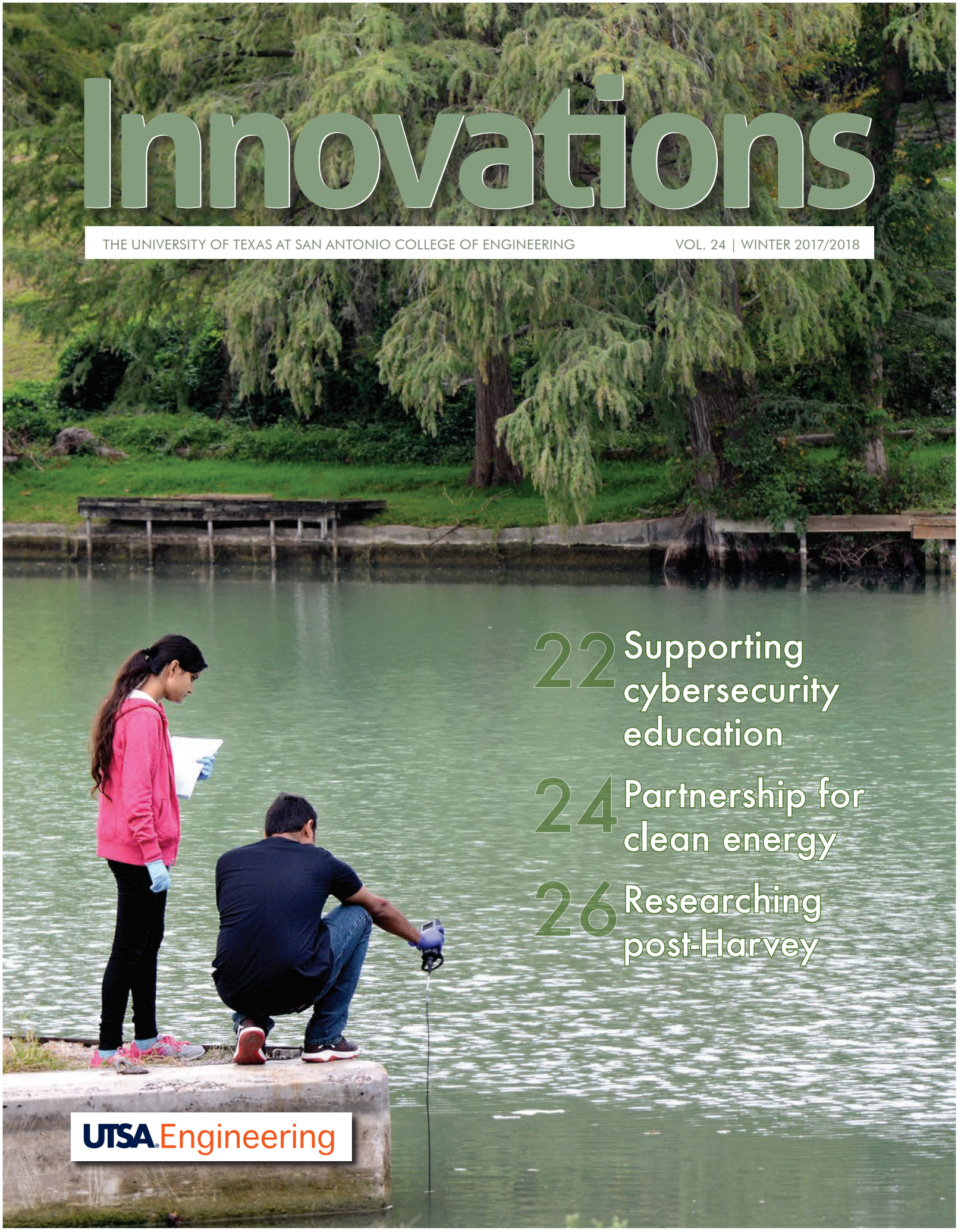
Innovations

THE UNIVERSITY OF TEXAS AT SAN ANTONIO COLLEGE OF ENGINEERING VOL. 24 | WINTER 2017/2018



UTSA Engineering

editorial

A message from the Dean of the College of Engineering

JoAnn Browning, Ph.D., P.E.
Dean, College of Engineering
David and Jennifer Spencer Distinguished Chair

Over the years, *Innovations* magazine has featured hundreds of stories from across the College of Engineering. From updates on new building construction, to photo collages of student activities, to articles featuring our outstanding faculty and staff, I am proud to have a publication like *Innovations* to help tell the story of the college. As we continue to grow in size and excellence, a number of changes are taking place across campus, and we are excited to see what 2018 has in store for UTSA and the College of Engineering.

The biggest change at UTSA in 2017 was our new president, Dr. Taylor Eighmy, who arrived in San Antonio in September and hit the ground running! Dr. Eighmy is an environmental engineer, and the faculty and staff in the College of Engineering are poised to help deliver on his vision of an urban-serving institution that leverages key partnerships in the city, the state, the nation, and beyond. Under Dr. Eighmy's leadership, UTSA will become an urban-serving university that cultivates cradle-to-career learning. We in the college are dedicated to graduating world-ready students with the skills that employers seek as the engineering workforce evolves in Texas and around the country.

Another wonderful change is that our new chemical engineering program welcomed its first cohort in fall 2017. These students have excellent academic credentials and are eager to share their skills with industry in South Texas and beyond. The program will eventually find its home in the new Science and Engineering Building (SEB), which broke ground in summer 2017 and will be complete in 2020. Faculty and staff offices, research spaces, and a state-of-the-art unit operations lab will be included in this structure located across the South Paseo from the Biotechnology, Sciences and Engineering Building (BSE).

The SEB will also house 17,000 square feet of maker space for our senior design students to occupy during the last year of their undergraduate curriculum. More than 600 students graduated with an engineering degree in 2016-17 – the largest number of graduates the College has had in an academic year – and this space will help to provide more opportunities for collaboration and innovation for our future engineering students. The results of our students' senior design work are demonstrated each semester at our Technology Symposium, and in fall 2017, we had over 80 different projects and posters on display with thousands of dollars in prizes at stake. If you have not been to our Tech Symposium, find your way to UTSA this spring to experience the thrill of the competition and the joy of a completed engineering degree! (*To see photos from this fall's event, go to page 12.)*

Our research continues to be top tier – with record-setting awards received and research expended in the 2016-17 academic year. We continue to grow in the number of faculty and the number of externally-supported research projects so that we can contribute cutting-edge, new knowledge and technological discoveries to our engineering communities. Please take the time to browse the awards section of *Innovations* starting on page 28 to see the array of problems that our faculty are solving.

I hope you enjoy this latest edition of Innovations, designed and edited by our award-winning Senior Communications Coordinator, Deborah Silliman. She, and the rest of the faculty and staff in the College of Engineering, is passionate about the success of our students, our college, and our university. We all hope that you enjoy perusing our engineering stories in this latest issue of *Innovations*!

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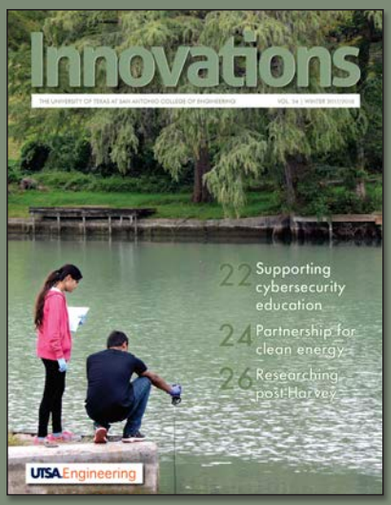

ON THE COVER

Environmental engineering graduate students Indrani Gupta and Tanvir Pasha collect water samples from the the banks of the Guadalupe River as part of UTSA Civil and Environmental Engineering Assistant Professor Vikrim Kapoor's National Science Foundation's RAPID grant research. *(Photo by Deborah Silliman/College of Engineering)*

welcome

A message from the President

Taylor Eighmy
President
The University of Texas at San Antonio

As I begin my second semester as the sixth president of The University of Texas at San Antonio, I am immensely grateful for the enthusiastic support on the part of the entire university community in our collective journey toward new levels of excellence. The passion of the many alumni, friends, faculty, staff and students I've met at events around campus and throughout San Antonio has been truly inspiring, and it reaffirms for me that UTSA is indeed a special place primed to tackle the grand challenges of today's world.

UTSA has all the ingredients to achieve new heights as a model urban-serving institution and driver of San Antonio's knowledge economy. Our multicultural discovery enterprise can create prosperity and opportunity for all – and the College of Engineering will be integral in every aspect of helping UTSA achieve these goals.

The College of Engineering is fully dedicated to recruiting and retaining the best and brightest minds into its programs. Our engineering faculty regularly receive grants from the National Science Foundation, the Texas Department of Transportation, CPS Energy, the Department of Defense, and many other private, governmental, and corporate foundations. In 2017, the College achieved an all-time high of $13.5 million in research expenditures, up 24 percent since 2013. All of this success in our research endeavors illustrates how UTSA is leveraging its scholarly impact for the betterment of our world.

While fostering research excellence, we must also create an environment where students can flourish. Before each undergraduate student steps into their first engineering class on campus, we want them to be academically prepared to succeed. Well-established initiatives like UTSA's Prefreshman Engineering Program are examples of how UTSA cultivates an education continuum that bridges secondary and higher education. In the months to come, we will be strengthening our partnerships with local school districts and the City of San Antonio to enhance student preparedness for college-level work. These efforts are instrumental in ensuring that students are prepared for the academic challenges they will face at UTSA.

Engineering holds a special place in my heart, not only because I have degrees in civil and environmental engineering, but also because I see the potential our engineering graduates have to make a significant impact in the San Antonio community and beyond. Over the past ten years, the College of Engineering's undergraduate student population has increased by more than 1,000 students, and I expect we will see more growth with the addition of our Chemical Engineering major and the new Science and Engineering Building slated to open in 2020.

As we build San Antonio's university of the future, I hope I can count on you to be a champion for the College of Engineering and for UTSA. Our vision for excellence cannot be achieved without the support, talents, and energy of so many who contribute to the university's forward momentum.

Thank you for the warm welcome to UTSA, and Go 'Runners!

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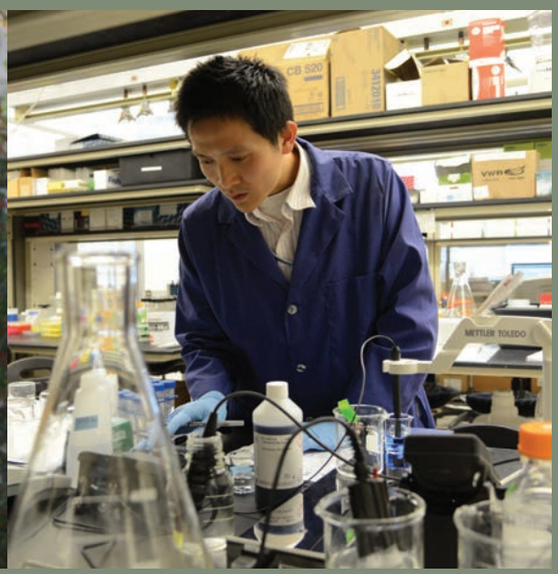

NEW FA

Please welcome the College of Engineering's newest faculty members

Mahmoud Abdelwahed

Associate Professor in Biomedical Engineering (Chemical Engineering program)
Ph.D., Zagazig University & Cairo University

Dr. Mahmoud Abdelwahed's research focuses on making a variety of novel nanomaterials and studying their optical, catalytic, biological, sensing, electrical, and mechanical properties. Colloidal chemical techniques are used to prepare different shapes, sizes, and structures of metallic and semiconductor nanoparticles on large scales. The prepared nanoparticles are assembled into 2-D or 3-D arrays and can be functionalized with organic polymers for use in optoelectronics, solar cell materials, optical filters and polarizers, nanocatalysis and photocatalysis, nano-sensing, and nano-switching. High-resolution electron and optical microscopic techniques and ultrafast spectroscopy are used to resolve the fine structure and properties of the nanomaterials.

Guenevere Qian Chen

Assistant Professor in Electrical and Computer Engineering
Ph.D., Mississippi State University

Dr. Guenevere (Qian) Chen received her Ph.D. in Electrical and Computer Engineering from Mississippi State University in 2014. Her primary research area is autonomic computing and cybersecurity. Dr. Chen's current research involves autonomic security management for distributed systems, industrial control systems, high performance computing, and healthcare information systems. Her research topics include risk assessment, attacks estimation, vulnerabilities investigation, intrusion detection and response, and end-to-end security solution development. Her research projects were funded by the National Science Foundation, the Department of Energy, the Department of Defense, Mississippi State University and Savannah State University. She also focuses on producing underrepresented cybersecurity workforce to address the cybersecurity expertise shortage issues for enhancing national cybersecurity.

Zhan Qin

Assistant Professor in Electrical and Computer Engineering
ABD, State University of New York at Buffalo

Dr. Zhan Qin's research area is in computer science/engineering and focuses on the security and privacy aspects of cloud-based computation, IoT devices, and critical infrastructure. His other research interests include secure computation outsourcing, privacy-preserving data collection, sharing and publication, cybersecurity of smart grid control and communication system, and cyber-physical security for smart devices with the current focus on exploring and improving the security and privacy assurance on cloud computing.

FACULTY

Eric Brey

Professor and Department Chair in Biomedical Engineering
Ph.D., Rice University

Dr. Eric Brey's research interests are in tissue engineering and biomaterials, and he has made significant contributions in these fields. Specifically, he has contributed to new methods for engineering vascularized tissues and is a leader in evaluating new imaging methods for analysis of engineered tissues. Dr. Brey's research has resulted in over 100 peer-reviewed publications, nine book chapters, over 300 presentations, and 50 invited talks. Dr. Brey is a fellow of the American Institute for Medical and Biological Engineers and was awarded the 2015 Educational Award from TERMIS, a Young Investigator Award from the International Society of Applied Cardiovascular Biology, a Sigma Xi Award for Excellence in Research, and a visiting professorship at Chang Gung Memorial Hospital in Taiwan.

Gary Jacobs

Assistant Professor in Biomedical Engineering (Chemical Engineering program)
Ph.D., University of Oklahoma

For over 16 years, Dr. Gary Jacobs' research has been directed at understanding catalytic phenomena, developing new catalyst formulations, and characterizing catalysts for natural gas conversion technologies. Examples include cobalt catalysts for converting natural gas-derived syngas by Fischer-Tropsch synthesis, as well as metal/ceria and related catalysts for hydrogen production and purification (e.g., low temperature water-gas shift) for fuel cell applications. In addition, he has researched renewable technologies, such as bioethanol reforming into hydrogen for fuel cells, carbon dioxide conversion to chemicals, and hydrodeoxygenation of pyrolysis oils.

Gabriela Romero Uribe

Assistant Professor in Biomedical Engineering (Chemical Engineering program)
Ph.D., University of Basque Country (Spain)

Dr. Gabriela Romero Uribe's research interests lie within the field of biomaterials, specifically the development of macromolecular bio-interfaces that challenge biomedical problems. The synthesis of multifunctional, biocompatible and stimuli-responsive materials is driving the development of novel approaches for the diagnosis and treatment of diseases. As a polymer and biomaterials chemist, she aspires to design and engineer soft matter platforms that enable the precise control of cellular signals and behaviors.

Ground broken for Large-Scale Structural Testing Facility on West Campus

Ground was broken in September for the Large-Scale Structural Testing Facility which will be located on the far-north portion of Barshop Boulevard, adjacent to Residential Lot 4, on West Campus.

At 15,000 square feet, the Large-Scale Structural Testing Facility is the largest institutional project, fully managed in-house, in UTSA history. Significant in many ways, the building will be a game changer for the College of Engineering's civil and structural engineering research and will have implications locally, regionally, and internationally.

The Large-Scale Structural Testing Facility will have a 40x80-foot reaction floor with a clearance of 40 feet, providing researchers the ability to test real-size structural systems and components. The reaction floor will have a thickness of at least 3 feet, with a service chase and 3-foot-thick walls underneath, conforming a reaction system with the capacity to apply test loads of up to 2 million pounds over the entire testing area. A thicker region of the floor will be rated for test loads of up to 4 million pounds, giving UTSA a capability unique in the U.S. for testing large-scale systems and components with spans of up to 70 feet. The laboratory will have dual cranes with 30-ton capacity to load, unload, and transport heavy specimens. The laboratory will have a large-capacity hydraulic power supply (HPS) and high-pressure distribution lines with access manifolds in the service chase that will facilitate the use of servo-controlled actuators anywhere in the test floor. The HPS and distribution system will provide the ability to induce large loads at very high deformation rates, allowing researchers to simulate a wide range of problems including high cycle fatigue, earthquake, and blast loads.

The structural testing area will be complemented with support areas for fabrication and instrumentation of specimens, offices for students, faculty, and staff, and a conference room where visitors will be able to observe tests being performed in the lab.

COE faculty earn tenure and promotion

In the fall of 2017, UTSA announced the promotion of six faculty members in the College of Engineering. The promotions were approved by the UT System Board of Regents in August and became effective Sept. 1.

"Our faculty play a crucial role not only in the classroom, but also in the development of innovative research," said JoAnn Browning, dean of the College of Engineering and the David and Jennifer Spencer Distinguished Chair. "I am extremely proud of all our faculty members who have reached this next step in their career here at UTSA."

Krystel Castillo, Department of Mechanical Engineering, and Xiaowei Zeng, Department of Mechanical Engineering, have been promoted to associate professor with tenure. Tenure is granted to faculty who have established a high standard of excellence in the classroom and have distinguished themselves through research and scholarship, as well in service to the community and the university.

The Department of Biomedical Engineering's Jing Yong Ye and the Department of Civil and Environmental Engineering's Samer Dessouky, Heather Shipley, and Firat Testik have all been promoted to full professor with tenure in recognition of the sustained academic and civic impact they have made on the university and their students.

UTSA ranks among nation's top minority-serving institutions for federal science and engineering expenditures

UTSA ranks No. 7 among the minority-serving institutions in the nation that received the most federal research obligations (expenditures) for science and engineering, according to data released in the fall of 2017 by the National Science Foundation regarding fiscal year 2015.

In FY 2015, UTSA expended $23.3 million in federal funding to support its sponsored projects, an increase from the $20.9 million it expended in FY 2014. Of that, $21.5 million of FY15 federal expenditures were for R&D initiatives, which supported top-tier research in cloud-computing security, the creation of cloud-computing testbeds, the development of new technology to demystify complex brain processes, and other projects. During this time, federal funding supported the creation of UTSA programs aimed at providing mentorship and assistance to financially disadvantaged students interested in engineering and science.

"Federal funding is important to UTSA because it allows us to invest in groundbreaking research initiatives that generate new leads and discoveries and attract top global talent to the university," said Bernard Arulanandam, interim vice president for research. "UTSA's innovative environment benefits our students, who learn and receive training from leading researchers in their fields as they prepare to become the next generation of science and engineering leaders. It benefits our society, as the breakthroughs in science, engineering, and technology happening on campus help us all."

UTSA Academy of Distinguished Researchers welcomes COE faculty member

The UTSA Academy of Distinguished Researchers recently inducted two new members: College of Engineering's Joo L. Ong and College of Science's Jose L. Lopez-Ribot.

The Academy of Distinguished Researchers was established in 2015 to select and honor outstanding faculty who are accomplished scholars and who share UTSA's continuing commitment to research excellence; to foster the highest quality of research and scholarly activity by UTSA faculty; and to promote the University's vision as a premier public research university. The Academy is comprised of researchers across all disciplines who represent the best of research on campus.

Each year, the group decides upon the induction of new members. Candidates are nominated by peers across campus, and their body of research work is evaluated. The Academy members review each candidate, looking at all the criteria, and discuss each candidate within the group.

"There are many components the committee considers to measure the research and academic impact of a nominee. We are looking for high-quality research and scholarly activities. It is a rigorous process to determine who is a true scholar," explained Hamid Beladi, chair of the Academy of Distinguished Researchers.

The Academy considers a number of factors including (but not limited to): the impact and the overall quality of the research; the number of citations and publications; publication in highly recognized and leading peer-reviewed journals; recognized works, performances and exhibitions; competitive grants (federal and international) and funded research; patents; major scientific inventions; editorships; and research recognitions.

This year, two UTSA researchers were selected for induction.

Joo L. Ong, Ph.D., is the USAA Foundation Distinguished Professor in the Department of Biomedical Engineering. He also serves as the associate dean of administration and graduate studies, College of Engineering.

His primary research interests focus on modifications and characterization of implant biomaterial surfaces for dental and orthopedic applications, tissue engineered bioceramic scaffolds for bone regeneration, protein-biomaterials interactions, and bone-biomaterials interactions.

Ong is a Fellow of the American Institute for Medical and Biological Engineering. He is also the associate editor for the *Journal of Biomedical Materials Research, Part B*. His publication portfolio includes two books (one edited), 16 book chapters, and 146 peer-reviewed journal publications. He has four issued patents from his research work and one pending patent filed with the U.S. Patent Office.

Jose L. Lopez-Ribot, Pharm.D., Ph.D., is a professor of microbiology and the Margaret Batts Tobin Distinguished Chair in Biotechnology, Department of Biology. He is also the associate director of the South Texas Center for Emerging Infectious Diseases.

His laboratory studies fungal infections, with an emphasis on the opportunistic pathogenic fungus *Candida albicans*, the main causative agent of candidiasis affecting an increasing number of immune- and medically compromised patients. Work in his laboratory ranges from the basic biology of the cell wall, biofilm formation, adhesion and morphogenetic conversions, to the use of animal models to better understand virulence and host responses, to the more translational and clinical aspects such as antifungal drug development, drug resistance and vaccines. The ultimate goal of his work is devising new strategies for the diagnosis, prevention and treatment of candidiasis.

"The Academy of Distinguished Researchers serves as a way to recognize the high caliber of research being done at UTSA and provides a forum for our researchers to connect and collaborate. Our institutional goal is to be recognized as a research-intensive institution based on the scholarly output of our outstanding faculty members," said Bernard Arulanandam, interim vice president for research.

With the 2017 induction, the Academy now has 15 members, representing the Colleges of Business, Education and Human Development, Engineering, Liberal and Fine Arts, Public Policy, and Sciences.

Left to right: C. Mauli Agrawal, interim provost and vice president for academic affairs; Joo L. Ong, USAA Foundation Distinguished Professor in the Department of Biomedical Engineering and associate dean of administration and graduate studies; Jose L. Lopez-Ribot, professor of microbiology and the Margaret Batts Tobin Distinguished Chair in Biotechnology, Department of Biology; and Bernard Arulanandam, interim vice president for research.

Seed funding awarded to engineering faculty members

The Office of the Vice President for Research's internal seed funding programs support UTSA's research enterprise by awarding faculty members seed funding to obtain preliminary data that can be cited in applications for extramural funding and enhance the breadth of scholarly and creative activity taking place on campus. These grants also support new areas of research for UTSA faculty and advance the university's goal of research excellence. The latest round of seed funding totaled $340,000 for 29 research projects at UTSA and with collaborators at the Southwest Research Institute (SwRI). Five of these projects are based in the College of Engineering.

GREAT FY 2018 Awardees

Biomedical Engineering, Teja Guda

Scaffolds with Soft Zones for Bone Regeneration

Mechanical Engineering, Wei Gao

Advanced Materials Based on Two-dimensional Building Blocks – Computational Design Based on Chemistry and Topology

Mechanical Engineering, R. Lyle Hood

An Improved Cystoscopic Approach for 3D Imaging of Intra-bladder Cancers

Connect FY 2018 Awardees

Mechanical Engineering, Brendy Rincon Troconis, UTSA, in collobration with James Dante, SwRI

Effects of Triazine-Based H2S Scavenger Byproducts on the Film Composition and Cracking of Carbon Steel in Oilfield Applications

Civil Engineering, Samer Dessouky, UTSA, in collobration with Jerome Helffrich, SwRI

Promoting Sustainability and Safety for Texas Rural Roadways Through Self-Powered Sensing and Detection Systems

UTSA receives $800K grant for earthquake research

Wassim Ghannoum, associate professor of civil and environmental engineering, has received a grant of nearly $800,000 from the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) to develop a new generation of computer simulation models that will characterize the impact of severe earthquake conditions on reinforced concrete structures.

The project will be conducted in conjunction with the NIST's Disaster Resilience Grants Research Program, which supports research aimed at advancing the principles of resilience in building design and building codes and standards.

"This work is a prime example of the creative top-tier research that UTSA strives for," said JoAnn Browning, dean of the College of Engineering. "This has the potential to have a tremendous impact on the lives of people living in our nation's cities and to improve the way we approach construction projects."

Ghannoum's work focuses on concrete columns that are used in bridges, apartment buildings and office structures. If their resilience in a seismic event is subpar, the result could be a massive loss of life and crippling costs for the community.

"My plan is to create simulation models that will pave the way for a new generation of tools," Ghannoum said. "These tools will provide engineers with critical engineering data to make more precise decisions that could prevent structures from crumbling under seismic pressure."

Additionally, Ghannoum plans to distribute his newly developed simulation tools to the structural engineering community through open-source software, which means the research will be instrumental in reducing the building rehabilitation costs that are associated with strengthening the structural integrity of concrete buildings.

"Dr. Ghannoum's concrete resilience research is not only vital, but it also fits into the Smart Cities model, a worldwide effort in which UTSA is involved," said Bernard Arulanandam, interim vice president for research. "Public institutions, government entities and private organizations are using data and technology to advance and refine the functionality of a city to improve the livability for all its residents."

San Antonio Smart City innovations startup emerges out of UTSA

A recent spinout from UTSA, Leaptran Inc., is bringing to market products that will optimize whole-building energy use while providing room-level comfort for individuals. Using artificial intelligence and smart building features, these integrated hardware and software products will optimize energy use among micro-grid distributed energy resources such as solar power generation and battery energy storage systems.

Leaptran's technologies are licensed from UTSA and are based on co-founder and UTSA Assistant Professor Bing Dong's more than 10 years of research in building energy efficiency, occupant behavior, big data analytics, intelligent building operation and optimization, measurement and verification, and buildings-to-grid integration research. UTSA entrepreneur-in-residence and energy storage expert Jeff Xu, founder of Leaptran, identified and evaluated these technologies and recognized their synergy with his skills as a great commercial opportunity.

Through UTSA, the Leaptran team received a $50,000 award to participate in the National Science Foundation's Innovation-Corps (I-Corps™) program to optimize their product and market development focus. As a UTSA New Venture Incubator member, they then landed a SBIR Phase I award of $149,991 funded by the Department of Energy's Office of Energy Efficiency and Renewable Energy through the Small Business Innovation Research program. In addition, Leaptran now has a contract in place with UTSA and CPS Energy to explore micro-grid-level energy optimization and the deployment of distributed energy resources intelligently.

Buildings consume more than 70% of total electricity usage in a city. Leaptran's energy management with predictive control (EMPC) for buildings and micro-grid will integrate sensing, energy optimization, machine learning, and behavior analysis. Their technology aims to reduce wasted energy in a building up to 50 percent. This efficiency will reduce both the electric bill and greenhouse-gas emissions.

To help buildings and micro-grids incorporate more renewable and distributed energy resources, Leaptran's products will balance increased load demands and integrate building energy management. Battery energy storage unlocks the potential for battery power in buildings and allows the grid to maximize renewable and distributed energy sources. With its intelligent capability, Leaptran's solution can also be adapted to a smart micro-grid solution.

Advancing prostate cancer research

Jing Yong Ye, professor of biomedical engineering, has received a two-year, $354,617 grant from the National Institutes of Health's National Cancer Institute to support the development of his noninvasive method of detecting prostate cancer. Ye's research team has been working on the development of a novel microscope based on a photonic crystal biosensor to detect the cancer through a urine sample. It will significantly improve accuracy compared to the approach used in current clinical practice.

Prostate cancer is the second most prevalent type of cancer, and the third leading cause of cancer-related deaths in men. Early detection is key to survival, which is why it is standard practice for doctors to screen all men over the age of 50 for the disease.

To screen patients for prostate cancer, medical professionals take a blood sample and look for prostate-specific antigen (PSA). If a high level of PSA is found, the patient is suspected to have prostate cancer and needs to have a prostate biopsy.

Unfortunately, PSA tests are far from providing satisfactory diagnoses and result in a large number of unnecessary prostate biopsies due to a high false-positive rate. This is because PSA elevation may also occur in men with infection and chronic inflammation or benign prostatic hyperplasia.

"False positive diagnoses are very common in prostate cancer tests," Ye said. "As a result, a patient may undergo a biopsy he doesn't need, which is painful and could cause an infection. Also, because prostate cancer is highly heterogeneous and even multicore prostate biopsy only samples a few local areas, it can easily be missed by clinicians."

Since about 70 percent of men who go through the biopsy process are found to be cancer-free, Ye wanted to look for a better way. His research team will develop a noninvasive imaging approach to check urine samples, since cells from the prostate are shed into urine naturally.

"The system we are developing utilizes a sensitive biosensor, which allows us to distinguish cancer cells from normal cells based on a unique feature of the cells," he said. "If you can detect a cancer cell, you're starting from a more precise place and you can give a more accurate diagnosis."

Ye's laboratory develops cutting-edge tools based on different biosensors, optical imaging methods and nanobiotechnology to address critical issues in biomedical engineering research and applications.

"We need to use every weapon in our arsenal to attack this disease," Ye said. "It's important to think outside the box and use innovation to address these critical issues."

Engineering faculty help preserve Edwards Aquifer

Vikram Kapoor, assistant professor of civil and environmental engineering, and Drew Johnson, professor of civil and environmental engineering, have been awarded a $692,452 funding agreement through the City of San Antonio's Proposition 1 Edwards Aquifer Protection Program to design and implement a way to track fecal bacteria in the Edwards Aquifer so that major contamination can be stopped before it starts. The Edwards Aquifer is the primary source of drinking water for millions of people living in Central and South Texas. Like all naturally occurring water sources, it is vulnerable to contamination from storm water runoff, municipal waste, or even leaking septic tanks on private properties.

"Some of the sources that contribute to bacteria in aquifer systems are uncharacterized and uncontrollable," said Kapoor. "San Antonio is a forward-thinking city, and UTSA is a forward-thinking university, which is why we seek to identify sources that can be characterized and controlled. We're going to use innovative molecular techniques to get ahead of any issues that could arise."

The project team will spend the next two years collecting samples over several different regions of the Edwards Aquifer. The researchers will then work to identify specific DNA markers that are found in fecal bacteria to determine whether there's contamination in the aquifer, to evaluate the level of contamination if present, and to accurately locate where it originated along the aquifer.

"Understanding and identifying the sources of surface and groundwater fecal contamination is paramount to protecting water quality and mitigating pollution and risk to human health," said Kapoor. "We will determine whether there's fecal contamination, then we'll advise the city on how to mitigate it."

Nuclear Regulatory Commission awards UTSA large grants for faculty and student development

The U.S. Nuclear Regulatory Commission (NRC) has awarded UTSA two grants totaling $849,351. The funding will support the creation of new faculty development and graduate fellowship initiatives focused on nuclear safety research and education in the College of Engineering.

In the summer of 2017, Harry Millwater, Samuel G. Dawson Endowed Professor, was awarded a $450,000 NRC grant to establish a faculty development program at UTSA. The program supports two tenure-track engineering junior faculty members in pioneering new research and an educational program related to the prevention and study of stress corrosion cracking in nuclear facilities. With 99 aging nuclear power reactors across the U.S., the challenge of material and structural safety due to corrosion and fracture is a continuing concern for the nuclear industry.

The objective of the program is to support Brendy Rincon Troconis, assistant professor of mechanical engineering, and Arturo Montoya, assistant professor of civil and environmental engineering, in becoming leading scholars in the field of stress corrosion cracking. They will receive enrichment opportunities in the three areas most commonly used to evaluate faculty performance: research, teaching, and service. They will also receive direct mentorship and support from Millwater and Heather Shipley, the Burzik Professor in Engineering and interim dean of UTSA's University College.

"Higher education is a competitive business, and it's important for faculty members and students alike to know that their university is invested in their success," said Millwater. "Strong development programs help UTSA attract and retain the nation's best scholars, and our students deserve to be trained by the nation's best teachers and researchers."

Fall 2017 Tech Symposium & Big Rowdy Idea Competition

Engineering innovation was on display during the 2nd annual fall Tech Symposium held Nov. 28, 2017, in the H-E-B University Center Ballroom. More than 30 student teams exhibited their senior design projects, which showcased their creative advances in engineering technology that they have been working on throughout their senior year. Additionally, five teams of business students competed in the Center for Innovation, Technology and Entrepreneurship's (CITE) Big Rowdy Idea Business Competition. The aim of the business model competition is to prepare participants to launch scalable entrepreneurial ventures while simultaneously pursuing their degree program or working at UTSA.

SENIOR DESIGN 2 OVERALL WINNERS

1st Place - Tool X-Roofing Clip Forming Machine, a machine designed to automate the production of roofing clips required for sheet metal roofs. Cory Monroe, Trent Marshall Hejazi, Joshua Parkman, Kristian Bounds

2nd Place - Nullam Ratio-UTSA Football Stadium. The team developed a design for a football stadium that includes traffic analysis, a flood study, structural analysis, geotechnical analysis, and environmental analysis. Angela Rivera, Jose A. Hernandez, Darcy Stephens, Fernando Royo, Abdulah Alissa, Denise Pyles

3rd Place - RS-Robotic Suitcase, a suitcase that will follow behind a user hands-free. Jonathan Neville, Andrew Frantzen, Bernardo Guerrero Garcia, Michael Hughes

CIVIL AND ENVIRONMENTAL ENGINEERING - SENIOR DESIGN 2

1st Place - Nullam Ratio-UTSA Football Stadium - Angela Rivera, Jose A. Hernandez, Darcy Stephens, Fernando Royo, Abdulah Alissa, Denise Pyles

2nd Place - JAME Star Engineering - Megan Amitrano, Aja Calderon, Eric Delgado, Jennifer Leigh Flores, Jordan Koskelin, Jonathon Landeros

3rd Place - Bix Six Engineering-McFarland Elementary - Travis Ortega, Rontez Manning, Mia Esposito, Seamus MacFarland, Ryan Kroll, Fahad Alissa

ELECTRICAL AND COMPUTER ENGINEERING - SENIOR DESIGN 2

1st Place -Virtual Reality Drone Control - Ruben Absedo

2nd Place-Smart Drop-Automated Shower - Edgar Perez, Roberto Bernal, Anthony Campos, Juan Perez

3rd Place-Intelligent Irrigation - Zachary Balcar, Benjamin Morgan, Mark Waclawiak

MECHANICAL ENGINEERING - SENIOR DESIGN 2

1st Place - Zero Elevation-Pneumatic Trailer - Michael Hernandez, Joel Longoria, Daniel Gonzalez, Tyler Clark

2nd Place - Promethius-Autonomous Golf Ball Picker - Cody Rose, Luis Martinez, Michelle Longsworth, Ali Kamal

3rd Place -Dynorunners-Formula SAE Dynamometer - Esteban Berenguer, Thomas Elliott, Rick Galvan, Brooke Megee

SENIOR DESIGN I POSTER OVERALL WINNERS

The Avo-Queros-Avacado Cutter - David Smith, Robert Brown, John Gould, David Berard

Schemata-Schemata Rover - Russell Wilson, Martin Plata Jr., Nathaniel Mireles, Fernest Lagneaux

MJMT Engineerin- Buffrs - Michael Ashiofu, Montgomery Bertschy, Jamie Perez, Tyler Landry

BIG ROWDY IDEA BUSINESS MODEL COMPETITION

1st Place - DNJ Solutions, a device to assist firefighters when operating a firehose. Nathaniel Mayberry, John Warden, Jaspreet Sidhu, Daniel Willis

2nd Place - Vertipro, a mobile app for vestibular rehabilitation therapy via augmented reality. Delano Covarrubias, Hayden Rosas, Jorge Pena, Austin Somlo, Alexander Lewis, Alexander Paul

3rd Place - Clutche Tech Ltd., a mobile app for food delivery in stadiums and arenas. Nicholas Ramos, Brett Davidoff, Kendall Nowlin, Matthew Mussenden


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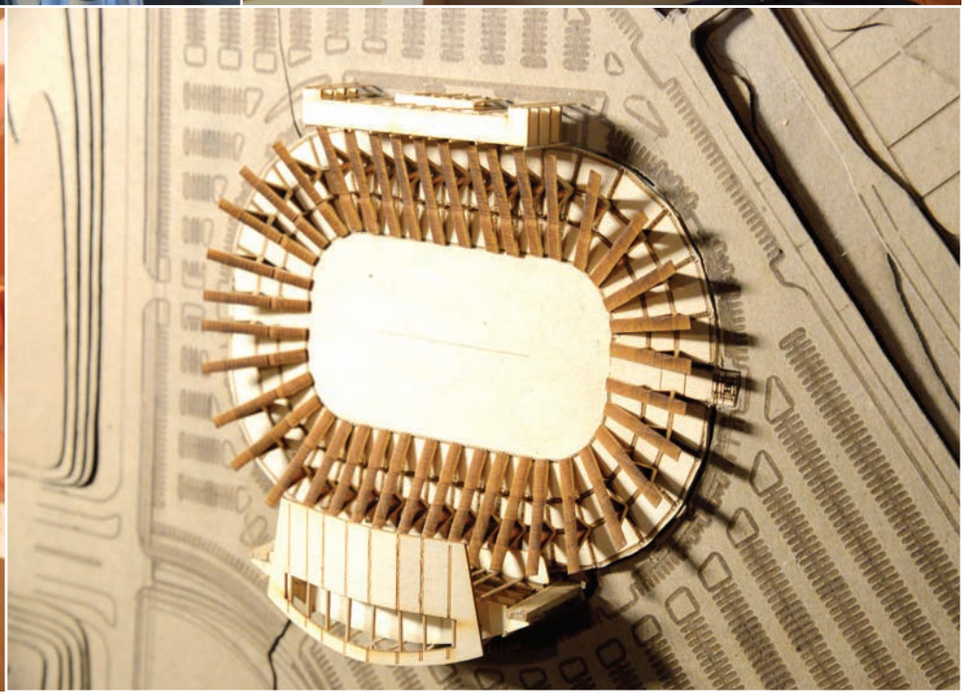
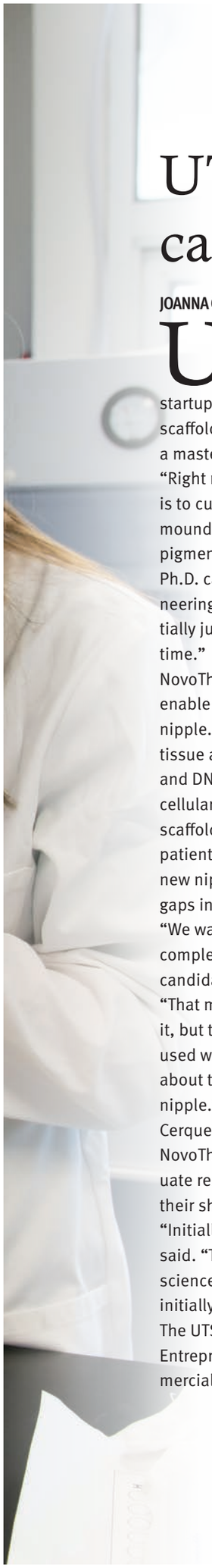


Bianca Cerqueira (left), biomedical engineering Ph.D. candidate at UTSA, and Lauren Cornell '12, a translational science Ph.D. candidate at UTSA, work in their laboratory at the San Antonio Technology Center. ***(Photo by Courtney Campbell/University Communications and Marketing)***



UTSA student startup helps breast cancer survivors regenerate nipples

JOANNA CARVER/UNIVERSITY MARKETING AND COMMUNICATIONS

UTSA graduate students Bianca Cerqueira and Lauren Cornell '12 are winning pitch competitions left and right with their new startup, NovoThelium, which uses bioengineered scaffolds to allow women to regenerate a nipple after a mastectomy.

"Right now, the best option for nipple reconstruction is to cut and suture the skin to create this little scar mound, which could then be tattooed for the desired pigmentation," said Cerqueira, a Ph.D. candidate in biomedical engineering. "But because it's essentially just scar tissue, it flattens over time."

NovoThelium, however, wants to enable women to recreate an actual nipple. They start with donor nipple tissue and process it to remove cells and DNA until it becomes an extracellular matrix scaffold. When the scaffold comes into contact with the patient's cells, she can regenerate a new nipple as it grows through the gaps in the scaffold.

"We want women to feel a sense of completeness," said Cornell, a Ph.D. candidate in translational science. "That may be an odd way of putting it, but this is the word most often used when women talk with us about their experience and why they would like a real nipple."

Cerqueira and Cornell's collaboration is unique in that NovoThelium did not develop as a result of their graduate research studies, but from a conversation about their shared family history of breast cancer.

"Initially we didn't know where to begin," Cerqueira said. "The biggest obstacle was that we both have science backgrounds, so the business aspects were initially a challenge for us."

The UTSA Center for Innovation Technology and Entrepreneurship (CITE) provided the pair with commercialization guidance and was also instrumental in NovoThelium receiving a $50,000 National Science Foundation grant that allowed them to develop their business model to better suit the market. In fall 2016, they won CITE's Big Rowdy Idea business model competition as well as three other pitch competitions, resulting in more than $60,000 in winnings in just one month. They were also named finalists in the prestigious Rice Business Plan Competition.

Lynda de la Viña, Peter Flawn Professor of Entrepreneurship and Technology Management, mentored the NovoThelium team in the development of their business plan and in rehearsing their pitch until it was flawless.

> "Bianca and Lauren's resilience and determination has really been something to behold. It was clear to me from the beginning that this was an idea that could really go far and have a tremendous positive impact on the lives of many people."
> - Lynda de la Viña, Peter Flawn Professor of Entrepreneurship and Technology Management

"Their resilience and determination has really been something to behold," de la Viña said. "It was clear to me from the beginning that this was an idea that could really go far and have a tremendous positive impact on the lives of many people."

The pair also received training from the Research Grant Proposal Program, led by the UTSA Graduate School, which helped them understand the process of applying for grant funding for their company. In the program, they learned how to write grant proposals, find the right sources of funding, and navigate the application process, among many other valuable lessons.

Cerqueira and Cornell are now based out of the San Antonio Technology Center, where they're using their funds to continue developing their scaffold. To further develop their business acumen, they've turned to the UTSA Small Business Development Center for guidance, where they received a wealth of free advice to support their company.

"I am most looking forward to seeing our first patient when she receives real nipples," Cornell said. "I think about that all the time. I just want to share that moment with her. I can't imagine a greater reward for our work than that."

Mikayla Rahman has spirit for biomedical engineering

Meet Mikayla Rahman. This UTSA Honors College student is balancing life as a biomedical engineering major and UTSA cheerleader.

Rahman was born in China and was adopted when she was 13 months old. That's when she moved to Colorado Springs to live with her new family. Rahman lived in Colorado for most of her life, but she knew she wanted to go to college out of state.

During her search for universities, she had two requirements for her future school: a well-known biomedical engineering program and an established cheer program. She discovered UTSA had both.

"I had a great experience during my visit. I fell in love with the campus and the culture of the city," said Rahman. "I knew right away that UTSA was the place for me."

Rahman joined the UTSA Honors College in Fall 2016 and had a full plate from the beginning. As a freshman, she took 17 credit hours, attended cheer practice every day, and was at football games almost every weekend.

"Being a cheerleader and in the biomedical engineering program can be stressful, but even though it's challenging, engineering is my passion," said Rahman. "At the same time, cheer is an outlet for me, and I enjoy it because it keeps me connected to campus."

Rahman's busy schedule doesn't stop there. She is also involved with student organizations on campus, such as UTSA VOICES, Society for Women in Engineering and the Biomedical Engineering Club.

Rahman is grateful for all the help and support she has received as a member of the Honors College.

"My adviser has truly been there for me every step of the way to navigate my degree and academic plan," said Rahman. "My professors have been great as well. They make sure that students get the most out of their classes and offer support when needed."

Based on her experiences, Rahman encourages future Roadrunners to invest their time and effort in the UTSA Honors College.

"I would tell them to go for it. When you join the Honors College, you find a new community of people at UTSA who share the same mindset and interests as you," said Rahman. "They are focused on academics and accomplishing their ultimate goal."

When Rahman graduates, she hopes to develop prosthetics that help children and wounded warriors in the military. Growing up less than 20 minutes from the Air Force Academy, the UTSA sophomore has always been inspired by the selflessness of military families and wants to help those heroes who need it.

"Seeing and hearing so many stories about military families and knowing how they give so much for us, I would love to be able to give something back to them one day using my degree from UTSA," Rahman said.

Photo by Deborah Silliman/College of Engineering

Engineering students chosen for all-star rugby team

Six members of the UTSA Rugby Club, including two mechanical engineering students, spent two weeks in New Zealand this past summer training and playing against some of the best rugby teams in the world. Mechanical engineering juniors Sean Lynch and Alex McCarty learned about the rare opportunity when a coach from New Zealand came to Texas to select an all-star team to compete worldwide.

"They held three major tryouts to find the best players in Texas, six of which ended up being UTSA players, the most chosen from any school," said William Wallace, UTSA Men's Rugby Club co-captain and president. Wallace said the all-star team met in various locations in Texas to practice before traveling to New Zealand.

Lynch, who started playing rugby in 2014, said that having the opportunity to travel to New Zealand was a truly life-changing experience.

"It was an honor to play rugby in the heartland of the sport," he said. "We got our butts kicked royally, but it didn't even matter. It was just an amazing experience to play against these world-class players on the other side of the world."

McCarty said that he enjoyed meeting new people and getting to see how the sport of rugby is treated in a different part of the world.

"Over there, rugby is like our football," he said. "You turn on the television and at least three channels are playing matches. We would walk around in our jerseys and people would come up to us for our autographs. It was a really interesting experience."

While rugby is not as well known in the United States, it's one of the most popular sports in New Zealand. The UTSA players trained with professional athletes and competed against several top New Zealand teams. They also toured the entire north island and experienced the country's culture.

Lynch and McCarty both said engineering and rugby are similar in the fact that to succeed in either one, you need support from your teammates.

"Engineering and rugby are really both team efforts," said McCarty. "Both require teamwork and support, and it isn't possible to be successful at either one if you try to go at it alone."

First-generation college student Deon Ford, a sport, event and tourism management major, learned about the Rugby Club during Late Night at the Rec in his freshman year. Now entering his senior year at UTSA, he's grateful to have shared this opportunity with his Roadrunner teammates.

"The greatest part of UTSA Rugby Club is the bond we will always have as brothers," Ford said. "The passion and heart when you are not just playing for yourself but the team as well."

Lynch also says the Rugby Club helps him in the classroom.

"My experience on the rugby team helps me stay awake and energetic for my academic days," Lynch said. "It keeps me from falling into robotic habits every day, just going to class and back."

Photo by Deborah Silliman/College of Engineering

Memorandum of understanding signed with Technical University-Darmstadt in Germany

UTSA signed a memorandum of understanding in October to begin an exchange program with Technical University-Darmstadt in Germany. The memorandum signing is part of a greater mission between the City of San Antonio and the City of Darmstadt to build cultural and educational bridges through a sister-cities agreement. The UTSA College of Engineering's Student Success Center is currently looking into a possible study abroad student exchange with Darmstadt in the coming years.

"We are thrilled that UTSA is partnering with TU-Darmstadt," said Jill Ford, assistant dean of the College of Engineering's Student Success Center. "The possibility of an exchange program opens up so many possibilities for our students to visit and gain a new engineering perspective outside of the United States. Studying abroad in a city like Darmstadt would give them a unique perspective on the engineering problems they come across in the classroom."

The exchange agreement encompasses student mobility, joint faculty projects, collaborative research, and academic cooperation between the two universities. UTSA and TU-Darmstadt have similar profiles in enrollment, academics, and research. Additionally, UTSA and TU-Darmstadt have the top cybersecurity programs in the United States and Germany, respectively.

"Partnerships such as this exchange agreement with TU-Darmstadt are critical to UTSA's commitment to being a world-engaged institution," said Interim Provost and Vice President for Academic Affairs Mauli Agrawal. "For the benefit of our students and community, we must cooperate and collaborate across borders and across oceans to address the complex challenges of the future."

UTSA representatives Agrawal and René Zenteno, vice provost for international initiatives, had the opportunity to visit the FraunHofer Secure Information Technology research institute, a German research organization with 69 institutes throughout Europe and seven centers in the U.S.

"As we prepare our students for a global workforce, exchanging ideas and expertise with some of the best of the best around the world is an exciting opportunity for UTSA," Zenteno said. "This partnership will also support UTSA in becoming a globally recognized university."

The city and university agreements align with the city's economic development strategy, while strengthening cultural and educational ties.

"This is a groundbreaking agreement between the University of Texas at San Antonio and Technical University – Darmstadt that will bring a new level of global literacy to the next generation of leaders," San Antonio Mayor Ron Nirenberg said. "Specifically, the memorandum of understanding will broaden educational exchanges with the prestigious research university and increase opportunities for exploring educational best practices that will lead to international collaboration."

Engineering students study, complete certificate at Shanghai, China, university

Six UTSA engineering students spent 22 days this past summer studying at the Shanghai University of Electric Power in Shanghai, China. In addition to the study abroad students, UTSA attendees included student mentor and UTSA Engineering alumna Brandy Alger, Ph.D. student John Parsi, and Chair of the Electrical and Computer Engineering Department CJ Qian. At the end of the study abroad session, the UTSA students presented their final projects to their classmates and representatives from Shanghai University of Electric Power including University Administrator Professor Li, officials from the International Exchange and Cooperation Offices Professors Zeng and Wang and their staffs, Dean of the College of Automation Engineering Dr. Yang, and seven local students who took part in Qian's class. All UTSA students who took part in this study abroad received their certificates for completing Programmable Logic Controllers (PLC) training.

Colombian engineering students, UTSA engineering students trade places in exchange initiative

This past summer, ten engineering students from Universidad EAN in Bogotá, Colombia, made San Antonio their home, and seven UTSA engineering students made Bogotá theirs.

As part of the 100,000 Strong in the Americas Initiative, a U.S. Department of State program aimed at increasing opportunities for academic mobility between the U.S. and other countries in the Western Hemisphere, the Colombian students dedicated two weeks to learning about engineering practices in the U.S. and experiencing life as UTSA students. At the same time, a group of UTSA engineering students had the chance to experience life as a Colombian engineering student when they traveled to South America and studied for two weeks at Universidad EAN.

The two universities collaborated to draft a proposal for the initiative and won a $25,000 grant to create an exchange program.

"We were thrilled to have the students from Universidad EAN at UTSA," said UTSA Office of International Programs Executive Director Lisa Marie Gomez. "To be selected for the 100,000 Strong Initiative underscores UTSA's commitment to internationalization and growing global competitiveness."

The Obama Administration in 2011 created the 100,000 Strong Initiative for universities that demonstrate the greatest commitment and innovation toward increasing study opportunities between the U.S. and countries in the Western Hemisphere.

"The main goal here is to get students motivated to broaden their perspective, learn how to work with people from different cultures, and for students to see how they can work together to achieve common goals," said Marjorie Maia, international officer for Universidad EAN.

A typical day for the Colombian students consisted of attending a customized English class provided by the Office of ESL Services with a focus on engineering-specific terms. Afterward, they attended engineering courses on soil contamination and sustainability. The UTSA engineering students had a similar experience when they traveled to Bogotá - they took specialized Spanish-language courses and also attended a soil contamination and sustainability class with UTSA professor Sazzad Bin-Shafique and a Universidad EAN professor.

The Colombian students had the opportunity to see what UTSA has to offer, including a campus environment they don't have at home.

"Campus life here teaches you an independence I haven't had before," said student Camila Zuluaga. "Here, I've had a complete experience. It's been extremely interesting to see what life is like in another country, to see how people here study and how they live."

In Bogotá, attending university in a city with 10 million people doesn't provide the same atmosphere a student gets at a U.S. university, said Alberto Uribe, a Universidad EAN professor.

"I had one student tell me she felt like she was in a Hollywood movie," Maia said.

The UTSA engineering students who traveled to Colombia also got to go out and explore Bogotá and a number of other cities in the country.

"I most enjoyed experiencing Colombia with our Colombian classmates and friends," said UTSA engineering student Kasai Omar. "From trying new dishes at Casa Vieja to biking through the center of Bogotá, each new story was made better by the Colombian students who took the time to share them with us. The representative from EAN, Marjorie, was a wonderful guide for us as well; we could not have done the trip without her."

But the exchange is much more than a travel adventure. It's an opportunity to develop skills and ideas.

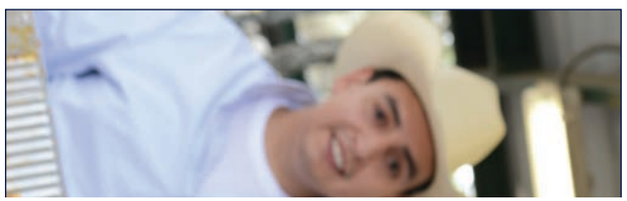
"To me, my experience at UTSA has helped in the sense of networking with other professionals in our fields. Being here helps you recognize some of the problems your country faces and how to tackle them in a way we might not have thought of before," said Colombian student Nicolas Sarmiento.

Like UTSA international programs leadership, Uribe said he, too, hopes this exchange can be a stepping-stone to future collobrations. The engineering class was chosen because it's the newest department at EAN. Others at the university have already expanded their internationalization efforts. The partnership with UTSA's team was an ideal match.

Uribe added, "We wanted to bring the engineering students to the same level as the other students at our university so we're looking forward to exploring other possibilities of cooperation with UTSA."

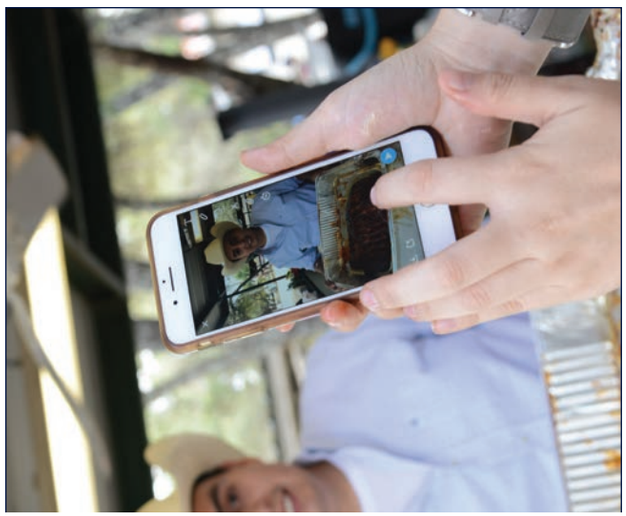
UTSA students who participated in the Colombia exchange included Emmanuel Rubio Perez, Karina Rangel, Javier Guerrero, Kasai Omar, Seamus MacFarland, Mazen Batooq, and Katrina Estrada.

MONSTER MASH PUMPKIN SMASH



ENGINEERING TAILGATE

BBQ COOKOFF



Photos by Deborah Silliman/College of Engineering

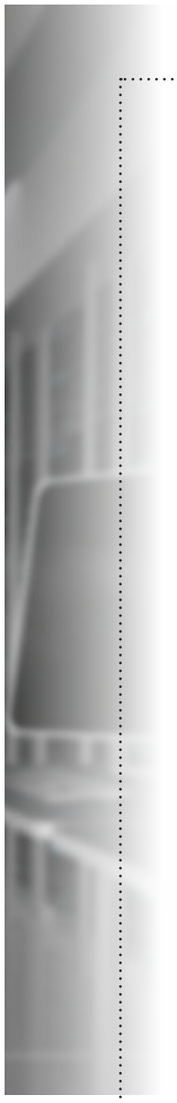
UTSA RECEIVES $5 MILLION TO SUPPORT NEW CYBERSECURITY EDUCATION PIPELINE

JOANNA CARVER/UNIVERSITY MARKETING AND COMMUNICATIONS

UTSA has received a five-year, $5 million grant from the National Science Foundation to create a multidisciplinary center fostering education and research at the intersection of cybersecurity and cloud computing. The Center for Security and Privacy Enhanced Cloud Computing (C-SPECC) will act as a pipeline to create well-trained professionals in the industry and strengthen San Antonio as a cybersecurity hub. Four UTSA colleges – engineering, science, education and business – will join the center which is led by Ravi Sandhu, Lutcher Brown Endowed Professor of computer science and founding executive director of the UTSA Institute for Cyber Security. Other lead researchers include Ram Krishnan, associate professor of electrical and computer engineering and Microsoft President's Endowed Professor; Jeff Prevost, assistant professor of electrical engineering; Nicole Beebe, associate professor of information systems and cybersecurity and Melvin Lachman Distinguished Professor in Entrepreneurship; and Guadalupe Carmona-Dominguez, associate professor of interdisciplinary learning.

Cloud computing allows computer-processing resources and data to be shared on-demand on internet-ready devices using privately owned clouds or public cloud providers. The practice, which offers consumers simplicity, affordability and reliability, has grown quickly over the last decade. Security and privacy, however, remain a concern among researchers and other industry experts. Additionally, well-trained and innovative professionals are needed to strengthen the industry and take on the hundreds of thousands of unfilled industry jobs in the U.S.

"For nearly two decades, UTSA has been a national leader in cybersecurity, a dynamic field that requires an equally nimble approach from academia, government, and industry," said UTSA President Taylor Eighmy. "Creating a place where UTSA can expand its cybersecurity focus and apply its vast expertise to cloud computing will enable the university to make meaningful contributions with a practical impact. The center will also give UTSA students an unparalleled learning opportunity to conduct



research alongside the university's nationally recognized experts in cyber, cloud, computing, and analytics."

The goals of C-SPECC are to become nationally recognized for excellence in research and innovation in secure cloud computing, to increase participation among underrepresented minorities in high-tech computing and to pursue innovative, research-based educational strategies for high school and college students.

To accomplish these goals and expand UTSA's role as an urban-serving university, the center will participate in an innovative UTSA-Northside Independent School District (NISD) partnership that broadens the university's cybersecurity recruitment to the high school level. Through C-SPECC, the UTSA College of Education and Human Development will offer certificate programs to NISD teachers and students, who will become known as "C-SPECC Scholars."

In the certificate programs, the NISD teachers will expand their understanding of cybersecurity and cloud computing and learn how to teach it to high school students. Each semester, UTSA will offer a new course for teachers to keep their educational approaches as fresh as possible to reflect the constantly growing and changing fields of cybersecurity and cloud computing.

High school students from NISD will be recruited to study cybersecurity and cloud computing at C-SPECC. The outreach program will give the teens an opportunity to try on security-related careers, engaging them as they consider areas of study to pursue in college and embark on college preparedness paths. These C-SPECC Scholars will participate in certificate programs that are tailored for their education level and will help build their interest and understanding of cybersecurity and cloud computing.

Four schools within NISD will participate: Business Careers High School, Earl Warren High School, William Howard Taft High School, and John Marshall Harlan High School. UTSA will work with these schools to offer local industry internships and foster mentorships with leaders in cybersecurity and cloud computing, expanding the pipeline of local talent prepared for cybersecurity careers and strengthening San Antonio as a cybersecurity hub.

"Research estimates that the world will have 1.5 million unfilled cybersecurity jobs by the year 2020," said Sandhu. "In addition to leading research at the intersection of cloud computing and cybersecurity, C-SPECC will play a critical role in attracting more youth to the profession. If we want to fill 1.5 million jobs, we need to begin recruiting smart kids and giving them the opportunity to experience a security career first hand."

Rackspace, a San Antonio-based managed cloud provider, will recruit students from C-SPECC for internships and part-time employment and participate in coding "hackathons" to promote interest in the field.

"The importance of information in business, society and our personal lives will only continue to become more important. From financial or personal information to autonomous vehicles, businesses must be prepared to protect information and critical systems," said Dave Neuman, Rackspace's chief information security officer. "It's critical to have the right people in place to help implement and strengthen a business' security plan, which is why we're excited UTSA has recognized this critical need for talent and invested in C-SPECC to help educate and train students as San Antonio becomes a hub for industry-leading cybersecurity experts."

The National Institute of Standards and Technology and NSS Labs, an Austin-based security testing and analysis company, will similarly partner with C-SPECC.

In addition to its community engagement mission, C-SPECC will focus on shaping the theories and standards that advance secure cloud computing through academic and research programs in cloud computing protection, detection and policy technologies. Over time, these UTSA contributions will advance the way businesses, consumers, and governments utilize the cloud as it evolves.

UTSA first identified cybersecurity as an area of strategic importance in 2001 and has since made considerable investments to grow its academic and research programs in security. Alumni have secured jobs with industry, government, and military employers such as Amazon, Microsoft, Rackspace, USAA, Raytheon, Booz Allen, the National Security Agency, and the U.S. Army.

The Institute for Cyber Security opened the university's first cloud computing research laboratory in 2008, which focused on sponsored research in secure cloud computing. In 2015, UTSA founded the Open Cloud Institute to support cloud computing and big data research and development. The 80/20 Foundation supported the launch of the institute with $4.8 million to support endowed professorships, faculty research positions, graduate student endowments, and research funding. The institute's researchers are helping the international business community improve its computing platforms through open-source hardware and cloud as well as big data technologies such as Open Compute, OpenStack, and Software Defined Networks.

That same year, the U.S. Department of Homeland Security awarded UTSA a $10 million grant to develop cybersecurity information-sharing standards to facilitate collaboration between the private sector and the government. The creation of the UTSA Information Sharing and Analysis Organization is promoting secure, rapid, and widespread information-sharing that helps organizations detect and block increasingly sophisticated cyber threats, through the UTSA Center for Infrastructure Assurance and Security.

Today, UTSA is home to the nation's leading cybersecurity program, according to a nationwide survey conducted by the Ponemon Institute. The university's unique approach includes researchers in business, science and engineering who work in multiple centers and institutes focused on solving global security challenges in today's increasingly technological world.

Clean Energy

Researchers at UTSA have begun work on five new research initiatives to enhance clean energy production/integration, improve air quality, and reduce greenhouse gas emissions through the Strategic Alliance between the Texas Sustainable Energy Research Institute (TSERI) and CPS Energy. The alliance was originally established in 2010. The new projects are supported by agreements with CPS Energy which total close to $1.5 million.

The Texas Sustainable Energy Research Institute was founded by UTSA in 2010 to leverage UTSA's diverse knowledge in energy and related areas, and to position San Antonio as a significant contributor to the 21st century global energy economy. The institute integrates scientific discovery, engineering innovation, and policy deliberations with pragmatic implementation and a commitment to multicultural traditions to realize the promise of tomorrow's America as a global energy leader.

"The work underway in our Texas Sustainable Energy Research Institute is a source of immense pride," said JoAnn Browning, dean of the UTSA College of Engineering. "This is an exciting time for energy research. Our faculty are pursuing innovative and creative projects that I'm certain will have a lasting impact on the world around us. I am so grateful to the leadership of TSERI Director, Dr. Krystel Castillo, and Associate Dean of Research, Dr. Harry Millwater, to help solidify this partnership."

Krystel Castillo, who is also the GreenStar Endowed Associate Professor in Energy, is facilitating the research endeavors of these five new projects representing five UTSA colleges.

The first is led by Hazem Rashed-Ali, UTSA associate professor of architecture, and includes professors Roger Enriquez, John Merrifield, Keith Muhlestein, Francine Romero, Hatim Sharif, and Rob Tillyer, who represent four UTSA colleges. Supported by a $500,000 agreement, Rashed-Ali and the team are partnering with the City of San Antonio to address climate change by developing a local plan to improve air quality and reduce greenhouse gas emissions. This new plan involves extensive research into reduction strategies that are working for other cities, community engagement approaches that will build a sense of shared goals, and input from San Antonio's citizens. The project aims to set local goals for greenhouse gas reduction, further positioning San Antonio as a leader in clean energy initiatives.

The second project, supported by a $356,631 collaboration, is an effort to create smart buildings that can actively talk to battery energy storage systems and power grids. Researchers will develop a system to gather information about energy consumption, solar energy generation, battery status, and occupancy behavior, and have buildings operate at a high energy efficiency while maintaining indoor thermal comfort. The project has the potential to reduce customer energy bills, create more stable grid performance, and enable the deployment of additional renewable energy initiatives. Bing Dong, UTSA assistant professor of mechanical engineering, is leading this project, which includes Castillo and Jeff Xu.

In the third project, supported by a $199,690 agreement, UTSA professors are working to prevent cyber attacks from

Paula Gold-Williams (center), president and chief executive officer of CPS Energy, presented a check to TSERI and the CPS Energy Strategic Alliance during the Equinox Festival held on UTSA Main Campus fall 2017.

TSERI launches five innovative projects to support clean energy, climate action

affecting smart grids using a forensics-driven approach. Raymond Choo, UTSA associate professor of information systems and cybersecurity, and Paul Rad, UTSA associate professor of information systems and cybersecurity, will lead this effort to track perpetrators of attempted cyber attacks against smart grids. The team will integrate forensics and machine learning approaches, which will allow the utility to discover the location, cause, perpetrator, time, and method of the attack. The team will also facilitate the integration of forensics tools into systems that can help the organization recover from a cyber-physical attack.

In the fourth project, researchers led by Samer Dessouky, UTSA professor of civil and environmental engineering, are harvesting alternative power from roadways. The team consists of Arturo Montoya, Athanassios Papagiannakis, Hatim Sharif, Amar Bhalla, Ruyan Guo, and Shuza Binzaid. This project received $298,881. Dessouky's team has created two prototypes for the project. The first uses the energetic mechanical strain induced by traffic. The second harvests energy from the heat of the asphalt. Both prototypes have a conversion module that converts energy into a stream of electric voltage that can be stored in a capacitor. The overarching aim of the project is to produce a clean and practical alternative source of power.

Finally, students led by Walter Richardson Jr., UTSA professor of mathematics, and Les Shepard, McDermott Distinguished Chair in Engineering, will apply machine learning to improve solar forecasting at the CPS Energy Joint Base San Antonio (JBSA) microgrid. Their goal is to enhance management of solar power generation and energy storage. The project, which is offically named the UTSA Sky-Imager, received $113,432 in funding. It's a low-cost computing and camera system that provides for real-time image acquisition and processing of all-sky images. These are used to forecast intra-hour "ramp" events, which occur when low-level cumulus clouds cast shadows on the solar panels and drastically reduce power output. Accurate prediction of ramp events will allow JBSA to more efficiently manage energy generation, storage, and usage.

"The fundamental start to any advancements in technology begins with research. We understand, to be a leader, we must embrace new opportunities," said Paula Gold-Williams, CPS Energy's president and CEO. "We are excited to partner with TSERI and are confident that the result of their hard work will be an innovative game changer in the energy industry. We are fortunate to have a progressive resource in this field in our very own community."

UTSA is also working with CPS Energy on opportunities for internships and employment, with the goal of preparing UTSA students for transition into jobs in the energy and sustainability fields.

"We truly value the opportunity to provide internships to local students," said Gold-Williams. "I'm humbled to know the future leaders of this company can come in at such a young age and get a head start on what is a complex industry. We welcome interns with open arms and are committed to providing them with all the support they need."

Recovery Research

Engineering researcher to study waterways contaminated by Hurricane Harvey damage

BY MONICA SIERRA/COLLEGE OF ENGINEERING

Vikram Kapoor, assistant professor in the Department of Civil and Environmental Engineering, has been awarded a Rapid Response Research (RAPID) grant from the National Science Foundation to research microbial contaminants along smaller towns in southeast and lower central Texas waterways following Category 4 Hurricane Harvey. The storm, which made landfall in Texas in late August, caused unprecedented damage to wastewater infrastructure, leading to 2 million pounds of contaminants to be released into the environment. More than 800 wastewater treatment plants reported spills and several oil refineries and chemical plants, along with a dozen toxic waste sites, were flooded or damaged.

"The research will provide urgent and critical information on microbiological water quality in the aftermath of a natural disaster," said Kapoor. "This project will directly impact multiple sectors of the water protection community like recreational-water monitoring, drinking-water utilities, and beach closures/advisories by providing them with better means to identify fecal sources, evaluate human health risk, and implement remediation strategies."

RAPID grants are awarded to research proposals focusing on projects with severe urgency regarding quick-response research on natural disasters. Kapoor was awarded $79,277 to study the mobilization and transport of microbial contaminants along Texas waterways, and he began his research in early September, just one week after Harvey made landfall.

"Our research seeks to understand the extent of wastewater releases during Hurricane Harvey and monitor human exposure to pathogens," Kapoor said. "We will test the hypothesis that sewage overflows and storm water runoff from Harvey have released high levels of potentially pathogenic organisms into Texas waterways. These circumstances pose a serious risk to human and environmental health via waterborne disease outbreaks, deterioration of recreational and drinking water quality, and degradation of aquatic ecology. This could cause some dreadful long-term effects on Texas, which now with the help of this RAPID grant, my team and I will have the opportunity to study."

Kapoor's team consists of environmental engineering Ph.D. student Duc Phan, environmental engineering graduate students Indrani Gupta and Tanvir Pasha, and geology undergraduate student Adrianne Lopez.

The release of these contaminants can pose a threat to humans in the areas affected by the storm, as seen by the two cases of bacteria-related infections that were traced back to the floodwaters from Hurricane Harvey, one of which ended in the death of a 77-year-old Kingwood woman.

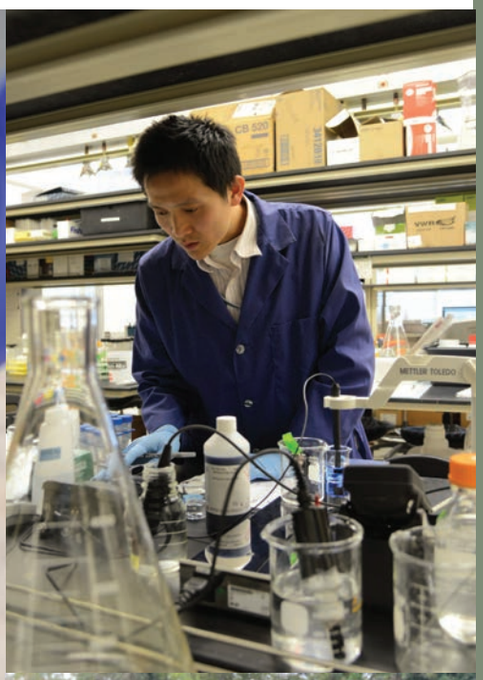
"Our research looks to build a predictive framework for assessing wastewater contamination following severe flooding," said Kapoor. "The information attained from this project will give the science community a deeper understanding of the transportation of pathogens that are released after flash floods, and hopefully this will lead the country to be better prepared for a future catastrophic event."

One of the pathogens Kapoor will be monitoring in his research is called *Vibrio vulnificus*, which lives in the Gulf Coast waters and kills 1 in 7 people it comes in contact with. This pathogen can lead to necrotizing fasciitis, a flesh-eating disease that can be deadly.

"Our team will evaluate the presence, abundance, and fate of fecal indicator bacteria, human mitochondrial DNA, and selected human pathogens, like *Vibrio spp.*, in flood-impacted surface waters," said Kapoor. "This will lead to better understanding of fecal source tracking as well as the use of human mtDNA as a direct measure to identifying sources of fecal contamination."

Kapoor's team consists of environmental engineering Ph.D. student Duc Phan, environmental engineering graduate students Indrani Gupta and Tanvir Pasha, and geology undergraduate student Adrianne Lopez.

Environmental engineering graduate students Indrani Gupta and Tanvir Pasha take water samples from the Guadalupe River just outside of Seguin, Texas, this past fall.



TOP: Environmental engineering Ph.D. student Duc Phanin works in Kapoor's lab where the team does water research. MIDDLE: Vikram Kapoor (left), assistant professor in the Department of Civil and Environmental Engineering, talks with Indrani Gupta (far right) and Tanvir Pasha on the banks of the Guadalupe River as they collect samples for Kapoor's National Science Foundation's RAPID grant research. BOTTOM: Samples from nine locations around Texas are placed in a deep freeze so that they can be studied at a later date.

(Photos by Deborah Silliman/College of Engineering)

Research Awards

It is UTSA's vision to be a premier public research university, providing access to educational excellence and preparing citizen leaders in the global environment. We are proud of all of our faculty and students who are striving to reach research excellence in UTSA's path to becoming a leading research institution. Listed here are the projects awarded between May 1, 2017 and Dec. 1, 2017.

Appleford, Mark (PI)
Dept. of Biomedical Engineering
Proposal Title: Your World - Dual Enrollment COE
Funding Agency: University of Texas at Austin 721
Amount: $28,000

Benavidez, Patrick (PI) Jamshidi, Mohammad (Co-PI)
Dept. of Electrical and Computer Engineering
Proposal Title: Loitering Alert System for Automated Teller Machine (ATM) Vestibules
Funding Agency: Bank of America N.A.
Amount: $131,825

Bhalla, Amar (PI) Guo, Ruyan (Co-PI)
Dept. of Electrical and Computer Engineering
Proposal Title: Conference Support for the Fourteenth International Meeting on Ferroelectricity
Funding Agency: National Science Foundation
Amount: $6,000

Cao, Yongcan (PI)
Center for Excellence in Engineering Education
Proposal Title: Human-Inspired Decision Making for Swarm Robots
Funding Agency: U.S. Dept. of the Navy
Amount: $507,388

Castillo Villar, Krystel (PI)
Open Cloud Institute (OCI)
Proposal Title: Cloud-based Data Analytics To Support Sustainable Clean Energy Production
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000

Chen, Fengshan (PI) Wan, Hung-Da (Co-PI)
Center for Advanced Manufacturing and Lean Systems (CAMLS)
Proposal Title: Support of Process Improvement Program in Air Force 149th Mission Support Group
Funding Agency: U.S. Dept. of the Air Force
Amount: $22,000

Engineering faculty member named Innovator of the Year

Excellence in research and discovery recognized at UTSA Innovation Awards

The University of Texas at San Antonio recognized engineering professor Bing Dong as its 2017 Innovator of the Year at its fifth annual Innovation Awards. His selection was based on a number of factors including the launch of his startup, grant awards, I-Corps participation, and licensing of his numerous technologies. Dong earned his Ph.D. at Carnegie Mellon University. Before joining UTSA in 2013, he was a senior research scientist at United Technologies Research Center. His current research interests include building energy modeling, intelligent building operation, occupant behavior in buildings, and buildings-to-grid integration towards smart community and city. His lab, Built Environment Science and Technology (BEST), is interdisciplinary, combining mechanical engineering, artificial intelligence, electrical engineering, and social science research. In 2017, he received the UTSA Faculty Research Award for Highest Funding as Principal Investigator (assistant professor category) and a Distinguished Service Award from the International Energy Agency. He has published one book, six book chapters, and over 50 journal and conference papers. Additionally, UTSA recognized 29 other members of its research community. Organized by the UTSA Office of Commercialization and Innovation, these annual awards are presented in four categories, reflecting UTSA's success at commercializing new knowledge and technologies.

"Our goal is to cultivate a research-intensive environment where our faculty and students can flourish and their research contributions have meaningful impact societally," said Bernard Arulanandam, interim UTSA vice president for research.

Bing Dong, assistant professor in the Department of Mechanical Engineering, was named 2017 UTSA Innovator of the Year.

Chen, Qian (PI)
Center for Excellence in Engineering Education
Proposal Title: RIA:Towards Realizing a Self-Protecting Healthcare Information System for the Internet of Medical Things
Funding Agency: National Science Foundation
Amount: $280,221

Choo, Kim-Kwang (PI) Najafirad, Peyman (Co-PI)
Texas Sustainable Energy Research Institute
Proposal Title: Smart Grid Security and Attack Resiliency: A Forensics-driven Approach
Funding Agency: City Public Service
Amount: $399,218

Dessouky, Samer (PI)
Department of Civil Engineering
Proposal Title: Simplified Approach for Structural Evaluation of Flexible Pavements at the Network Level
Funding Agency: Louisiana State University
Amount: $17,000

Dessouky, Samer (PI) Guo, Ruyan; Binzaid, Shuza; Papagiannakis, Athanassios; Montoya Rodriguez, Arturo; Bhalla, Amar; Sharif, Hatim (Co-PIs)
Texas Sustainable Energy Research Institute
Proposal Title: A Hybrid Integrated Sensing and Energy Conversion (HISEC) System For Harvesting Mechanical and Thermal Energy from Roadways
Funding Agency: City Public Service
Amount: $596,986

Dessouky, Samer (PI) Ahmed, Sara (Co-PI)
Department of Civil Engineering; Department of Electrical and Computer Engineering
Proposal Title: CONNECT: Promoting Sustainability and Safety for Texas Rural Roadways Through Self-Powered Sensing And Detection Systems
Funding Agency: UTSA VPR Office
Amount: $50,000

Dessouky, Samer (PI) Sharif, Hatim (Co-PI)
Department of Civil Engineering
Proposal Title: Technical Assistance Agreement Between UTSA and City of San Antonio-Traffic Study
Funding Agency: City of San Antonio
Amount: $50,000

Dessouky, Samer (PI) Papagiannakis, Athanassios (Co-PI)
Department of Civil Engineering
Proposal Title: Development of a Self-Powered Structural Health Monitoring System ROR Transportation Infrastructure
Funding Agency: Louisiana State University
Amount: $69,000

Dong, Bing (PI)
Department of Mechanical Engineering
Proposal Title: Marriott Strategic Data Analysis and Management Project
Funding Agency: Marriott International Inc.
Amount: $48,957

Dong, Bing (PI)
Department of Mechanical Engineering
Proposal Title: An Open Source Proactive Energy Management System (PEMS) for Integrated Control of Energy Storage and Solar Powered Buildings
Funding Agency: Leaptran Inc.
Amount: $45,000

Dong, Bing (PI) Castillo Villar, Krystel; Xu, Jeff Qiang (Co-PIs)
Texas Sustainable Energy Research Institute
Proposal Title: An Open Source-based Proactive Energy Management System (PEMS) for Integrated Control of Battery Energy Storage System (BESS) and Solar-Powered Buildings
Funding Agency: City Public Service
Amount: $701,288

Duan, Lide (PI)
Open Cloud Institute (OCI)
Proposal Title: Designing Power Efficient Data Centers With High Quality Cloud Services
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000

Gao, Wei (PI)
Department of Mechanical Engineering
Proposal Title: GREAT: Advanced Materials Based on Two-dimensional Building Blocks - Computational Design Based on Chemistry and Topology
Funding Agency: UTSA VPR Office
Amount: $20,000

Gatsis, Nikolaos (PI) Akopian, David; Taha, Ahmad (Co-PIs)
Center for Excellence in Engineering Education; Department of Electrical and Computer Engineering
Proposal Title: CIF: Small: Integrated Framework for Detection and Mitigation of GPS Spoofing Attacks in Smart Grids
Funding Agency: National Science Foundation
Amount: $399,934

Ghannoum, Wassim (PI) Matamoros, Adolfo (Co-PI)
Department of Civil Engineering
Proposal Title: Decision-oriented Column Simulation Capabilities for Enhancing Disaster Resilience of Reinforced Concrete Buildings
Funding Agency: National Institute of Standards and Technology
Amount: $798,892

Ghannoum, Wassim (PI) Diaz, Manuel (Co-PI)
Department of Civil Engineering
Proposal Title: (PS 18-28) Evaluating Bridge Behavior Using Ultra-High Resolution, Next-Generation Digital Image Correlation (DIC): Applications in Bridge Inspection and Damage Assessment
Funding Agency: Texas Department of Transportation 601
Amount: $419,432

Giacomoni, Marcio (PI) Shipley, Heather (Co-PI)
Department of Civil Engineering
Proposal Title: Implementation of a Low Impact Development Test Bed on The University of Texas at San Antonio Main Campus
Funding Agency: San Antonio River Authority
Amount: $1,069,113

Guda, Teja (PI)
Dept. of Biomedical Engineering
Proposal Title: GREAT: Scaffolds with Soft Zones for Bone Regeneration
Funding Agency: UTSA VPR Office
Amount: $20,000

Hallam, Cory (PI)
Center for Innovation, Technology and Entrepreneurship (CITE)
Proposal Title: NovoThelium: Nipple Regeneration for Breast Cancer Survivors
Funding Agency: National Science Foundation
Amount: $50,000

Hallam, Cory (PI)
Center for Innovation, Technology and Entrepreneurship (CITE)
Proposal Title: IC2 Interagency Cooperation Contract - SEAL 2017
Funding Agency: University of Texas at Austin 721
Amount: $3,000

Hallam, Cory (PI)
Center for Innovation, Technology and Entrepreneurship (CITE)
Proposal Title: UT-UTSA MOU - Faculty Engagement
Funding Agency: University of Texas System 720
Amount: $7,444

Hallam, Cory (PI) Guda, Teja (Co-PI)
Department of Information Systems and Cyber Security; Department of Biomedical Engineering
Proposal Title: NSF I-Corps Site Renewal Grant
Funding Agency: National Science Foundation
Amount: $299,820

Hood, Robert (PI)
Center for Simulation, Visualization and Real Time Prediction (SiViRT)
Proposal Title: GREAT: An Improved Cystoscopic Approach for 3D Imaging of Intrabladder Cancers
Funding Agency: UTSA VPR Office
Amount: $20,000

Kapoor, Vikram (PI)
Department of Civil Engineering
Proposal Title: RAPID: Mobilization and Transport of Microbial Contaminants Along Texas Waterways Following Hurricane Harvey
Funding Agency: National Science Foundation
Amount: $79,277

Kapoor, Vikram (PI) Johnson, Drew (Co-PI)
Department of Civil Engineering
Proposal Title: Tracking the Primary Sources of Fecal Pollution in the Recharge and Contributing Zones of Edwards Aquifer in Bexar County, Texas, using Molecular Tools
Funding Agency: San Antonio River Authority
Amount: $692,452

Lee, Wonjun (PI)
Open Cloud Institute (OCI)
Proposal Title: The Machine Learning-based Immune System for Containerized Cloud Computing
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000

Matamoros, Adolfo (PI) Testik, Firat (Co-PI)
Department of Civil Engineering
Proposal Title: Coastal Bridges Under Hurricane Stresses Along the Texas and Louisiana Coast
Funding Agency: Louisiana State University
Amount: $60,000

Mayer, Kathryn (PI)
Center for Simulation, Visualization and Real-Time Prediction (SiViRT)
Proposal Title: Gold Nanoparticles for Radiation Therapy Enhancement and CT Image Contrast

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Funding Agency: San Antonio Medical Foundation
Amount: $103,750
Millwater, Harry (PI)
Open Cloud Institute (OCI)
Proposal Title: Fleet Management and Efficiency Improvements - Extensions to the SMART|DT Software
Funding Agency: U.S. DOT Federal Aviation Administration
Amount: $480,000
Millwater, Harry (PI)
Open Cloud Institute (OCI)
Proposal Title: Digital Twin Big Data and High-performance Computing in the Cloud
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000
Montoya Rodriguez, Arturo (PI) Rincon Troconis, Brendy; Millwater, Harry; Shipley, Heather (Co-PIs)
Department of Civil Engineering, Department of Mechanical Engineering
Proposal Title: Faculty Development Program at the University of Texas at San Antonio: Probabilistic Risk Assessment of Stress Corrosion Cracking in Nuclear Facilities
Funding Agency: U.S. Nuclear Regulatory Commission
Amount: $450,000
Najafirad, Peyman (PI)
Open Cloud Institute (OCI)
Proposal Title: Cyber Physical Threat Hunting Using Crowd IoTs and Advanced Data Analytics
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000
Papagiannakis, Athanassios (PI)
Department of Civil Engineering
Proposal Title: Evaluation Of Comparative Damaging Effects Of Multiple Truck Axles For Flexible Pavements
Funding Agency: Louisiana State University
Amount: $60,000
Prevost, John (PI)
Open Cloud Institute (OCI)
Proposal Title: Technical Application: Cloud-based IoT Edge Framework for Real-time Control of Remote Agents
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000
Qian, Chunjiang (PI)
Center for Excellence in Engineering Education
Proposal Title: Network Control for Nonlinear Systems in Smart Energy Applications
Funding Agency: TaiHuai Smart Industry Co.
Amount: $14,700
Rao, Hejamadi (PI) Krishnan, Ramnarayan (Co-PI)
Department of Information Systems and Cyber Security; Department of Electrical and Computer Engineering
Proposal Title: NSF Student Travel Grant for 2017 Secure Knowledge Management Workshop (SKM)
Funding Agency: National Science Foundation
Amount: $12,142
Rashed-Ali, Hazem (PI) Sharif, Hatim; Tillyer, Robert; Romero, Francine; Enriquez, Roger; Merrifield, John; Muhlestein, Keith (Co-PIs)
Texas Sustainable Energy Research Institute
Proposal Title: City of San Antonio Climate Action and Adaptation Plan
Funding Agency: City Public Service
Amount: $500,000
Richardson, Walter (PI) Shephard, Les (Co-PI)
Texas Sustainable Energy Research Institute
Proposal Title: Using Machine Learning to Improve Intra-Hour Prediction of Solar Irradiance and Ramp Events in the CPS Microgrid At JBSA
Funding Agency: City Public Service
Amount: $216,633
Rincon Troconis, Brendy (PI)
Department of Mechanical Engineering
Proposal Title: Effect of Passive Film Composition on the Electrochemical Behavior and Cracking of Corrosion Resistant Alloys Utilizing Surface Enhanced Raman Spectroscopy
Funding Agency: NACE International
Amount: $30,000
Rincon Troconis, Brendy (PI)
Department of Mechanical Engineering
Proposal Title: CONNECT: Effects of Triazine-based H2S Scavenger Byproducts on the Film Composition and Cracking of Carbon Steel in Oilfield Applications
Funding Agency: UTSA VPR Office
Amount: $50,000
Sandhu, Ravinderpal (PI) Krishnan, Ramnarayan; Carmona-Dominguez, Guadalupe; Beebe, Nicole; Prevost, John (Co-PIs)
Institute for Cyber Security (ICS); Cyber Center for Security and Analytics (CCSA) Open Cloud Institute (OCI)
Proposal Title: CREST: Center for Security and Privacy Enhanced Cloud Computing (C-SPECC)
Funding Agency: National Science Foundation
Amount: $5,000,000
Saygin, Can (PI) Wan, Hung-Da (Co-PI)
Center for Advanced Manufacturing and Lean Systems (CAMLS)
Proposal Title: Incorporating Lean-Six Sigma Methodologies into the Institute for Integration of Medicine and Science - Phase 2
Funding Agency: University of Texas Health Science Center at San Antonio 745
Amount: $50,000
Shadaram, Mehdi (PI)
Dept. of Electrical and Computer Engineering
Proposal Title: Summer Engineering Camp for High School Students
Funding Agency: Texas Higher Education Coordinating Board 781
Amount: $11,727
Sharif, Hatim (PI)
Open Cloud Institute (OCI)
Proposal Title: Prediction of Crash Incidence and Severity on Texas Roadway
Funding Agency: University of Texas at San Antonio Open Cloud Institute
Amount: $30,000
Sharif, Hatim (PI) Dessouky, Samer; Weissmann, Jose (Co-PIs)
Department of Civil Engineering
Proposal Title: Reducing Traffic Crashes at Road Construction Access Points
Funding Agency: Texas Department of Transportation 601
Amount: $298,509
Sharif, Hatim (PI) Dessouky, Samer (Co-PI)
Department of Civil Engineering
Proposal Title: Relationship between Road Network Characteristics and Traffic Safety
Funding Agency: Louisiana State University
Amount: $50,000
Shipley, Heather (PI) Montoya Rodriguez, Arturo (Co-PI)
Department of Civil Engineering
Proposal Title: Graduate Fellowship Program in Nuclear Safety: Critical Thinking, Research Skills and Professional Development
Funding Agency: U.S. Nuclear Regulatory Commission
Amount: $399,351
Taha, Ahmad (PI) Giacomoni, Marcio; Gatsis, Nikolaos (Co-PIs)
Department of Electrical Engineering; Department of Civil Engineering
Proposal Title: Collaborative Research: Cherry-Picking Sensors and Actuators for Topologically Evolving Networked Dynamical Systems: Battling Contamination in Water Networks
Funding Agency: National Science Foundation
Amount: $299,974
Taha, Ahmad (PI) Qian, Chunjiang; Bhounsule, Pranav (Co-PIs)
Department of Electrical Engineering; Department of Mechanical Engineering
Proposal Title: Control Systems Education and Outreach to Low-Income High-school Students in San Antonio
Funding Agency: Arizona State University
Amount: $10,000
Testik, Firat (PI)
Department of Civil Engineering
Proposal Title: RAPID: Hurricane-driven Beach Sand Sorting from Dune to Shoreline: The Case of Hurricane Harvey
Funding Agency: National Science Foundation
Amount: $38,662
Wang, Xiaodu (PI)
Department of Mechanical Engineering
Proposal Title: Supplement to Multiscale Modeling of Ultrastructural Origins of Bone Fragility
Funding Agency: National Science Foundation
Amount: $8,000
Ye, JingYong (PI)
Dept. of Biomedical Engineering
Proposal Title: Noninvasive Detection of Prostate Cancer with a Label-Free Imaging System
Funding Agency: National Institutes of Health
Amount: $354,617
Ye, JingYong (PI) Nash, Kelly (Co-PI)
Department of Biomedical Engineering; Department of Physics and Astronomy
Proposal Title: Establish Advanced Photoacoustic Imaging Facility at UTSA
Funding Agency: U.S. Department of Defense
Amount: $312,356

In remembrance

Roadrunner's legacy lives on through UTSA scholarship

Former UTSA student Eric Hernandez was just 22 when he died in a car accident. To honor his legacy, his parents established a scholarship in his memory.

By Yvonne Zamora Byrd/Operations and Advancement Services

It was Christmas Eve 2013 when the lives of Laura and Gus Hernandez were turned upside down. At just 22-years-old, their son Eric, a junior at UTSA, was killed in a head on collision. In those early moments of grief, the couple decided to turn the tragedy into an opportunity to help others.

"I decided that I wanted to do something to make my son proud," said Mrs. Hernandez. "I wanted something good to come out of this."

Eric was the youngest child and only son born to the Hernandezes. He was a young man with many interests who played various musical instruments, such as six string bass guitar and the ukulele. He was also a Mexican Folkloric dancer for 17 years. Described as a kind-hearted and soft spoken young adult, Eric majored in mechanical engineering at UTSA.

Eric Hernandez

Following their son's memorial service, the Hernandezes established the Eric Daniel Hernandez Memorial Scholarship at UTSA. With the scholarship, they hope to help engineering students achieve their dreams while preserving the memory of their son. Awarded annually in the amount of $1,500, the scholarship has already helped four students, including Alex Wright, a senior studying mechanical engineering.

"I met Laura and Gus at a UTSA scholarship event. I could tell how much they loved helping me and other students complete our education," said Wright. "I only hope I can be worthy of the charity the family has shown me. I hope someday to be financially stable enough myself to do the same for a student in need."

To ensure the future of the scholarship, the duo hosts fundraising events. Recently Mrs. Hernandez decided to make a planned gift to the UTSA College of Engineering, by allocating a percentage of her life insurance to the scholarship. This will provide enough gift funding to permanently endow the scholarship, ensuring the legacy of her son will live on even after she's gone.

"We're not rich, we're just regular people who want to help," said Mrs. Hernandez. "I hope that when these students go on and become successful, a little piece of Eric goes with them."

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Live, In-Studio

UTSA Department of Civil and Environmental Engineering faculty members Adolpho Matamoros, Peter T. Flawn Distinguished Professor, and Hatim Sharif, professor, are interviewed live, in-studio on the KENS 5 news set about the flooding and rebuilding taking place after Hurricane Harvey. KENS 5 Emmy award-winning anchor Deborah Knapp also asked the engineering faculty members about the logistics of rebuilding and what types of engineering jobs might crop up as a result.