




The University of Texas at Austin  
Civil, Architectural and  
Environmental Engineering  
*Cockrell School of Engineering*

# CITIES · WATER · ENERGY

Fall 2016

[caee.utexas.edu](http://caee.utexas.edu)



**Student participants in the U.S. Department of Energy's Solar Decathlon spent two years imagining how to power our homes and keep our daily lives running on energy from the sun.**

*Photo: UT Austin School of Architecture*

*dedicated to Dr. Joseph F. Malina, Jr. and family*

## A Message from the Chair



Richard L. Corsi

We hear a lot about infrastructure these days. The public complains about it. Our profession talks about its state of disrepair. Politicians promise to do something about it. One thing is certain, we need to stop doing business as usual when it comes to our nation's infrastructure. Infrastructure of the future needs to be resilient in the face of extraordinary natural and man made challenges. This means that individual components of urban infrastructure should no longer be considered in isolation of other components. The web of infrastructure that makes our nation, state, cities and neighborhoods function needs to be looked upon as an infrastructure system. Water and wastewater infrastructure depends on energy infrastructure. Energy and transportation infrastructure can be adversely impacted by poor water infrastructure. Energy infrastructure will need to be transformed as transportation modes and infrastructure changes. There are countless other examples of increasingly complicated infrastructure interactions,

from communication systems to what I refer to as "social infrastructure," that which will make cities more desirable for working, learning, playing and just living.

Infrastructure systems of the future will also need to become more sustainable in terms of energy use, water use, materials, longevity and more. And it will also need to become more adaptable, allowing for the pressures of rapidly increasing populations and unintended decay that comes with shrinking populations. The model of decades past has become archaic in a world that is seeing rapid waves of technological advancement and opportunities for much-improved infrastructure systems.

Future infrastructure systems will be supported by new technologies that improve their effectiveness. These technologies include low-cost sensors for real-time monitoring of infrastructure health, unmanned aerial vehicles and robots that monitor and even repair challenged infrastructure, modern communication systems that inform populations about resource demands, and infrastructure challenges and failures. These sensors and systems will generate near real-time data on scales that once took months to years to collect, requiring new visualization tools and models to process and inform decision-making that will transform the effectiveness and livability of cities.

I am so very proud that the Department of Civil, Architectural and Environmental Engineering (CAEE) at The University of Texas at Austin sees this future with clarity. It is at the heart of our strategic vision and the research that our faculty and students are conducting. That vision informs changes to our curriculum to educate future leaders who will weave a better society. It has and will continue to inform the hiring of wonderful new faculty members. I am proud of these colleagues, for they are lifting CAEE into a bright future. In this newsletter you will read about new faculty members who bring different dimensions and essential modern tools to our CAEE community. Our department is exploding with creativity, new technologies and excitement because of the great faculty members we have been hiring. Our present is energized and our future is looking very bright!

In this newsletter, you will also be updated on the implementation of our strategic vision, with examples of research related to water, energy, the growth of cities, links between these strategic pillars and the infrastructure that connects it all together. And you will learn about an exciting new graduate area called Sustainable Systems that relates directly to the future of infrastructure as a systems enterprise. This new area was catalyzed by our young faculty members who think across disciplinary boundaries with a knowledge and belief of the power of infrastructure systems.

In these pages you will read about the accomplishments of our outstanding students in the Solar Decathlon and Concrete Canoe competitions. You will also read about the tremendous recognition that our faculty members are receiving for teaching, research and contributions to the profession, and the accolades that our outstanding alumni are receiving for what they do for society. Two esteemed colleagues, Jim Jirsa and David Fowler, both taught their last lectures at UT in May 2016. You will read their thoughts about their extraordinary careers.

Finally, it is with sadness that you will read about the passing of a good friend, teacher and past department chair, Joe Malina. Joe made major contributions to the environmental engineering field, CAEE, and countless students. Joe was never short on giving me advice on efforts as department chair. Across the globe, he is missed.

As you read this I hope that you will take pride in our students, alumni, staff, young faculty, senior faculty, retired faculty, and faculty who are no longer with us. We are a great community. Hook'em!

A handwritten signature in blue ink that reads "Richard L. Corsi".

Richard L. Corsi, Ph.D., P.E.  
Department Chair and Joe J. King Chair in Engineering #2

## Welcome, New Faculty



### Juan Murcia-Delso

Assistant Professor  
Structural Engineering

Juan Murcia-Delso joined the CAEE faculty in August 2016. He is formerly a senior researcher at Teczalia Research & Innovation. He received his BS/MS in Civil Engineering from the Universitat Politècnica de Catalunya (UPC); an MS in Structural Analysis of Monuments and Historical Constructions, which is a joint degree from the University of Minho and UPC; and a PhD in Structural Engineering from the University of California, San Diego, where he was also a postdoctoral researcher. His research interests are in the behavior of reinforced concrete structures, and the development of innovative analysis, design and retrofit methods for enhancing the performance of structures under extreme loading and aging effects, all of which involves structural testing and computational modeling.



### Zoltan Nagy

Assistant Professor  
Architectural Engineering, Building Energy and Environments

A roboticist turned engineer, Zoltan Nagy joined the CAEE faculty in August 2016. His research interests are in smart buildings and cities, renewable energy systems, control systems for zero-emission building operation, machine learning and artificial intelligence for the built environment, complex fenestration systems and the influence of building occupants on energy performance. Prior to joining UT Austin, Zoltan was a senior scientist at the Swiss Institute of Technology (ETH) in Zurich, in the Department of Architecture. He received a PhD in Robotics (2011) and an MS in Mechanical Engineering (2006) with a focus on micro-electro-mechanical systems (MEMS) and robotics, both from ETH Zurich. He also spent an academic exchange semester at the Danish Technical University and was a visiting researcher in the Distributed Robotics Laboratory at MIT.



### Lina Sela

Assistant Professor  
Environmental and Water Resources Engineering

Lina joined the CAEE faculty in August 2016 in the fields of sustainable water resources systems management and cyber-physical urban systems. To address the problems of finite water sources, climate change and population growth, she investigates strategies for sustainable water systems with an emphasis on resilient monitoring, fault diagnostic, and control tools. Previously a post doctoral research associate at MIT, she earned a BS, MS and PhD at Technion-Israel Institute of Technology. Her research focus includes investigating problems in fault diagnostics and control of distribution systems facilitated by active sensing and real-time data analytic techniques. She also develops algorithms based on optimization, graph theory, and machine learning methods to support smarter cyber-physical systems.

## Outstanding Young Alumnus

### Gregory A. Kolenovsky, BSCE 1998

*Established in 2003, the Outstanding Young Alumnus/Alumna Award recognizes a graduate of the Department of Civil, Architectural and Environmental Engineering under the age of 40 who has distinguished himself or herself with outstanding service and contributions to the engineering profession and community. Greg is the 2015-16 award recipient.*

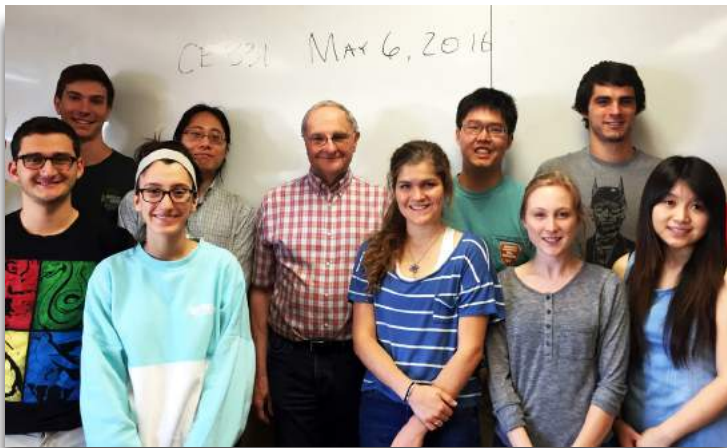
Greg Kolenovsky is Vice President of Trigon Associates, LLC, an engineering consulting firm based in New Orleans that he co-founded in 2009. As one of the owners, he is involved with many aspects of the business but primarily oversees project delivery and business development activities. Trigon has been named a “Best Places to Work” by multiple local and national publications for the past four years

Most of Greg’s professional experience has revolved around municipal infrastructure such as water, wastewater, drainage and roads. Outside of the U.S., he has also worked on projects in the Middle East and Haiti, including a large infrastructure program with the U.S. Agency for International Development’s West Bank/Gaza Mission.

Greg is active in many professional organizations and has received numerous awards for community service activities. He enjoys teaching kids about engineering, providing presentations and hands-on demonstrations to school children and frequently mentors civil and environmental engineering students.



*Greg is on site at a flood protection structure during operation near New Orleans, Louisiana.*



*After 44 years of outstanding service to the university, Jim Jirsa taught his final class in May 2016.*

### Calendar of Events

**9/22 - 9/23**

Structural Engineering Education Reunion  
STEER - Celebrating the Career of Jim Jirsa

**9/23**

Jim Jirsa Retirement Dinner & Celebration

**9/30**

Academy of Distinguished Alumni Banquet

## Announcements & Briefs

### UT ASCE Wins Regional Concrete Canoe Competition



The University of Texas' American Society of Civil Engineers (ASCE) Chapter won the 2016 Texas-Mexico Concrete Canoe Competition and advanced to the national competition, where the team won 11th place overall.

The regional competition featured over 17 ASCE student chapter teams from major universities in Texas and Mexico, all competing for the opportunity of going to the national competition. The Concrete Canoe Competition provides civil engineering students with hands-on experience working with concrete mix designs, materials technology and applications, and project management and leadership skills, while also increasing awareness of the value of ASCE membership.

To serve as a technical mentor or support the team with a gift, please contact [utexasconcretecanoe@gmail.com](mailto:utexasconcretecanoe@gmail.com)

### Sustainable Systems Graduate Program

The Sustainable Systems graduate specialty was launched in spring 2016 to focus on a cross-disciplinary approach to addressing the complex problems surrounding the nexus of cities, water and energy. The MS/PhD program allows for considerable flexibility in course selection and research experiences. Students who understand the global imperative for innovation will be trained by faculty from across disciplines to understand, analyze and drive change as it relates to the environment, economics and society.



### DEPARTMENT SNAPSHOT

Our undergraduate and graduate programs are routinely ranked among the top 10 in the U.S.

In the most recent *U.S. News & World Report*, our programs were ranked:

- #6 Undergraduate Civil Engineering
- #5 Undergraduate Environmental Engineering
- #2 Graduate Civil Engineering
- #4 Graduate Environmental Engineering

#### UNDERGRADUATE STUDENTS

- 782** Enrolled
- 43%** Women
- 26%** Underrepresented minorities

#### GRADUATE STUDENTS

- 399** Enrolled
- 30%** Women
- 57%** U.S. Residents

## Academy of Distinguished Alumni Inductees 2015 - 2016



**Stacy J. Bartoletti MS 1993** is President and CEO of earthquake and structural engineering firm Degenkolb Engineers, headquartered in Silicon Valley. He is recognized for his technical expertise in methods of assessing and upgrading the seismic safety of existing buildings. He has implemented techniques to improve the safety of countless buildings on the West Coast, contributed to the success of Degenkolb, and mentored many young engineers.

Stacy is active in organizations and community programs including the American Council of Engineering Companies, the Council of American Structural Engineers, the Washington Seismic Safety Committee, and the United States Resiliency Council. He is a leader in Washington's policy initiatives to improve seismic safety of critical lifelines. Stacy has testified before Congress on seismic safety and has actively participated in the development of the CREW Cascadia Subduction Zone Earthquake Scenario as well as the EERI Seattle Fault Scenario.



**Rajendra P. Bhattarai MS 1980** embarked on a career of planning and implementing municipal and wastewater infrastructure, and has become an international leader in improving water quality and environmental protection. He currently manages Austin Water Utility's Environmental and Regulatory Services Division.

He oversees research projects, Total Maximum Daily Load and water quality management, assists treatment plants with operational issues and troubleshooting, tracks environmental regulations and legislation and ensures regulatory compliance. He and his team are also liaisons to regulatory agencies, environmental, professional and research organizations, and they also manage the activities of the Center for Environmental Research, a consortium of the City of Austin, UT Austin, and Texas A&M University. Raj is a frequent guest lecturer for several courses at UT Austin in environmental engineering and the LBJ School of Public Affairs.



**Erin Flanigan MS 1994** is a Principal at Cambridge Systematics where she leads research and analysis work in the areas of transportation operations and intelligent transportation systems, specifically concentrating on key federal transportation programs. She has worked closely with state departments of transportation, the Federal Highway Administration, National Academy of Sciences, Transportation Research Board (TRB), the American Association of State Highway and Transportation Officials and National Highway Institute on various technical, research and planning efforts. She is also a member of the TRB Emerging Technology Law Committee (AL040).

During this past year, Erin led a workshop series in advancing transportation systems operations and management in over 20 states. She has also served as Chair of the CAEE External Advisory Committee and is a founder of the CAEE Transportation Engineering Endowed Excellence Fund.

The Academy of Distinguished Alumni in the Department of Civil, Architectural and Environmental Engineering was established in 2003 to recognize the professional achievements and contributions of our graduates. Academy members are leaders within their professional communities and serve as role models for our students.



**David T. Ford BS 1973, MS 1975, PhD 1978** is Owner and President of David Ford Consulting Engineers, a water resources engineering firm in Sacramento, California, and is an internationally recognized expert in water resources engineering, planning and management. His more than 35 years of experience includes working as a senior engineer at the U.S. Army Corps of Engineers Hydrologic Engineering Center, an adjunct professor at the University of California, Davis and a lecturer at California State University, Sacramento.

He has served as a consultant to the U.S. Army Corps of Engineers, National Weather Service, governmental agencies in California, Texas and other states in the U.S., India, Portugal, Indonesia, Romania, and for the United Nations, the World Bank, the U.S. Agency for International Development and to engineering firms worldwide. David's technical specialties include watershed engineering analysis, river hydraulics analysis, reservoir system analysis, project benefit/risk analysis, real-time forecasting, flood warning systems, decision support systems, training, and software development to support water resources engineering analyses.



**Marek J. Gromiec MS 1970** has been a monumental contributor to water pollution control in Poland, and by the same token, to the protection of the Baltic Sea. During his 49 years of experience in the field, his research interests have been concentrated on water quality modeling integrated with geographic information systems. After earning a degree at UT Austin, he joined the Institute of Meteorology and Water Management at Warsaw, where he served as Chief Engineer, Head of the Department of Water Management, and Plenipotentiary of Director General for Special Projects, until his retirement in 2009. He was assigned large-scale water projects related to planning of water pollution control in river basins, and he directed the preparation of the National Program on Urban Wastewater Treatment Plants, leading to the construction and modernization of 1,300 plants, with a total estimated investment of \$21 billion.

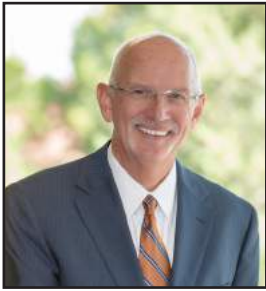
Marek is currently serving as Chairman of Experts on Water Management for Commission on Environment of the Polish Senate and as Permanent Advisor for Commission of Environment, Natural Resources and Forestry at the Polish Parliament.



**Julia M. Harrod MS 1994** is the President and CEO of MWM Design Group, a multi-disciplinary firm providing civil engineering, architecture, land surveying, landscape design, and permitting services throughout Texas. Starting out as a civil engineering technician, she now serves as Project Principal and Chief Quality Control Reviewer for the firm's engineering and landscape architectural projects, and holds primary responsibility for the firm's strategic initiatives and financial operations.

Among her accomplishments, she was awarded the Distinguished Engineer of the Foundation by the Texas Engineering Foundation, National Society of Engineering's (NSPE) Professional Engineers in Private Practice Merit Award and the Texas Society of Engineering's (TSPE) "Engineer of the Year." She has also served as president of the TSPE and the Austin Branch of the American Society of Civil Engineers. She is the current NSPE Treasurer, Chair of the CAEE External Advisory Committee, and First Lego League Team Coach.

## Academy of Distinguished Alumni Inductees 2015 - 2016



**Joseph R. Rapier BS 1981** Joseph Rapier is President and Chief Executive Officer of Parkhill, Smith & Cooper, a full-service design firm that provides engineering and architectural design primarily in the public sector or with public entities, such as municipal infrastructure, education, health care and transportation. Since becoming president of this West Texas-based firm, it has grown in size while continuing to have the reputation of being one of the best places to work in the region.

He leads the 25-person partnership, corporate division, human resources and marketing teams at PSC, and he is a champion of the personal and professional development of PSC employees, their families and communities served by the firm. He has also given back to his community through leadership roles in the Lubbock Chamber of Commerce, city boards, Reese Redevelopment Authority, Carillon Retirement Community Foundation, St. Elizabeth’s Catholic Church and by helping to develop leaders through BSA Troop 157.



**William B. Ratliff BS 1983** is President of The Ratliff Group, LLC, a firm specializing in construction management for the private sector. Since graduation from UT Austin, he has been involved in major water supply projects across Texas, served as a city engineer for several small cities in North Texas and founded his firm to concentrate on the management of commercial construction projects in the Southwest United States.

In his community, Bennett’s service for nine years as a Trustee on the Coppell School Board and in the Texas House of Representatives during the 83rd Legislative session were rewarded by nominations in both 2013 and 2014 for the Dallas Morning News Texan of the Year in Education. He was also named to the “Legislator Hall of Fame” by the Texas PTA, Legislative “Champion” by the Texas Retired Teachers’ Association, and awarded an Honorary Life Membership in the Texas PTA for distinguished service to children. Bennett has been a mentor and sponsor of the Coppell High School Engineering Academy and Solar Car Team since its inception while he was on the school board.



**José Holguín-Veras PhD 1986** is a teacher and researcher who emphasizes the integration of state-of-the-art economic principles and transportation modeling. At Rensselaer Polytechnic Institute, he is the William H. Hart Professor; Director of the Center for Infrastructure, Transportation, and the Environment; and Director of the Volvo Research and Educational Foundations Center of Excellence for Sustainable Urban Freight Systems. José has led more than 55 projects with the National Science Foundation, National Cooperative Freight Research Program, USDOT and others funding more than \$14 million.

His work has led to numerous awards, including the 2013 White House Champion of Change Award for his contributions to freight transportation and disaster response research. His research group has conducted detailed analyses of the most prominent disasters of recent times, including: Hurricane Katrina, the Port-au-Prince earthquake, the tornadoes in Joplin and Alabama, Hurricane Irene, and the Tohoku disasters in Japan.

## Academy of Distinguished Alumni Facts

**21** Academy Endowed **Scholarships** awarded since 2007 totalling over **\$46K** in assistance

**13** Academy Endowed **Fellowships** awarded since 2010 totalling over **\$35K** in assistance

### Membership Demographic

- Architectural Engineering **9%**
- Civil Engineering **16%**
- Construction Engineering & Project Management **10%**
- Environmental and Water Resources Engineering **18%**
- Geotechnical Engineering **8%**
- Non-Practicing **6%**
- Structural Engineering **25%**
- Transportation Engineering **8%**



## Student Activities

### Solar Decathlon Team Places Fourth

After two years of imagining how to power a home and keep it running on energy from the sun, a team of Longhorns took a futuristic, solar-powered house to compete in the prestigious U.S. Department of Energy's Solar Decathlon competition in Irvine, California.

In the final standings, NexusHaus finished fourth with several top five finishes including: Market Appeal, Home Life, and Communications; placed third for Engineering; second for Affordability and tied for first place in Commuting and Energy Balance.

Architectural engineering students collaborated with students from across The University of Texas at Austin and the Technische Universität München in Germany as part of the NexusHaus team. Their home aimed to address broad sustainability and affordability issues while also focusing on key issues facing Austin, such as the increased demand for energy and water.

The final product is in an affordable, modular residential green building design that demonstrates transformative technologies in Zero Net Energy, Zero Net Water capability and it is carbon neutral in its use of sustainable building materials.

The prototype, made almost entirely from sustainable materials and equipped with an efficient water-treatment system and rooftop solar panels, was one of 20 selected to compete out of more than 150 teams that applied. It includes two 400-square-foot modules and a central connector. One module serves as a living unit with kitchen and dining space, and the second contains a full bathroom and two bedrooms. The solar panels provide enough electricity for lighting, air conditioning, household appliances and an electric car.

The 2015 Solar Decathlon marks the fourth time UT Austin has been selected to compete, with the most recent UT team competing in 2007. UT Austin was the only Texas university represented in the 2015 competition.



### Future Engineers Design Rain Garden

CAEE students and mentors from the ASCE Austin Branch teamed up to design and install much-needed rain gardens at two local elementary schools. Each garden was developed to reduce erosion problems so that rainwater now seeps into the soil and eventually the aquifer.

All civil engineering seniors at CAEE are required to take an Engineering Professionalism course that prepares students for their careers by providing real-world experience. Students are charged with developing designs and plans for actual clients and stakeholders. They also explore the non-technical aspects of civil engineering practice, including balancing the demands of engineering, science, policy, law, ethics and business.

The rain garden project is also an excellent opportunity to teach elementary school children about water resources, engineering and the environment, while helping improve the water quality of our local creeks.

## Faculty News



**Amit Bhasin** received a 2015-16 UT Austin President's Associates Teaching Excellence Award in recognition of great teaching of undergraduates in the core curriculum. He is one of only eight faculty members on campus to receive this award and is the first engineering faculty member to have ever received this award.

**Chandra Bhat** received a 2016 Distinguished Alumnus Award from the Indian Institute of Technology Madras. This award is given each year for outstanding achievements by an alumnus of IIT Madras.



**Stephen Boyles** was recognized with a Dean's Award for Outstanding Teaching by an Assistant Professor by the Cockrell School of Engineering.

**Richard Corsi** received the 2016 Regents' Outstanding Teaching Award, the highest teaching honor bestowed by The University of Texas System Board of Regents. The awards are offered annually in recognition of faculty members who have demonstrated extraordinary classroom performance and innovation in undergraduate instruction.

**Chadi El Mohtar** was the host of the 37th Annual Short Course on Grouting Fundamentals and Current Practice at UT Austin. Since 1979, the Grouting Fundamentals and Current Practice course has covered the applications of pressure grouting to a broad array of geo-structural construction and remediation techniques.



**Raissa Ferron** was named one of the 2016 Top 20 Under 40 winners for Engineering News Record in the Texas and Louisiana Region. She was the only academic to receive the award in 2016.

**Robert Gilbert** was named to the UT Austin Academy of Distinguished Teachers for 2016. The academy recognizes tenured faculty members who throughout their careers have maintained significant contributions to education, particularly at the undergraduate level.



**David Maidment** was elected to the class of 2016 National Academy of Engineering for the development of geographic information systems applied to hydrologic processes. Throughout his career, David has been an innovator in hydrology and water resource planning. His work developing geographic information systems has helped numerous communities design solutions to complex flooding problems.

## Faculty News

**Paola Passiacqua** has been selected to receive the 2016 Association of Environmental Engineering & Science Award for Outstanding Teaching in Environmental Engineering and Science.



**Eric Williamson** received the Society of American Military Engineers (SAME) 2015 Bliss Medal for excellence in education and student mentoring. The student chapter at CAEE, which he advises, was also recognized as a Distinguished Student Chapter.

**Kenneth Stokoe** was recently named a Distinguished Member of the American Society of Civil Engineers, the highest honor the society can bestow. He is recognized for world-renowned contributions to the understanding of soil dynamics in geotechnical engineering.



**C. Michael Walton** was inducted into the American Road and Transportation Builders Association (ARTBA) Foundation's Transportation Development Hall of Fame. He is the first academic to receive this honor, and is recognized for having made extraordinary contributions to US transportation development and for demonstrating exceptional leadership over his career.

**Ying Xu** was recognized as an Outstanding Young Alumna of the Charles E. Via, Jr. Department of Civil and Environmental Engineering at Virginia Tech University.

### IN MEMORY OF JOSEPH F. MALINA, JR., 1935 - 2016

Emeritus Professor Joseph (Joe) Malina, Jr. passed away on the afternoon of June 14. After more than half a century with UT Austin, he leaves a lasting legacy as a respected teacher, mentor, industry leader and professional engineer.



Joe was the second of nine children born in Brooklyn, New York, to first-generation Polish and Czechoslovakian immigrants.

He began his lifelong dedication to his work and education early on, receiving a bachelor's degree in civil engineering from Manhattan College followed by M.S. and Ph.D. degrees in civil engineering (sanitary engineering) at the University of Wisconsin at Madison. He moved to Austin in 1961 and began his 53-year career at The University of Texas at Austin in the Cockrell School of Engineering. He officially retired in the fall of 2012 and continued to mentor and supervise students until the end of 2014.

Joe's expertise was in the field of wastewater treatment. During his more than half a century at UT Austin as an environmental and water resources engineering professor, he supervised generations of students and consulted with over 70 companies. Many of his graduate students have been instrumental in terms of design and operation of wastewater treatment plants throughout the world and have helped the environment and society. These accomplishments rightfully earned him high honors in his profession, including awards from the Texas Society of Professional Engineers, American Academy of Environmental Engineers, American Water Works Association, Water Environment Federation, American Society of Civil Engineers, and many others.

After moving to Austin, he met his wife Ida and they were married on January 9, 1965. They were blessed with 51 years of marriage and a life centered around children, family and faith.

## Strategic Vision

UT CAEE engineers are developing and testing new ideas for sustainable infrastructure in this increasingly urban world. The complex problems surrounding the nexus of cities, water, and energy will challenge engineers for decades, and we aspire to be leaders in developing innovative solutions to these problems. From faculty hires to classroom innovations and research partnerships, here are just a few examples of how our faculty and students are advancing our strategic vision.



## Cities

To help address the nation's pressing need for better air quality, the U.S. Environmental Protection Agency recently awarded \$30M in grants to create multidisciplinary, multi-institutional research centers. The centers will investigate the effects of global climate change, technology and societal choices on local and regional air quality and health. **Assistant Professor Joshua Apte** is Principal Investigator on one of the winning teams, the Center for Air, Climate, and Energy Solutions, to be headquartered at Carnegie Mellon University and University of Washington. The grant will position The University of Texas at Austin as a key collaborator in a unique interdisciplinary effort to understand how future transitions in energy systems and urban infrastructure will lead to changes in air pollution exposures, health effects and greenhouse gas emissions.

**Assistant Professor Stephen Boyles** has been researching how self-driving cars (autonomous vehicles, or AVs) will impact our cities. His research team is establishing mathematical models to show how AVs can increase roadway capacity and dramatically reduce congestion at stoplights by coordinating with each other. They have also looked at the changes in how people will travel, and they have found there may be unintended consequences. The research suggests that AVs will be a major competitor to public transit once the cost makes them widely accessible, and that because additional travel may be more convenient, congestion might actually get worse, even if the cars can drive more efficiently.

As war and unrest continue, hosting countries such as Germany are housing a large influx of refugees and handling associated issues such as fresh water, sanitation, and security. **Assistant Professor Kasey Faust** joined the faculty in August 2015 and is studying the impact of the recent Middle East refugee crisis on Germany's infrastructure with special emphasis on assessing the normative and cultural-cognitive perturbations on water and sanitation utilities caused by sudden, large population influxes. Faust's NSF RAPID grant-sponsored research examines how to best mitigate the ongoing crisis with regards to infrastructure needs and will enable more resilient planning, policy, and technical design that can accommodate potential disaster migration and other extreme population growth.

**Associate Professor Fernanda Leite** has been awarded a \$200,000 three-year research grant from the National Science Foundation to create an automation process that will systematically and continuously analyze the built environment while detecting changes from a previous assessment. Part of a larger grant with Drexel University collaborators James Lo (BS '98, MS '05, PhD '12) and Ko Nishino (Computer Science), the research will result in a fundamental change in construction record-keeping and will benefit building operators by enabling maintenance and renovations to be more easily planned. In turn, the findings of this work will be integrated into undergraduate and graduate educational modules.

## Water

**Assistant Professor Navid Saleh's** laboratory has been aiming to develop safe and effective nano-enabled technologies for water treatment, which can provide higher efficiency for target contaminant removal at a reasonable cost. PhD candidate Lewis Stetson Rowles III, also co-advised by Professor Desmond Lawler, continues to work with Navajo Nation potter Deanna Tso to create a nanomaterial-enabled ceramic filter that will enhance economically challenged communities' access to potable water. Uranium mining in the area has left a legacy of water contamination. The groundwater is

## Strategic Vision

contaminated with radionuclides while the surface water's biological quality in the Navajo Nation also continues to be compromised. The team hopes to help solve water contamination issues on the Navajo land and other economically challenged communities by engineering novel nanomaterials and infusing these in pottery, designed and developed following century-old Navajo tradition.



River deltas around the world are in decline, primarily in response to human activities such as the damming of rivers, extensive embankment systems, groundwater and gas extraction, and intense land-use pressures. These settings are also among the world's most physically dynamic and their vulnerabilities are further magnified in highly populated delta systems. As part of a collaborative NSF grant with Vanderbilt University, University of Colorado-Boulder, and Louisiana State University, **Assistant Professor Paola Passalacqua** will serve on a team of diverse scholars that will answer questions about the fate and future sustainability of the Ganges-Brahmaputra-Meghna delta and its human population, which hosts 150 million people in an area the size of Louisiana.

## Energy

In collaboration with the National Renewable Energy Laboratory and the University of Miami's Rosenstiel School of Marine & Atmospheric Science, **Professor Lance Manuel** has recently completed work on a DOE-funded project that involved assessment of the structural demands on offshore wind turbines resulting from coupled wind, wave, and current inputs during a hurricane. The team undertook studies involving numerical simulation of Hurricane Ike and the associated response of hypothetical wind turbines that experience Ike's extreme winds and coupled ocean wave and current fields. They also studied risks to jacket platform-supported wind turbines at potential mid-Atlantic coastal sites during Superstorm Sandy where complex wind, wave, currents and storm surge patterns were observed.



Coal burning power plants in the U.S. generate about 110 million tons of coal ash per year. About half of this ash is beneficially reused in portland cement concrete and structural fills, for example. The remainder is landfilled or impounded. These impoundments present environmental hazards, especially from leaching of contaminants into groundwater. Solidification and stabilization of these ashes prior to disposal can decrease groundwater contamination. **Professor Maria Juenger** and her team are exploring improved solidification/stabilization of coal ashes through alkali-activation, also called geopolymerization. They are designing geopolymer mixtures using thermodynamic phase equilibria modeling to minimize porosity in the solidified material and maximize formation of reaction products that stabilize heavy metals. These mixtures are tested in the laboratory for solidification, through unconfined compressive strength and porosity measurements and stabilization using static and dynamic leaching tests.

The state of Tamaulipas in Mexico is anticipating a future surge in hydraulic fracturing activity as a result of the recent energy reform. These activities are likely to be focused in the Burgos Basin, which is Mexico's most promising shale gas resource, as well as the Tampico-Misantla Basin. The transportation infrastructure that will support such activities contains a network of paved roads but also many unpaved roads that will experience substantial traffic and subsequent damage. Research on Texas infrastructure indicates that costs of road maintenance can be reduced by almost 90% if pavements are strengthened prior to experiencing traffic related to hydraulic fracturing. **Professor Randy Machemehl's** group has developed a geographic information system that can be used to geographically pinpoint routes where future pavement damage will occur. The analysis uses routing by closest facility paths to and from hydraulically fractured wells. This modeling helps explain how truck travel will take place during the construction and production phases as resources are transported to and from well sites. The tools provided by the UT team will enable Tamaulipas to prepare its infrastructure and thereby control infrastructure costs associated with energy production.

## Alumni

# Dedication of the DATUM Engineers Design Studio



In April 2016, students, faculty, alumni and friends celebrated the grand opening of the newly renovated architectural engineering design studio with a ribbon cutting ceremony and student design showcase. Defining the identity on the third floor, the new space includes a Virtual Design Lab, Daylight Lab and Seminar Room where students can collaborate and engage with faculty, classmates, mentors and engineering professionals.

Alumnus Thomas W. Taylor (BS ArE '59) and his wife, Dane (BBA '75) made a personal pledge to renovate the suite. A longtime supporter of the department, Taylor has been a leader and innovator in the building industry throughout his 50+ year career as a structural engineer. Now a Principal Design Engineer at Datum Engineers, he took over operations in 1963 and helped Datum grow into a nationally recognized firm.

Taylor is grateful for the public education he received at The University of Texas at Austin, which led him to an enjoyable career at the intersection of design, architecture and structural engineering. He hopes that students will be inspired to bring buildings to life by learning the integration of architecture and engineering systems.



## Alumni



“In this space, we have the creative freedom to learn together and exchange ideas. We can find dynamic and sound solutions to some of the most complex problems of the 21st century.”

-Brandon Comisarenco  
architectural engineering senior

## Alumni

# Sky Bridge Creating a Campus Landmark

With 52,000 students and 20,000 staff members, trying to get from one side of the campus to the other can be daunting and even dangerous.

Providing a much-needed connection between three buildings at the Moody College of Communication, the Moody Pedestrian Bridge crosses over a busy campus thoroughfare and creates a gateway for students and visitors. This new, unique structure connects the second floor of the new Belo Center for New Media and the college's two other buildings.

The bridge is a one-of-a-kind inverted Fink Truss bridge, and the only one worldwide with a single central tower as the main supporting member. The bridge was designed by noted bridge designer Miguel Rosales of Rosales + Partners in Boston, Massachusetts, and Freese and Nichols, Inc. served as the structural engineer of record. The bridge is characterized by a series of slender steel towers that vary in height and scale. With an overall length of 302 feet and a high tower of 65 feet, the bridge is supported from the ground at only one location, in the median of West Dean Keeton Street, and clear spans about 150 feet on each side to connect to the existing buildings.

John Dewar (BSCE 1989), who served as the Principal-In-Charge for the structural engineering team at Freese and Nichols, Inc. says that "We did not want to add support columns at the ends of the bridge since this would conflict with drive lanes and pedestrian areas, so the bridge bears on the existing buildings at each end. But since the buildings were never designed to support a long-span bridge reaction, this presented a special challenge."

According to Dewar, the bridge is also constructed so that there is an initial uplift reaction on each building as a means to avoid large downward reactions on each building. The uplift counteracts the subsequent pedestrian load reactions.

"This was accomplished during construction by fabricating and initially installing the bridge out of vertical alignment at one end," says Dewar. "Then, that out-of-alignment end was drawn down into correct position and locked off, thus creating uplift reactions at each end that were resisted by the weight of the existing buildings themselves."

As Principal-In-Charge, Dewar oversaw the team of engineers and inspectors who helped make the bridge a reality. Two other alumni from Freese and Nichols were also involved with this project - Spencer Maxwell (BSCE 2002) served as Project Manager, coordinating the firm's team members and the progression of the project, and Brad Watson (MSCE 1991) performed quality control and completed a detailed review of the design.

The \$2.3 million bridge, which is illuminated at night, opened to pedestrians in March 2016. There has already been many positive responses to the aesthetics of the modern-looking bridge, but students are particularly excited about the added accessibility. They now have a shorter and much safer walk across a precarious street.

"I attended the dedication ceremony, and it was incredible," says Dewar. "It's always a moving experience to hear the awesome Longhorn Band play The Eyes of Texas, but it was doubly moving to hear the band play it on a new bridge that I was a part of."

Check out more photos of the Moody Bridge construction, dedication ceremony and more at [bit.ly/moodybridge](https://bit.ly/moodybridge)





# Alumni



Plot: 19.1s (LMS Tech) F&N Proj No: RSL14368 Plot Date: 2/5/2015 9:05 AM Plot By: trng Filename: N:\ST\ST-BDG-PL-LAYT01.dwg

## Community

# Honoring the Legacy of Retiring Faculty

## ... in their own words

52

years of service



David W. Fowler

**What is your proudest moment as a teacher/researcher?** Every time I went into the classroom or represented UT in research, I felt proud and honored to be a member of the faculty.

**What opportunities has UT Austin given you?** I could not have scripted my career better, and it was all due to opportunities at UT. But it really is about people - the faculty, students and staff have all been an integral part of my life.



**What inspired you during your career?** It all began with my parents who were great role models for honesty, humility, hard work and practicing the Golden Rule. I had some great professors at UT who inspired me. Professor Phil Ferguson spent the last lecture of the semester sharing his views on being successful,

being great human beings and contributors to society. Later, using his example, I was inspired to do the same thing.

**What is the funniest or oddest thing that happened to you as a teacher?** I wish I had kept a diary over the years of my experiences in the classroom!

**What are your retirement plans?** My wife Maxine and I love to travel so we will do more of that. I would like to assist the department in developing an intern program for students who wish to work in the summer. I want to do more volunteer work with my church and other charitable organizations. And I will continue some professional activities like attending occasional conferences, and writing, presenting and reviewing papers. So I won't have any trouble keeping busy.

**What is your proudest moment as a teacher/researcher?** The success of students who have been in my classes or have worked with me on research projects is a great source of pride. Their achievements bring distinction to our program.

**What opportunities has UT Austin given you?** I came here because I wanted to be a part of a structural engineering program that had an outstanding faculty and students who were eager to study at UT. I wanted to be in a group where ideas were shared and a team spirit existed. I have had the privilege of working with some of the brightest students in any structural engineering program.

**What inspired you during your career?** The enthusiasm of the students and their desire to learn and apply that knowledge during their careers. Many of them have become lifelong friends. Receiving notes of appreciation years after they leave UT is gratifying. My faculty colleagues have also inspired me with their advice and support, and fostered a team approach that few universities emulate.

**What is the funniest or oddest thing that happened to you as a teacher?** In my first teaching position, I was assigned a course on surveying, and students had to practice using their instruments/tools out on the campus. That was before we had today's modern digital and laser equipment so a hatchet was included for making stakes and driving them into the ground. After one of the lab sessions, the department chair (who taught and wrote a book on surveying) told me how disappointed he was to see one of my students practicing by throwing his hatchet into a tree. He was not amused and I doubt the student ever used a hatchet again.

44

years of service



James O. Jirsa



# Alumni Updates

CAEE alumni have varied professions and interesting careers. Faculty, current students, and fellow graduates are always interested in learning about the lives alumni lead after they leave UT.

If you have an update you'd like to share - a career change, promotion, retirement, marriage or birth, please email Laura Klopfenstein at [klopfenstein@mail.utexas.edu](mailto:klopfenstein@mail.utexas.edu) or visit our website at [www.caee.utexas.edu/alumni](http://www.caee.utexas.edu/alumni)



Let us know about your future engineer and we'll send you a free "Future Texas Engineer" t-shirt, compliments of the Friends of Alec Annual Giving Program.



## '00s

**Josh Aldred** (MS '10, PhD '15) was honored as the nation's top federal engineer with the 2016 Federal Engineer of the Year Award. He is currently stationed at the Air Force Civil Engineer Center at Tyndall AFB and is supporting Air Force-wide energy programs in the Energy Directorate at AFCEC.



## '70s

**Rudy Bonaparte** (BS '77) received an ASCE 2016 Opal Lifetime Award for Design based on his extensive experience in the siting, design, permitting, construction and closure of municipal, industrial, and hazardous waste landfills and liquid impoundments. For the last 20 years, Bonaparte has been the President and CEO for Geosyntec Consultants in Atlanta.

## Brandon

**Klenzendorf** (BS '05, MS '07, PhD '10) was named the 2016 Texas Outstanding Young Engineer of the Year by the Texas Society of Professional Engineers (TSPE). He also received the Young Engineer of the Year award from the TSPE Travis Chapter in February 2016.

## '80s

**Ahmad Abdelrazaq** (BS '84 MS '84) received the 2015 ASCE Ernest E. Howard Award for his achievements in high-rise building technology. He was one of the key figures behind the construction of Dubai's Burj Khalifa.



## '90s

**Brian LaFoy** (BS '93) was recognized as 2015 Engineer of the Year by the TSPE Dallas Chapter.



**Anca Neagu** (MS '97) is currently located in Killeen, Texas, and is the Engineering Department Manager for Killeen Engineering & Surveying. She is the first ever

professional engineer to compete on the U.S. Women's National Boxing Team and represented the U.S. at the 2005 Women's World Boxing Championships.

**Sergio Martinez** (MS '14) is serving as Director of Transportation and Infrastructure at the Secretary of Mobility in Bogota, Colombia.

**Jason Stith** (PhD '10) received the National Society of Professional Engineers' 2016 Young Engineer of the Year Award. Stith is a structural engineer at Michael Baker International in Louisville, Kentucky.



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 The University of Texas at Austin  
**Civil, Architectural and  
Environmental Engineering**  
*Cockrell School of Engineering*



Professors Spyros Kinnas and Bob Gilbert (the only ones in ties!) teach several sections of the short course “Fundamentals and Application to Design of Fixed Offshore Platforms.” Developed specifically for engineers, scientists, and technologists, the continuing education course offers the fundamentals of all types of offshore structures (fixed or floating) and, in the case of fixed platforms, covers applications of these principles.



@ut\_caee

For more on the Department of Civil, Architectural and Environmental Engineering, or for information on ways to get involved with CAEE, please contact Laura Klopfenstein at 512-471-1279, or [klopfenstein@mail.utexas.edu](mailto:klopfenstein@mail.utexas.edu)