

Innovations



THE UNIVERSITY OF TEXAS AT SAN ANTONIO COLLEGE OF ENGINEERING

VOL. 19 | SPRING 2015

Congratulations

to our first class of biomedical engineering undergraduates

UTSA.Engineering

COLLEGE OF ENGINEERING

Dean
JoAnn Browning

Associate Dean for Research and Graduate Studies
Harry Millwater

Associate Dean for Student Affairs and Policies
Mark Appleford

Assistant Dean
Kirstin Wilsey

Director of Development
Lindsay Land

Communications Coordinator
Innovations Managing Editor
Deborah Silliman Wolfe

Contributors
KC Gonzalez, Rebecca Esparza,
Ruben Asebedo

Associate Vice President for
Communications and Marketing
Joe Izbrand

Executive Director of University Communications
Christi Fish

Mailing Address
The University of Texas at San Antonio
College of Engineering
One UTSA Circle
San Antonio, TX 78249

Visit us on the web
engineering.utsa.edu



ON THE COVER

Twenty biomedical engineering undergraduate students walked across the stage at commencement this spring. This marked the first graduating class from the program. The members of the inaugural undergraduate biomedical engineering class had an average class GPA of 3.53. (Photo by Deborah Silliman Wolfe/College of Engineering)





Students in Pranav Bhounsule's mechatronics class participate in the Battling Rowdy Bot Contest earlier this spring. Bhounsule, an assistant professor in the Department of Mechanical Engineering, teaches the upper-level mechanical engineering class, which educates students about sensors, motors and microprocessors and how they are integrated together to develop electro-mechanical systems. In the Battling Rowdy Bot Contest, a four-student team built and programed a mobile robot with the prime objective of pushing their opponents' robot out of the arena. "The students get a kick out of the contest; each team wants to outsmart their opponent team," Bhounsule said. "This captivates their interest and drives them to learn and apply the concepts taught in the course." To watch a video of the robots in action visit tiny.cc/pranavb_rowdybot

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When Ender Finol was a young child growing up in Venezuela, he never dreamed he'd one day be at the forefront of pioneering research that could save lives. "I knew I would be an engineer one day, since my father was a professor of mechanical engineering, but I never thought I'd be where I am today," he said...

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The National Institutes of Health recently awarded a \$1.08 million grant to Yufei Huang, professor in the UTSA College of Engineering Department of Electrical and Computer Engineering, and Jianqiu (Michelle) Zhang, associate professor in the UTSA Department of Electrical and Computer Engineering, to develop new bioinformatics tools to study mRNA methylation and breast cancer...



Elnakat chosen to help manage San Antonio's growth

Long-time San Antonio residents can remember a time not so long ago when pastures and wildflowers filled what is now The University of Texas at San Antonio Texas Main Campus. The city's sprawl should not be surprising to locals who have seen the growth first-hand — San Antonio was the fastest-growing of the top 10 largest cities in the United States from 2000 to 2010. In preparation for future growth, the City of San Antonio has put together SA Tomorrow — a planning effort to guide the city toward smart, sustainable growth. Afamia Elnakat, associate professor of research at the UTSA Texas Sustainable Energy Research Institute, has been chosen by the city to serve as a chair on the SA Tomorrow steering committee.

"San Antonio is expected to receive over 1 million additional people by 2040," said Elnakat. "The SA Tomorrow approach is unique in that it includes feedback from everyone — citizens to local institutions — to address issues of importance to the entire community including transportation, jobs, housing, air and water quality, and energy efficiency."

A three-pronged planning effort, SA Tomorrow will encompass a Comprehensive Plan update, a Sustainability Plan, and a Multi-modal Transportation Plan, all focused on addressing the challenges and opportunities associated with adding one million people to San Antonio by 2040.

"UTSA is one of the partnering agencies that was invited to provide feedback to better align our growth master planning with the region," said Elnakat. "More people coming to San Antonio means potentially more students coming to UTSA. For UTSA, managing our growth and infrastructure is part of this growth opportunity."

Jamshidi leads UTSA portion of \$5M grant

The United States Air Force has awarded a \$5 million grant to fund a research team which will establish "Testing, Evaluation and Control of Heterogeneous Large-scale Autonomous Vehicles (TECHLAV)" as a Research Center of Excellence in Autonomy. This is a joint project between The University of Texas at San Antonio, North Carolina A&T State University, and the Southwestern Indian Polytechnic Institute. Dr. Mo Jamshidi, Lutcher Brown Endowed Distinguished Chaired Professor of Electrical and Computer Engineering at UTSA, will be leading UTSA's research, "Modeling, Analysis and Control of Autonomous Vehicles." The five-year project will expand the use of autonomous vehicles, such as drones, to a larger and more diverse scale.



Shipley recognized by OUR

The Office of Undergraduate Research (OUR) awarded Dr. Heather Shipley, associate professor and chair of the Department of Civil and Environmental Engineering, the annual Faculty Service to Undergraduate Research and Creative Inquiry Award at the spring Undergraduate Research and Creative Inquiry Showcase. She received this award for her ongoing commitment to undergraduate researchers at UTSA.



Browning selected as Purdue Distinguished Women Scholar

Dr. JoAnn Browning, dean of the College of Engineering at The University of Texas at San Antonio, has been selected as a Purdue University Distinguished Women Scholar for 2015-2016. The awards program, led by Purdue's Office of the Provost in partnership with Purdue University's Susan Bulkeley Butler Center for Leadership Excellence, honors alumnae who earned a Purdue doctorate and have made significant scholarly contributions to their academic communities.

ASEE-GSW Section Meeting hosted by UTSA

UTSA College of Engineering hosted the 2015-American Society for Engineering Education-Gulf Southwest (ASEE-GSW) Section meeting earlier this spring at the historic Menger hotel in downtown San Antonio, Texas.

"The theme of this year's conference, Challenges Facing Engineering Education, was particularly appropriate because at UTSA, the College of Engineering has experienced rapid growth in the past several years," said Ricardo Romo, UTSA president. "The college is expected to continue to grow to meet the growing needs for engineers in our communities."

The conference allows those engaged in the practice of educating future engineers to share ideas and best practices to improve the overall educational experience for students.

"I am confident that participation in this conference will help promote collaboration and innovation in engineering education," said JoAnn Browning, dean of the College of Engineering. "We aspire to better our profession with this conference by promoting excellence in instruction, research, public service, and practice, and it is an honor for the College of Engineering at UTSA to be hosting our colleagues from around the region."

Two COE faculty inducted to UTSA Academy of Distinguished Researchers

Sos Agaian, Peter T. Flawn Professor, Department of Electrical and Computer Engineering, and Rena Bizios, Peter T. Flawn Professor and Director of the Cellular and Tissue Engineering Laboratory, Department of Biomedical Engineering, have been inducted into The University of Texas at San Antonio's newly established Academy of Distinguished Researchers.

The purposes of the Academy are to honor outstanding faculty who exemplify excellence in research; to foster a culture of exceptional research practices at UTSA; and to create a collective of faculty advocates who can serve as a resource for their colleagues.

The Academy is intended to mirror the Academy of Distinguished Teaching Scholars, which was established in 2012 to uphold exceptional teaching practices. Similarly, promoting the very highest quality of research and scholarly activity supports the university's educational mission, said John H. Frederick, provost and vice president for academic affairs.

"Learning takes place at all levels of the university—from our first-year students to our senior faculty," said Frederick. "For many of our faculty, being actively engaged in discovery and innovation in their disciplines is part of what makes them such effective teachers."

The charter members were selected by the UTSA Research Advisory Board for the demonstrated academic impact of their research and scholarly activity. Academic impact might include publications in leading journals, citation counts and access counts, academic ranking,



Rena Bizios, Peter T. Flawn Professor and Director of the Cellular and Tissue Engineering Laboratory, Department of Biomedical Engineering



Sos Agaian, Peter T. Flawn Professor, Department of Electrical and Computer Engineering

editorship or other involvement in peer-review journals, appointments to leadership positions in professional societies, conference invitations, and patents awarded, among other measures. New inductees will be chosen and recognized each year.

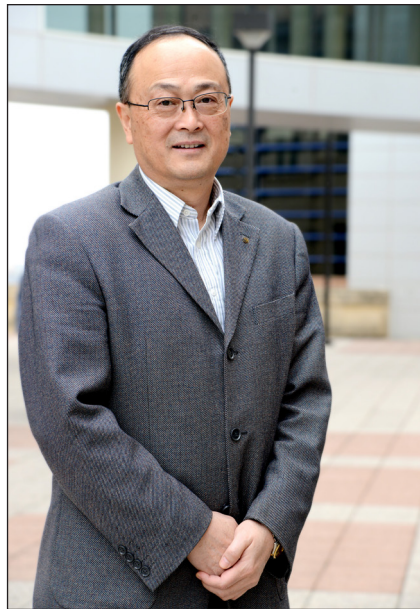
"UTSA has many, many outstanding researchers, and the inaugural class of the Academy of Distinguished Researchers exemplifies the outstanding research being conducted at the university," said C. Mauli Agrawal, vice president for research. "Each of the faculty who were selected as charter members are accomplished scholars who share the university's vision of being a premier public research university."



Heather Shipley, civil and environmental engineering associate professor and holder of the Burzik Professorship in Engineering Design, has been named the chair of the Department of Civil and Environmental Engineering.

new department chairs named

Hai-Chao Han, mechanical engineering professor, has been named the Zachry Endowed Chair and department chair of the Department of Mechanical Engineering.



Wang elected to AIMBE's College of Fellows

Dr. Xiaodu Wang, professor in the Department of Mechanical Engineering, has been selected to be part of the American Institute for Medical and Biological Engineering's (AIMBE) College of Fellows.

"It is a great honor for me to be elected to the AIMBE College of Fellows, which is a prestigious recognition of my contribution in the field of biomedical engineering," said Wang. "I am so excited to join the group of great scientists and engineers in the endeavor of advancing the research and innovations in the field."

According to the AIMBE website, fellows are nominated each year by their peers and represent the top 2 percent of the medical and biological engineering community. They are considered the life-blood of AIMBE and work towards realizing AIMBE's vision to provide medical and biological engineering innovation for the benefit of humanity. Since AIMBE's inception, more than 1,500 esteemed individuals have been inducted to AIMBE's College of Fellows. AIMBE's College consists of clinicians, industry professionals, academics, and scientists who have distinguished themselves through their contributions in research, industrial practice and/or education. Fundamental to their achievements is the common goal of embracing innovation to improve the healthcare and safety of society.

"Dr. Wang has contributed extensively to published literature in the form of journal and conference papers, books and chapters in addition to making critical contributions to the biomechanics of bone by investigating the interaction of collagen and calcium phosphate mineral at the microstructural and ultrastructural levels," said Dr. Mauli Agrawal, vice president for research at The University of Texas at San Antonio. "His mark in the medical and biological engineering field is indelible and he is highly worthy of recognition as an AIMBE Fellow."



IIE award to Chen

F. Frank Chen, Professor and Lutchter Brown Distinguished Chair in the Department of Mechanical Engineering,

has been awarded the Institute of Industrial Engineers' Lean Teaching Award for 2015 offered by IIE's Lean Division for the remarkable work he has been doing to advance the knowledge and practice of lean concepts. The lean division's teaching award is given out annually to honor the services of a person/group of people who have developed curriculum and disseminated courses in the subject area.



National Geographic photographer visits with COE students

The College of Engineering was a co-sponsor in bringing National Geographic photographer Annie Griffiths to UTSA this spring. In addition to speaking to the entire campus community, Griffiths took the time to meet with a number of the College of Engineering's female students to discuss what an important impact female engineers can make in society. In addition to being one of the first female photographers at National Geographic, Griffiths is also the executive director of a non-profit organization that is helping to provide solutions to women in the developing world. Many of the projects involve bringing clean water and energy security to lift whole communities out of poverty.



COE's Bing Dong (middle) with graduate students Gaellen McFadden (left) and Rome Edward (right).

UTSA engineers tapped to improve Marriott's energy efficiency

Marriott International, an industry leader in energy conservation efforts, is partnering with The University of Texas at San Antonio (UTSA) to help it reach its current environmental goal of reducing energy and water consumption (on an intensity basis) by 20 percent throughout its approximately 1,200 managed properties by 2020.

Over the last few decades the lodging industry has become increasingly focused on reducing its energy use and environmental impact. Hotels rely on energy to maintain their operations, and investing in new and innovative energy management tools is allowing many hotel companies to make significant reductions in energy and water use, operating costs and utility bills.

Through the new partnership, UTSA will help Marriott improve its hotels' ability to collect and analyze utility data in real-time and in turn make immediate energy-saving adjustments on-site.

Bing Dong, assistant professor of mechanical engineering and Texas Sustainable Energy Research Institute affiliated faculty member, has developed a proprietary tool and software to capture, model and analyze real-time occupant behavior and energy consumption data. The tool helps users quickly identify ways to increase energy efficiencies.

Using these findings, Dong and his graduate student team will evaluate Marriott's current energy systems and processes and recommend a method to capture data from multiple sources into a single database that provides timely and detailed performance feedback through visualization. They will also create a communication strategy to help motivate hotel employees to conserve energy. UTSA professor of architecture Taeg Nishimoto is also involved in the project.

"We are very excited to be working with UTSA and Bing's team to improve our energy conservation processes at Marriott so that we can accomplish our long term goals for reducing our global energy footprint."

- Robert Bahl, vice president of engineering and facilities
Marriott International

Pack speaks at international drone competition

Daniel Pack, professor and chair of the Department of Electrical and Computer Engineering, recently gave a speech on the topic of cooperative unmanned aerial vehicles

to an international audience at the 2015 Drones for Good Competition in Dubai, United Arab Emirates. In addition to being plenary speaker for the event, Pack served as a judge for the competition where more than 800 teams from all around the world competed for a \$1M prize.

"The judging experience was wonderful," said Pack. "We evaluated technical, presentation, and demonstration areas for each team submission. There were judges for three different categories (governmental, national, and international) and I served as one of five judges for the governmental category."

There were more than 800 team submissions, but event organizers conducted a set of evaluations before the event so there were total of more than 30 teams who actually presented and competed at the 2015 International Competition. According to dronesforgood.ae, the competition is dedicated to rewarding the most promising prototypes of future services that may benefit humanity at large. The goal of the international competition is to highlight the most advanced research into UAVs and drones and accelerate their application in humanitarian, development, and public service applications.



UTSA announces creation of Open Cloud Institute

The University of Texas at San Antonio has announced the creation of the Open Cloud Institute, an initiative to develop degree programs in cloud computing and big data and foster collaboration with industry, positioning UTSA and San Antonio as world leaders in open cloud technology. The Open Cloud Institute is administered out of the College of Engineering, with the intention to provide ample opportunities for engineering, business, and science faculty and students to participate in charting future UTSA open cloud computing research and education.

"We are thrilled to know the college played a major part in establishing the institute and look forward to working with the institute in making UTSA a world renown leader in open cloud computing," said Daniel Pack, chair of the Department of Electrical and Computer Engineering. "With its broad and strategic partnerships with industry and government agencies, the institute will enable our students and faculty to engage in solving the most challenging and relevant cloud computing research problems of our society. As the faculty incorporates the research problems and technologies to solve those problems into engineering curricular, we expect that UTSA will become and will be known as the place to obtain the avant-garde cloud computing education in the world."

Through the 80/20 Foundation and other industry supporters, the Open Cloud Institute will launch with initial gifts and in-kind investments of \$9 million. The foundation has committed \$4.8 million to support four endowed professorships, up to two faculty research positions, 10 graduate student endowments, and research funding.

Additionally, UTSA has received in-kind donations from industry leaders such as Rackspace, AMD, Intel, Mellanox Technologies and Seagate, and support from the Open Compute Project and the OpenStack Foundation. The investment re-affirms industry's belief that UTSA is the nation's academic leader in open

cloud computing education and research.

"By recruiting the nation's most sought-after scholars, UTSA has developed tremendous expertise in cloud, cyber, computing and analytics. The Open Cloud Institute further builds on that strength," said UTSA President Ricardo Romo. "With the support of our industry partners, UTSA students and researchers now have unparalleled opportunities to collaborate on projects that will lead to new innovations in this dynamic field."

UTSA is already recognized as the top university in the country for cybersecurity education, with education and research programs that span its College of Business, College of Engineering, and College of Sciences. The Open Cloud Institute further distinguishes UTSA as a top-tier research institution.

"UTSA is the nation's academic leader in cloud computing education with its innovative cloud computing programs in three different colleges, pioneering faculty, and intentional pedagogical strategies to engage students. The industry and government partnerships the institute brings will further strengthen the cloud computing education at UTSA," said Pack.

The Open Cloud Institute will actively engage with industry partners such as Rackspace and others to facilitate technology transfer and provide a platform for industry projects in next-generation cloud technology.

"As adoption of cloud computing accelerates, the next industry that will get to harness this powerful and complex resource is academia. This will allow for increased innovation in scientific research and help to solve some of society's grand challenges," said Graham Weston, chairman at 80/20 Foundation and Rackspace. "UTSA is emerging as a global leader in academic research built upon open technologies. The Open Cloud Institute will enhance UTSA's capabilities, while boosting the supply of cloud engineers that all of our businesses need in order to power the technology companies of the future."





Castro Cybersecurity Amendment elevates level of university

Congressman Joaquin Castro (TX-20) introduced two cybersecurity amendments this spring that both unanimously passed the House of Representatives. The first amendment elevates the profile of The University of Texas at San Antonio (UTSA) and highlights the cybersecurity work being done there. The second amendment makes self-assessment tools available to small and medium-sized businesses for determining their cybersecurity readiness.

"The city of San Antonio and UTSA are national cybersecurity leaders," said Rep. Castro. "These amendments elevate the great work being done in our city and help communities and businesses across the country strengthen their cyber defenses. I'm proud of San Antonio's growing role in keeping America's digital assets safe."

Rep. Castro's first amendment gives the Secretary of the Department of Homeland Security (DHS) authority to formally establish the UTSA-led National Cybersecurity Preparedness Consortium within DHS. The consortium will address unique issues related to cybersecurity on the state and local level, serving as the lead entity within DHS for cybersecurity training and technical assistance for states and local first responders and officials.

UTSA cyber defense team goes to nationals

The University of Texas at San Antonio Collegiate Cyber Defense Competition team won the Southwest Regional and advanced to the National Collegiate Cyber Defense Competition (NCCDC), which took place this spring in San Antonio.

"Electrical engineering student Mark Pena was extremely successful in securing our linux machines, bringing in his own scripts to automate fixes to known vulnerabilities and configuration of security toolkits," said Nicole Beebe, team faculty advisor and Associate Professor of Information Systems and Cyber Security. "No Linux machines were ever compromised."

The teams were tasked with protecting computer networks against the same type of real-world cyber threats that are infiltrating major retailers, corporations, social networks and financial institutions today. Students from more than 180 colleges and universities from across the country are competing in various regional tournaments. The UTSA team was one of the ten regional winners who advanced to compete in the two-day national competition.

"As the presenting sponsor of the National Collegiate Cyber Defense Competition, Raytheon is very committed to helping our country meaningfully increase the number of young men and women who can protect the vital computer networks that our government agencies, private sector companies and frankly all organizations depend upon so much," said Dave Wajsgas, president of Raytheon Intelligence, Information and Services. "Our partnership in support of NCCDC includes providing our own cyber security professionals and technology to give the students real practical experience."

Wajsgas added, "The need for the cyber security talent is real and growing based upon Raytheon's own research which, indicates that roughly two-thirds of commercial and government organizations need more knowledgeable and experienced professionals to protect their networks."



RACE to EXCELLENCE

UTSA engineering students win Freescale Cup Car Racing Competition

By Ruben Asebedo/College of Engineering

A trio of engineering students from The University of Texas at San Antonio (UTSA) won the first place in The Freescale Cup USA Central Regional Finals competition held at Texas State University on April 11, 2015. This win advanced the team to the USA National Final that was held at the Rochester Institute of Technology, New York on May 2, 2015.

"I was really excited to see our efforts [to build a smart car demonstrated] in motion and paying off, in addition to [an opportunity to see] the products produced by all the other colleges," said Patrick Stockton, a student member of the UTSA Cup car team. "Work between the team was very fluid and was a major factor in being able to take first at Central Regionals. It's been a great way for students like us to become familiar with embedded systems and control."

The Freescale Cup Challenge began in 2003 when 80 teams of students competed at Hanyang University in Korea. The competition has grown considerably since then, and now takes place at campuses across the world. According to the Freescale Cup website, the "spirit of the competition is that students demonstrate excellent hardware integration and superior programming."

"All of the teams begin the build with about the same basic kit to design the car, which includes a small, plastic race car body and wheels," explains Bob Applonie, student and chief programmer for the UTSA Cup car team. "Assembling the Cup car was not too hard of a task, but what set our car apart was its ability to assess different situations, and adapt based on conditions we programmed onto the microcontroller board."

Applonie continues on to explain if the team's car was met with a steep incline on the course, it could

read whether the wheel motors have come to a stop and then apply a greater current to them.

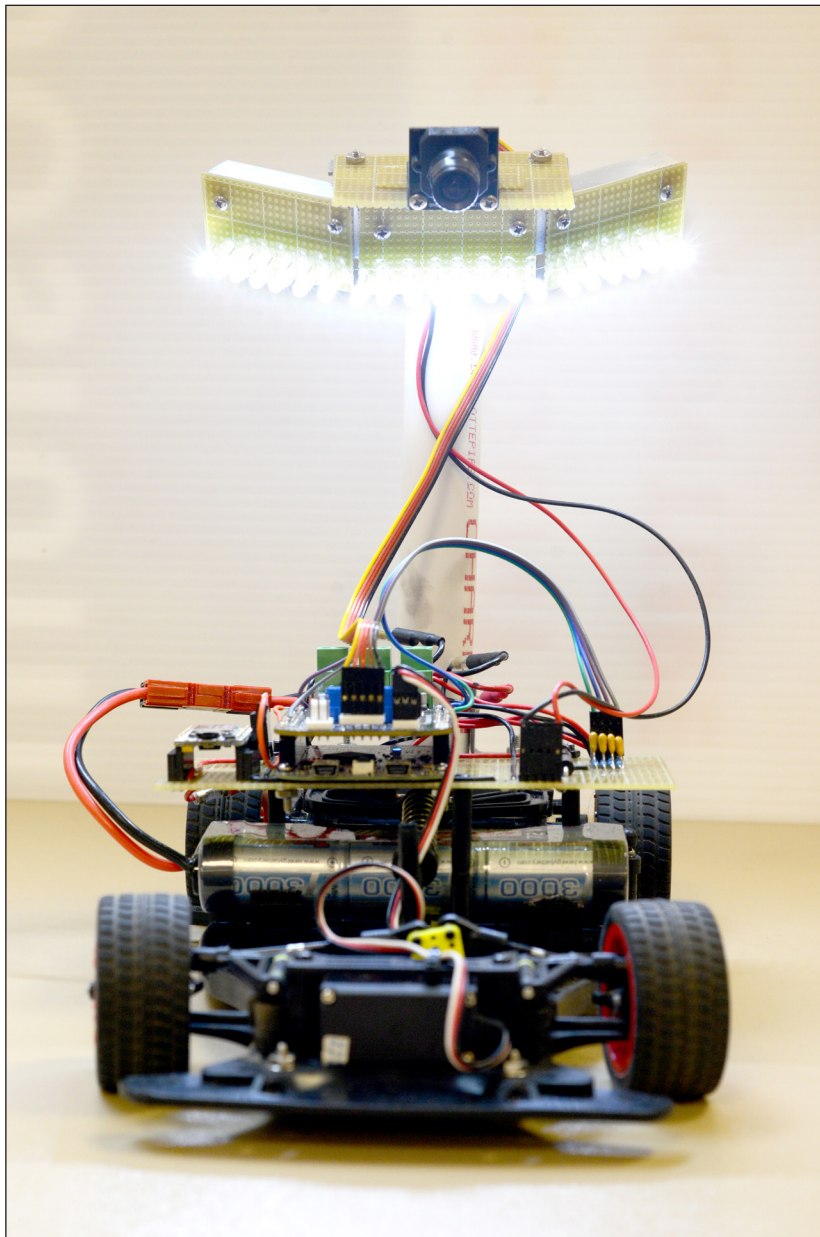
"It again reads whether this level of current made a difference, and if it stays at a standstill, [it] will continue to exponentially increase drive power," he adds.

This spring, all of the UTSA Freescale Cup team members took Microcomputers II instructed by Paul Morton, lecturer III with the Department of Electrical and Computer Engineering. Throughout the course, Dr. Morton extensively covers the FRDM-KL25Z microcontroller board to demonstrate hands-on use with embedded controls.

The FRDM-KL25Z microcontroller is a small, credit card-sized circuit board produced by Freescale Semiconductor, Inc. that can be programmed through a laptop or computer to do a number of tasks such as powering LED lights, running motors, or reading information from a small camera. All of these tasks were used to run the Frees-

cale Cup car throughout the competition.

The Freescale Cup cars are built with the Freescale FRDM-KL25Z microcontroller board set in the center of the plastic housing of the race car, which is then programmed through a computer to make the car move and turn on its own without using a remote control. The KL25Z board (the small computer built into the car) is then also programmed to run the car autonomously and follow a black line that spans the length of the race track. This black line is recognized by the Line Scan Camera that faces toward the front of the car and discerns whether it should continue forward or veer left/right to maintain a view of the guide line. How fast each team can accomplish this with their car around a pre-built track determines the winner of the competition.





EWB recognized for work in Peru

The University of Texas Engineers Without Borders student organization received a Distinguished Service Award this spring at the Texas Partners of the Américas Gala for their work in of Vina Vieja, Peru, for their work in Peru to facilitate the construction of a reliable, locally sourced water system owned and operated by the residents.



Doc student places in research competition

Biomedical Engineering doctoral student Mirunalini Thirugnanasambandam won 2nd place in the doctoral portion of the Ready, Set, Research! Competition held April 3, 2015. Six colleges and 25 programs were represented in the competition, where students are challenged to present their research in 3 minutes or less. Thirugnanasambandam presented her research Rupture risk of Abdominal Aortic Aneurysms.

Ph.D. candidate wins 1st at ASEE-GSW

Hossein Roshani, Ph.D. candidate in the Department of Civil and Environmental Engineering, won the first place Graduate Student Paper Award at the 2015 annual meeting of American Society of Engineering Education-Gulf Southwest (ASEE-GSW) conference held in San Antonio earlier this spring. The paper, who was co-authored by Samer Dessouky, associate professor in the Department of Civil and Environmental Engineering, was titled "Feasibility Study to Harvest Electric Power from Highway Pavements Using Laboratory investigation."

ECE students show their skills in Colorado

Students in the Department of Electric and Computer Engineering participated and showcased their engineering skills in the Perseus III technology demonstration held at the United States Air Force Academy, Colorado Springs, Colorado, this spring. The goal of the demonstration, sponsored by the Deputy Assistant Secretary of Defense Office, is to challenge students to examine emerging technologies that may be of significant interest to the Department of Defense. In particular, the task this year was to build an Unmanned Aerial Vehicle (UAV) to collect data on a potential target and design a defensive capability to protect a target from a small UAV. The UTSA team was led by Drs. Pack and Akopian.



ASCE/AISC places 1st regional Student Steel Bridge competition

The University of Texas at San Antonio Steel Bridge Team placed first in the 2015 ASCE/AISC Student Steel Bridge regional competition held at The University of Texas, Austin in January. UTSA topped fourteen university teams from Texas and Mexico.



2015 Technology Symposium

More than 50 senior design teams competed for The University of Texas at San Antonio (UTSA) College of Engineering departmental awards at the 2015 Tech Symposium held this April in the UTSA H-E-B University Center ballroom on the Main Campus. Seven teams participated in the Center for Innovation and Technology Entrepreneurship (CITE) 100K competition, which was held during the symposium.

The Technology Symposium was designed to provide a public venue for UTSA senior engineering students to present their Capstone Design Projects to other UTSA students, their parents, and high school students, as well as industry and government sponsors. The goal of the Capstone Design Projects is to have engineering seniors apply the knowledge they have accumulated throughout their undergraduate career in the design, development, and implementation of their projects. Additionally, this year, seven teams consisting of engineering and business students were selected to compete in the CITE 100K Competition.

Team Vita Ingenium Solutions was

crowned the winner at the CITE 100K Competition. The Vita Ingenium team designed a contact lens removal, storage and disinfection device that allows for easy portability and use in situations where cleanliness of surroundings or a persons' hands is questionable. UTSA competitors Mentis and OXYvo placed second and third respectively in the business planning competition.

TECHNOLOGY SYMPOSIUM WINNERS

Biomedical

1st - Micro Auxilium Melisa Alanis, Diana Castillo, Leah Muse, Rebekah Rodriguez

2nd - Vita Ingenium Xabier Basañez, Alejandra Hernández Molina, Analaura Villarreal Berain, David Zhang / COB students: María Acevedo, Ryan Quinn

3rd - Conceptum Biologics Ehab Abdelaziz, Victor Aguero, Daniela Arriaga, Jair Castillo / COB students: Andrew E., Larry Laws, Paula Nguyen

Civil Engineering

1st - The Offices of Broadway Bernice Espinosa, Chris Salinas, Edith Gonzalez, Jesus Zapata

2nd - Fire Station No. 52 Joshua Canter, William Castro, Christina Cruz, Martin Garcia, Dustin Laws

3rd - Red McCombs Toyota Dealership Turki Alroug, Walid Gharib, Marcelo Cabllero, Fahad Alshatii, Lorenzo Rubio, Abdulaziz Mallah

Electrical/Computer Engineering

1st - E-UAV Shahla Moosavi, Brandon Philpot, and Clark Johnson

2nd - MeCa (Meeka) Stanislav Gankov, Alan Hutsell, Tacito Loschiavo, Daniel Staudt

3rd - Mentis - Sultan Alotaibi, Christopher Herzing, Rikki Pilgrim, Kenneth Poulin

Mechanical Engineering

1st - Aircraft Surfacing Austin Beisert, Kenneth Hudson, Preston Roberts, Colin Stubbs

2nd (TIE) Robo Meks - Robert Brothers, Raquel de la Garza, Eric S. Sanchez, Christian Trevino

FOE - Ryan Ellis, Wade Mayo, Bryant Phamyu, Austin Powada

3rd - FOA Rico Giovanni Ulep, Ezra Ameperosa, Kyle Seay, Scott Miller



& CITE Awards



TOP: A team shows off their senior design project to a judge. MIDDLE: Somer Baburek, a UTSA graduate and former CITE 100K winner, was one of the 10 judges at this semester's CITE Competition. BOTTOM: Team Vita Ingenium Solutions, winners of the 100K CITE competition. LEFT: Gabriele Niederauer, CEO and President of Bluegrass Vascular Technologies, Inc., gave the keynote address.

A portrait of Marissa Wechsler, a young woman with long dark hair, smiling and wearing a blue button-down shirt. She is standing in front of a building with large windows. The text "meet" is written in a script font above her name.

meet

Marissa Wechsler

The first student who enrolled in UTSA's undergraduate biomedical engineering program four years ago has excelled in her studies and research

Meet Marissa Wechsler. She was the first student to enroll in UTSA's undergraduate biomedical engineering program.

She's also a member of the first UTSA undergraduate class that will receive their bachelor's degrees in Biomedical Engineering this May.

As an undergraduate student, Wechsler obtained fundamental training and knowledge in several aspects of biomedical engineering. UTSA's biomedical engineering curriculum requires students to take courses in various areas including biomaterials, biomechanics, tissue engineering, imaging and nanotechnology.

Through these courses, students acquire a basic understanding of the broad scope of biomedical engineering but through electives can also focus on specific areas in which they are interested.

Wechsler's concentrations are in Biomaterials and Tissue Engineering.

In addition to the traditional engineering course curriculum, and throughout her undergraduate studies, Wechsler participated in research through the UTSA Minority Biomedical Research Support-Research Initiative for Scientific Enhancement (MBRS-RISE) and the Maximizing Access to

Research Careers-Undergraduate Student Training for Academic Research (MARC-U*STAR) programs. These programs are designed to promote the interest among and train and increase the number of underrepresented students who pursue careers in biomedical sciences and engineering. Wechsler acknowledges the impact the MBRS-RISE and MARC-U*STAR programs had on her training and appreciates the opportunities these programs gave her to achieve many research-related accomplishments during her undergraduate years at UTSA.

Wechsler's undergraduate research focused on optimizing the effects of electric current on the differentiation of mesenchymal stem cells into osteoblasts, the bone-forming cells. She conducted her research under the mentorship of Rena Bi-

zios, Peter T. Flawn Professor in the Department of Biomedical Engineering. Bizios is a pioneer in both biomedical engineering teaching and research. Wechsler's research project became her UTSA Honors College undergraduate thesis.

With academic strengths and a personal interest in mathematics and science, Wechsler credits her parents for motivating her to pursue a degree in engineering at UTSA. Until she came to UTSA, Wechsler did not know what it meant to either do research or to get a Ph.D. degree. Following graduation, she plans to continue her studies toward a Ph.D. degree and aspires to a career in academia.

In addition to acquiring research-related skills and experience, communication is one of the top attributes Wechsler says she has learned from Bizios. This skill has been reflected by her ability

to gain recognition, including awards for her research which, to date, has been presented at various local, regional and national scientific conferences.

In 2014 alone, Wechsler won the Best Undergraduate Presentation Award in the area of Regenerative and Molecular Medicine at the UTSA College of Sciences Research Conference, and she was one of very few among 1,700 undergraduate and graduate students to receive a first place award for her podium presentation

in the Engineering, Physics and Mathematics section at the Annual Biomedical Research Conference for Minority Students (ABRCMS).

Most importantly, Wechsler received a National Science Foundation (NSF) Graduate Research Fellowship in the spring of 2015. This prestigious award was the result of a nationwide competition and will provide complete financial support for three years of Wechsler's graduate studies toward her doctoral degree in Biomedical Engineering.

"Being awarded this NSF fellowship is such an honor," said Wechsler. "I cannot describe the feeling, but it is amazing to be recognized as one of the top young engineers and scientists in the country. Accepting this fellowship will definitely help me achieve my career goals."

"Being awarded this NSF fellowship is such an honor. I cannot describe the feeling, but it is amazing to be recognized as one of the top young engineers and scientists in the country."

-Marissa Wechsler



Congrat

UTSA graduates first class of undergraduate

More than 4,000 graduation candidates walked across the stage as The University of Texas at San Antonio (UTSA) celebrated spring 2015 commencement ceremonies at the Alamodome. Included in that number were the first 20 undergraduate students who were admitted to the College of Engineering's biomedical engineering program in Fall 2011.

"I am very proud of our undergraduate biomedical engineering students," said Anson Ong, chair of the Department of Biomedical Engineering and USAA Foundation Distinguished Professor. "In addition to the excellent academics and research activities, many of the students from this graduating class are also involved in activities outside the classroom, including being UTSA Ambassadors, Engineering Ambassadors, as well as being members of the UTSA Presidential Leadership Council. Additionally, one of the teams from the BME graduating class was named the first place winner of the Center for Innovation and Technology Entrepreneurship (CITE) \$100K Competition, which took place earlier this spring."

In Fall 2011, 25 students started in the undergraduate biomedical engineering program. After four years in the program, 20 of these students completed the program, which gives the program an 80% graduation rate. The members of the inaugural undergraduate biomedical engineering



ulations!

the biomedical engineering students

class had an average class GPA of 3.53.

"I am so proud of all of our graduates, and I am especially excited for the members of our first undergraduate class of biomedical engineers," said JoAnn Browning, dean of the College of Engineering and David and Jennifer Spencer Distinguished Chair. "The College of Engineering is growing and expanding our research and educational opportunities every year, and the members of the Department of Biomedical Engineering are an important factor in our success. We expect great things from these graduates!"

The objectives of the undergraduate biomedical engineering program were founded on the belief that the engineering principles and understanding of biological and physical sciences are critical to the investigation of fundamental bioengineering questions associated with complex living systems as well as with the diagnosis and treatment of human diseases.

Graduates of the program are able to contribute positively in the biomedical engineering industry and other sectors such as hospitals, government agencies and academia; enhance competence in biomedical engineering by pursuing an advanced and/or professional degree in the practice of bioengineering; and work successfully as a member in a team environment to facilitate biomedical engineering practices.





Engaging Community



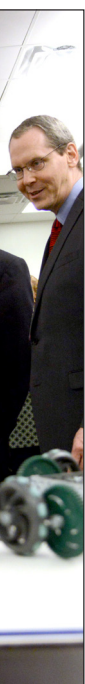
TOP: Patrick Benavidez, doctoral student in electrical engineering, gives a tour of the Autonomous Control Engineering Laboratory (ACE Lab) to a group of students from the Young Women's Leadership Academy in Fort Worth. The school brought 85 sophomore and junior students who were interested in engineering to campus to tour UTSA and learn more about the programs offered in the College of Engineering. The ACE lab is directed by Mo Jamshidi, Lutcher Brown Endowed Chair and professor in electrical and computer engineering. LEFT: A student from Young Women's Leadership Academy tours the UTSA Advanced Visualization Laboratory (VizLab). The VizLab allows researchers from all disciplines of art, science, and engineering to conduct simulation and visualization research to better understand complex phenomena and translate data into images on large-scale and high resolution visualization walls or other display devices.



ABOVE: Members of the ACE Lab show off their drones during an event at the San Antonio Children's Museum earlier this spring.



ng *our* unity



ABOVE: During Spring Break, UTSA's Interactive Technology Experience Center (iTEC), hosted hundreds of school-aged children the UTSA Main Campus for the center's spring break camps. The camps focus on getting children interested in the fields of science, technology, engineering, and math through hands-on activities. The instructors at iTEC go beyond the classroom and understand that kids learn more when they are excited about the topics being discovered. The iTEC mission is to inspire youth by creating an environment where they can understand how engineering, science, and technology shape our lives and the future of the world.



FAR LEFT: The San Antonio Masters Leadership Program, a group that provides proven leaders with a unique opportunity to learn firsthand about the issues and needs in Bexar County, visited UTSA Main Campus this spring. The group had the chance to tour two of the College of Engineering's labs, while learning more about engineering at UTSA. LEFT: Dr. JoAnn Browning, dean of the College of Engineering, presented at the Texas Society of Professional Engineers-Bexar Chapter Proclamation Breakfast at the Norris Conference Center to kick off Engineers Week 2015. The event was attended by local professional engineers as well as over a hundred high school students who have an interest in engineering.



Krystel Castillo

receives GreenStar Endowed Professorship in Energy

by Deborah Silliman Wolfe/College of Engineering

The University of Texas at San Antonio (UTSA) College of Engineering is excited to announce that Krystel Castillo has been awarded the GreenStar Endowed Professorship in Energy. Castillo came to the College of Engineering in 2012 as an assistant professor in the Department of Mechanical Engineering and has excelled in both her mentorship of students and research during the last three years.

"Dr. Castillo is an example to both our faculty and students," said JoAnn Browning, dean of the College of Engineering. "She is leading her department right now in terms of research productivity and is forming research partnerships both nationally and internationally. Additionally, she is a fantastic mentor for our Hispanic students. Dr. Castillo is an excellent example of what an assistant professor can be. Faculty members such as Dr. Castillo should be recognized and given the extra support that they need to be even more successful in their careers."

The GreenStar Endowed Professorship in Energy was established with a generous gift to the College of Engineering from Paul and Alice Duran through their company, GreenStar LED Products, Inc., a North American electric equipment manufacturer providing eco-friendly, cost-saving light-emitting diode (LED) lighting. In 2011,

the company won a contract to replace 25,000 of San Antonio's streetlights and, as part of the deal with the city, the firm moved its plant from Boerne to the West Side of San Antonio and agreed to contribute \$10 to UTSA's College of Engineering for every light fixture the firm sold the city. That money was used to fund the GreenStar Endowed Professorship in Energy.

"We are very, very impressed with Dr. Castillo, her credentials, and where she is heading with her research," said Paul Duran.

"Green energy is the future. If we are going to leave a good earth and planet to our children and our grandchildren, this is something we have to do. This is the way to go and that is why we wanted to endow a professorship in energy."

Dr. Castillo's expertise is mathematical programming and optimization techniques for analyzing large-scale, complex systems under uncertainty. Dr. Castillo is currently conducting research on modeling and design of green energy (bioenergy) systems; modeling the impact of increased adoption of Electric Vehicles and Natural Gas Vehicles on the distribution network and operational costs for fleet owners; and big data analytics for healthcare and defense applications.

"We are so grateful to the Durans for having the vision to recognize the need for an endowed professorship such as the



Krystel Castillo, assistant professor in the Department of Mechanical Engineering and recipient of the GreenStar Endowed Professorship in Energy, presents her research to Paul and Alice Duran in the Manufacturing Systems and Automation Laboratory at the UTSA Main Campus.

GreenStar," said Browning. "I think they are going to be very proud of the work that Dr. Castillo has done and will continue to do with the support of this endowment."

Dr. Castillo is currently conducting a U.S. Department of Agriculture-funded project focusing on water treatment, agricultural-logistics, and green energy. This project establishes a multidisciplinary platform to increase the scientific and educational capability of engineering curriculum in renewable energy and water resources; nurture next-generation green engineers; and investigate new models applied to green energy integration, production, and technology.

Her research has been funded by U.S. Department of Agriculture; CPS Energy through the Texas Sustainable Energy Research Institute; Air Force Research Laboratory; Toyota Manufacturing Texas; National Council of Science and Technology; San Antonio Life Sciences Institute; and UTSA seed grants, among others.

"I am very honored and thankful for this GreenStar Endowment," said Castillo. "This endowed professorship means a lot to me, a junior faculty member, because it offers me the flexibility to use funds to advance my research, and keep up with cutting-edge technologies in emerging energy fields and developments in the new green economy. This endowment fund will allow my

research group to sustain the fast-track pace and momentum that we have reached."

As the first female Hispanic faculty member in the Department of Mechanical Engineering, Castillo has been recruiting students who are underrepresented in STEM fields for her research group including female engineers, Hispanics, and other minorities. In addition to her assistant professor position, she is also the co-director of the Manufacturing Systems and Automation Laboratory; affiliated faculty of the Texas Sustainable Energy Research Institute; core faculty of the Center of Advanced Manufacturing and Lean Systems; and core faculty of the Center for Simulation, Visualization, and Real-Time Prediction. Castillo is also the recipient of the prestigious Air Force Summer Faculty Fellowship for the summers of 2014 and 2015 to conduct research at the Air Force Research Lab at Wright-Patterson Air Force Base.

"Our college is a young engineering school and even though we have made significant strides in the time that we have aimed to be a research-orientated college of engineering, there is more work to be done," said Browning. "Having endowed positions like this allows our new or existing faculty who are very successful in their fields to have the resources that are necessary for sustained research and educational opportunities for our students, as well as being able to keep our labs in top condition."

Energizing Data

The Texas Sustainable Energy Research Institute brings together data, energy and manpower in a unique environment

By Deborah Silliman Wolfe/College of Engineering

Rolando Vega/The Texas Sustainable Energy Research Institute

Friendly chatter and laughter filled the room as faculty, staff, and student members of the Texas Sustainable Energy Research Institute gathered together for the Institute's planning meeting. Though the mood was light, as the planning session got underway, the room became more serious. Energy research. Cloud computing. Data analytics. Topics that are relevant to all aspects of society — from digitally protecting a company's confidential data, to deciphering massive amounts of data, to shaping the technological landscape to create a more sustainable future.

"The research that is currently taking place here at the Institute not only affects the issues we deal with today, but the issues that we as a society are going to be dealing with ten, twenty, and forty years down the line," said Les Shephard, institute director and McDermott Distinguished Chair in Engineering.

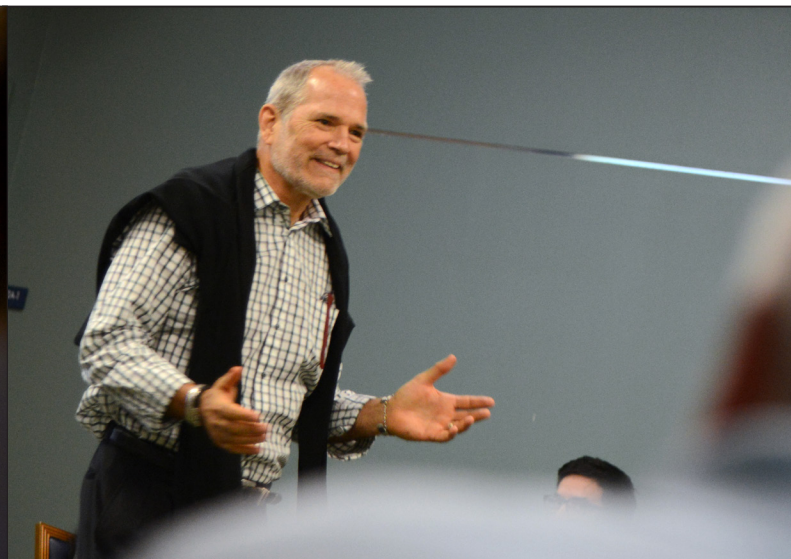
In addition to the groundbreaking research taking place at the Institute, Shephard says that the Institute's team of faculty, staff, and students work together in an innovate and collaborative environment.

"We are building a cyber physical system that we call the Roadrunner

Open Cloud (the ROC) energy analytics platform in partnership with the Open Cloud Institute," said Dwain Rogers, a public policy expert and attorney working as research director at the Institute. "The ROC allows faculty, staff, and students to work together to process data in near real-time, create insights and new intelligence for our industry partners, and couple that info with a laboratory physical infrastructure."

And it's not just the faculty and staff members that are doing the leg work in the Institute. Juan Gomez, associate director and research director of the Institute, stresses that the UTSA students who work at the Institute play an integral part in the Institute's success.

"We work as an interconnected unit, playing off of each other and using each



other for support,” Gomez said. “The UTSA students who work at the Institute come from a variety of interdisciplinary fields and make a huge impact on the work that is being done.”

Rolando Vega, a research director at the Institute, works in renewable energy and grid forecasting, said that the Institute’s laboratories host over 30 graduate and undergraduate students and 18 faculty members in science, engineering, and business.

Current research being done with the Institute includes Building Technologies led by Dr. Bing Dong; Power Electronics and Power Systems led by Dr. Hari Krishnaswami; Software Communications and Navigation led by Dr. David Akopian; Advanced GIS and Mapping Technologies led by Dr. Hongjie Xie; Applied Mathematics and Image Processing led by Dr. Walter Richardson; Wind Farm and Flow Modeling led by Dr. Kiran Bhaganagar; Information Systems and Cyber Security led by Dr. Nicole Beebe, Dr. Glenn Dietrich, and Dr. Max Kilger; Data Science by Dr. DJ Ko; Renewable Energy Management by Dr. Nikolaos Gatsis; Computational Statistics and Data Analysis led by Dr. David Han; Energy Engagement led by Dr. Afamia Elnakat; and Open Cloud Computing led by Dr. Jeff Prevost and Paul Rad.

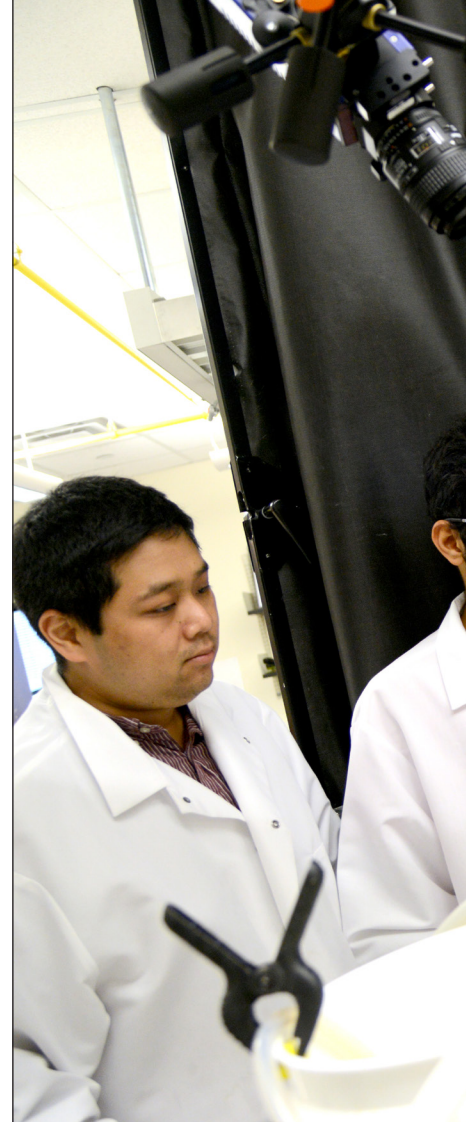
“We want to push the boundaries of imagination and create new amazing energy technologies in the process,” said Vega.

The Institute is one of the reasons that UTSA is on the forefront of sustainability research — creating new knowledge and finding top-tier solutions to real energy problems in San Antonio, the nation, and beyond. The Institute was established in 2010 to serve as a catalyst for coalescing the many energy research and education projects underway at the university. Specializing in the areas of energy and sustainability, the institute maintains strong partnerships with CPS Energy, the National Renewable Energy Laboratory, Microsoft, private energy companies, universities, and nonprofits.

“The research that is currently taking place here at the Institute not only affects the issues we deal with today, but the issues that we as a society are going to be dealing with ten, twenty, and forty years down the line.”

- Les Shephard, institute director and McDermott Distinguished Chair in Engineering





Saving lives

All in a day's work for Ender Finol

By Rebecca Esparza/MBA

When Ender Finol was a young child growing up in Venezuela, he never dreamed he'd one day be at the forefront of pioneering research that could save lives.

"I knew I would be an engineer one day, since my father was a professor of mechanical engineering, but I never thought I'd be where I am today," he said.

Finol, an associate professor in the Department of Biomedical Engineering at The University of Texas at San Antonio, was recently awarded a \$1.8 million grant from the National Institutes of Health to study the clinical management of abdominal aortic aneurysms.

According to the American Heart Asso-

ciation, an abdominal aortic aneurysm occurs when the large blood vessel responsible for supplying blood to the abdomen, pelvis and legs becomes enlarged. A ruptured aneurysm is fatal. The disease is most common in men over age 60 with one or more risk factors, including: a family history, emphysema, high blood pressure, obesity, high cholesterol and smoking.

"We need a faster and more accurate way of knowing when these aneurysms will rupture," he noted. "Through our research study, we hope to learn more about when surgery is unnecessary and when it can actually save lives."

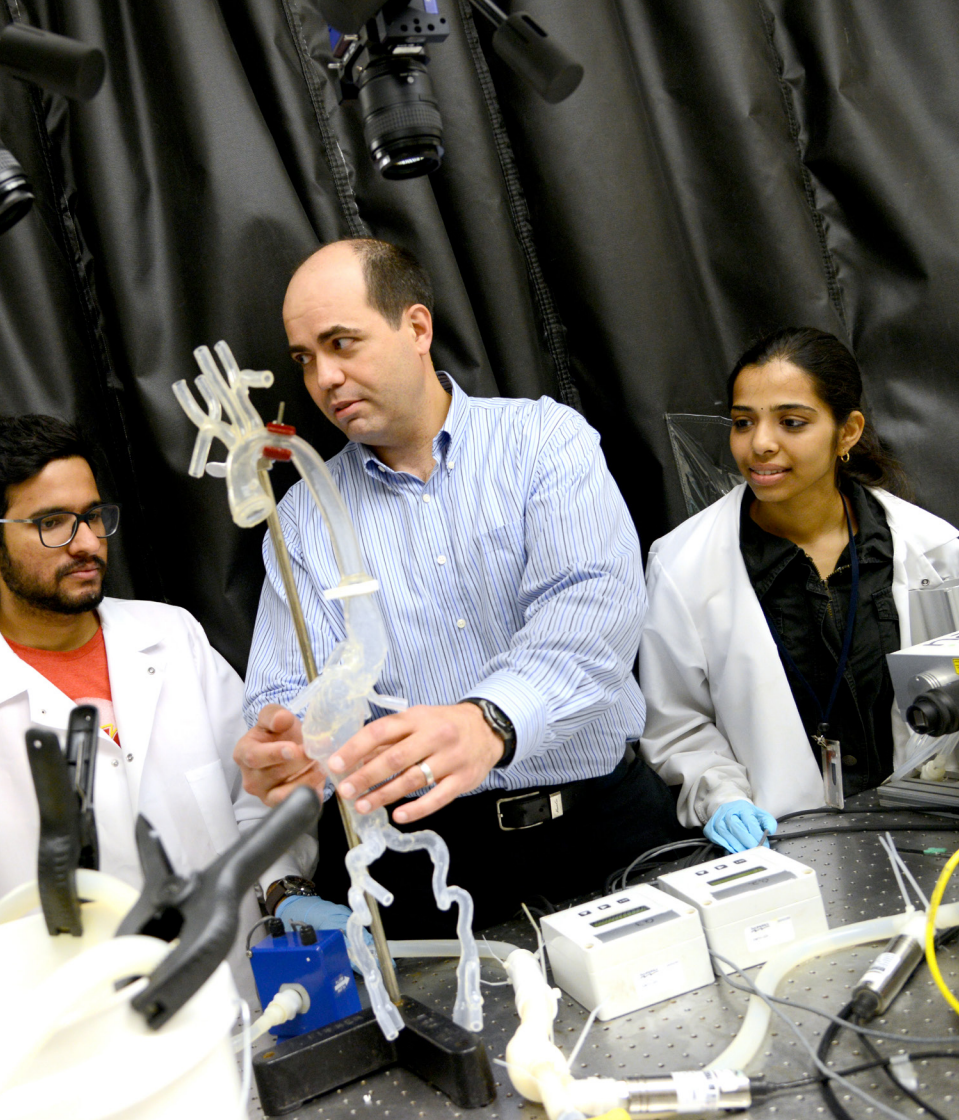
Finol said the primary goal of the grant is to develop a tool to predict when an abdominal aortic aneurysm is at risk

for a rupture. The Centers for Disease Control reported aortic aneurysms were the primary cause of more than 10,000 deaths in the United States in 2009.

Each year, an estimated 200,000 people are diagnosed with an aortic aneurysm.

"We are trying to provide vascular surgeons with a resource they can use in the clinic to decide whether a patient should be operated on right away or if surgery can be delayed in favor of surveillance," he said.

One of the key tools Finol and his team will use in the study (the first step, which begins this summer) is called a vascular phantom, a silicone replica of a human aorta with an abdominal aortic aneurysm. It will be used for experiments to mimic the blood flow circulation in



the aorta using Magnetic Resonance Imaging (MRI).

"The images acquired from the scanner will allow us to validate the method we are developing for the grant, which consists of predicting the wall stress on the aneurysms solely with the use of clinical images," he explained.

Eventually, the grant will involve clinical research of 200 patients at Allegheny General Hospital in Pittsburgh. Finol is working in collaboration with colleagues at the Allegheny Health Research Network, École Nationale Supérieure des Mines de Saint-Étienne in France and Drs. Victor De Oliveira and Prahlad Menon at UTSA. Studying the patients will take three years, with the fourth and final year of the study dedicated solely to analyzing the data.

Finol began his work in this field 17 years ago, when he started his Ph.D. studies and his thesis advisor suggested he study blood flow in abdominal aortic aneurysms. He said he's grateful

of the support he has received from the university.

"The reputation of UTSA is enhanced with this research grant and it expands the research portfolio of UTSA as a whole," he said. "NIH is the most prestigious source of funding for research with a bioengineering or clinical focus. The grant also has a local economic impact, as we will eventually employ two post-doctoral fellows."

Born and raised in Venezuela, Finol is a mechanical engineer by training and first started his career at the Ford Motor Company as a Quality Engineer, ensuring cars in the Venezuelan factory met quality standards.

"After awhile, I realized I was unsatisfied with my job. I knew I wanted to make a difference somehow and I didn't feel I was applying all my knowledge," he recalled. "I also needed more intellectual stimulation, so I decided to pursue my graduate studies, which eventually led to where I am today."

FAR RIGHT: Ender Finol stands in his lab in the Biotechnology, Sciences and Engineering Building on UTSA Main Campus with a vascular phantom — a silicone replica of a human aorta with an abdominal aortic aneurysm. MIDDLE TOP: The vascular phantom will be used for experiments to mimic the blood flow circulation in the aorta using Magnetic Resonance Imaging (MRI). MIDDLE BOTTOM: SathyaJeeth Chauhan, a graduate student working toward his Master of Science in Biomedical Engineering, helps Finol set up the vascular phantom. NEAR RIGHT: Finol chats with Chauhan, Mirunalini Thirugnanasambandam, a Ph.D. student in biomedical engineering, and David Zhang, a senior biomedical engineering student. The students will be working with Finol on his National Institutes of Health grant.

When Finol learned he had received the NIH grant, his largest to date, he was elated.

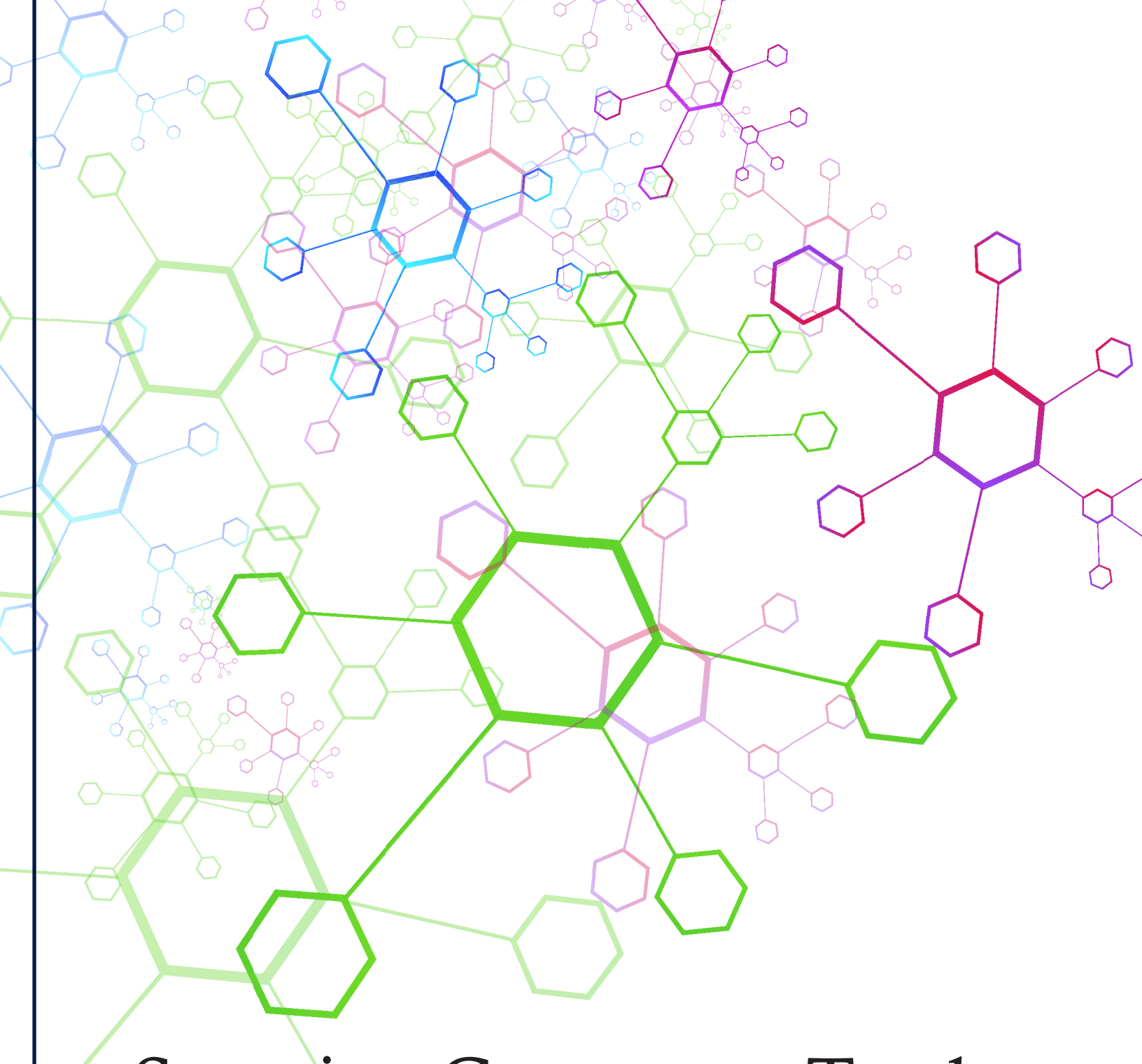
"My first reaction was: 'At last...this has been a long time coming!'" he laughed. "I was working from home that morning, writing a manuscript that was later submitted for publication. Needless to say, that was a good day!"

Although actual work on the grant is not slated to begin until the summer, Finol has plenty to keep himself busy, including his biggest accomplishment: being a married father of three children, all girls, ages 10, 9 and 6.

"It's an interesting job, to have responsibility of the lives of three little humans," he reflected. "It brings a different perspective to life."

Raising three small girls in a world of biomedical engineering, Finol said he hopes at least one of his children has an interest in the field someday. He also has advice for parents who wish to cultivate a budding scientist or engineer.

"Children need a role model, someone the child can look up to, like a scientist or engineer. They learn directly from their role models, either at school or home. The earlier you expose them to math and science, the better the odds they will develop a genuine love of all things engineering."



Stopping Cancer in its Tracks

By Deborah Silliman Wolfe/College of Engineering

UTSA College of Engineering
receives \$1.08 million NIH
grant to study cancer cells

The National Institutes of Health recently awarded a \$1.08 million grant to Yufei Huang, professor in the UTSA College of Engineering Department of Electrical and Computer Engineering, and Jianqiu (Michelle) Zhang, associate professor in the UTSA Department of Electrical and Computer Engineering, to develop new bioinformatics tools to study mRNA methylation and breast cancer.

"Basically, we are looking at the inner workings of mRNA and methylation and by using deep genome sequencing technology and computer models, we are trying to uncover a new mechanism of cancer," said Huang. "Such mechanisms can help us predict which cells in a human's body may become cancerous and stop cancer in its tracks before it even forms."

The research team also includes Manjeet K. Rao, an RNA biologist, and Yidong Chen, an expert in deep sequencing and bioinformatics, from the University of Texas Health Science Center San Antonio.

"By bringing together computer engineers who are experts in computational modeling with experts in biology and RNA sequencing, we have added a new dimension to the emerging study of mRNA methylation," said Huang.

mRNA methylation refers to the chemical modifications to the mRNA molecules that code genetic information. Abnormal modification could alter the genetic codes that command the orderly functions of human cells and thus lead to diseases such as cancer.

Huang says that the result of this research hopefully will cast new light on the role of mRNA methylation in regulating the dynamics between normal and disease states and thus may provide leads to more effective strategies for future therapeutic intervention.

"The research planned to be performed by doctors Huang and Zhang with the team at the UT Health Science Center San Antonio through this NIH grant has potential to fundamentally change how we see human diseases," said Daniel Pack, chair of the Department of Electrical and Computer Engineering. "By bringing experts from both medical and engineering fields together to study cancer using powerful computational engineering tools, the team has a great chance to contribute in finding solutions to one of the society's most difficult problems. Doctors Huang and Zhang are the right individuals with the right knowledge and skills to be on this team."

To address the need for high computational power need to run the study's simulations, the team also will work with UTSA Cloud and BigData Laboratory researchers to seek computing solutions for these bioinformatics tools. The UTSA Cloud uses a multi-cell concept where a cell consists of compute, storage and network nodes that are built using the Open Compute hardware, and allow for flexibility in adapting the systems to changing engineering and scientific application requirements.

"We are so excited to be working on such an exciting project that could possibly change the way we look at cancer," said Huang. "I am honored that we were awarded this prestigious NIH grant, and know that we are going to be doing some groundbreaking research in the course of the next few years."

We are so excited to be working on such an exciting project that could possibly change the way we look at cancer.

- Yufei Huang, professor,
Department of Electrical and
Computer 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 The University of Texas at San Antonio's path to becoming a Tier One institution. Listed here are the projects awarded between May 1, 2014, and May 1, 2015.

Agaian, Sos (PI)

Dept. of Electrical and Computer Engineering
Proposal title: Evaluation of the Use of a Non-Contact, 3D Scanner for Collecting Post Mortem Fingerprints
Funding Agency: FLASHSCAN3D
Amount: \$99,612

Akopian, David (PI)

Dept. of Electrical and Computer Engineering
Proposal title: Pediatric Obesity Management Intervention Trial for Hispanic Families
Funding Agency: National Institutes of Health, through Univ. of Texas Health Science Center at San Antonio
Amount: \$275,000

Akopian, David (PI)

Dept. of Electrical and Computer Engineering
Proposal title: Tobacco Cessation Services for Bi-Lingual and Spanish Speaking Young Adult Latinos in South Texas
Funding Agency: Cancer Prevention Research Institute of Texas, through Univ. of Texas Health Science Center at San Antonio
Amount: \$181,379

Alaeddini, Adel (PI)

Dept. of Mechanical Engineering
Proposal title: Integrative Statistical and Operational Methods for Effective Chronic Disease Management
Funding Agency: UTSA VPR Office
Amount: \$20,000

Alaeddini, Adel (PI)

Dept. of Mechanical Engineering, Center for Advanced Manufacturing & Lean Systems
Proposal title: Applying Lean Principles to the Faculty Appointment Process at VP-AFSA-UTHSC
Funding Agency: Univ. of Texas Health Science Center at San Antonio
Amount: \$5,100

Alaeddini, Adel (PI)

Dept. of Mechanical Engineering, Center for Advanced Manufacturing & Lean Systems
Proposal title: Review Warranty Claims from the City of San Antonio Against Toter Two-Wheeled Carts for Curbside Automated Waste
Funding Agency: Toter LLC
Amount: \$12,950

Alaeddini, Adel (PI) Agaian, Sos (Co-PI)

Dept. of Mechanical Engineering
Proposal title: Image-based Process Monitoring Phase 1: Real-time Quality Monitoring of Printing Process
Funding Agency: Harland Clarke
Amount: \$77,630

Castillo Villar, Krystel (PI)

Dept. of Mechanical Engineering
Proposal title: Integrated Modeling and Optimization of Supply Chain Design for Sustainable Bioenergy Systems
Funding Agency: UTSA VPR Office
Amount: \$20,000

Castillo Villar, Krystel (PI)

Dept. of Mechanical Engineering
Proposal title: Scheduling and Routing Optimization for Supply Chains with Disruptions in Transportation
Funding Agency: Conacyt-Consejo Nacional de Ciencia
Amount: \$77,360

Castillo Villar, Krystel (PI) Giacomoni, Marcio (Co-PI) Chen, Fengshan (Co-PI) Shipley, Heather (Co-PI)

Dept. of Mechanical Engineering and Dept. of Civil and Environmental Engineering
Proposal title: Opportunities for Higher Education and Research Experience in Renewable Energy and Water Quality to Enable STEM Hispanic Leaders
Funding Agency: US Dept. of Agriculture
Amount: \$290,000

Dessouky, Samer (PI) Guo, Ruyan (Co-PI)

Papagiannakis, Athanassios (Co-PI) Montoya Rodriguez, Arturo (Co-PI) Bhalla, Amar (Co-PI)
Dept. of Civil and Environmental Engineering, Dept. of Electrical and Computer Engineering
Proposal title: Phase 1: Development of Highway Sensing and Energy Conversion (HiSEC) Modules For Generating Power"
Funding Agency: Texas Dept. of Transportation
Amount: \$3,490,339

Diaz, Manuel (PI) Arroyo, G (Co-PI)

Dept. of Civil and Environmental Engineering
Proposal title: Dwight D. Eisenhower Transportation Fellowship Grant
Funding Agency: U.S. Dept. of Transportation
Amount: \$10,000

Dong, Bing (PI)

Dept. of Mechanical Engineering
Proposal title: DOE/Aerofluid LLC: Assessment of Automated Evaluation Measurement of Verification (EM&V) Methods
Funding Agency: Aerofluids LLC
Amount: \$9,700

Dong, Bing (PI) Nishimoto, Taeg (Co-PI)

Dept. of Mechanical Engineering, COA Dept. of Architecture, Texas Sustainable Energy Research Institute
Proposal title: Strategic Data Management for Energy and Water Consumption Efficiency in Marriott Hotels
Funding Agency: Marriott International Inc
Amount: \$35,000

Dupont, William (PI) Manteufel, Randall (Co-PI) Gunhan, Suat (Co-PI) Rashed-Ali, Hazem (Co-PI)

Dept. of Mechanical Engineering, COA Dept. of Architecture, Center for Cultural Sustainability
Proposal title: Radiant Barrier Retrofits to Improve Energy Efficiency of Older Homes in Hot - Humid Climate Zones
Funding Agency: U.S. DOI National Park Service
Amount: \$38,500

Feng, Yusheng (PI) Quarles, John (Co-PI) Huang, Yufei (Co-PI) Castillo Villar, Krystel (Co-PI)

Dept. of Mechanical Engineering, COS Dept. of Computer Science, Dept. of Electrical and Computer Engineering, Center for Simulation, Visualization and Real Time Prediction
Proposal title: SALSI: Medical Data Analytics and Visualization Cluster
Funding Agency: Univ. of Texas System
Amount: \$150,000

Finol, Ender (PI) Menon Gopalakrishna, Prahlad (Co-PI) De Oliveira, Victor (Co-PI)

Dept. of Biomedical Engineering, COB Dept

of Management, Science & Statistics
Proposal title: Geometric Surrogates for
Clinical Management of Abdominal Aortic
Aneurysms

Funding Agency: National Institute of
Health

Amount: \$514,370

Frederick, John (PI) Acevedo, Gabriel
(Co-PI) Shipley, Heather (Co-PI) Sponsel,
Valerie (Co-PI)

Academic Affairs, Provost, COLFA Dept. of
Sociology, Dept. of Civil and Environmental
Engineering, COS Dept. Of Biology
Proposal title: ADVANCE IT-Catalyst:
Institutional Self-Study on Women Faculty
in STEM and SBS Disciplines at UTSA
Funding Agency: National Science
Foundation

Amount: \$168,000

Gatsis, Nikolaos (PI)

Dept. of Electrical and Computer Engineering
Proposal title: CIF: Small: Collaborative
Research: From Communication to Power
Networks: Adaptive Energy Management for
Power Systems with Renewables
Funding Agency: National Science Foundation
Amount: \$171,409

Guo, Ruyan (PI) Bhalla, Amar (Co-PI)

Dept. of Electrical and Computer Engineering
Proposal title: Unified Approach to
Increase STEM Undergraduate Students
Employment in Department of the Navy -
UTSA Contribution
Funding Agency: University of Texas at Austin
Amount: \$255,000

Han, Hai-Chao (PI), Jin, Yufang (Co-PI)

Dept. of Mechanical Engineering
Proposal title: San Antonio Cardiovascular
Proteomic Center
Funding Agency: Univ. of Texas Health
Science Center at San Antonio
Amount: \$256,269

Huang, Jie (PI) Sharif, Hatim (Co-PI)

Dessouky, Samer (Co-PI)

Dept. of Civil and Environmental
Engineering
Proposal title: Evaluating Use of Sub-Grade
Drains with PFC for Stormwater Drainage
Funding Agency: Texas Dept. of
Transportation
Amount: \$99,530

Huang, Yufei (PI)

Dept. of Electrical and Computer
Engineering
Proposal title: Identification and characteriza-
tion of mRNA methylation in Breast Cancer

Funding Agency: Univ. of Texas Health
Science Center at San Antonio

Amount: \$130,000

Huang, Yufei (PI) Zhang, Jianqiu (Co-PI)

Dept. of Electrical and Computer Engineering
Proposal title: Graphical Models for
Characterizing Global RNA Methylation
Funding Agency: National Institute of Health
Amount: \$1,085,774

Jamshidi, Mohammad (PI) Kelley, Brian
(Co-PI)

Dept. of Electrical and Computer
Engineering
Proposal title: Modeling, Analysis And
Control of Large Scale Autonomous
System Of Vehicles
Funding Agency: North Carolina
Agricultural & Tech State
Amount: \$266,200

Johnson, Drew (PI) Shipley, Heather (Co-PI)

Dept. of Civil and Environmental
Engineering, Water Institute of Texas
Proposal title: Activated Sludge Aeration
Waste Heat for Membrane Evaporation
of Desalination Brine Concentrate: A
Bench Scale Collaborative Study
Funding Agency: U.S. Dept. of the Interior
Amount: \$85,587

Johnson, Drew (PI) Shipley, Heather
(Co-PI)

Dept. of Civil and Environmental Engineering
Proposal title: Support for Historical
Data Review and Source Analysis for
Lower Leon Creek Watershed
Funding Agency: Texas Commission on
Environmental Quality
Amount: \$62,881

Krishnan, Ramnarayan (PI) Park, Jae
Hong (Co-PI)

Dept. of Electrical and Computer
Engineering, Institute for Cyber Security
Proposal title: Enhancing Situational
Awareness for Emergency Response
Using Social Media Provenance
Funding Agency: LMI Research Institute
Amount: \$50,000

Krishnan, Ramnarayan (PI) Sandhu,
Ravinderpal (Co-PI)

Dept. of Electrical and Computer
Engineering, College of Sciences
Proposal title: TWC: Small: Attribute
Based Access Control for Cloud
Infrastructure as a Service
Funding Agency: National Science
Foundation
Amount: \$500,000

Liu, Rui (PI) Dong, Bing (Co-PI) Du, Jing
(Co-PI)

Dept. of Mechanical Engineering, COA

Dept. of Construction

Proposal title: Building Information
Modeling Supported Building Life Cycle
Management: On the Edge of Total
Information Management
Funding Agency: Univ. of Texas at Austin
Amount: \$68,220

Matamoros, Adolfo (PI)

Dept. of Civil and Environmental Engineering
Proposal title: Composite Action in
Prestressed NU I-Girder Bridge Deck
Systems Constructed with Bond Breakers
to Facilitate Deck Removal
Funding Agency: Univ. of Kansas Ctr. Res. Inc.
Amount: \$7,647

Millwater, Harry (PI)

College of Engineering
Proposal title: Gas Turbine Engine
Probabilistic Fracture Mechanics Research
Funding Agency: Southwest Research Institute
Amount: \$16,626

Millwater, Harry (PI) Ocampo De los Rios,
Juan (Co-PI)

Dept. of Mechanical Engineering, Center
for Simulation, Visualization, and Real
Time Prediction

Proposal title: Probabilistic Risk
Assessment of Aircraft Structures
Funding Agency: Texas Res. Inst. Austin Inc.
Amount: \$42,750

Montoya Rodriguez, Arturo (PI) Maldonado,
Victor (Co-PI) Alaeddini, Adel (Co-PI)

Dept. of Civil and Environmental Engineering,
Dept. of Mechanical Engineering
Proposal title: A Novel Pipeline
Monitoring System
Funding Agency: Flatrock Engineering &
Environmental Ltd.
Amount: \$84,272

Ong, Anson (PI)

Dept. of Biomedical Engineering
Proposal title: Establishment of
Pancreatic Microenvironment Ex Vivo to
Grow and Preserve Pancreatic Islets
Funding Agency: SALS
Amount: \$100,000

Ong, Anson (PI)

Dept. of Biomedical Engineering
Proposal title: Nanotechniques and
Instrumentation - 2015
Funding Agency: Alamo Community
College District
Amount: \$1,500

Ong, Anson (PI) Guda, Teja (Co-PI)

Dept. of Biomedical Engineering
Proposal title: Processing and Characterization
of Coatings for Polymeric Implants
Funding Agency: North Carolina State Univ.
Amount: \$37,000

Pack, Daniel (PI)

Dept. of Electrical and Computer Engineering
Proposal title: A Strap-down Image-Based
Guidance on Virtual Field of View
Funding Agency: Agency for Defense Development
Amount: \$220,000

Pack, Daniel (PI)

Dept. of Electrical and Computer Engineering
Proposal title: Cooperative Control and
Sensing for Multiple Unmanned Aerial Vehicles
Working in GPS-denied Environments
Funding Agency: U.S. Department of the Air Force
Amount: \$125,000

Pack, Daniel (PI) Akopian, David (Co-PI)

Dept. of Electrical and Computer Engineering
Proposal title: Perseus III
Funding Agency: U.S. Dept. of the Navy
Amount: \$70,000

Pack, Daniel (PI) Huang, Yufei (Co-PI)

Dept. of Electrical and Computer Engineering
Proposal title: Controlling Cooperative UAVs
Cognition and Neuroergonomics Collaborative
Technology Alliance Technology Transition
Subcontract for Mutually Adaptive Systems
Funding Agency: Office of the Secretary of Defense
Amount: \$282,925

Pack, Daniel (PI) Qian, Chunjiang (Key
Personnel) Akopian, David (Key Personnel)
Huang, Yufei (Key Personnel) Maldonado,
Victor (Key Personnel)

Dept. of Electrical and Computer Engineering,
Dept. of Mechanical Engineering
Proposal title: Acquisition of Small Unmanned
Aerial Systems for Advancing Cooperative Man-
Machine Systems Research and Education
Funding Agency: US Dept of the Army
Amount: \$446,105

Pei, Ruoting (PI)

Dept. of Civil and Environmental Engineering
Proposal title: Does Cell-cell Communication
Promote Microcystis Aeruginosa Blooms?
Funding Agency: National Science Foundation
Amount: \$290,468

Ramasubramanian, Anand (PI)

Dept. of Biomedical Engineering
Proposal title: IIMS: A Rapid, Low-cost Device
for MRSA Identification and Drug Susceptibility
Funding Agency: Univ. of Texas Health
Science Center at San Antonio
Amount: \$43,000

Ramasubramanian, Anand (PI) Reddoch,
Kristin (Co-PI)

Dept. of Biomedical Engineering RISE
Programs
Proposal title: Cell Death Machinery Involved
in Cold Platelet Storage for Transfusion
Funding Agency: American Heart Association
Amount: \$25,000

Rogers, Dwain (PI) Castillo Villar, Krystel
(Co-PI)

Dept. of Mechanical Engineering, Texas
Sustainable Energy Research Institute
Proposal title: Central Texas Fuel
Independence Project Fleet Analysis
Funding Agency: Austin Energy
Amount: \$20,000

Saygin, Can (PI) Wan, Hung-Da (Co-PI)

Dept. of Mechanical Engineering,
Center for Advanced Manufacturing & Lean
Systems
Proposal title: Incorporating Lean-Six
Sigma Methodologies into the Institute for
Integration of Medicine and Science
Funding Agency: Univ. of Texas Health
Science Center at San Antonio
Amount: \$100,000

Saygin, Can (PI) Wan, Hung-Da (Co-PI)

Castillo Villar, Krystel (Co-PI) Alaeddini, Adel
(Co-PI)

Dept. of Mechanical Engineering, Center for
Advanced Manufacturing & Lean Systems
Proposal title: Predictive Maintenance -
Phase 2: From Data to Performance Metrics
Funding Agency: Harland Clarke
Amount: \$90,000

Shadaram, Mehdi (PI)

Dept. of Electrical and Computer
Engineering, Center for Excellence in
Engineering Education
Proposal title: Engineering Summer Residential
Camp for Texas High School Students
Funding Agency: Texas Higher Educ.
Coordinating Board
Amount: \$12,500

Shadaram, Mehdi (PI)

Dept. of Electrical and Computer Engineering,
Center for Excellence in Engineering Education
Proposal title: Somerset ISD GEAR
Funding Agency: Somerset ISD Office of the
Superintendent
Amount: \$15,600

Sharif, Hatim (PI)

Dept. of Civil and Environmental Engineering
Proposal title: The Use of Operational
Precipitation Products in The Context of
Flood Forecasting
Funding Agency: U.S. Dept. of the Army
Amount: \$147,340

Shephard, Les (PI)

Dept. of Civil and Environmental Engineering
Proposal title: National Incubator Initiative
for Clean Energy
Funding Agency: Univ. of Texas at Austin
Amount: \$43,476

Vega, Rolando (PI) Shephard, Les (Co-PI)

Dept. of Civil and Environmental
Engineering, Texas Sustainable Energy
Research Institute
Proposal title: Outdoor test system
configuration and reflective material
characterization for bifacial solar photo-voltaic
technology
Funding Agency: Mission Solar Energy
Amount: \$100,000

Wang, Xiaodu (PI)

Dept. of Mechanical Engineering
Proposal title: Intrafibrillar mineralization vs.
bone fragility
Funding Agency: National Institute of Health
Amount: \$362,174

Wang, Xiaodu (PI) Zeng, Xiaowei (Co-PI)

Dept. of Mechanical Engineering
Proposal title: Non-collagenous proteins vs.
bone fragility
Funding Agency: National Institute of Health
Amount: \$366,698

Weissmann, Jose (PI)

Dept. of Civil and Environmental Engineering
Proposal title: A Process for Designating
and Managing Overweight Truck Routes in
Coastal Port Regions
Funding Agency: Texas Dept. of Transportation
Amount: \$48,749

Weissmann, Jose (PI)

Dept. of Civil and Environmental Engineering
Proposal title: Review and Evaluation of Current
Gross Vehicle Weights and Axle Load Limits
Funding Agency: Texas Dept. of Transportation
Amount: \$90,990

Weissmann, Jose (PI) Papagiannakis,
Athanassios (Co-PI)

Dept. of Civil and Environmental Engineering
Proposal title: Evaluation of the Benefits of
Diamond Grinding of CRC Pavements
Funding Agency: Texas Dept. of Transportation
Amount: \$79,992

College Award Winners



Faculty Award Winner, Research

Krysel Castillo



Faculty Award Winner, Teaching

Sos Agaian

Each spring, the College of Engineering, with the help of the COE Engineering Advisory Council, choose members of the college to receive awards in faculty research, faculty service, faculty teaching, and staff excellence. Congratulations to this year's honorees!



Faculty Award Winner, Service

Chunjiang "CJ" Qian



Staff Excellence Award

Nguyen "Xuan" Uribe

James Johnson

Shaping young minds for lifelong success

The Richard S. Howe
Outstanding Undergraduate
Teaching Award

By Rebecca Esparza/MBA

James Johnson was graduating from high school when he faced a critical, life-changing decision: accept a scholarship to study flute or pursue a degree in engineering. Johnson, currently a senior lecturer at UTSA's Department of Mechanical Engineering, said the decision was tough, but engineering has always been his passion.

"I figured I would starve to death as a musician, so I pursued engineering," he chuckled light-heartedly. "And while I still enjoy the flute, sometimes even playing with my granddaughter, I think I made the right choice."

"When you ask Professor Johnson for advice or help, he will always ask you a penetrating question that will guide you to seek your own answer."

*- from a student evaluation
of James Johnson's senior
design class*

Johnson was recently honored with The Richard S. Howe Outstanding Undergraduate Teaching Award, which recognizes sustained excellence in working with undergraduate students in signature experiences outside of the traditional classroom environment. These experiences can include providing extensive mentoring; designing and overseeing service-learning experiences; chairing Honors theses; and supervision of undergraduate research or study abroad experiences for undergraduates.

He recalled the day he learned about his award, quite appropriately, in the middle of one of his classes.

"I looked up and saw a number of people enter the room, one carrying balloons, followed by a cameraman," he said. "Dean Browning walked to my podium and announced I had won the award. The most rewarding moment was when my entire class of 98 students erupted in hoots, hollers and applause. It was a moment of confirmation that maybe what I do really does matter!"

Growing up in Harlingen, his passion for engineering was fostered by his father, who worked for the railroad. His childhood was idyllic and carefree, filled with adventures in scouting, baseball, water skiing and the flute. But his exposure to his father's engineering office left a long-lasting impression.

"When I was young, I would spend Sunday mornings after church at his office playing around with the drafting tables and drawing instruments. This is where the passion for design started," he said.

His fervor for engineering really took off in high school, when he applied for an amateur radio license. He passed a test in which he had to send and receive Morse code. From there, he started building receivers and transmitters.

"My weekends were filled with designing, building, flying and crashing model airplanes and rockets," he recalled with a smile. "Somehow the science thing was in my blood. I wanted to design things to solve technical problems, especially those related to airplanes and space flight. That passion has never left my soul and that's what has kept me going through my professional career."


Before Johnson began teaching at UTSA in 2010, he had a successful four-decade-long career at the Southwest Research Institute as a researcher and engineering manager. Today, he takes his roles as mentor, advisor and instructor seriously, especially when considering he is shaping the minds of future engineers and builders.

"My primary academic responsibility is to guide raw recruits through a transformation process, so they are battle-hardened, confident and competitive engineers, ready to excel," he noted. "I've seen it all and I can pass along considerable wisdom and keys to success. As my students will tell you, the Capstone Senior Design class is no push over. It takes grit, guts, and determination to make it through."

He believes encounters with his students are a learning opportunity for everyone.

"I listen to my students and always reflect upon the fact I was once a student, but I also do my best to impart my lifelong wisdom. I've learned much by applying one of Steven Covey's principles: 'Seek first to understand and then be understood,'" he added.

His teaching style can be deemed unconventional, as Johnson recalled a meeting in which improving the "student pass rate" was a hot topic of discussion. During the meeting, Johnson argued his students deserved better than just passing: they deserved a quality engineering education.



"Our grandchildren will be driving over bridges, flying airplanes, driving cars, using medical and commercial products designed by UTSA-educated engineers. I want competent engineers in the industry, with integrity," he explained. "If I and other engineers can impart our passion for seeking the complete engineering or scientific truth, then graduation rates take care of themselves."

One of the best rewards of teaching, Johnson said, is seeing firsthand the successes of his students, especially when they have overcome challenges and still were able to deliver.

"For all their hard work, there are one to three patents or provisional patents that come out each semester and usually one company is formed," he noted. "The class has won numerous entrepreneurial competitions and NASA Design Challenge awards, as well."

Although his teaching life is busy, he has not forgotten about the important role his family plays in his life. He makes time for white water rafting and extended family vacations with wife Patricia and their children, now grown with families of their own. Spirituality and his family are at the top of his list of priorities.

"I think a rewarding life is all about balance between the many choices we might have and the energies we put into the paths to fulfill our destiny. Whatever you think is critical today because someone else told you so, probably isn't."

UTSA President Ricardo Romo presents The Richard S. Howe Outstanding Undergraduate Teaching Award to College of Engineering's James Johnson at the University Excellence Ceremony held earlier this spring. Johnson is senior lecturer in the College of Engineering's Department of Mechanical Engineering.



Order of the Engineer

UTSA Alumni and current StandardAero employees Sergio Medina, Monique Whitehurst, Van Garcia, Yvonne Addison, and Art Sepulveda were inducted in to the Order of the Engineer in a ceremony held May 9, 2015, on UTSA Main Campus. "When some of us graduated from UTSA, we didn't have the ring ceremony like the college does now," said Yvonne Addison, a service engineer at StandardAero. "We wanted to take part in this engineering tradadition so when we had the chance, we took it!"