerae Adaptations to Improve Cholera Prevention.”

Mechanical Engineering senior, **Timothy Grider** was recently selected as the 2017-18 recipient of the Frank M Coda Scholarship by the Tennessee Valley Chapter of the American Society of Heating, Refrigeration, and Air Conditioning Engineers.

Senior **Brandon Roberts** and Junior **Jonathan Burkeen** in Mechanical Engineering and Junior, **Michael LaPage**, in Environmental Engineering presented a poster entitled the Art Stamper at the ASEE Zone 2 Conference in San Juan, Puerto Rico in March 2017 and won 2nd place in the 1st and 2nd year Design Team Division.

At the May 1 meeting of the CECS Advisory Board Steering Committee, senior Chemical Engineering student and Brock Scholar **Cooper Thome** was presented the 2017-18 Tennessee Engineering Foundation (TEF) Scholarship Award. Steering Committee member and TEF Board Member Mr. Mack McCarley presented the award to Cooper. Cooper's research efforts are extensive, and his work with the late Dr. Frank Jones led to his participation in a National Science Foundation-funded program at Emory University last summer. Out of a highly competitive cohort of participants in that program, he was selected to travel to Japan for 10 weeks in summer 2017. The trip was sponsored by the National Science Foundation's Nanotechnology Coordinated Infrastructure Research Experience for Undergraduates Program (REU). While in Japan Cooper studied micro and nano structures of tissues.

During 2017 community-wide Engineers Week observances in February, two CECS Civil Engineering students were awarded scholarships by the Chattanooga Branch of the American Society of Civil Engineers (ASCE). Senior **Analisa Shepherd** and Junior **Seth Caudle** were recognized for their academic records and service to the student chapter of ASCE at the Engineers Week Banquet held at the Chattanooga Hotel. Also at the banquet Senior Mechanical Engineering major and 2017-18 student president for the American Society for Mechanical Engineers, **Lianna Castillo**, received the ASME 2017 Engineers Week Scholarship for 2017-18.



#29 Karina Jensen



#8 CJ Board



Chase Clouch

These three engineers follow a College tradition of commitment to excellence in both academics and athletics. CECS alumna, Mechanical Engineer, and outstanding Lady MOC Basketball player Julie Copeland Christian is a 2016-17 inductee in the UTC Athletics Hall of Fame. Dr. Charles “Chuck” Margraves, CECS Assistant Professor of Mechanical Engineering, is an alumnus of the College, former Southern Conference Cross Country Champion, and current of the UTC Athletics Board.

## OUTSIDE THE CLASSROOM

Commitment to Excellence in the Classroom, Laboratory, and on the Fields and Court

Time management is a challenge for every college student. From classes, to laboratory research, family and work responsibilities and more, all of our students have difficult “balancing acts.” Perhaps none of them more so than the CECS student athletes and those who support the Mocs teams behind the scenes. With mandatory times for practice, competitions, travel, and workouts which conflict with lab works and studies, these students face unique challenges during their academic careers that often put their academic and physical prowess to the proverbial test. Three of our student athletes are Karina Jensen, Brandon “Chase” Clouch, and CJ Board.

Collierville, TN native Karina Jensen completed her freshman year as an aspiring Civil Engineer and a formidable defender on the Lady Mocs soccer team. Karina wears #29 on the field and relishes both in “playing on the soil, and learning how its composition effects the science of Civil Engineering.” She is a dedicated student with plans to

apply her Civil Engineering degree to enlistment in the US Coast Guard. Brandon “Chase” Clouch, is a rising senior majoring in Mechanical Engineering, who has been on the Dean’s List every semester since matriculation. As team manager for the Lady Mocs Basketball Team, he spends countless hours in support of the highly successful Southern Conference Champion team.

CJ Board as he had recently reported to the Baltimore Ravens where he was signed as a wide receiver free agent, and was later signed by the Tennessee Titans as a wide receiver. With 47 college career starts, 146 catches for over 2,000 yards, and 10 touchdowns to his credit as a football Moc, CJ ranks 6th in all-time receptions and 5th in all-time receiving yards in Mocs Football history. What the Clarksville, TN native takes even greater pride in is earning his BS: Civil Engineering degree with multiple semesters on the Dean’s List, the Athletic Director’s Honor Roll, and membership on the Southern Conference All-Academic Team.

In addition to Karina, CJ, and Chase, the following students in the College are also MOC Scholarship Athletes:

**Matthew Marshall**, Men’s Track, Computer Science: Information Security and Assurance

**Brennen Huber**, Men’s Cross Country, Computer Science: Scientific Applications

**Hailey Abston**, Women’s Soccer, Engineering Technology Management: Construction Management

**Luke Davis**, Football, Engineering Technology Management: Construction Management

**Taylor Helton**, Football, Engineering Technology Management: Construction Management

**Tyler Martin**, Football, Engineering Technology Management: Construction Management

**Brandon Bourk**, Football, Engineering Technology Management: Engineering Management

**Rashun Freeman**, Football, Engineering Technology Management: Engineering Management

**Chloe Arnold**, Women’s Soccer, Civil Engineering

**Jacob Etheridge**, Men’s Cross Country, Civil Engineering

**Cameren Swafford**, Women’s Soccer, Civil Engineering

**Michael Coleman**, Manager, Football, Chemical Engineering

**John Payne**, Men’s Cross Country, Chemical Engineering

**Lucas Plesky**, Men’s Tennis, Chemical Engineering

**Nathan Watson**, Men’s Cross Country, Chemical Engineering

**Brianna Nelson**, Women’s Cross Country, Engineering: Environmental

**Monica San Juan**, Women’s Cross Country, Engineering: Industrial

**Corey Winston**, Football, Electrical Engineering

**Will Young**, Football, Electrical Engineering

**Tamya Long**, Women’s Basketball, Mechanical Engineering

**Aidan Murphy**, Wrestling, Mechanical Engineering

**Joshua Nunnally**, Football, Mechanical Engineering

**Joshua Topham**, Men’s Cross Country, Mechanical Engineering

**Anthony Trotter**, Football, Mechanical Engineering

## OUTSIDE THE CLASSROOM

Two Marines find their home in Chattanooga and CECS



Rashard and Haley with their three children

Image courtesy of Leanne Parker Shean

For Haley Sebastian and Rashard Minnis, it was love at first sight when they stopped in Chattanooga to get a bite to eat during a road trip.

“We ate lunch by the aquarium and we walked across the Walnut Street Bridge and visited Renaissance Park. We loved it,” Sebastian said.

After that serendipitous trip, the married couple and former U.S. Marines decided to put down roots in Chattanooga and attend UTC to get their undergraduate degrees in civil engineering.

The couple met as drill instructors at the Marine recruit depot on Parris Island, S.C. Initially, Minnis had to be persistent to win Sebastian’s affection.

“He was trying to talk to me for awhile, but I kept saying I was too busy with work and kids. He kept trying, and I finally gave in. Pretty much from the first time we hung out, we were inseparable,” Sebastian said.

The two complement each other well, Minnis said.

“She’s a good balance to my madness. Haley is very smart. I struggle with

schoolwork, but she’s the one who stresses over it,” he said.” It’s like Michael Phelps stressing about swimming. She has nothing to worry about. I’m the more laid-back one.”

Sebastian said she enjoys Minnis’s spontaneity.

“He keeps me on my toes. I like to plan things. He’s the type that says things like, ‘Hey, school’s cancelled. Let’s go somewhere.’”

The two now are taking classes together, with Minnis hoping to go into structural engineering and Sebastian into construction manage-

ment after graduation.

“Even though we’re not your typical 18-year-old college students, everyone has been really inviting,” Sebastian said. “In most of our classes, there have been other veterans and we’ve gotten involved in a couple of clubs.”

“The teachers are very understanding,” Minnis echoed. “A lot of them have gone through military training and are very attuned to the needs of veterans. My previous school wasn’t like that. It’s something that UTC does very well.”

## CECS WELCOMES NINE NEW FACULTY MEMBERS

Beginning fall 2017, CECS students will work and learn alongside nine new faculty members who joined the College on August 1. In response to enrollment growth and the College’s commitment to teaching and applied research, these new faculty positions will enhance student learning experience and faculty expertise. The faces of some of the nine folks are familiar, while others will be new to our students. In August, the new faculty participated in a number of orientation activities, including the new CECS faculty orientation.

Pictured L to R are:

**Dr. Jejal Reddy Bathi**, Chemical Engineering – Visiting Assistant Professor, Ph.D. from the University of Alabama

**Dr. Robert Webster**, Mechanical Engineering – Associate Professor, Ph.D. from Mississippi State University

**Dr. Sungwoo Yang**, Chemical Engineering – Assistant Professor, Ph.D. from Duke University

**Dr. Kidambi Sreenivas**, Mechanical Engineering – Associate Professor, Ph.D. from Mississippi State University

**Dr. Soubantika Palchoudhury**, Chemical Engineering – Assistant Professor, Ph.D. from the University of Alabama

**Wolday Abrha**, Engineering Technology Management – Visiting Professor, Ph.D. Candidate from UT Knoxville

**Dr. Vahid Rasouli Disfani**, Electrical Engineering – Assistant Professor, Ph.D. from the University of South Florida

**Dr. Abdelrahman Karrar**, Electrical Engineering – Ph.D. Associate Professor, Ph.D. from Loughborough University, United Kingdom

**Dr. Anthony Skjellum**, Computer Science and Engineering – Director of the SimCenter and Professor, Ph.D. from California Institute of Technology (not pictured, see page 17)



The UTC College of Engineering and Computer Science is the home of 85 U.S. veterans and their dependents.

## FACULTY RECOGNIZED FOR THEIR SCHOLARSHIP AND SERVICE

The late **Dr. Ron Cox**, Burkett Miller Chair in the Department of Engineering Management and Technology, was named 2016 recipient of the Bernard R. Sarchet Award by the American Society of Engineering Management (ASEM). The Sarchet Award is the Society's highest honor which recognizes contributions to the organization and to the field of engineering management on local, regional, national and international levels.



Dr. Hong Qin

**Dr. Hong Qin** joined the UTC faculty in the fall of 2016 in a jointly appointed position in the Departments of Computer Science and Engineering and Biology. Dr. Qin was recently named recipient of a National Science Foundation Career Award. Dr. Qin comes to the College with a distinguished record of research in a number of key areas including medical and pharmacology data.



Dr. James Newman III

**Dr. James Newman III** was honored and inducted as an AIAA Associate Fellow at the AIAA Associate Fellows Recognition Ceremony and Dinner on Monday, January 9, 2017, at the Gaylord Texan Hotel & Convention Center, Grapevine, Texas, which was held in conjunction with the 2017 AIAA Science and Technology Forum and Exposition.

The grade of Associate Fellow recognizes individuals "who have accomplished or been in charge of important engineering or scientific work, or who have done original work of outstanding merit, or who have otherwise made outstanding contributions to the arts, sciences, or technology of aeronautics or astronautics."

AIAA is the largest aerospace professional society in the world, serving a diverse range of more than 30,000 individual members from 88 countries, and 95 corporate members.



Dr. Li Yang receiving her award, pictured with Dean Pack and Provost Gerald Ainsworth

## 2017 RECIPIENTS OF COLLEGE AND UNIVERSITY -WIDE AWARDS FOR DISTINCTION IN FULFILMENT OF THE COLLEGE'S MISSION

**Dr. Aldo McLean**, Assistant Professor of Engineering Technology Management - Outstanding Teaching

**Dr. Li Yang**, Guerry Professor of Computer Science and Engineering - Outstanding Research

**Dr. James Hiestand**, Professor of Mechanical Engineering - Outstanding Service

**Ms. Holley Beeland**, Graphic and Web Support - Outstanding Service as a Staff Member

2017 Recipient of University-Wide Award for Outstanding Faculty Research and Creative Achievement:

**Dr. Li Yang**, Guerry Professor of Computer Science and Engineering

## CECS FACULTY AWARDED PRESTIGIOUS PROFESSORSHIPS

During the 2016-17 academic year, three members of the College faculty were awarded distinguished UTC professorships.

University of Chattanooga Professor and Assistant Dean of the College **Dr. Li Yang** was named Guerry Professor of Computer Science and Engineering. Established in memory of University of Chattanooga President Alexander Guerry and his wife, Charlotte, the Guerry Professorship is funded through the University of Chattanooga Foundation, and recognizes a select group of outstanding professors for their accomplishments to their disciplines and to the fulfillment of the University's goals. The Guerry Professorship is considered to be the most prestigious professorship at the campus.



Dr. Li Yang

Dr. Yang is the director of UTC Information Security (InfoSec) Center, a National Center of Academic Excellence in Information Assurance/Cyber Defense (CAE-IA/CD). Her research interests include network and information security, big data analytics, massive data mining, bioinformatics and engineering techniques for complex software system design. She has authored over 70 papers on these areas in refereed journal, conferences and symposiums. Dr. Yang is editor-in-chief of the International Journal of Information Security and Privacy. Over the past ten years, she has secured more than \$4 million in external funding from National Science Foundation (NSF), National Institute of Health (NIH), Department of Defense (DoD) and Oak Ridge National Laboratory (ORNL).



Dr. Neslihan Alp

In the Summer of 2016, **Dr. Neslihan Alp**, Associate Dean of the College, Director of CECS' Graduate Studies, and Head of the College's Department of Engineering Technology Management, was named a Chattanooga Manufacturers' Association Professor.

Dr. Alp joined the CECS faculty in 1999. Through her service as a faculty member, department head, and interim dean, as well as in her current post as

associate dean, Dr. Alp has played a crucial role in the growth and expansion of the College's Engineering Management undergraduate and graduate degree programs. During the past year, the MS Engineering Management Program was named in the top 20 of online Engineering Management Program in the nation by Top Management Degrees. Under Dr. Alp's leadership, the program transitioned to a completely online format allowing students from all over the world to obtain their degrees.



Dr. Daniel Loveless

In April, **Dr. Daniel Loveless**, Assistant Professor of Electrical Engineering, was named a University of Chattanooga Professor. Through the UC Foundation Professorships, the UC Foundation seeks to recognize and retain outstanding teachers and research scholars who are relatively early in their careers with the University.

Since joining the faculty in 2014, Dr. Loveless has secured over \$500,000 in research funding, published 17 scholarly articles, and has been invited to speak 6 times in international venues. His work has been responsible for new capabilities for the Electrical Engineering Department in microelectronics, embedded systems, space systems, and photonics. He also created UTChattSat to connect his research to the broader community and K-12 education. This work has developed into local collaborations with the STEM school, Chattanooga Girls Leadership Academy (CGLA), the Baylor School, and Co.Lab. In leading the Electrical Engineering Department's re-accreditation efforts, he established a college-wide methodology for student outcome assessment.

## GRADUATE ENGINEERING MANAGEMENT PROGRAM

The Engineering Management Graduate program was named a 2017 Top Online Colleges Best Value - by SR Education Group. "These 25 top colleges offer online engineering degrees at the bachelor's or master's levels. Prospective students find affordable schools with high academic strength scores on this list, the University of Tennessee at Chattanooga ranked #17..." The full ranking is available here:

[GuideToOnlineSchools.com/degrees/engineering#best-value](http://GuideToOnlineSchools.com/degrees/engineering#best-value)



## CECS, UTC, AND THE EXTENDED COMMUNITY REMEMBER DR. RONALD B. COX AND DR. FRANK J. JONES

During the past year, the College's students, faculty, staff, alumni, and friends joined with members of the community in remembrance of two distinguished faculty members, Dr. Ron Cox and Dr. Frank Jones.

Dr. Ronald B. Cox, Burkett Miller Chair of Excellence and Professor of Engineering Management and Technology, passed away in January. Dr. Frank J. Jones, University of Chattanooga Professor of Chemical Engineering and Director of the Chemical Engineering Program, passed away in September.

For more than four decades, Dr. Ron Cox ably served this College, the University, the extended community, and his chosen profession with dedication and distinction. As the College's longest serving faculty member, he was known in our community and across the nation for his visionary leadership in the fields of engineering, engineering technology, and management. Dr. Cox was a recognized figure for his service as a community volunteer and advocate for excellence in higher education. Soon after the University was renamed as the University of Tennessee at Chattanooga, he was hired to support the vision for and establishment of a College of Engineering. From 1979 to 1996, Dr. Cox served as Dean of the College and led the efforts to expand curricula, develop new programs, incorporate Computer Science as an integral component of the College, and extend the College's community and regional partnerships in STEM education and applied research. During that key period of the College's growth, he continued its strong commitment to excellence in teaching, and the importance of the College as an economic and workforce engine for the community.

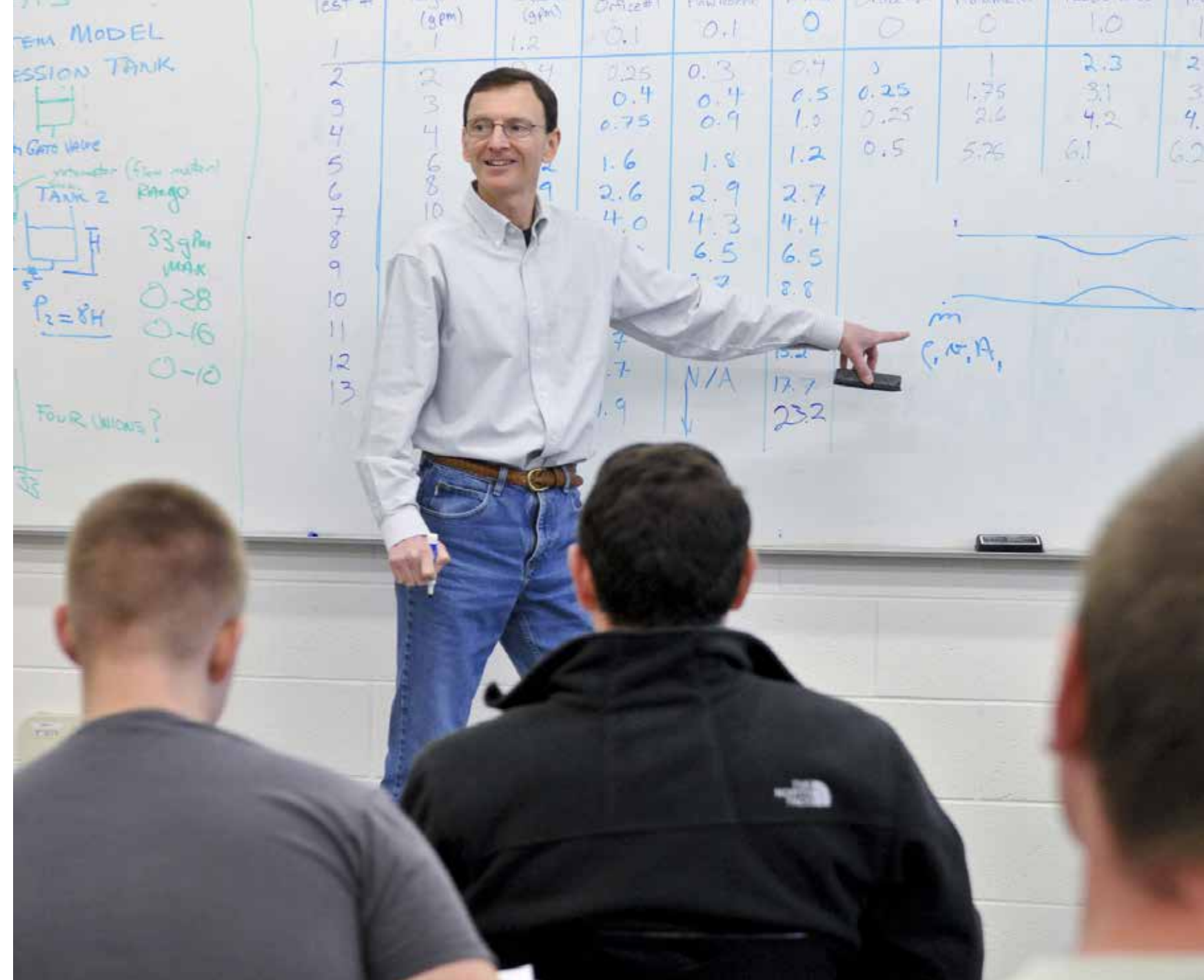
In his illustrious career, Dr. Cox served as Chief Operating Officer and Director for the U.S. Department of Transportation, the Chair of the Board of Trustees of the Tennessee Engineering Foundation, Chairman and Founder of the International Engineering and Management Corporation, National President of the American Society for Engineering Management, Chairman of the National Issues Management Board, and Chairman of the Third District of Tennessee Congressional Campaign. He served as a member of numerous corporate, state, and professional society boards including the Tennessee Engineering Foundation, the University of Tennessee/Saturn Corporation, EMI Corporation, Integrated Voice Solutions, Inc., NOBIC Corporation, and the American Society of Mechanical Engineers.

Dr. Cox's well-deserved awards and distinctions are many, and include receipt of the 2016 Bernard Sarchet Award, the pre-eminent recognition for service to the discipline of Engineering Management; naming as a White House Fellow Finalist; Chattanooga Engineers Club Engineer of the Decade; and selection as a Paul Harris Fellow by Rotary International.

Dr. Cox is greatly missed by all whose lives he touched. In February, the Chattanooga Engineers Club honored the Dr. Cox's legacy of service in the naming of a student scholarship in his memory.



Dr. Ronald B. Cox



Dr. Frank J. Jones

Dr. Frank Jones came to the College of Engineering and Computer Science in 2000 and became Director of the CECS Chemical Engineering program in 2007. His career as teacher, mentor, and administrator included service as University of Tennessee at Chattanooga as UC Foundation Professor of Chemical Engineering, a Professor of Chemical Engineering at Louisiana Tech University, and a Visiting Assistant Professor of Chemical Engineering at Drexel University.

Dr. Jones was an active member of several professional organizations including the American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS), Sigma X, Phi Lambda Upsilon (an honorary chemical society), the American Society for Engineering Education (ASEE), and the Council on Undergraduate Research (CUR). His many honors and awards included: the Engineering Research Award presented by the UTC College of Engineering and Computer Science: 2001, 2003, 2007; the Exceptional Merit Award for Research 2005-06, 2008-09; the Outstanding Departmental Researcher Award 2009-10, 2011-12; and the Outstanding Teacher in Chemical Engineering Award 2012-13, 2013-14.

Dr. Jones was a dedicated teacher and included both students and colleagues in his prolific research publications and presentations. Dr. Jones is greatly missed by his beloved family, colleagues and former students. Through the generosity of his family, the Dr. Frank Jones Chemical Engineering Lab Fund was established. The College will be able to ensure that Dr. Jones' legacy lives on with the naming and dedication of his former research lab (Room 119 in the EMCS Building to be dedicated to his memory). Each year, a portion of the endowment will support the development and construction of a chemical reaction-powered car for UTC's participation in the AiChE annual Chem-E- Car Competition, and will assist with the design and analysis of microreactors for the production of bio-renewable fuels.

## UTC: A NEW CYBERCORPS INSTITUTION DEFENDING AMERICA'S CYBERSPACE

On January 4th, 2017, the College of Engineering and Computer Science (CECS) received a grant award from the National Science Foundation (NSF), totaling \$1,522,456. The funded grant entitled, Strengthening the National Cyber Security Workforce, will support activities to recruit and train the future workforce in the area of cybersecurity and information assurance. As the demand for cybersecurity careers continues to grow, so will the need for highly talented and skilled technical personnel.

The CECS team headed by Assistant Dean Dr. Li Yang will work with NSF, Office of Personnel Management (OPM), Department of Homeland Security (DHS), and other agencies to develop a responsive, agile and well-educated workforce trained in cybersecurity. Scholars in the CyberCorps program will conduct collaborative, applied research and participate in Collegiate Cyber Defense Competition (CCDC), community services, K-12 outreach. Through this award, UTC now becomes one of 69 CyberCorps institutions in the nation. The CyberCorps team at UTC consists of Dr. Joseph Kizza, Dr. Neslihan Alp, Professor Kathy Winter, Dr. Karen Adsit, and Dr. Dalei Wu.

The CECS also partners with Tuskegee University which helps to increase underrepresented individuals in the program. UTC InfoSec center Defense, housed in the College of Engineering and Computer Science is a Center of Academic Excellence in Information Assurance and Cybersystems designated by Department of Homeland Security (DHS) and National Security Agency (NSA).



On January 4th, 2017, Dean Daniel Pack, Associate Dean Neslihan Alp, Assistant Dean Li Yang, and Computer Science and Engineering Department Head Joseph Kizza attended the ceremony where UTC was inducted as a new CyberCorps institution in Arlington, Virginia.

## NEW LEADERSHIP AT SIMCENTER - NEW DIRECTOR DR. ANTHONY SKJELLUM JOINS CECS FACULTY

In Spring 2017, Dr. Anthony Skjellum was named Director of the SimCenter: National Center for Computational Science and began his service as of August 1.

A graduate of Cal Tech, his PhD work emphasized portable, parallel software for simulation, with a specific emphasis on message-passing systems. From 1990-93, he was a computer scientist at Lawrence Livermore National Laboratory, working in the areas of performance-portable message passing and portable parallel math libraries. He held faculty positions at Mississippi State University and the University of Alabama at Birmingham from 1993-2014.

Prior to coming to UTC, he led research and development in cyber and high performance computing at Auburn University's College of Engineering. He is a senior member of ACM and IEEE, and Associate Member of the American Academy of Forensic Science (AAFS), Digital & Multimedia Sciences Division.



Dr. Anthony Skjellum



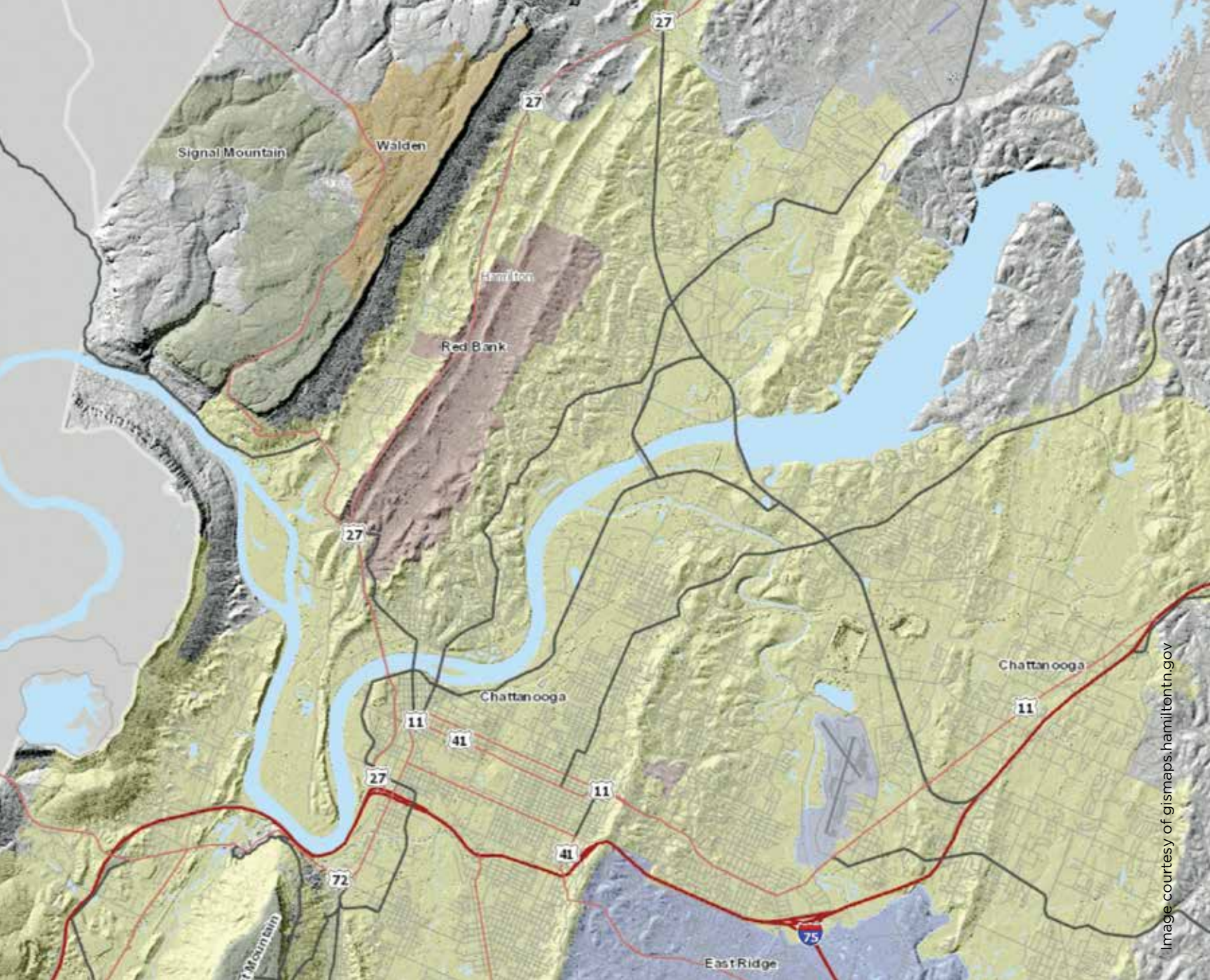
Dr. Mina Sartipi

## DR. MINA SARTIPI LEADS UTC'S SMART CITIES AND URBAN SCIENCE AND TECHNOLOGY INITIATIVES

Chattanooga is a Smart City and UTC is Chattanooga's University. The College is actively involved in the big Smart City vision for the city and the campus. UC Foundation Professor of Computer Science Dr. Mina Sartipi is coordinating the University's Smart Cities and Urban Science and Technology efforts in concert with local and national partners.

The College's faculty and students are currently working with others across the University in support of Chattanooga's vision for a Smart City, is rooted in six priority areas (Safer Streets, Stronger Neighborhoods, Smarter Students, Stronger Families, High Performing Government, and Growing Economy) that orient planning and implementation toward overarching goals to increase the mobility of people and goods, improve safety for all users, and respond to and limit climate change.

In her role as UTC's Smart Cities coordinator, Dr. Sartipi will continue to reach out to faculty across the College and our campus to build teams to partner with agencies in the City of Chattanooga, peer researchers at other institutions to address smart city challenges, and expand the research and development portfolio and educational activities of CECS and other UTC colleges.



GIS Map of Chattanooga and the surrounding region.

## CECS COMPUTER SCIENTISTS' RESEARCH BENEFITS URBAN INFRASTRUCTURE GROWTH AND DISASTER RECOVERY

With both planned urban growth and so-called “sprawl,” municipalities have a challenge in sensing the presence of underground utility infrastructure. Meeting that challenge is particularly difficult when man-made or natural disasters occur. Research by a team of CECS computer scientists led by Assistant Professor Dr. Dalei Wu are working to meet the challenge.

Funded through an award in excess of \$299,000 from the National Science Foundation, a US Ignite Collaborative Project between UTC and the University of Vermont explores the use of urban telecommunication networks to sense conditions and improve management and usage of urban utility infrastructure, including water supply, waste and storm water sewage, natural gas, electricity, steam, and telecommunications.

Using network-based sensing, data transmission, data analytics, and mapping technologies, Dr. Wu, and his UTC colleagues, Drs. Li Yang and Yu Liang, have partnered with scientists in Vermont to use ground penetrating radar, leak sensors, robotic inspectors, and optical techniques to “see beneath the surface.” This important “above ground” look at below ground structures and networks enables cities to manage, maintain, and grow their infrastructure in ways that will improve service, sustainability, and resilience, while reducing costs, energy consumption, and wasted resources.

## 2016-2017 RESEARCH AWARDS

### Ahmed, Raga

**Project title:** Board of Architectural and Engineering Examiners Grant Equipment, Library and Fees  
**Funding agency:** Tennessee Board of Architectural and Engineering Examiners  
**Amount:** \$25,716

### Alp, Neslihan

**Project title:** Low-Income Community Design Studio  
**Funding agency:** Tennessee Board of Architectural and Engineering Examiners  
**Amount:** \$20,000

### Alp, Neslihan

**Project title:** EXCEL: EXploring Clean Energy through hands-on Learning  
**Funding agency:** Tennessee Higher Education Commission  
**Amount:** \$73,991

### Alp, Neslihan

**Project title:** UTC Girls to Engineers Network (GEN)Funding Priority - Programs to Encourage Middle School Girls in Engineering  
**Funding agency:** Engineering Information Foundation  
**Amount:** \$14,586

### Elliott, Louie

**Project title:** On the Simulation and Modeling of Sheet Metal Forming for Gestamp Chattanooga  
**Funding agency:** Gestamp  
**Amount:** \$79,615

### Elliott, Trevor

**Project title:** Baja SAE Capstone Project  
**Funding agency:** Denso North America Foundation  
**Amount:** \$66,200

### Harris, Bradley

**Project title:** A computational study of the impact of exogenous fatty acid substitutions on the Vibrio cholerae outer and inner membranes  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$27,481

### Loveless, Thomas

**Project title:** Fundamental Research into Radiation Resiliency of Emerging Circuit Technologies Appropriate to the CWMD Mission  
**Funding agency:** U.S. Air Force  
**Amount:** \$74,964

### Pack, Daniel

**Project title:** Distributed, Large Scale Spectrum Measurement and Analysis - SBIR - Shared Spectrum Company  
**Funding agency:** Shared Spectrum Company  
**Amount:** \$8,325

### Pack, Daniel

**Project title:** Cognition and Neuroergonomics Collaborative Technology Alliance Technology Transition Subcontract for Mutually Adaptive Systems  
**Funding agency:** U.S. Army  
**Amount:** \$88,912

### Palchoudhury, Soubantika

**Project title:** Computational Fluid Dynamic Approach to Predict Transport and Distribution of Nanodrug  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$89,221

### Qin, Hong

**Project title:** A probabilistic gene network model of cellular aging and its application on the conserved lifespan extension mechanisms of dietary restriction  
**Funding agency:** National Science Foundation  
**Amount:** \$124,067

### Qin, Hong

**Project title:** A probabilistic gene network model of cellular aging and its application on the conserved lifespan extension mechanisms of dietary restriction  
**Funding agency:** National Science Foundation  
**Amount:** \$133,156

### Qin, Hong (Hope, Klug - PI)

**Project title:** The development and application of computational tools to address fundamental questions  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$88,998

### Qin, Hong

**Project title:** Connecting the Control Theory in Engineering to a Network Theory of Cellular Aging in Biology  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$91,906

### Reising, Donald

**Project title:** Learning from Power Quality Wave Forms  
**Funding agency:** Electric Power Research Institute  
**Amount:** \$58,941

### Reising, Donald R.

**Project title:** Unlocking the Secrets of RF-DNA  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$91,978

### Rollins, Alex\*

**Project title:** Efficient Modular Wall Systems for New Construction and Retrofit  
**Funding agency:** Precast/Prestressed Concrete Institute  
**Amount:** \$45,000

### Sartipi, Mina

**Project title:** Collaborative Research: Robust Asset-and-User-Aware Power Grid Dispatch during Extreme Temperatures  
**Funding agency:** National Science Foundation  
**Amount:** \$119,829

### Sartipi, Mina

**Project title:** US Ignite: Collaborative Research: Focus Area 1: Fleet Management of Large-Scale Connected Autonomous Vehicles  
**Funding agency:** National Science Foundation  
**Amount:** \$298,325

### Sartipi, Mina

**Project title:** REU Supplement for NSF Award#1647161 - US Ignite: Collaborative Research: Focus Area 1: Fleet Management of Large-Scale Connected and Autonomous Vehicles in Urban Settings  
**Funding agency:** National Science Foundation  
**Amount:** \$15,600

### Sartipi, Mina

**Project title:** Enabling Wireless 3C Technologies for Smart and Connected Cities  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$92,000

## 2016-2017 RESEARCH AWARDS (CONT.)

### Sreenivas, Kidambi

**Project title:** Simulation of Pelton Turbine  
**Funding agency:** ORNL - Oak Ridge National Laboratory  
**Amount:** \$4,000

**Sreenivas, Kidambi** (Bao, Feng - PI)  
**Project title:** Computational Modeling and Uncertainty Quantification for Wave Energy  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$84,771

### Sreenivas, Kidambi

**Project title:** Development of Computational Aeroacoustics Capability for Aerospace/Defense Applications

\*Faculty member left the University during 2016-17.

**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$68,065

### Wang, Endong

**Project title:** Robust Multifactor Framework for Large-scale Fault Detection and Diagnosis in Energy Systems of the U.S. Commercial Buildings  
**Funding agency:** THEC Center of Excellence in Applied Computational Science & Engineering (CEACSE)  
**Amount:** \$49,902

### Wu, Dalei

**Project title:** US Ignite: Collaborative Research: Focus Area 1: Fiber Network for Smart Mapping, Monitoring and Managing

**Underground Urban Infrastructure**  
**Funding agency:** National Science Foundation  
**Amount:** \$299,884

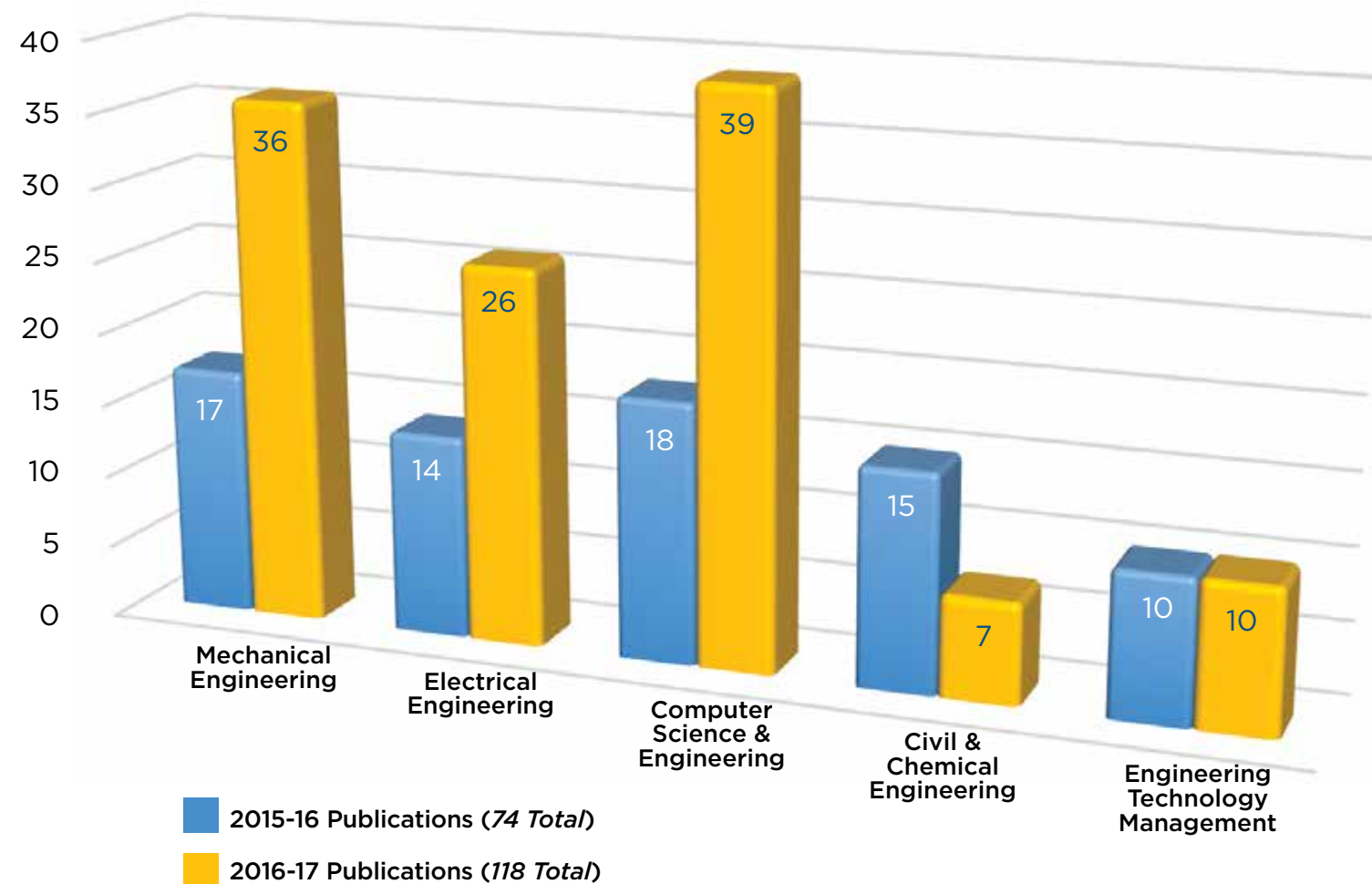
### Yang, Li

**Project title:** Collaborative Research: SFS Program: Strengthening the National Cyber Security Workforce  
**Funding agency:** National Science Foundation  
**Amount:** \$153,334

### Yang, Li

**Project title:** CyberCorps: Collaborative Research: Building Security Education Capacity through POGIL  
**Funding agency:** National Science Foundation  
**Amount:** \$164,997

## CECS PUBLICATION OUTPUTS BY DEPARTMENT



## BEYOND THE BOOKS

New Director at CECS Success Center Creating 'Safe Haven' for Students



Image courtesy of Thom Benson

Student Success Director Julie David Speaking with High School Students

When Julie David considers how to help students in the College of Engineering and Computer Science, she thinks about her 16-year-old-daughter and 25-year-old son.

"I try to see each student as I would want my child to be treated if they're coming to an advising appointment or they're coming to a college fair or they're asking the same question that you've heard 100 times that week, remembering it's the first time they've asked it," she explained.

Thinking about students — their needs, their fears, their feelings, their goals — is critical to David in her new job as Director for Student Success in the college. Brand-new in a brand-new position, David is molding the program into something that helps students maneuver through the typical problems that crop up during four years of college.

"It's not just handing them a sheet of paper and telling them 'These are the classes you need to take,'" she said. Success extends beyond the classroom, giving students the confidence to know where to go and how to ask for help when they need it, to understand their strengths and weaknesses, to make connections that help lay the course for them both at UTC and off-campus, David said. And, yes, to land a job, she adds. "When students feel supported and that they have a voice, they have that confidence," she said. Although she's only been at UTC for a little over six months, she said it's "inspiring" to see the "passion for students' success in this college."

David brings more than 20 years of experience in higher education, including a stint about 12 years ago in financial aid, recruitment, and other offices at Chattanooga State Community College. She came to UTC from the Columbus campus of Indiana University Purdue University, where she worked with traditional students as well as adults returning to school to learn new skills or hone the ones they already had.

Dean Pack said he was impressed by David's "leadership and student-advising experiences at institutions of higher learning, her strong communication skills, and her genuine care for students."

Even with all the juggling that students must handle during their stay at college, David has a pretty clear goal of what student success looks like to her. "Success is they've earned their degree and they're moving on to graduate school or employment, not a job, but a career that they love. For them to say, 'I'm proud to be a UTC graduate.'"

OUTREACH AND COMMUNITY ENGAGEMENT  
 "Engage communities through scholarship and service."



Mr. Albert Woodard speaking about Becoming an Engineering Entrepreneur

## COLLEGE ESTABLISHES DISTINGUISHED SPEAKER SEMINAR SERIES

Under the leadership of Assistant Dean Dr. Li Yang, the College launched a Distinguished Speaker Seminar Series this year. In support of CECS' teaching, research, and service mission, the series offerings focused on innovations in research, and the development of "soft skills" like effective communication, interviewing, time management and life skills. As a further outreach commitment, the series was open to all UTC students, faculty, staff, and the extended community.

The Speaker Series presentations provided opportunities for sharing information from noted researchers in a variety of fields, as well as experiences and timely insights from alumni, industry leaders, and partner professionals. The inaugural seminar was shared with a standing-room-only crowd and featured a panel discussion by CECS alumni David Wade, President and CEO of EPB; Tammy Womack, Manager with TVA; and Jason Allen, Vice President of Chattem/Sun Pharma on the topic, "Workforce Readiness and How Students Can Prepare for the Challenges and Opportunities of Future Job Demands."

Throughout the year, the Series' speakers from universities and corporate entities, including Georgia Tech, UT Knoxville, TVA, KaZee Computer Applications, and Pfizer, presented information on topics ranging from multi-robot systems to cyber-physical systems to becoming an engineering Entrepreneur. The Speaker Series concluded in April with a talk by College alumnus Tom Kline. Mr. Kline and his journey from UTC to Vietnam to the corporate suite was shared with a large audience, and is featured in this publication.



A local artist from Open Arms Care with her artworks created using tools designed by engineering students.

## ART FOR ALL

Engineering and art don't always come to mind when thinking about collaborations, but that's what happened at UTC for the benefit of disabled children and adults with art ambitions.

In the "Art for All" project, engineering students designed devices to help people with disabilities create their own artwork. At the same time, art students helped the artists bring their ideas into the world.

"The art students and engineering students came together to brainstorm possible solutions," says Dr. Cecelia Wigal, UTC professor of mechanical engineering. "The art students also helped the engineering students understand the tools and materials artists use and what are the artistic results of using the tools or materials."

Students also met with the artists "to more completely understand the problem," Wigal says.

Some artists have physical and mental disabilities. Some use wheelchairs, and some have limited movement of their arms or head. 2017 was the first year that Dr. Wigal and her students worked on a project aimed specifically at creating visual art. In the future, Wigal says, she hopes to add projects in performing arts.



ACT Workshop Participants from Local High Schools

## STUDENT CHAPTER OF NATIONAL SOCIETY OF BLACK ENGINEERS CONTINUES TRADITION OF HELPING HIGH SCHOOL STUDENTS

Preparing to take the ACT admissions test can be stressful for high school students, parents, guidance counselors, and teachers. The CECS members of the campus chapter of the National Association of Black Engineers (NSBE) consider it their mission to help lower those anxiety levels by offering a day-long ACT prep course complete with a pizza lunch and fellowship.

Following a long tradition of giving back to the community, in spring 2017, the NSBE students once again offered an admissions test workshop for the eighth consecutive year. Open to high school juniors and seniors across the region, more than 75 students came to the college on a Saturday morning for instruction in test content and test-taking strategies.

The CECS NSBE chapter is sponsored by Dr. Raga Ahmed, Assistant Professor of Electrical Engineering, who supported the students in the coordination of the day's events which included admissions information provided by the UTC Undergraduate Admissions Office, and the administration and scoring of a complete ACT sample test.

## CECS HOSTS SQL SATURDAY

In July, CECS once again hosted SQL Saturday – a day-long training event designed for server professionals to learn about innovations in the use of Structure Query Language. Widely used in managing database systems, SQL is an essential tool in both public and private sectors. SQL Saturday was coordinated by CECS Computer Science alumnus Larry Ortega, a TVA professional who also serves as Co-Chapter Leader of the SQL Professionals of Chattanooga. The event was a part of CECS's outreach to the extended community and commitment to professional development for computer scientists in our region. The workshops and social interactions of SQL Saturday provided an opportunity to showcase the College's programs and facilities, while also reconnecting with CECS alumni and friends.

## DEPARTMENT HOSTS PECHAKUCHA NIGHT

In April, the Department of Engineering Technology Management hosted a PechaKucha Night to help students network with local professional engineering management organizations with career resources and employment opportunities. Students from the College's Engineering Management Club and Dr. Aldo McLean, Assistant Professor and club advisor, coordinated the event as part of the College's commitment to professional development and community partnerships.

PechaKucha 20x20 is a concise presentation format in which presenters show 20 images for 20 seconds each, giving them a total of 6 minutes and 40 seconds to present their information, requiring each presenter to "cut to the proverbial chase."



Associate Dean Dr. Neslihan Alp and Professor Emeritus Ed McMahon join community partners at the Living Studio site.

## CECS CONSTRUCTION MANAGEMENT, UTC INTERIOR DESIGN, UTK PARTNERSHIP BENEFITS STUDENTS AND THE BOZENTOWN COMMUNITY

The College's Engineering Technology Management: Construction Management students and faculty have partnered with UTC Interior Design Program, UT Knoxville's School of Architecture, the Tennessee Board of Architectural and Engineering Examiners (TBAEE), and First Baptist Church of Bozontown to establish a community design studio. The Living Studio was established within the church's facilities located on Dodds Avenue in Chattanooga, and will serve the community as a resource to assist area citizens with residential design challenges.

With grant funding provided by TBAEE, spaces in First Baptist Church were transformed into a design laboratory and work space for students in all three academic programs. During the summer, students from CECS and the Interior Design Program of UTC's College of Health, Education, and Professional Studies invested "sweat equity" in cleaning, painting, and refurbishing spaces to be used later by community residents as well as the undergraduate and graduate students who will assist them.

All five partners involved with the concept and implementation of the Living Studio are excited about the opportunity to work together on behalf of residents of the Chattanooga community, and welcome the chance to bring new concepts in energy efficiency, improved space utilization, and maintenance to the University's neighbors. As part of the project, students in each of the three programs are also working with a local human needs not-for-profit, Widow's Harvest. Their work with Widow's Harvest provides critical structural improvements to homes of low-income Chattanoogaans. This "hands on" experiential learning initiative will provide UTC and UTK students with the chance to apply what they have learned in the classrooms to real life needs, and is part of CECS' commitment to outreach and service.

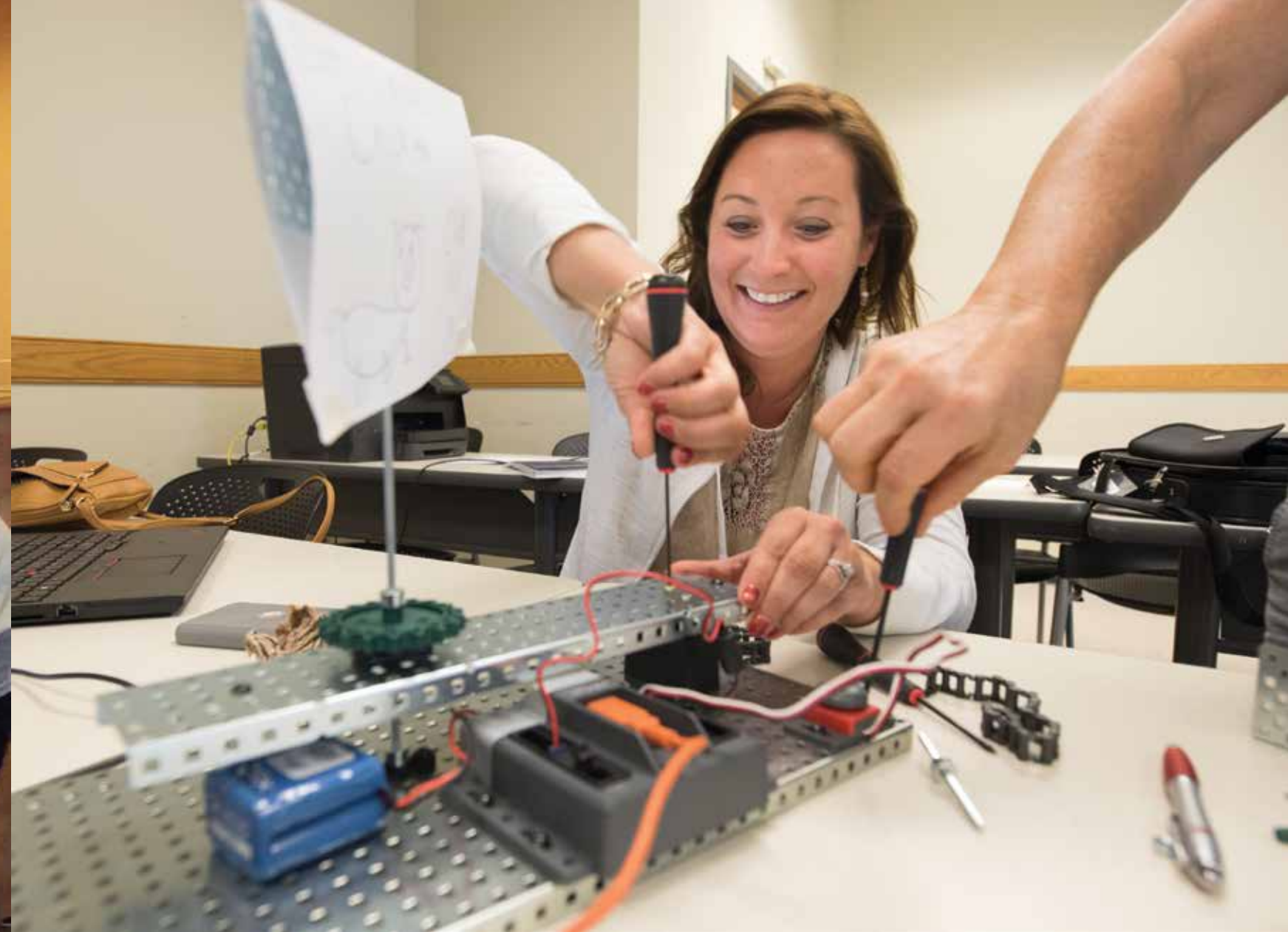


Student volunteers Jason Johnson, Jarrod Magouirk, Haley Stewart and Claire Defoor.

## CECS STUDENTS PAINT THE GREATER CHATTANOOGA AREA FOOD BANK RED!

In February, student members of the American Society of Civil Engineers (ASCE) and the Associated General Contractors (AGC) Student Chapter volunteered to help the Greater Chattanooga Food Bank, investing their time and sweat equity on a Saturday for a great cause. Six student leaders spent a full and rewarding day literally painting the Food Bank's offices with bright red paint and additional signage.

Mr. Roger Tuder, member of the College's Advisory Board Steering Committee and Executive Director of the AGC, reached out to the College with this welcomed opportunity for community service. The Civil Engineering and Engineering Management: Construction Management students "jumped" at the chance to help that worthwhile organization which serves 20 counties in Tennessee and Georgia and more than 144,000 of our neighbors in need.



Summer 2017 Project Lead the Way Participant

## CECS' SUMMER EDUCATIONAL OUTREACH INITIATIVES

In support of the University's community service mission, CECS welcomed partnerships with several educational programs open to students and middle and high school educators, during the months of June through August. In hosting a National Science Foundation Camp, the annual Gear Up Program, and Project Lead the Way, the College was able to share information about CECS programs and potential careers in engineering and computer science with over 200 students and teachers.

In cooperation with several grant-funded initiatives, CECS hosted a summer camp sponsored by the National Science Foundation during the month of July. The camp was organized to introduce high school students from across the region to the variety of engineering and computer science majors, as well as internship and full-time career opportunities upon graduation.

Throughout the regular school year, UTC's Gear Up Program works with potential first generation college

students from Hamilton County schools to share with them information about the advantages and opportunities of post-secondary study. Gear Up counselors also work with the students and their families in mastering the admissions and financial aid processes necessary for enrollment at UTC. During the month of June, CECS and the EMCS Building became the summer "home" for the Gear Up students as they participate in various courses and enrichment activities.

In July, CECS hosted multiple courses as a part of its annual Project Lead the Way Program. Over the course of two weeks, three dozen middle and high school teachers came to the college to learn from master teachers, new instructional methods and content in a variety of STEM courses. Sponsorship of the Project Lead the Way curriculum provides the opportunity for the teachers to meet CECS faculty and see the College's facilities, while learning about the academic programs and scholarships for their students.

## EXCEL-ING: TEACHERS TAKE KNOW-HOW - AND ROBOTS - BACK TO SCHOOL

It kind of looks like the wheeled container that gardeners use to hold their tools while they sit on it to save their aching backs.

Well, except for the solar panel on top and the computer motherboard and wiring underneath and UTC spelled out in clear-plastic letters on each side.

The device is actually a robot built during EXCEL: Exploring Clean Energy through hands-on Learning, a five-day conference held June 19-23 at UTC and hosted by the College of Engineering and Computer Science. The robot building was part of the Robotics and Solar Energy exercise.

The College of Health, Education and Professional Studies and College of Arts and Sciences also were instrumental in designing the conference. Other conference programs included Introduction to Design Thinking, 3D Manufacturing and Energy Storage.

Twenty-five math and science teachers from 15 schools in Hamilton, Bradley and Polk counties, and from the neighboring cities of Dalton and Cleveland, built robots during the conference. The educators, who teach grades ninth through 12th, will take what they learned back to their schools.



*Finished Product*

“Their ultimate goals are to learn new technologies, understand how to bring them to their class, increase awareness among their students for the STEM field, and help students to be much more real-world ready about new technologies,” says Dr. Neslihan Alp, Department Head of Engineering Management and Technology and Director of Graduate Programs for the College of Engineering and Computer Science.

Each participant also received 25 robotic kits to use in their classrooms. The kits were provided by TechTown, the college’s partner when it came to securing the \$74,000 grant from the Tennessee Higher Education Commission. This marks the first time the College of Engineering and Computer Science has received a grant through THEC’s Improving Teachers Quality program.

Chattanooga’s TechTown also helped run the Robotics and Solar Power program, which covered 15 hours of instruction, says Chris Ramsey, CEO of TechTown, a local learning center that focuses on hands-on technology programs for teachers as well as students from second through 12th grades. “We will continue to work with UTC on future teacher professional development efforts, providing access to our facility, technology, and staff experts,” Ramsey says.

With the robots taken back to their schools, they “teach students how to build, program, and operate a robot that powered by the solar power,” Alp says.

“This was a great opportunity to share our knowledge and experience with teachers who teach math and science. For some of them, it was the first time they were at UTC and CECS. It was a great opportunity to show them our campus, facilities, labs, classrooms, etc.,” Alp said.



*Testing during classes*



*Mr. Kline speaking with Undergraduate and Graduate Students*

## CECS ALUMNUS TOM KLINE: HIS JOURNEY FROM UTC TO VIETNAM TO THE BOARD ROOM

A lot can change in 50 years. In that same time, a lot can change on a college campus. Just ask Mr. Tom Kline, a 1966 engineering graduate of the University of Chattanooga. “The campus is definitely bigger, and I’m proud of the growth,” Tom shares. “It’s better. The College’s students and the community it serves have many more opportunities.”

Tom was so impressed that he returned in Spring 2017 to close out the inaugural year of the CECS Speaker Series. Upon his return, he noted, “Fifty years go by fast, but I can still see the people, the places like yesterday. It still feels like home.”

After his arrival at UTC, Tom switched his major from business to industrial engineering. “Our professors cared about us. They were invested in us and our future. I’ve carried that with me. It inspired me,” says Tom.

After earning his undergraduate degree and a Master of Science in industrial engineering from the University of Missouri-Columbia, Tom entered the Army during the height of the war in Vietnam. He completed

Engineering Officers training and served first as a second lieutenant in the U.S. Army Corps of Engineers. As a platoon leader during the Vietnam War, Tom was awarded the Bronze Star Medal, the Army Commendation Medal, and the Vietnamese Civil Works Medal.

Following the war, Tom started a 34-year career with the pharmaceutical company Pfizer Inc. “I always say my career started at UC, and not New York, because without this university, I would not have a career.”

Tom continued to apply his engineering training and leadership skills in other settings. In 1975, he was selected in a national competition as a White House Fellow and served as special assistant to the U.S. Secretary of Agriculture under President Gerald Ford. “What an honor!” Tom recalls. “It was hard work, but I learned so much about leadership.”

Tom says, “My engineering courses from the University, and experience building roads in Vietnam served me well.” At Pfizer, Tom established and led the company’s global logistics, manufacturing procurement, and contract manufacturing operations.

Tom’s volunteer efforts gained him national recognition for his leadership in improving public education, reducing

*continued on next page*



### Tom Kline (cont.)

crime, creating employment and building hundreds of residences for the needy. His experiences led him to write “The Golden Hand Grenade — A Lifetime Fighting to Rebuild a Tiny Stretch of Urban America.”

Today, he is principal of the Tom Kline Health Group. “If I can help someone to be better, then it’s good for everyone,” Tom shares. “Better for them. Better for the world. That’s what problem solving in engineering is about - making the world a better, more efficient, cleaner and happier place.”

Tom is a competitive race walker, completing more than 100 marathons and ultra-marathons. In 2016 he walked 6,500 miles from Point Barrow, Alaska, the northernmost point in the United States, to Key West, Florida, in an effort to help rid the world of malaria.

Tom’s remarkable journey taught him about leadership and relationships. His gratitude for his experience in the College inspired him to give back to his alma mater. Tom shares, “There were people here who were there when I needed them.” Tom now gives back through a minority scholarship for students in CECS. “The most important skill of a leader is to give back,” Tom says. “I’ve seen the value firsthand, and I want to help students become leaders. If you are blessed to have attended UTC, you are equally blessed to give back to those in need.”

## TVA/EPB PARTNERSHIPS SUPPORT STUDENT INITIATIVES, RESEARCH, AND PROGRAMS

The College has partnered with the Tennessee Valley Authority every year since it was established 48 years ago. Each year has resulted in effective programs and impactful research and the 2016-17 was no exception. With vital support for ongoing research initiatives by the Electrical Engineering faculty and students in the critical area of power network systems, funding for Hamilton County high school students to study CAD Net under the guidance of CECS faculty, and significant gifts to two of the College’s student organizations, TVA’s endorsement of the College’s efforts have had a significant positive impact.

Dr. Abdelrahman Karrar and the undergraduate and graduate students under his tutelage, built upon their prior year’s efforts in perfecting power network systems work in the area of develop more accurate and affordable methods of protection against open phase faults. With support from TVA’s nuclear group, the research continues to garner national recognition.

Under the sponsorship of TVA, high school students from the Hamilton County Department of Education learn CAD Net computer design applications. The College and TVA partnership extends to the location of the CAD Net instruction, as students study at the site of the CECS Test Track facility, with coordination by Dr. Trevor Elliott, Assistant Professor of Mechanical Engineering.

In cooperation of the shared goal of CECS and TVA to support and enhance the enrollment of underrepresented groups in engineering, technology, and computer science programs, TVA invested funds in the activities of the College’s chapters of the Society of Women Engineers and the National Society of Black Engineers. With TVA’s support, students of both organizations and their faculty sponsors were able to participate in the national meetings of



TVA presents gift to the UTC Chapters of the National Society of Black Engineers and the Society of Women Engineers.

their professional societies, providing invaluable networking opportunities and participation in workshops.

As one of America’s largest publicly owned electric power providers, EPB truly empowers Chattanooga and the entire region. EPB’s Gig City initiative has not only made the dream of high-speed internet service a reality for residential and commercial customers, but has also been a “magnet” for researchers and scholars including the College’s faculty. An additional recent demonstration of EPB’s continuing commitment to CECS has had a positive impact on our students and faculty. Led by CECS Advisory Board Chairman and EPB Chairman Joe Ferguson and CECS alumnus and Steering Committee Advisory Board member and EPB President David Wade, a multi-year gift from EPB provides support for short-term student projects and laboratory enhancements.



Dean Daniel Pack, AGC Executive Director Roger Tuder, and Associate Dean Neslihan Alp, join CECS Advisory Board Steering Committee Members Jimmy Lail, Bill Raines, and Joe Ferguson (Chair) for AGC Lab Dedication.

## ASSOCIATED GENERAL CONTRACTORS OF EAST TENNESSEE SUPPORT NEW CECS LAB

In the Spring, the College dedicated its new Associated General Contractors (AGC) of East Tennessee Construction Lab. Supported by a \$150,000 gift from the AGC, the lab provides materials for undergraduate and graduate students in the Engineering Management: Construction Management degree programs. The undergraduate program, which began in 2007, was the first four-year undergraduate degree in construction management offered in Tennessee. In 2010, a master’s degree program in that discipline was established.

AGC of East Tennessee and the organization’s local construction firms helped supply the lab with new software programs, including ArchiCAD Building Information Modeling software with a value of \$425,000.

Over 100 of the College’s students are currently enrolled in the Construction Management undergraduate and graduate programs. During the decade since the undergraduate’s program was established, more than 120 graduates of the bachelor and master’s degree programs have joined the workforce following completion of their degrees.

## SUMMER CAMP MARKS CONTINUED PARTNERSHIP WITH CHANGSHA UNIVERSITY OF SCIENCE AND TECHNOLOGY

In recent years, the College’s Civil Engineering Program expanded its joint degree program with Changsha University of Science and Technology (CUST). As part of the collaborative efforts, in Fall 2018, 50 Changsha students are expected to enroll in the College. In an effort to learn more about life in the U.S. and enrollment at UTC, several Changsha students and their mentors visited the campus, toured Chattanooga sites, and spent time in other U.S. cities in July.

Located in Hunan Province, as an engineering-centered multidisciplinary institution integrating engineering, science, management, economics, liberal arts, and law, Changsha University emphasizes features partnerships with industries in the fields of communication, electric power, and water conservancy.

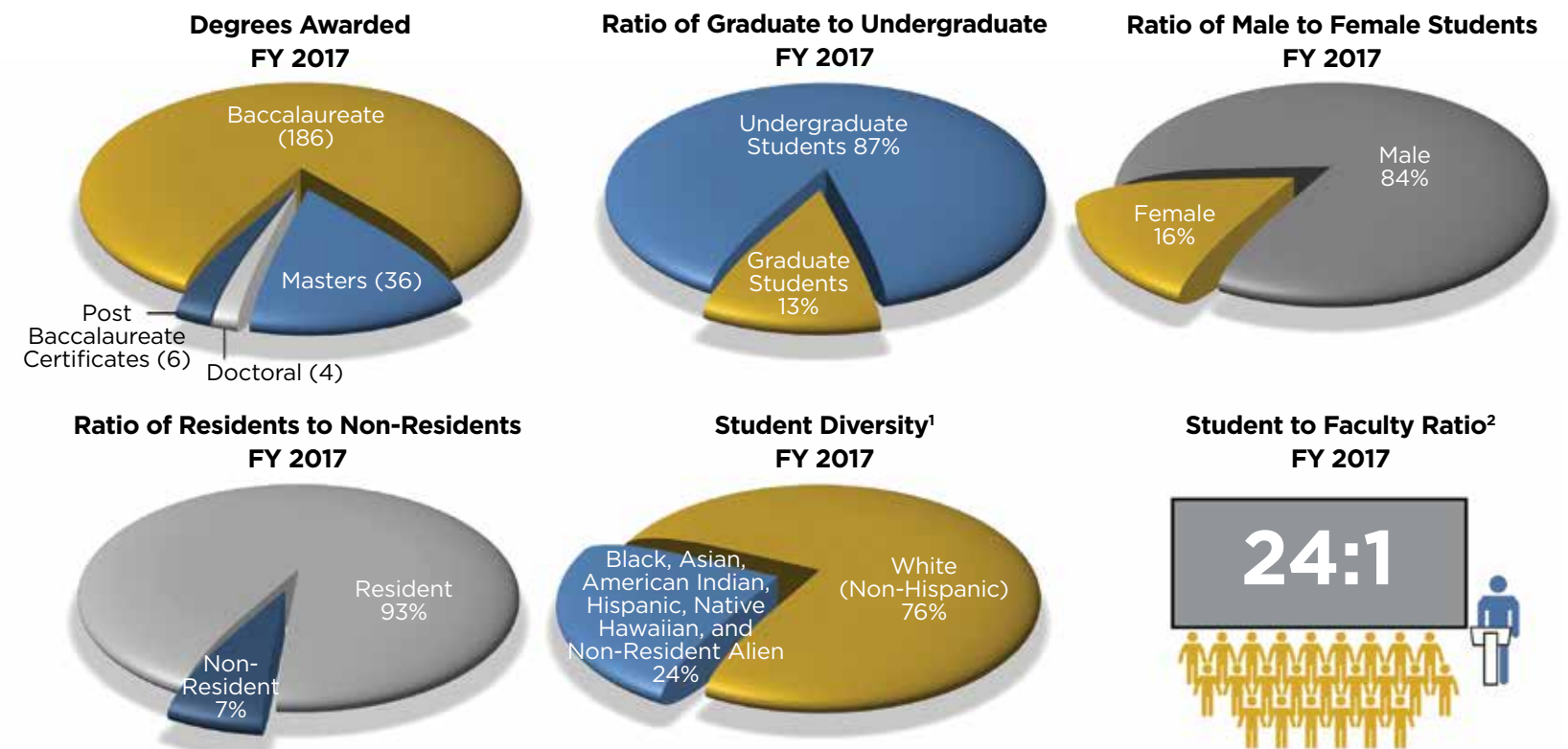


Dr. Louie Elliot, left, shows students his 3D printing samples at Get On Board Day.

## APPLIED RESEARCH INITIATIVES WITH INDUSTRY PARTNERS IN CHATTANOOGA

Building on the College's strengths in mechanical and computational engineering, an applied research initiative with Gestamp Chattanooga, led by Dr. Louie Elliott, Assistant Professor of Mechanical Engineering as Principal Investigator, is designed to help develop technologies to model and forecast sheet metal stamping forms used in automobile parts manufacturing. Dr. Elliott has demonstrated expertise in physics as well as mechanical and computational engineering, and welcomed this opportunity to direct CECS student interns in this applied research initiative with a local manufacturer. This new partnership with Gestamp Chattanooga engages our students with real-world research while enriching and expanding the College's focus on applied research.

When commenting on this new initiative, Dr. Elliott said, "The students benefit directly from this applied research – learning skills and gaining experience that will remain with them their entire careers leading to exciting employment opportunities. The relationship between the College and Gestamp has long-term regional impact. While improving the workforce available to manufacturer, it also demonstrates the success of attracting further advanced manufacturing to Chattanooga."



### FACULTY

#### TENURE/TENURE-TRACK



### 2016-17 RESEARCH AWARDS:

**\$5.1 million**

Research awards include subcontracts and internal CEACSE projects.

<sup>1</sup> Diversity % includes Black, Asian, American Indian, Hispanic, Native Hawaiian, and Non Resident Alien racial and ethnic categories.

<sup>2</sup> The student to faculty ratio was calculated following the same formula as defined in the Common Data Set. The ratio reported is of full-time equivalent students (FT + 1/3 PT) to full-time equivalent instructional faculty (FT + 1/3 PT). Computational Science students and faculty were excluded from this calculation as they are considered a stand-alone graduate program.

### DEGREES OFFERED

#### ENGINEERING

- Bachelor of Science
  - Chemical Engineering (B.S.Ch.E.)
  - Chemical Engineering: Environmental (B.S.Ch.E.)
  - Civil Engineering (B.S.C.E.)
  - Civil Engineering: Environmental (B.S.C.E.)
  - Electrical Engineering (B.S.E.E.)
  - Mechanical Engineering (B.S.M.E.)

- Master of Science (M.S.)
  - Engineering: Automotive Systems
  - Engineering: Chemical
  - Engineering: Civil
  - Engineering: Electrical
  - Engineering: Mechanical

- Ph.D. Programs
  - Computational Science with concentrations in
    - Computational and Applied Mathematics
    - Computational Engineering
    - Computer Science

#### COMPUTER SCIENCE & ENGINEERING

- Bachelor of Science (B.S.)
  - Computer Science with concentrations in
    - Computer Engineering
    - Cyber Security
    - Data Science
    - Software Systems
    - STEM Education

- Minor
  - Computer Science
- Undergraduate Certificates
  - Advanced Information Systems Security
  - Information Systems Security

- Master of Science (M.S.)
  - Computer Science with concentrations in
    - Computer Science
    - Data Science
    - Information Security and Assurance

#### ENGINEERING MANAGEMENT & TECHNOLOGY

- Bachelor of Science (B.S.)
  - Engineering Technology Management with concentrations in
    - Construction Management
    - Engineering Management

- Minor
  - Construction Management
  - Engineering Management

- Master of Science (M.S.)
  - Engineering Management with concentrations in
    - Construction Management
    - Engineering Management

#### POST-BACCAULAUREATE CERTIFICATE PROGRAMS

- Post-Baccalaureate Certificates
  - Computer Science:
    - Biomedical Informatics
    - Smart Power Distribution
    - Sustainable Electric Energy
  - Engineering:
    - Power System Protection
    - Smart Grid
    - Engineering Management:
      - Construction Management
      - Fundamentals of Engineering Management
  - Leadership and Ethics
  - Logistics and Supply Chain Management
  - Power Systems Management
  - Project and Technology Management
  - Quality Management



2016-17 UTC Chem-E-Car Team

## SUPPORT FOR STUDENT INITIATIVES

Student competitions, design projects, plant visits, and other experiential learning initiatives are key components of the student experience at CECS. Developing support for these student-led efforts from the public and private sectors, as well as from alumni and friends, is a critical piece in establishing beneficial learning opportunities.

Designed with a “Go Fund Me” website which displays established goals and progress toward their attainment, Launch UTC is an easy and effective way for contributors to support these important student efforts.

[www.mocsconnect.com/s/1341/utc/wide.aspx?sid=1341&gid=3&pgid=7442](http://www.mocsconnect.com/s/1341/utc/wide.aspx?sid=1341&gid=3&pgid=7442)

## COLLEGE OF ENGINEERING AND COMPUTER SCIENCE 2016-2017 ADVISORY BOARD

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For more information on how to support the great initiatives in CECS, please contact Philip Bonfiglio (Philip-Bonfiglio@utc.edu) or call (423) 425-5940.

**MocsConnect.com/GiveCECS**