31 Dec 2020

2020 Scholarly Productivity Report

Missouri University of Science and Technology

MISSOURI S&T
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2020 Scholarly Productivity

Civil, Architectural and Environmental Engineering

Dear Friends,

The year 2020 started strong with great anticipation for celebration. It marked a special year for us, as it was the 150th anniversary of the founding of the Missouri School of Mines and Metallurgy (MSM). The charter was signed on Feb. 24, 1870. Two of the first three graduates from MSM earned civil engineering degrees. Those two civil engineers — Gustavus Adolphus Duncan and John Holt Gill — started the legacy of civil engineering in Rolla, Missouri, that continues today. Much has changed over those 150 years, but the legacy of high expectations and outstanding work remains the underpinning for all we attempt to accomplish at Missouri S&T, regardless of any obstacles encountered.

As 2020 came to a close, we reflected on our many accomplishments. The year marked the ending of our aggressive strategic plan, Vision 2020. We achieved many of our goals and increased scholarly output that led the campus in performance. We saw budgetary impacts due to COVID-19. Most labs across campus and inside Butler-Carlton Hall shut down for months, then re-opened with limited activity. We stayed on course and managed to prevail with enrollment topping 625 students!

We'd also like to note a strong year of production. More than 195 peer-reviewed journal articles were written and a number of international talks and presentations were delivered virtually. New grants and contracts reached $4 million. Our talented faculty received recognition — ranging from national educator of the year to Missouri President's Award for Sustained Career Excellence. They were also recognized for outstanding teaching, service and research efforts (pg. 5). I'd like to draw special attention to those efforts that were most impactful and timely — Dr. Yang Wang addressed COVID-19 mask material questions with national acclaim; we dedicated the new Clayco Advanced Construction and Materials Lab (ACML); we and our partners formed the Missouri Construction Consortium for Innovation; and Fred and June Kummer made a $300 million gift that will impact future generations of Miners. CArEE students achieved great success in competition and scholarship. *U.S. News and World Report* rankings placed our civil engineering program at #46 in the U.S. (that's in the top 30%) which is the highest ranked graduate civil engineering program in Missouri public education. Our talented team, their research efforts and our exceptional educational facilities will undoubtedly create opportunities for future generations of CArEE graduates to go out and **Change The World**!

If you have any questions, don't hesitate to contact me at burken@mst.edu.

Joel G. Burken

Ph.D., P.E., BCEE, F.AEESP

burken@mst.edu

Department Chair and Curators' Distinguished Professor Civil, Architectural and Environmental Engineering

ON THE COVER:

- New ACML building dedicated
- Wang studies face mask filters
- Myers and ElGawady recognized by international association of advanced materials
- Bartels speaks at commencement
- Showalter receives Outstanding Educator Award from AGC

CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING

BY THE NUMBERS

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RANKED IN TOP 50

CIVIL ENGINEERING #46, AND ENVIRONMENTAL ENGINEERING #48

U.S. News & World Report

Graduate engineering programs at both public and private universities (2020)

30 Full-time faculty members

16,000 ft²

NEW LAB SPACE IN 2020

CLAYCO ACML

Advancing S&T's leadership in infrastructure engineering research (Dedication, October 2020)

625+

CArEE student enrollment

8 GRADUATE CERTIFICATES

Start earning college credit toward your master's degree. (Learn more: distance.mst.edu)

TOP 15 ONLINE GRADUATE PROGRAMS

U.S. News & World Report Rankings

35%

CArEE department undergraduate female engineers

Peer-reviewed journal articles written by our faculty in 2020

195

$4.3M Research expenditures (FY 2020)

7 DEGREE PROGRAMS

CIVIL ENGINEERING

Bachelor of Science (B.S.)

Master of Science (M.S.)

Doctor of Philosophy (Ph.D.)

Doctor of Engineering (D.E.)

ARCHITECTURAL ENGINEERING

Bachelor of Science (B.S.)

ENVIRONMENTAL ENGINEERING

Bachelor of Science (B.S.)

Master of Science (M.S.)

$400K

Annual scholarships awarded

COLLEGE OF ENGINEERING AND COMPUTING

cec.mst.edu

16 ABET-accredited engineering programs

CEC total engineering enrollment **6,000**

One of 20

LARGEST ENGINEERING COLLEGES IN U.S

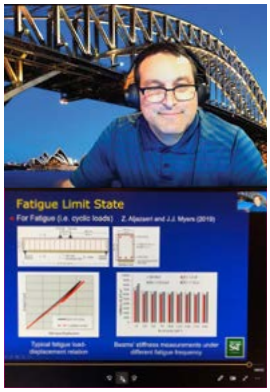
$32M

New research awards (FY 2020)

Highlights

Rising to the challenge

Learning and teaching looked alot different in 2020 at universities across the nation as higher education grappled with COVID-19. Faculty and students adjusted to remote learning at an accelerated pace. Faculty adapted to new delivery methods and tried their best to continue to deliver the quality education Missouri S&T is known for across the state, nation and world.



Pictured L-R: Dr. Mark Fitch working comfortably at his dining table; Dr. John Myers using Zoom's features; Dr. Lesley Sneed preparing to record one of her lectures.

Researchers study face mask filters and materials

From the *New York Times* to the TODAY Show — **Dr. Yang Wang** and his Ph.D. student **Weixing Hao**'s crucial research on protective face mask filters and materials made headline news. Missouri S&T students joined forces across campus to print, improve and test the filtration efficiency of face masks and shields made from different materials. The work was a huge collaboration by the Kummer Student Design Center, S&T Makerspace, and S&T IT Research Support Services. There was also input by partners at Phelps Health Medical Center that allowed rapid progress to help meet the needs of the Rolla community.

Featured website articles:

- **www.nytimes.com/article/coronavirus-homemade-mask-material-DIY-face-mask-ppe.html**
- **www.today.com/style/what-kind-filter-should-you-put-face-mask-t179037**
- **people.com/lifestyle/cloth-face-mask-filters/**

Weixing Hao studies different face mask filters and materials.

Fred and June Kummer in the Kummer Atrium of Butler-Carlton Hall.

Kummers give $300 million gift

In the largest single gift in the history of Missouri higher education, St. Louis businessman **Fred Kummer**, CE'55, and his wife, **June**, donated $300 million to a foundation that will support Missouri S&T. The gift will enable the university to establish a new school of innovation and entrepreneurship, develop new areas for research, provide numerous scholarships and fellowships for students, and bolster the Rolla region's economy. Fred and June have been longtime supporters of S&T and Mr. Kummer has also been a longtime contributor of his time and talent, a member of the Academy of Civil Engineers for nearly 40 years and an inaugural member of the Missouri S&T Alumni of Influence.

Studying renewable energy adoption

Dr. Islam El-adaway, the Hurst/McCarthy Professor of Civil Engineering, received $250,000 from the National Science Foundation (NSF) to study how utility customers use electricity, how utility companies distribute power, and how consumer acceptance levels and economic factors affect the adoption of renewable energy, specifically solar power. Ultimately, his team's findings will be incorporated into courses at S&T and will be used to raise public awareness of the benefits of solar power by offering panel sessions and exercises at national conferences, regional workshops, and local meetings with consumers, business leaders and utility operators.

CArEE student Jessi Schoolcraft is first in class of Missouri S&T's Global Engineering Program

Jessi Schoolcraft, a junior at S&T from Willard, Missouri , discussed the benefits of combining an engineering education with foreign language skills and cross-cultural experiences in an interview on the national "Lead with Languages" campaign website. The Lead with Languages campaign, sponsored by the American Council on the Teaching of Foreign Languages (ACTFL), aims to create a new generation of Americans who are competent in other languages and cultures and are fully equipped to compete and succeed in a global economy.

Schoolcraft is one of the first students to join S&T's new Global Engineering Program. She is majoring in both environmental engineering and multidisciplinary studies with an emphasis in French and will graduate with a degree in both fields. The program prepares its graduates to work in international settings by adding knowledge of another language and culture to the highly ranked engineering education students receive at Missouri S&T.

Pictured L-R: Dean Richard Wlezien; Bob Brinkmann, founder of Brinkmann Constructors; Dr. Islam El-adaway, professor and MoCCI director; Brian Satterthwaite, Brinkmann Constructors; Steve Sieckhaus, Clayco; Dr. Joel Burken, chair and John Komlos, ARCO Construction Company.

Missouri construction and academic leaders collaborate through new consortium

Missouri construction companies and Missouri S&T have combined their expertise to spur innovation in the construction industry. The Missouri Consortium for Construction Innovation (MoCCI) was established in 2020, with a celebration at the headquarters of charter member, Brinkmann Constructors, in Chesterfield, Missouri.

MoCCI is composed of various construction-associated members such as contractors, owners, subcontractors, vendors and service providers. Brinkmann is one of the initial MoCCI members, along with McCarthy Building Companies, Arco Construction, Clayco, BJC HealthCare and the Greensfelder law firm. All have operations in St. Louis.

Three core areas make up the focus of MoCCI: education, research and professional development. The corporate-academic relationship will provide S&T students with increased opportunities for broader education programs and direct employment, internships and cooperative educational opportunities with MoCCI members.

For more information, visit the website at **mo-cci.mst.edu**.

Faculty honored for excellence in teaching, research and service

Below are faculty members from our department who were honored with 2019-20 campus awards for excellence and achievements in teaching, research and service.

FACULTY EXCELLENCE AWARD
- **Dr. Mohamed ElGawady**, professor
- **Dr. Hongyan Ma**, assistant professor

FACULTY ACHIEVEMENT AWARD
- **Dr. Jeffrey Thomas**, associate teaching professor, Missouri State University

FACULTY RESEARCH AWARD
- **Dr. Grace Yan**, associate professor
- **Dr. Xiong Zhang**, professor

OUTSTANDING TEACHING AWARD
- **Dr. XianBio Hu**, assistant professor
- **Dr. Lesley Sneed**, professor

OUTSTANDING TEACHING COMMENDATION
- **Dr. Genda Chen**, Robert W. Abbett Distinguished Chair in Civil Engineering
- **Dr. Mohamed ElGawady**, professor
- **Dr. Kamal Khayat**, Vernon and Maralee Jones Chair in Civil Engineering

Promotions

Faculty members who received promotions beginning Sept. 1.

- **Dr. Nicolas Ali Libre**, promoted to associate teaching professor
- **Dr. Lesley Sneed**, promoted to professor
- **Dr. Grace Yan**, promoted to associate professor with tenure
- **Dr. Xiong Zhang**, promoted to professor

CEC award winners

Two of our faculty members received awards from the S&T College of Engineering and Computing (CEC).

DEAN'S EDUCATOR AWARD
- **Dr. Jeffery Thomas**, associate teaching professor (Missouri State University), recognized as a mid-career and beyond faculty for teaching and service excellence.

DEAN'S SCHOLAR AWARD
- **Dr. Grace Yan**, associate professor, recognized as an early- and mid-career faculty for scholarship excellence.

Faculty Achievements

Showalter named AGC Outstanding Educator

The Associated General Contractors of America (AGC) awarded its 2020 Outstanding Educator Award to **Dr. Eric Showalter**, a professor of civil engineering at Missouri S&T, at the AGC Annual Convention in Las Vegas. Each year, AGC recognizes an educator who makes a significant mark in the field of construction education. The honor included a $5,000 cash award for Showalter and two $2,500 scholarships for students of Showalter's choosing. He has named two undergraduates in civil engineering to receive the scholarships: **Devin Schrieber** of Waterloo, Illinois, and **Raymond Boos** of Cape Girardeau, Missouri.

Two professors recognized by International Association of Advanced Materials

Dr. John J. Myers, deputy director of the Missouri Center for Transportation Innovation and professor of structural engineering at Missouri S&T, was elected as a fellow of the International Association of Advanced Materials (IAAM) in recognition of his research in materials science, engineering and technology. According to Sweden-based IAAM, the honor of fellow is conferred upon deserving researchers around the world who have made significant original contributions to the field of advanced materials science and technology.

Dr. Mohamed ElGawady, Benavides Faculty Scholar and professor, was awarded an International Association of Advanced Materials (IAAM) Scientist Award for 2020. This Advanced Materials Medal is bestowed upon researchers and scientists working in interdisciplinary fields to recognize their important contributions in the field of advanced materials science, engineering, and technology all over the world.

Oerther elected to national EWB board

Dr. Daniel B. Oerther, professor of environmental health engineering, was elected to the board of directors of Engineers Without Borders-USA. His three-year term begins January 2021. Since joining S&T's faculty in 2010, Oerther has provided advice to the student chapter of Engineers Without Borders.

Founded in 2002, the mission of Engineers Without Borders-USA is building a better world through engineering projects that empower communities to meet basic needs and equip leaders to solve the world's most pressing challenges. In 2019, more than 9,500 volunteers contributed to nearly 500 projects in 39 countries and 26 states and territories. This engineering work affected more than a million people worldwide.

Khayat honored by ACI

The Concrete Research Council of the American Concrete Institute (ACI) Foundation honored **Dr. Kamal Khayat**, the Vernon and Maralee Jones Professor of Civil Engineering and director of the Center for Infrastructure Engineering Studies, with the 2020 Robert E. Philleo Award. The award acknowledges Khayat's body of research, teaching, innovation and leadership related to high-performance concrete, and specifically his pursuit of knowledge transfer regarding the science, performance, design and testing standards of self-consolidating concrete (SCC). This award is considered to be among the highest research honors ACI bestows for career contributions to materials research.

El-adaway recognized by American Society of Civil Engineers

The American Society of Civil Engineers (ASCE) recognized **Dr. Islam El-adaway**, the Hurst/McCarthy Professor at Missouri S&T, and his team with the 2020 Thomas Fitch Rowland Prize for significant contributions to construction engineering.

El-adaway won the prize for the paper "First Attempt Toward a Holistic Understanding of the Interdependent Rippled Impacts Associated with Out-of-Sequence Work in Construction Projects: System Dynamics Modeling Approach."

El-adaway collaborated on the paper with lead author Dr. Ibrahim Abotaleb, an assistant professor of construction engineering at the American University in Cairo. He received the award in March 2020, during the Construction Research Congress in Tempe, Ariz. The prize recognizes papers in which the authors describe accomplished works of construction or make valuable contributions to construction management and engineering.

Student Recognition

One reaction to pandemic learning

Pandemic learning is when the opportunity for virtual learning is created overnight. The luxury of time to reflect on what works and what doesn't work is nonexistent. We know the situation wasn't ideal, but it makes our hearts feel good to have such supportive and resilient students like Hannah Franceschini who helped us persevere through these extraordinary times.

"I just want to say I am lucky to be in the CArEE department especially since classes have gone online. My professors have been understanding and are doing great with this horrible situation. I know as a student it's easy to blame professors, but this is new for everyone. I know everyone's trying their best. I think I'm in the best department."

— **Hannah Franceschini**
Senior, Civil Engineering

Bartels speaks at commencement

Katie Bartels, who earned a master's degree in environmental engineering, served as a commencement speaker during the university's virtual ceremony held May 16. While at S&T, Bartels was involved in Chi Epsilon Honor Society, Graduate Leadership Institute, Water Environment Federation, Society of Women Engineers and the American Society of Civil Engineers. In 2017, she earned a bachelor's degree in environmental engineering with a minor in geology. She now is a junior environmental engineer consultant for Golder Associates Inc.

ACI student team finishes third

Team Members:

Victoria Smith
Elizabeth Sayre
Alex Zarate
Kearn Mccullough
Austin Richardson
Alec McMurry
Kenneth Flores

Missouri S&T's student team placed in the American Concrete Institute (ACI) Concrete Solutions Competitions on Oct. 25, 2020, during the ACI Virtual Concrete Convention. The team finished third in the Most Innovative Design/Developmental Use of Concrete category with their floating concrete entry.

Pommerenke earns ACS award

Rahel Pommerenke, EnvE'20, was among a group of selected students to be awarded a 2020 ACS Undergraduate Student Award in Environmental Chemistry. The award recognizes outstanding students, encourages the advancement of chemistry and helps promote careers as chemists. Pommerenke worked as an undergraduate researcher for three years in the electrical, geological, and environmental engineering departments. She served as a student field technician for the USGS Missouri Water Science Center.

Pourhassan selected to receive MAPA scholarship

Alireza Pourhassan, a graduate student in civil engineering, was selected by the Missouri Asphalt Pavement Association's (MAPA) Research and Education Fund (REF) as a recipient of a $1,500 scholarship. The scholarship recognizes students who significantly impact the asphalt construction industry upon completion of their degree program.

Graduate students chosen for CEC Dean's Scholar Awards

Abdulazeez

Assaad

Two graduate students from our department were selected to receive 2019-20 CEC Dean's Ph.D. Scholar Awards. **Mohanad Abdulazeez** and **Rayan Assaad** were honored for their scholarly contributions and teaching excellence.

Shrestha wins poster award

Binod Shrestha, a Ph.D. student in civil engineering, received an honorary award for his poster titled "Repair of Corroded Steel Bridge Columns Using Ultra-High Performance Concrete: Experimental Study" at the 2020 Oklahoma Transportation Research Day Poster Competition, held in October.

Faculty Profiles

Magdy Abdelrahman

Missouri Asphalt Pavement Association Endowed Professor
MATERIALS ENGINEERING

Ph.D., civil engineering, University of Illinois-Urbana

Scholarly Focus, Teaching or Research Areas

Experienced in the area of infrastructure sustainability with applications in pavement engineering; expert in asphalt modifications including the use of recycled modifiers in civil/construction applications

Honors or Awards

- Missouri Asphalt Pavement Association (MAPA) Endowed Professorship in Flexible Pavement, 2017
- CAREER Award, National Science Foundation (NSF), 2009

Selected Academic Activities or Research Projects

- Preparing Interdisciplinary Professional for Rebuilding/ Engineering Resilient Infrastructure of the Nation, U.S. Dept. of Education, 2019-22
- Understanding and Improving Heterogeneous and Modern Recycled Asphalt Mixes, Missouri Department of Transportation (MoDOT), 2018-21

Selected Publications and Presentations

Ragab, M., **Abdelrahman, M.**, Attia, M., "Investigation of the Changes in Asphalt Rubber Binder Fractions and their Relation to Performance Enhancement," *Advances in Civil Engineering Materials*, American Society of Testing Materials, Vol. 9, No. 1, pp. 105-116, 2020, DOI: 10.1520/ACEM20190157.

Dyer, T., **Abdelrahman, M.**, Cheng, Z.H., "Construction and Demolition Wastes," Section: Recovery of Materials and Energy from Urban Waste, Encyclopedia of Sustainability Science and Technology. Meteor Springer, 2018, DOI: 10.1007/978-1-4939-2493-6_118-3.

Noureldin, E., **Abdelrahman, M.**, "Parametric Analysis of Resilient Modulus Modeling for Recycled Asphalt Pavement in Base Layer," *Journal of the Transportation Research Board* (TRB), No. 2401, pp. 30-43, 2014.

Abdelrahman, M., Hardy, A., "Incorporation of Property-Based Testing in Coarse Aggregate Specifications for Pavement Applications," *Journal of ASTM International*, Vol. 7, No. 10, 2010, DOI: 10.1520/JAI102670.

Stuart Baur

Assistant Chair and Associate Professor
ARCHITECTURAL ENGINEERING

Ph.D., civil engineering, Missouri University of Science and Technology

Scholarly Focus, Teaching or Research Areas

Developing sustainable communities through renewable energy technology including various techniques that involve energy efficient lighting design and daylight integration

Honors or Awards

- Experiential Learning Award, S&T
- Outstanding Academic Advising Award, S&T
- Engineers Make a World of Difference Award, American Military Engineers
- Outstanding Solar House Team Advisor Award, S&T

Selected Academic Activities or Research Projects

- 2020 Solar Decathlon – Phase I, Department of Energy, 2019
- Photovoltaic Recycling, Ozark Regional Solid Waste Management District, 2018-19
- 3rd Place Architecture, Innovation and Appliances, 4th place Communications, 4th place Overall, Department of Energy National Design Competition, Solar Decathlon, 2017
- A Climate-Responsive Adaptive Control for a Combination Passive Solar Shading and Natural Ventilation, Environmental Protection Agency (EPA), 2013-14

Selected Publications and Presentations

Feng, Y., Duan, Q., Wang, J., **Baur, S.W.**, "Approximation of Building Window Properties Using In Situ Measurements," *Building and Environment*, Vol. 169, February 2020.

Stanley, R.J., **Baur, S.W.**, Ziegler, B., "Missouri Instructor Survey Assessment of Project Lead the Way Program: A Follow-Up Study," *Transactions on Techniques for STEM Education*, Vol. 5, No. 1, pp. 60-70, October-December 2019, ISSN:2381-649X.

Yildirim, S., **Baur, S.W.**, LaBoube, R.A., "Formulation of Problem-Based Learning in 'Building Components Design' Education," *Journal of Engineering and Architecture*, Vol. 2, No. 2, pp.63-74, December 2014.

Yildirim, S., **Baur, S.W.**, LaBoube, R.A., "Problem-Based Learning with Framing Construction in Architectural Engineering," *Journal of Engineering and Architecture*, Vol. 2, No. 2, pp.13-26, December 2014.

Wermager, S., **Baur, S.W.**, "Modeling Analysis of a Solar House in the Midwest," *Journal of Energies*, Vol. 6, No. 12, pp. 6373-6390, 2013.

Joel Burken

Department Chair and Curators' Distinguished Professor CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING

Ph.D., civil and environmental engineering, University of Iowa

Scholarly Focus, Teaching or Research Areas

Phytoremediation, plant-chemical interactions, mine restoration and remote sensing

Honors or Awards

- U.S. EPA Science Advisory Board, 2016-23
- Milton Gordon Award, Lifetime Research Accomplishment in Phytoremediation, International Phytoremediation Society, 2019
- American Academy of Environmental Engineers and Scientists (AAEES) Science Award, 2018
- President, Association of Environmental Engineering and Science Professors (AEESP), 2011-12
- Member Board of Directors, AEESP, 2008-12
- Fellow, AEESP, Class of 2016

Selected Academic Activities or Research Projects

- Integrated Enhanced Natural Attenuation Approach for Risk-Based Closure of a Toluene Contaminated Site, Natural Sciences and Engineering Research Council of Canada (NSERC), University of Guelph, $2.35M
- Mitigating Nonpoint Source Pollution Impacts on Nearshore Health in the Great Lakes Basin, USA, Great Lakes Research Institute, U.S. EPA, $591,139, Collaborative with USFS, 2016-2021
- Excellence in Research: Elucidating Uptake Mechanisms of Silver/Zinc Oxide Nanoparticles into Food Crops and Transport through Soil Ecosystem, $499,915, NSF, Collaborative with Lincoln University, 2020-2023

Selected Publications and Presentations

Bagheri, M., Al-Jabery, K., Wunsch, D., **Burken, J.G.**, "Examining Plant Uptake and Translocation of Emerging Contaminants Using Machine Learning: Implications to Food Security," *Science of the Total Environment*, Vol. 698, January 2020.

Manley, P.V., Fritsche, F., Sagan, V., **Burken, J.G.**, "Remote Sensing of Explosives-Induced Stress in Plants: Hyperspectral Imaging Analysis for Remote Detection of Unexploded Threats, *Remote Sensing*, Vol. 11, No. 15, pp. 1827, 2019.

Rossi, L., Bagheri, M., Zhang, W., Chen, Z., **Burken, J.G.**, "Using Artificial Neural Network to Investigate Physiological Changes and Cerium Oxide Nanoparticles and Cadmium Uptake by Brassica Napus Plants, *Environmental Pollution*, Vol. 246, pp. 381-389, 2019.

Genda Chen

Robert W. Abbett Distinguished Professor CIVIL ENGINEERING Director, Center for Intelligent Infrastructure

Ph.D., civil engineering, State University of New York at Buffalo

Scholarly Focus, Teaching or Research Areas

Structural health monitoring (SHM), structural control, structural dynamics, robotic platform dynamics, bridge preservation, infrastructure resilience to multi-hazards, computational and experimental mechanics

Honors or Awards

- SHM Person of the Year, *Structural Health Monitoring*, 2019
- Certificate of Registration, Adaptive Wavelet Transform, 2019
- Faculty Research Excellence Awards, S&T, 2009, 2011, 2013
- U.S. Patent, Strain Sensitive Coax Cable Sensor, 2008
- CAREER Award, NSF, 1998

Selected Academic Activities or Research Projects

- An Unmanned Aerial System of Visible Light, Infrared and Hyperspectral Cameras with Novel Signal Processing and Data Analytics, Pipeline and Hazardous Materials Safety Administration
- Traffic Disruption-Free Bridge Inspection Initiative with Robotic Systems, Seven-State Pooled-Fund Study, MoDOT
- Inspecting and Preserving Infrastructure through Robotic Exploration (INSPIRE) – a Tier 1 University Transportation Center, USDOT
- Nano Ferrous Particles Dispersed on Optical Fiber Sensors for Distributed Corrosion Assessment of Civil Infrastructures, NSF

Selected Publications and Presentations

Guo, C., Zhang, Y., Klegseth, M., Gao, J., **Chen, G.**, "Micrometer-Accuracy 2D Displacement Interferometer with Plasmonic Metasurface Resonators," *Optics Letters*, Vol. 45, No. 23, pp. 6474-6477, December 2020.

Li, Z., Tang, F., Chen, Y., Tang, Y., **Chen, G.**, "Elastic Buckling of Thin-Walled Liners Encased in Partially-Grouted Pipelines Under External Pressure," *ASCE Journal of Structural Engineering*, Vol. 164, No. 4, April 2020.

Qu, H., Li, T., Cain, J., **Chen, G.**, "Early Detection of Wire Fracture in 7-Wire Strands Through Multiband Wavelet Analysis of Acoustic Emission Signals," *Engineering Structures*, Vol. 207, 110277, March 2020.

Chen, G., Keynote Speaker, "Empowering and Rejuvenating Civil Engineering with Informatics, Automation and Actuation," 10th Annual Workshop on Advancing Intelligent Transportation Infrastructure, 99th Annual Transportation Research Board Meeting, Washington D.C., January 2020.

Islam El-adaway

Hurst/McCarthy Professor and Founding Director, Missouri Consortium of Construction Innovation
CONSTRUCTION ENGINEERING

Ph.D., civil engineering,
Iowa State University

Scholarly Focus, Teaching or Research Areas

Modeling and simulation, sustainable infrastructure management, resilient hazard management, energy management, contractual and dispute management, decision and risk management

Honors or Awards

- Thomas Fitch Rowland Prize, ASCE, 2020
- Editor's Choice Peer-Reviewed Journal Paper, (3 times), ASCE
- Best Peer-Reviewed Journal Paper, ASCE, 2017
- Outstanding Reviewer (7 times), ASCE

Selected Academic Activities or Research Projects

- Alleviating Electric Grid Congestion – Understanding Consumer and Utilities Response to Infrastructure Investment in Distributed Solar Generation, National Science Foundation (NSF)
- The Impact of Offsite Construction on the Workforce, Construction Industry Institute
- Using the Transmission Network, Consumer Behavior, and Market Structure to Maximize the Value of Solar Generation, Sloan Foundation
- A Multidisciplinary Fellowship Program in Engineering Management and Systems Engineering for Rebuilding Infrastructure, U.S. Department of Education

Selected Publications and Presentations

Abdul Nabi, M., **El-adaway, I.**, "Modular Construction: Determining Decision-Making Factors and Future Research Needs," *Journal of Management in Engineering*, American Society of Civil Engineers, 04020085, Vol. 36., No. 6, pp. 1-36, 2020.

Ali, G., **El-adaway, I.**, "Studying the Relationship Between the Electric Power Sector Development and the Socio-Economic Parameters: A Statistical Analysis Approach," *Journal of Energy Engineering*, American Society of Civil Engineers, Vol. 146, No. 5, 04020045, pp. 1-17, 2020.

Assaad, R., **El-adaway, I.**, "Evaluation and Prediction of the Hazard Potential Level of Dams Using Artificial Intelligence Algorithms," *Journal of Management in Engineering*, American Society of Civil Engineers, 04020051, Vol.36, No. 5, pp. 1-14, 2020.

Mohamed ElGawady

Professor and Benavides Faculty Scholar
CIVIL ENGINEERING

Ph.D., structural engineering,
Swiss Federal Institute of Technology (EPFL)
Lausanne, Switzerland

Scholarly Focus, Teaching or Research Areas

Resilient infrastructure, earthquake engineering, extreme loads, impact loads, infrastructure repair, metamaterial, sustainable material, tire derived aggregate, geopolymer concrete, 3D printing

Honors or Awards

- Scientist Award and Medal, International Association of Advanced Materials (IAAM), Sweden-Based, 2020
- American Society of Civil Engineers (ASCE) Innovation Award with Ph.D. student, Yasser Darwish, 2019
- First Place and Second Place Poster Prize, Oklahoma Transportation Research Conference, Midwest City, 2019

Selected Academic Activities or Research Projects

- Assessment and Repair of Over-Height Truck Impact with Prestressed Concrete Bridge Girders, 2021-23
- Assessment of Bridge Girders Subjected to Vehicle Impact, Mid-America Transportation Center (MATC), 2021-22
- Using Tire Derived Aggregates for Bridge, Masonry, Concrete and Chip Seal Applications, MoDOT and MoDNR
- Behavior of Corroded Steel H-Piles Before and After Repair Using FRP, Geopolymer Concrete, UHPC, Polymer Modified Concrete, USDOT, MoDOT
- CrunchPillow: Meta-Material Impact Protection Units, NSF
- Recycled Paint for More Durable Concrete Structure, MoDNR
- Evaluating and Relaxing the Limits on Flexural Reinforcement Ratio of Masonry Shear Walls, National Concrete Masonry Association
- Class-C Fly Ash, Off-Spec Fly Ash, and Bottom Ash for Geopolymer and Flowable Fill Concrete, MoDOT, MoDNR, and Ameren Corp.

Selected Publications and Presentations

Gomaa, E., Gheni, A., **ElGawady, M.A.**, "Repair of Ordinary Portland Cement Concrete Using Ambient-Cured Alkali-Activated Concrete: Interfacial Behavior," *Cement and Concrete Research*, Vol. 129, No. 105968, 2020.

Shrestha, B., Gheni, A., Abdulazee, M., **ElGawady, M.A.**, "Innovative Approach to Repair Corroded Steel Piles Using Ultra-High Performance Concrete," *Transportation Research Record*, 2020, https://doi.org/10.1177/0361198120929329.

Wang, S., **ElGawady, M.A.**, "Effects of Accelerated Seawater Corrosion on Hollow-Core FRP-Concrete-Steel Columns Under Sustained Axial Load," *Journal of Composites for Construction*, ASCE, Vol. 24, No. 3, 04020017, 2020.

Dimitri Feys

Associate Professor
MATERIALS ENGINEERING

Ph.D., civil engineering,
Ghent University,
Ghent, Belgium

Scholarly Focus, Teaching or Research Areas

Rheology of cement-based materials and complex suspensions; mix design, workability and placement of concrete

Selected Academic Activities or Research Projects

- Minimizing the Effect of Pumping on SCC Workability and Freeze-Thaw Durability, ACI-CRC
- Influence of Casting Conditions on Durability and Structural Performance of HPC-ARL: Changes in Workability and Air-Void System of Concrete due to Pumping, RE-CAST
- Understanding Early Age Behavior of Cement: Rheology and Hydration Kinetics of Pure C_3S and C_3A, UMRB

Selected Publications and Presentations

Feys, D., "Challenges Encountered When Performing and Interpreting Rheological Measurements on Cement-Based Materials," Invited Lecture, Gordon Research Conference, Ventura, CA, February 2020.

Ley-Hernández, A.M., **Feys, D.**, Kumar, A., "How Do Different Testing Procedures Affect the Rheological Properties of Cement Paste?" *Cement and Concrete Research*, Vol. 137, DOI: 106189, 2020, https://doi.org/10.1016/j.cemconres.2020.106189.

Salinas, A., **Feys, D.**, "Estimation of Lubrication Layer Thickness and Composition through Reverse Engineering of Interface Rheometry Tests," *Materials*, Vol. 13, No. 8, pp. 1799, 2020, https://doi.org/10.3390/ma13081799.

Galvez-Moreno, D., **Feys, D.**, Riding, K., "Characterization of Air Dissolution and Reappearance Under Pressure in Cement Pastes by Means of Rheology," *Frontiers in Materials*, Vol. 6, pp. 73. DOI: 10.3389/fmats.2019.00073, 2019.

Ley-Hernandez, A.M., **Feys, D.**, Hartell, J.A., "Effect of Dynamic Segregation of Self-Consolidating Concrete on Homogeneity of Long Pre-Cast Beams," *Materials and Structures*, Vol. 52, No. 1, pp. 4, DOI: 10.1617/s11527-018-1303-z, 2019.

Mark Fitch

Assistant Chair and Associate Professor
ENVIRONMENTAL ENGINEERING

Ph.D., chemical engineering,
University of Texas at Austin

Scholarly Focus, Teaching or Research Areas

Constructed wetlands/biochemical reactors for metals removal, biofiltration/membrane biofiltration, nutrient uptake in streams

Honors or Awards

- UM System President's Award for University Citizenship – Service, 2019

Selected Academic Activities or Research Projects

- Nonpoint Source Pollution Mitigation in an Urban Watershed: USGS-funded project exploring several approaches to mitigating nutrient pollution in urban watersheds with application to eutrophic urban ponds. The project is determining uptake by various native plants and by algae in floating treatment wetlands, where aquatic vegetation is suspended in the water column of streams and lakes to take up nutrients with plant growth.
- Biochemical Reactors for treatment of mine-impacted water: Passive bioreactors generate sulfide as wood is degraded, and that sulfide reacts with metals to form precipitates. The lifespan of such reactors is practically unknown and change in precipitation efficiency over time is entirely unknown. This long-term project involves operating thirty small reactors and evaluating performance and extent of wood decay over a decade.

Selected Publications and Presentations

Deef-Allah, E., Abdelrahman, M., **Fitch, M.**, Ragab, M., Bose, M., He, X., "Balancing the Performance and Environmental Concerns of Used Motor Oil as Rejuvenator in Asphalt Mixes," *Recycling*, Vol. 4, No. 1, pp. 11, 2019, DOI: 10.3390/recycling4010011.

Sochacki, A., Yadav, A.K., Srivastava, P., Kumar, N., **Fitch, M.**, Mohanty A., "Constructed Wetlands for Metals: Removal Mechanism and Analytical Challenges," Chapter 11 in Constructed Wetlands for Industrial Wastewater Treatment, Alexandros Stefanakis (Ede.), John Wiley & Sons, 2018, ISBN 978-1-119-26834-5.

William Gillis

Asst. Teaching Professor
CIVIL AND ARCHITECTURAL ENGINEERING

Ph.D., engineering management, Missouri University of Science and Technology

Scholarly Focus, Teaching or Research Areas

Heating, ventilation, and air-conditioning systems; building electrical systems; architectural materials and construction methods; LEED certification; commissioning of new-building construction, the building envelope, and existing buildings; project management for quality building systems design; project management and construction management for quality constructed buildings through commissioning

Honors or Awards

- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T, 2020
- Outstanding Professional Engineer in Higher Education, Missouri Society of Professional Engineers, St. Louis Chapter, 2015

Selected Publications and Presentations

Cudney, E., **Gillis, W.**, "Quality Function Deployment Implementation in Construction: A Systematic Literature Review," *Frontiers of Engineering Management*, Vol. 3, No. 3, pp. 224-230, 2016.

Gillis, W., Cudney, E., "A Methodology for Applying Quality Function Deployment to the Commissioning Process," *Engineering Management Journal*, Vol. 27, No. 4, pp. 177-187, 2015.

Gillis, W., Cudney, E., "A Standard for the Commissioning Process," *Frontiers of Engineering Management*, Vol. 2, No. 1, pp. 39-51, 2015.

Gillis, W., Cudney, E., "A New Methodology for Eco-Friendly Construction: Utilizing Quality Function Deployment to Meet LEED Requirements," Azevedo, S., Brandenburg, M., Carvalho, H., Cruz-Machado, V., Editors, *Eco-Innovation and the Development of Business Models: Lessons from Experience and New Frontiers in Theory and Practice*, Springer, 2014.

Gillis, W., Cudney, E., "Applying the House of Quality to the New-Building Construction Commissioning Process," Freund, L., Cellary, W., Editors, *Advances in the Human Side of Service Engineering*, AHFE Conference, 2014.

XianBiao Hu

Assistant Professor
TRANSPORTATION ENGINEERING

Ph.D., transportation engineering, University of Arizona

Scholarly Focus, Teaching or Research Areas

Connected and autonomous vehicles, electric vehicles, big data, artificial intelligence, mobility modeling, traffic flow theory, traffic operation and safety

Honors or Awards

- Outstanding Teaching Award, S&T, 2020
- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Scholarly Achievement Award, S&T, 2020
- Fellow, Excellence in Civil Engineering Education (ExCEEd), American Society of Civil Engineers (ASCE)

Selected Academic Activities or Research Projects

- Development of ATMA/AIPV Deployment Guidelines Considering Traffic and Safety Impacts, Colorado DOT
- Electric Vehicle Charging Station (EVSE) Innovation: Streetlight Charging in City Right-of-Way, DOE
- National Center for Transportation Infrastructure Durability and Life Extension (NCTriDurLE), USDOT

Selected Publications and Presentations

Tang, Q., Cheng, Y., **Hu, X.**, Chen, C. , Song, Y. , Qin, R., "Evaluation Methodology of Leader-Follower Autonomous Vehicle System for Work Zone Maintenance," *Transportation Research Record: Journal of the Transportation Research Board*, 2021.

Cheng, Y., Tang, Q., **Hu, X.**, Qi, H., Yang, H., "A Monte Carlo Tree Search-Based Mixed Traffic Flow Control Algorithm for Arterial Intersection," *Transportation Research Record: Journal of the Transportation Research Board*, 2020.

Qi, H., Dai, R., Tang, Q., **Hu, X.**, "Quasi-Real Time Estimation of Turning Movement Spillover Events Based on Partial Connected Vehicle Data," *Transportation Research Part C: Emerging Technologies*, 2020.

Li, Y., Yang, D., **Hu, X.**, "A Differential Privacy-Based Privacy-Preserving Data Publishing Algorithm for Transit Smart Card Data," *Transportation Research Part C: Emerging Technologies*, 2020.

Kamal Khayat

Vernon and Maralee Jones Professor
CIVIL ENGINEERING
Director, Center for Infrastructure Engineering Studies

Ph.D., civil engineering, University of California, Berkeley

Scholarly Focus, Teaching or Research Areas

High-performance cement-based materials for structural applications and rehabilitation; self-consolidating concrete; high-performance concrete with adapted rheology; fiber-reinforced composites; materials for 3D printing; sustainable hydraulic binders; recycled materials for concrete

Honors or Awards

- President's Award for Sustained Career Excellence, University of Missouri System, 2020
- Robert E. Philleo Award, ACI Concrete Research Council, 2020 "For outstanding contributions to research, teaching, innovation, and leadership targeting the advancement of high-performance concrete with adapted rheology and self-consolidating concrete (SCC), and the relentless pursuit of knowledge transfer regarding the science, performance, design, and testing standards of SCC"
- Listed in 2% Top Scientists in the World published by Stanford University (ranking #31 in Building and Construction category out of 27,014 individuals, 2020
- Fellow: RILEM, 2015; ACI, 2004

Selected Academic Activities or Research Projects

- Center for Novel Carbon-Efficient Binders for Sustainable Infrastructure, UM System
- Field Implementation of Compacted Concrete Pavement, Mexico, Mo., MoDOT
- Superabsorbent Polymers in Concrete to Improve Durability, University of Illinois, Urbana Champaign
- Enhanced Performance of Fiber-Reinforced Concrete for Construction and Repair, Euclid Chemical

Selected Publications and Presentations

Khayat, K.H., Co-Chair, Gordon Research Conference, Advanced Materials for Sustainable Infrastructure Development, Ventura Beach, CA, February 23-28, 2020.

Khayat, K.H., Keynote Speaker, 3rd ACF/ HNU International Conference on UHPC Materials and Structures – UHPC'2020, Nanjing, China, October 29-November 1, 2020.

Khayat, K.H., TRB Special Webinar, "Practice: Use of Self-Consolidating Concrete in Bridge Applications," 465 participants, June 9, 2020.

Nicolas Ali Libre

Associate Teaching Professor
STRUCTURAL ENGINEERING

Ph.D., civil engineering, University of Tehran, Iran

Scholarly Focus, Teaching or Research Areas

Teaching innovations and educational technologies; computational mechanics and applied mathematics; advanced composite materials

Honors or Awards

- Provost's eFellows Grant Program Recipient, S&T
- Educational Research Grant Recipient, Center for Advancing Faculty Excellence, S&T
- UM System President's Award for Innovative Teaching
- FTTC Teaching with Technology Award, UMSL
- Faculty Achievement Award, S&T
- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T

Selected Academic Activities or Research Projects

- Development and Evaluation of an Early Alert System to Identify Academically At-Risk Students," Educational Research Grant, S&T Center for Advancing Faculty Excellence
- Develop, Implement, Assess, and Disseminate Entrepreneurially Minded Modules in Mechanics of Materials," Awarded by Lawrence Technological University and KEEN Partners
- Roller Compacted Concrete for Rapid Pavement Construction, Co-PI, MoDOT

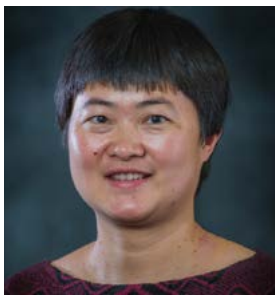
Selected Publications and Presentations

Wu, Z., **Libre, N.A.**, Khayat, K.H., "Factors Affecting Air-Entrainment and Performance of Roller Compacted Concrete," *Construction and Building Materials*, Vol. 259, pp. 120413, 2020, https://doi.org/10.1016/j.conbuildmat.2020.120413.

Schmidt, J., **Libre, N.A.**, "Implementation and Evaluation of Active Learning Techniques: Adaptable Activities for a Variety of Engineering Courses," 127th ASEE Annual Conference and Exposition, Virtual Online Conference, https://www.asee.org/public/conferences/172/papers/30515/view, June, 2020.

Libre, N.A., Baur, S.W., Fitch, M., Showalter, W.E., "Introducing High School Students to Engineering Disciplines: Activities and Assessment," 127th ASEE Annual Conference and Exposition, Virtual Online Conference, https://www.asee.org/public/conferences/172/papers/30843/view, June, 2020.

Jenny Liu



Professor
MATERIALS AND PAVEMENT ENGINEERING

Ph.D., civil engineering,
Texas A&M University

Scholarly Focus, Teaching or Research Areas

Engineering characterization and modeling of infrastructure materials; pavement design, testing, preservation, and condition assessment; sustainable materials and resilient infrastructure adapting to climate change/extreme events

Honors or Awards

- Faculty Research Award, S&T, 2019
- Best Paper Award (3 times), 2014, 2016, 2017
- Outstanding Reviewer (2 times), ASCE
- Engineer of the Year, Alaska Society of Professional Engineers, Fairbanks Chapter, 2016

Selected Academic Activities or Research Projects

- Associate Editor, *ASCE Journal of Materials in Civil Engineering*
- Associate Editor, *ASCE Journal of Transportation Engineering Part B: Pavements*
- Chair, ASCE Bituminous Materials Committee
- Implementing the LWD for MoDOT Construction Acceptance of Unbound Material Layers, MoDOT
- National Center for Transportation Infrastructure and Life-Extension (TriDurLE), S&T Program, USDOT
- Preparing Multidisciplinary Datahub for Digital and Intelligent Infrastructure System, Preliminary Phase, CII
- Use of Recycled Plastics in Asphalt Pavements, TriDurLE
- Development of Holistic Methodologies for Improving Asphalt Mix Durability, TriDurLE

Selected Publications and Presentations

Li, L., **Liu, J.**, Zhang, X., Saboundjian, S., Li, P., "Characterizing Influence of Water Access Condition during Freezing on Resilient Behavior of Base Course Materials," *Transportation Research Record*, https://doi.org/10.1177/0361198120918242, 2020.

Liu, J., **Liu, J.**, Zhu, A., Saboundjian, S., "Evaluation of Multiple Stress Creep Recovery Test on Alaskan Asphalt Binders," *ASCE Journal of Materials in Civil Engineering*, Vol. 32, No. 10, DOI: 04020302, 2020.

Zhao, S., **Liu, J.**, Li, L., Li, P., "Evaluation of Precut Technique to Control Thermal Cracking in Alaskan Asphalt Concrete Pavements," *ASCE Journal of Transportation Part B: Pavements*, Vol. 146, No. 3, 2020, DOI: 04020047, https://doi.org/10.1061/JPEODX.0000206.

Hongyan Ma

Assistant Professor
MATERIALS ENGINEERING

Ph.D. civil engineering,
Hong Kong University of Science and Technology

Scholarly Focus, Teaching or Research Areas

Next-generation cements; solid waste upcycling; smart materials and systems; biotechnology in construction; multi-scale modeling; durability of concrete structures; thermal energy storage; carbon sequestration; mechanics of materials

Honors or Awards

- Faculty Excellence Award, S&T, 2020
- Faculty Research Award, S&T, 2019
- Dean's Scholar, College of Engineering and Computing, S&T, 2019
- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T, 2019

Selected Academic Activities or Research Projects

- MRI: Acquisition of High-Resolution X-Ray Computed Tomography System for Real-Time, In Situ Studies of Various Effects on Microstructure of Materials, NSF, 2020-21
- Sustainable and Durable Calcium Sulfoaluminate Binders Enabled by Multi-Physics Characterization and Theory-Guided Machine Learning, NSF, 2019-22
- Collaborative Research: In-Situ Production of Calcium Carbonate Nanoparticles in Fresh Concrete, NSF, 2018-21
- A Thermo-Kinetic Approach to Enhance the Use of Clays in Concrete, NSF, 2017-21
- Health Inspection of Concrete Pavement and Bridge Members Exposed to Freeze-Thaw Service Environments, INSPIRE UTC

Selected Publications and Presentations

Zhang, P., Liao, W., Zhang, Q., Kumar, A., **Ma, H.**, "Characterization of Sugarcane Bagasse Ash as a Potential Supplementary Cementitious Material: Comparison with Coal Combustion Fly Ash," *Journal of Cleaner Production*, Vol. 277, 123834, 2020, DOI: 10.1016/j.jclepro.2020.123834.

Liao, W., Zhuang, Y., Zeng, C., Deng, W., Huang, J., **Ma, H.**, "Fiber Optic Sensors Enabled Monitoring of Thermal Curling of Concrete Pavement Slab: Temperature, Strain and Inclination," *Measurement*, Vol. 165, 108203, 2020, DOI: 10.1016/j.measurement.2020.108203.

Cai, R., Han, T., Liao, W., Huang, J., Li, D., Kumar, A., **Ma, H.**, "Prediction of Surface Chloride Concentration of Marine Concrete using Ensemble Machine Learning," Cement and Concrete Research," Vol. 163, 106164, 2020, DOI: 10.1016/j.cemconres.2020.106164.

Cesar Mendoza

Associate Professor
WATER RESOURCES ENGINEERING
Associate Chair
GRADUATE PROGRAM

Ph.D., civil engineering,
Colorado State University

Scholarly Focus, Teaching or Research Areas

Environmental fluid mechanics, hydraulics, sediment transport and mathematical modeling; teaches undergraduate and graduate-level courses in the areas of fluid mechanics, hydraulics, rheology and environmental fluid mechanics

Honors or Awards

- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T, 2008
- Outstanding Student Advisor Award, Miner Alumni Association, 2007
- Excellence in Teaching Award, S&T School of Engineering, 2005, 2006

Selected Academic Activities or Research Projects

- Board of Editors, *Mechanics Research Communications*, ELSEVIER; Review Board, *International Journal of Sediment Research*, WASER
- Erosion Potential of the Osage River Downstream from Bagnell Dam, AMEREN UE
- Transport Processes of Mining Related Metals in the Black River of Missouri's New Lead Belt, EPA
- USSES – Expert System for Urban Streams, MSD
- Cell-Enabled Water Citizen Science for Data and Knowledge Generation: WatCitSci, NSF

Selected Publications and Presentations

Mohammed-Ali, W., **Mendoza, C.**, Holmes, Jr., R., "Influence of Hydropower Outflow Characteristics on Riverbank Stability: Case of the Lower Osage River (Missouri, USA)," *Hydrological Sciences Journal*, 2020, DOI: 10.1080/02626667.2020.1772974.

Mohammed-Ali, W., **Mendoza, C.**, Holmes, Jr., R., Riverbank Stability Assessment during Hydro-Peak Flow Events: The Lower Osage River Case (Missouri, USA)," *International Journal of River Basin Management*, 2020, DOI: 10.1080/15715124.2020.1738446.

Zhou, D., **Mendoza, C.**, "Growth Model for Sand-Wavelets," *Journal of Hydraulic Engineering*, ASCE, Vol. 131, No. 10, pp. 866-876, 2005.

El-Habel, F., **Mendoza, C.**, Bagtzoglou, A.C., "Solute Transport in Open Channel Flows and Porous Streambeds," *Advances in Water Resources*, Vol. 25, No. 4, pp. 455-469, 2002.

John J. Myers

Professor
STRUCTURAL ENGINEERING
Deputy Director, Missouri Center for Transportation Innovation

Ph.D., civil engineering,
University of Texas at Austin

Scholarly Focus, Teaching or Research Areas

Structures/high-performance concrete (HPC) behavior and durability performance; fiber-reinforced polymers (FRP) in structural repair and strengthening applications with an emphasis related to concrete and masonry structures and durability performance; development of environmentally sensitive construction materials; hybrid materials and enhanced systems for blast resistant structures

Honors or Awards

- Society Fellow, ACI, ASCE, IAAM, IIFC, TMS and VEST
- National Outstanding Educator Award, AEI
- Professional Recognition Award, ASCE
- Honorary Member, S&T Academy of Civil Engineers
- Faculty Excellence Award (9 times), Faculty Research Award (2 times), Faculty Teaching Award and Commendation (8 times), S&T

Selected Academic Activities or Research Projects

- Durability of GFRP Bar Reinforcement Extracted from In-service Concrete Structures, ACI-SDC, USDOT
- GFRP Reinforced Bridge Barriers, MoDOT
- GAANN Program for Doctoral Training in Civil Infrastructure Condition Assessment, Sustainability, and Resiliency, U.S. Dept. of Education

Selected Publications and Presentations

Al-Khafaji, A.F., **Myers, J.J.**, Alghazali, H.H., "Evaluation of Bond Performance of Glass Fiber Rebars Embedded in Sustainable Concrete," *Elsevier's Journal of Cleaner Production*, Vol. 282, 124516, pp. 16, Feb. 2021.

Al-Khafaji, A.F., Haluza, R.T., Benzecry, V., **Myers, J.J.**, Bakis, C.E., Nanni, A., "Durability Assessment of 15-20 Years Old GFRP Bars Extracted from Bridges in the USA – Part II: GFRP Bar Assessment," American Society of Civil Engineering – *Journal of Composites for Construction*, Vol. 25, Issue 2, April 2021.

Hui, C., Zhang, F., Zhang, Z., Liu, X., Hai, R., **Myers, J.J.**, "Research on the Compression Behavior of Steel Reinforced Concrete Columns with Built-in Steel Tubes," *International Journal of Steel Structures*, Vol. 1, No. 8, 2020.

Alghazali, H.H., Aljazaeri, Z.R., **Myers, J.J.**., "Effect of Accelerated Curing Regimes on High Volume Fly Ash Mixtures in Precast Manufacturing Plants," *Elsevier's Cement and Concrete Research*, Vol. 131, May 2020.

Daniel Oerther

Professor
ENVIRONMENTAL HEALTH ENGINEERING

Ph.D., environmental engineering, University of Illinois, Urbana-Champaign

Scholarly Focus, Teaching or Research Areas

Renowned for interprofessional education and community based participatory research improving access to clean water and nutritious food worldwide

Honors or Awards

- Stanley E. Kappe Lecturer, American Academy of Environmental Engineers and Scientists, 2020
- Honor Award in Environmental Sustainability for, "Science Diplomacy: COAST – Caribbean Ocean and Aquaculture Sustainability faciliTy," Excellence in Environmental Engineering and Science competition, 2020
- Gordon Maskew Fair Distinguished Engineering Educator Award, Water Environment Federation, 2020

Selected Academic Activities or Research Projects

- Elected, President-Elect of the American Academy of Environmental Engineers and Scientists, Annapolis
- Appointed, Director of Engineers Without Borders – USA, Denver
- Appointed, Commissioner Missouri Hazardous Waste Commission, Jefferson City

Selected Publications and Presentations

Voth-Gaeddert, L., Stoker, M., Torres, O., **Oerther, D.B.**, "The Influence of Local Market and Household Factors on Aflatoxin Presence in Maize and Symptoms of its Exposure to Children in Guatemala," *International Journal of Environmental Health Research*, Vol. 30, pp. 312-326, 2020.

Oerther, D.B., Watson, R., "Risk Communication is Important in Environmental Engineering During COVID-19," *Journal of Environmental Engineering*, Vol. 146, No. 01820002, 2020.

Oerther, S., Lach, H., **Oerther, D.B.**, "Immigrant Women's Experiences as Mothers: A Scoping Review," *American Journal of Maternal Child Nursing*, Vol. 45, pp. 6-16, 2020.

Oerther, D.B., Peters, C.A., "Educating Heads, Hands, and Hearts in the COVID-19 Classroom," *Environmental Engineering Science*, Vol. 37, pp. 303, 2020.

Guney Olgun

Assistant Professor
GEOTECHNICAL ENGINEERING

Ph.D., civil and environmental engineering, Virginia Polytechnic Institute and State University

Scholarly Focus, Teaching or Research Areas

Energy geotechnology, energy geostorage, geothermal foundations and shallow geothermal systems, geotechnical earthquake engineering, deep foundations, soil improvement, liquefaction, granular geomechanics, fluvial erosion, disaster resilience

Honors or Awards

- ASCE ExCEEd Fellow, 2020

Selected Academic Activities or Research Projects

- Disaster Resilience and Risk Management (DRRM) – Creating Quantitative Decision Making Frameworks for Multi-Dimensional and Multi-Scale Analysis of Hazard Impact, NSF
- Performance-Based Decision Support System for Resilient and Sustainable Multi-Hazard Building Design, NSF
- Reduction of Seismic Shaking Intensity on Soft Soil Sites Using Stiff Ground Reinforcement, NSF
- Long Term Performance and Group Effect Considerations of Energy Piles, NSF

Selected Publications and Presentations

Khosravi, M., Boulanger, R.W., Wilson, D.W., **Olgun, C.G.**, Tamura, S., Shao, L., "Stress Transfer from Rocking Shallow Foundations on Soil-Cement Reinforced Clay," *Soils and Foundations*, 2019, DOI: 10.1016/j.sandf.2019.04.003.

Akinola, A.I., Wynn-Thompson, T., **Olgun, C.G.**, Mostaghimi, S., Eick, M.J., "Fluvial Erosion Rate of Cohesive Streambanks is Directly Related to the Difference in Soil and Water Temperatures," *Journal of Environmental Quality*, 2019, DOI: 10.2134/jeq2018.10.0385.

Sutman, M. **Olgun, C.G.**, Laloui, L., "Cyclic Load – Transfer Approach for the Analysis of Energy Piles," *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 145, No. 1, January 2019, doi.org/10.1061/(ASCE)GT.1943-5606.0001992.

Sutman, M., Brettmann, T., **Olgun, C.G.**, "Full-Scale In-Situ Tests on Energy Piles: Head and Base-Restraining Effects on the Structural Behaviour of Three Energy Piles," *Geomechanics for Energy and the Environment*, Vol. 18, June 2019, pp. 56-68, doi.org/10.1016/j.gete.2018.08.002.

Heath Pickerill

Assistant Teaching Professor
ARCHITECTURAL ENGINEERING

Ph.D., human environmental science, with an emphasis in architectural studies, University of Missouri-Columbia

Scholarly Focus, Teaching or Research Areas

Teaches architectural design courses, helping students understand the fundamental principles of architectural analysis and how to apply these concepts to the successful solution of contemporary building designs and also engineering communications and computing courses, increasing students' written, oral and technical communications skills as they apply to the professional civil and architectural engineering practice.

Director of Missouri's Local Technical Assistance Program and Rural Transit Assistance Programs

Manages the operations and administration of Missouri LTAP and RTAP located on Missouri S&T's campus. These public service programs provide training, information, technology transfer and technical assistance to Missouri's local governments and rural transit agencies through Missouri Department of Transportation, Federal Highway Administration and Federal Transit Administration funding.

Honors or Awards

- Missouri's State Transportation Innovation Council
- Traffic Engineering Association of Missouri, Governing Board Member
- Missouri Roadway Safety Coalition – Infrastructure Subcommittee, Member
- Missouri Association of County Transportation Officials Conference, Planning Board Member

Selected Publications and Presentations

Pickerill, H., Keynote Speaker, Missouri Association of County Transportation Officials Conference, October 2019.

William Schonberg

Professor and Assistant Chair, Distance Education and Remote Programs
CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING

Ph.D., civil engineering, Northwestern University

Scholarly Focus, Teaching or Research Areas

Armor/anti-armor, penetration mechanics, spacecraft shielding against meteoroid and orbital debris impacts, hypervelocity impact phenomena, building failure and collapse, design and construction of moon and Mars habitats, professionalism and engineering ethics

Honors or Awards

- Associate Editor, *International Journal of Impact Engineering*
- Fulbright Specialist Program Award
- Fulbright Distinguished Chair, Advanced Science and Technology, U.S. State Department
- Distinguished Scientist Award, Hypervelocity Impact Society
- Honor Award, NASA Engineering and Safety Center
- Fraunhofer Bessel Research Award, Humboldt Foundation
- Manuel T. Pacheco Academic Leadership Award, University of Missouri System
- Fellow, ASME, ASCE

Selected Academic Activities or Research Projects

- Assessment of Spacecraft Passivation Requirements, NASA
- Improved Prediction of Terminal Ballistic Events Using Advanced Penetration Algorithms, DST Group, Melbourne, Australia
- Rupture of Composite Overwrapped Pressure Vessels, NASA
- Lightweight Installable Micrometeoroid and Orbital Debris Shield Concepts for International Space Station (ISS) Modules, NASA

Selected Publications and Presentations

Schonberg, W.P.., "Will it Leak? Will it Burst? COPV Perforation and Rupture after an MMOD Impact," *Journal of Space Safety Engineering*, Vol. 7, No. 3, 2020, pp. 213-221.

Schonberg, W.P., "Meeting Passivation Requirements for Spacecraft Pressure Vessels and Fuel Tanks," *Journal of Space Safety Engineering*, Vol. 7, No. 3, 2020, pp. 222-229.

Schonberg, W.P., "Improved Ballistic Limit Equations for High-Speed Non-Aluminum Projectiles Impacting Aluminum Dual-Wall Spacecraft Systems," *Springer Nature Applied Sciences Journal*, Vol. 2, No. 8, 2020, Paper No. 1426-2020.

Eric Showalter

Assistant Chair and Teaching Professor
CIVIL ENGINEERING

Ph.D., civil engineering,
Purdue University

Scholarly Focus, Teaching or Research Areas

Teaches introductory courses in construction and the capstone design course, along with construction cost estimating, construction methods and project delivery

Honors or Awards

- Associated General Contractors of America (AGC) National Outstanding Educator, 2020
- St. Louis Section ASCE Professional Recognition Award, 2019
- Faculty Achievement Award, Missouri S&T, 2019

Selected Academic Activities or Research Projects

- Advisor to the S&T AGC Student Chapter, EWB and Concrete Canoe Student Design Teams and the Blacksmith Club

Lesley Sneed

Professor and Stirrat Faculty Scholar
STRUCTURAL ENGINEERING

Ph.D., civil engineering,
Purdue University

Scholarly Focus, Teaching or Research Areas

Behavior of reinforced and prestressed concrete structural members and systems; structural models and experimental methods; innovative methods of repair and strengthening of structures; evaluation of existing structures; and design codes for structural concrete

Honors or Awards

- University of Bologna Institute of Advanced Studies Visiting Fellowship, 2018
- Missouri S&T Faculty Excellence Award, 2016
- American Concrete Institute Fellow

Selected Academic Activities or Research Projects

- Performance of Earthquake-Damaged Reinforced Concrete Bridges with Repaired Columns, USDOT/MATC
- Doctoral Training in Civil Infrastructure Condition Assessment, Sustainability, and Resiliency, GAANN Program
- Active Microwave Thermography for Nondestructive Evaluation of Infrastructure: A Multi-Physics Based Approach

Selected Publications and Presentations

D'Antino, T., Foccaci, F., **Sneed, L.H.**, Pellegrino, C., "Shear Strength Model for RC Beams with U-Wrapped FRCM Composites," *Journal of Composite for Construction*, Vol. 24, No. 1, 04019057-1-12, 2020, DOI: 10.1061/(ASCE) CC.1943-5614.0000986.

Yang, Y., **Sneed, L.H.**, Morgan, A., Saiidi, M.S., Belarbi, A., "Repair of RC Bridge Columns with Interlocking Spirals and Fractured Longitudinal Bars – An Experimental Study," *Construction and Building Materials*, Vol. 78, pp. 405-420, 2015, DOI: 10.1016/j.conbuildmat.2015.01.010.

Sneed, L.H., D'Antino, T., Carloni, C., Pellegrino, C., "A Comparison of the Bond Behavior of PBO-FRCM Composites Determined by Double-Lap and Single-Lap Shear Tests," *Cement and Concrete Composites*, Vol. 64, pp. 37-48, 2015, DOI: 10.1016/j.cemconcomp.2015.07.007.

D'Antino, T., Carloni, C., **Sneed, L.H.**, Pellegrino, C., "Matrix-Fiber Bond Behavior in PBO FRCM Composites – A Fracture Mechanics Approach," *Engineering Fracture Mechanics*, Vol. 117, pp. 94-11, 2014, DOI: 10.1016/ j.engfracmech.2014.01.011.

Sanjay Tewari

Assistant Teaching Professor
MSU PROGRAM AND WATER RESOURCES ENGINEERING

Ph.D., civil engineering, Texas A&M University

Scholarly Focus, Teaching or Research Areas

Teaching undergraduate/graduate courses on wastewater/water treatment, fluid mechanics and water-resources; research interests are electro-chemical processes such as capacitive deionization, electrokinetics, electro-coagulation and desalination

Honors or Awards

- Crying Towel Award, Louisiana Tech University, 2016 and 2013
- Mills Scholarship, Texas Water Resources Institute, Texas A&M University, 2010
- Mickey Leland Environmental Intern, Texas Commission on Environmental Quality, 2005

Selected Academic Activities or Research Projects

- Pollution Prevention (P2) Grant, Pollution Prevention Technical Assistance and Training, U.S. EPA, 2020-22
- Combined Effect of Sea-Level Rise and Coastal Land Subsidence – Identification of Critical Transportation Infrastructure At-Risk in Coastal SPTC Region, Southern Plains Transportation Center, U.S. Department of Transportation Region 6 Regional University Transportation Center, 2017-18
- Coastal Protection and Restoration Authority through the RESTORE Act Center of Excellence for Louisiana, Protecting Subsurface Freshwater Using Electrokinetic Barriers Against Seawater Intrusion in Coastal Louisiana, 2017-18
- Corrosion Map for Metal Pipes in Coastal Louisiana, Louisiana Department of Transportation and Development, Louisiana Transportation Research Center, 2016-17

Selected Publications and Presentations

Ahmed M.A., **Tewari, S.**, "Performance Evaluation of Asymmetric Capacitive Deionization with Carbon Aerogel Based Fiber-Paper Electrodes: Effect of Gold Deposition vs. Acid Treatment," *Journal of Electroanalytical Chemistry*, Vol. 835, pp. 30-39, 2019, https://doi.org/10.1016/j.jelechem.2019.01.006.

Ahmed M.A., **Tewari, S.**, "Capacitive Deionization: Concepts, Processes, Materials, and State of the Technology," *Journal of Electroanalytical Chemistry*, Vol. 813, pp. 178-192, 2018, https://doi.org/10.1016/j.jelechem.2018.02.024.

Tewari, S., Manning, F., "Identifying Corrosion Zones in Coastal Regions for Metal Pipes – A GIS Approach," Proceedings of Pipelines 2017: Planning and Design, Phoenix, AZ, pp. 618-625, 2017, https://doi.org/10.1061/9780784480885.057.

Jeffery Thomas

Associate Teaching Professor
MSU PROGRAM AND STRUCTURAL ENGINEERING

Ph.D., engineering mechanics, Missouri University of Science and Technology

Scholarly Focus, Teaching or Research Areas

Computer-based student assessment, online content delivery, measurement of student engagement

Honors or Awards

- Faculty Achievement Award, S&T, 2020
- Dean's Educator Award, College of Engineering and Computing, 2020
- Faculty Excellence in Teaching, Missouri State University, 2018

Selected Publications and Presentations

Mechanics of Materials: An Integrated Learning System, 5th edition, John Wiley & Sons, 2020.

Mechanics of Materials: An Integrated Learning System, 4th edition, John Wiley & Sons, 2017. (used by 26,000 students)

WileyPLUS Learning Environment containing 2,000 reading questions, 2,750 Problems, 1,100 tutorials and 770 videos.

Educational websites used by 670,000 people from 206 countries.

More than 5 million hours of student and faculty use of media in WileyPLUS Learning Environment.

Jianmin Wang

Professor
ENVIRONMENTAL ENGINEERING

Ph.D., civil engineering,
University of Delaware

Scholarly Focus, Teaching or Research Areas

Sustainable wastewater treatment and reuse; nanoparticle ecotoxicity; fate and transport of heavy metals in the environment

Honors or Awards

- CAPEES Best Paper Award
- Faculty Research Award

Selected Academic Activities or Research Projects

- Development of Robust Technologies for Advanced Wastewater Treatment and Reuse, U.S. Army
- Understanding and Modeling of the Metal Leaching Process From Coal Fly Ash, EPRI

Selected Publications and Presentations

Yu, Y.H., Su, J.F., Shih, Y., **Wang, J.**, Wang, P.Y., Huang, C.P., "Hazardous Wastes Treatment Technologies," *Water Environment Research*, Vol. 92, pp. 1833-1860, 2020, https://doi.org/10.1002/wer.1447.

Campbell, K., **Wang, J.**, "New Insights into the Effect of Surfactants on Oxygen Transfer in Activated Sludge Process," *Journal of Environmental Chemical Engineering*, Vol. 8, pp. 104409, 2020, https://doi.org/10.1016/j.jece.2020.104409.

Liu, X., **Wang, J.**, "Algae (Raphidocelis subcapitata) Mitigate Combined Toxicity of Microplastic and Lead on Ceriodaphnia Dubia," *Frontiers of Environmental Science and Engineering*, Vol. 14, No. 6, pp. 97, 2020, https://doi.org/10.1007/s11783-020-1276-3.

Campbell, K., **Wang, J.**, Daigger, G., "Filamentous Organisms Degrade Oxygen Transfer Efficiency by Increasing Mixed Liquor Apparent Viscosity: Mechanistic Understanding and Experimental Verification," *Water Research*, Vol. 173, pp. 115570, 2020, https://doi.org/10.1016/j.watres.2020.115570.

Yang Wang

Assistant Professor
ENVIRONMENTAL ENGINEERING

Ph.D., energy, environmental and chemical engineering,
Washington University in St. Louis

Scholarly Focus, Teaching or Research Areas

Air pollution control, atmospheric aerosols, bioaerosols, functional nanoparticle synthesis, combustion

Honors or Awards

- NASA Group Achievement Award for CAMP^{2}Ex airborne Earth Science Mission

Selected Academic Activities or Research Projects

- Understanding the Evolution and Transport of Indoor Bioaerosols, NSF
- Understanding the Vertical Transport and Removal of Aerosols during Deep Convective Events, DOE
- RAPID: A Novel Detector for Mitigating the COVID-19 Pandemic based on Phase Interrogated Ultra-Sensitive Microwave Resonance, NSF

Selected Publications and Presentations

Zheng, G.*, **Wang, Y.***, Wood, R., Jensen, M.P. , Kuang, C., McCoy, I.L., Matthews, A., Mei, F., Tomlinson, J.M., Shilling, J.E., Zawadowicz, M.A., Crosbie, E., Moore, R., Ziemba, L., Andreae, M.O., Wang, J., "New Particle Formation in the Remote Marine Boundary Layer," *Nature Communications,* Vol. 12, No. 527, pp. 1-10, 2021.

Hao, W., Xu, G., **Wang, Y.**, "Factors Influencing the Filtration Performance of Homemade Face Masks," *Journal of Occupational and Environmental Health,* DOI: 10.1080/15459624.2020.1868482, 2021.

Hao, W., Parasch, A., Williams, S., Li, J., Ma, H., Burken, J.G., **Wang, Y.**, "Filtration Performances of Non-Medical Materials as Candidates for Manufacturing Facemasks and Respirators." *International Journal of Hygiene and Environmental Health*, Vol. 229, pp. 113582, 2020.

Wang, Y., Xu, G., Huang, Y.W., "Modeling the Load of SARS-CoV-2 Virus in Human Expelled Particles During Coughing and Speaking," *PLoS ONE*, Vol. 15, No. 10, pp. e0241539, 2020.

Vazquez-Pufleau, M.*, **Wang, Y.***, Biswas, P., Thimsen, E., "Measurement of Sub-2 nm Stable Clusters During Silane Pyrolysis in a Furnace Aerosol Reactor," *Journal of Chemical Physics*, Vol. 152: pp. 024304, 2020.

(*equal contribution)

Chenglin Wu

Assistant Professor
STRUCTURAL ENGINEERING

Ph.D., engineering mechanics, University of Texas at Austin
Ph.D., civil engineering, Missouri University of Science and Technology

Scholarly Focus, Teaching or Research Areas

Nano-mechanics, nanomaterials, nanomanufacturing, machine learning assisted material design and characterization, 3D printing of infrastructure materials, sensing and multifunctional materials

Honors or Awards

- Best Paper Awards, Society of Engineering Science, 2019
- Best Poster, ASME 2019 International Mechanical Engineering Congress and Exposition, Salt Lake City, Utah, 2019

Selected Academic Activities or Research Projects

- Atomic-Layer Dependent Adhesion of Two-Dimensional Transitional Metal Carbides (MXenes), NSF
- 3D Printed FRP-Concrete-Steel Composite Hollow Core Bridge Column, USDOT
- Wireless Sensing Platform Using Low-Dimensional Nanocomposites, USDOT
- Wireless Crack Sensing for Bridge Structures, MoDOT

Selected Publications and Presentations

Li. Y., Han, S., Wei C., **Wu, C.** , Mochalin, V., "Adhesion of Two-Dimensional Titanium Carbides (MXenes) and Graphene to Silicon," *Nature Communications*, Vol. 10, No. 3014, 2019, https://doi.org/10.1038/s41467-019-10982-8.

Guo, C., **Wu, C.**, Chen G., Li. W., "Ultrasensitive Corrosion Sensors with Gr/AgNW Electroplated Fe-C Coating on LPFG," *Sensor and Actuator B: Chemical*, Vol. 283, pp. 334-342, DOI: https://doi.org/10.1016/j.snb.2018.12.059.

Wei C., **Wu, C.**, Wojnar C., "Effect of Patterned Inclusions on Fracture Behavior of Ceramic Composites," *Composite B: Engineering*, Vol. 172, https://doi.org/10.1016/j.compositesb.2019.05.058.

Chen, S., **Wu, C.**, Zeng, Q., Yan, D., Yang. F., "Binder-Scale Creep Behavior of Metakaolin-Based Geopolymer," *Cement and Concrete Research*, Vol. 124, 105810, https://doi.org/10.1016/j.cemconres.2019.105810.

Grace Yan

Associate Professor
STRUCTURAL ENGINEERING

Ph.D., engineering mechanics, Harbin Institute of Technology, China

Scholarly Focus, Teaching or Research Areas

Simulation of natural hazards and their actions on built environment, hazard mitigation and community resilience, improvement of risk awareness of natural hazards and informed decision-making, computational wind engineering, structural health monitoring and condition assessment

Honors or Awards

- Faculty Research Award, S&T, 2020
- Dean's Scholar Award, S&T, 2020
- Presidential Engagement Fellow, UM System, 2020
- Missouri Accelerated Research Award, 2019
- Outstanding Alumni Award, Harbin Institute of Technology, 2016
- UTEP Outstanding Research Performance Award, 2014
- NSF Fellow for ENHANCE, 2013

Selected Academic Activities or Research Projects

- SCC-CIVIC-PG Track B: Community Resilience Micro-Bonds to Balance Cost and Social Equity among Stakeholders, NSF
- CoPe EAGER: Coastal Community Resilience Bonds to Enable Coupled Socio-Physical Recovery, NSF
- Damage and Instability Detection of Civil Large-Scale Space Structures Under Operational and Multi-Hazard Environments Based on Change in Macro-Geometrical Patterns/Shapes, NSF

Selected Publications and Presentations

Li, T., **Yan, G.R.**, Yuan, F., Chen, G., "Dynamic Responses on Large-Scale Dome Structures Induced by Tornado," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 190, pp. 293-308, 2019.

Li, T., **Yan, G.R.**, Feng, R., Mao, X., "Investigation of the Flow Structure of Single- and Dual-Celled Tornadoes and their Wind Effects on a Dome Structure," *Engineering Structures*, https://doi.org/10.1016/j.engstruct.2019.109999, 2019.

Yuan, F., **Yan, G.R.**, Honerkamp, R., Isaac, K.M., Zhao, M., Mao, X., "Numerical Simulation of Laboratory Tornado Simulator that can Produce Translating Tornadoes," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 190, pp. 200-217, 2019.

Xiong Zhang

Professor
GEOTECHNICAL ENGINEERING

Ph.D., civil engineering (geotechnical engineering), Texas A&M University

Scholarly Focus, Teaching or Research Areas

Unsaturated soil mechanics, advanced testing techniques, constitutive modeling, numerical methods and modeling, remote sensing, expansive and collapsible soils, frozen ground engineering, permafrost degradation, frost heave and thaw weakening, image analysis and computer vision

Honors or Awards

- International Award for Innovation in Unsaturated Soil Mechanics, Technical Committee on Unsaturated Soils (TC106) within the International Society for Soil Mechanics and Geotechnical Engineering, 2016
- Keynote Speaker, 7th Asia-Pacific Conference on Unsaturated Soils, 2019, Nagoya, Japan
- Keynote Speaker, 4th International Conference on Transportation Soil Engineering in Cold Regions, 2019, St. Petersburg, Russia
- Keynote Speaker, GEO-Omaha 2020, 37th Annual Geotechnical Conference, Omaha, Neb.

Selected Academic Activities or Research Projects

- Navigating the New Arctic Track 1: Collaborative Research on Sociodemographic, Cultural, and Infrastructure Resilience and Adaptation under the Effects of Permafrost Degradation and Coastal Erosion, NSF, 2019-24
- National Center for Transportation on Infrastructure Durability and Life-Extension (TriDurLE), USDOT, 2019-22
- Development of Design Method for H2Ri Wicking Fabric in Pavement Structures: Phase II, TenCate Geosynthetics, Georgia, 2019-21

Selected Publications and Presentations

Zhang, X., Li, L., Chen, G., Lytton, R.L., "A Photogrammetry-Based Method to Measure Volume Changes of Unsaturated Soil Specimens during Triaxial Testing," *Acta Geotechnica*, Vol. 10, No.1, pp. 55-82, 2015.

Zhang, X., Lytton, R.L., "A Modified State Surface Approach on Unsaturated Soil Behavior Study (III) Modeling of Coupled Hydro-Mechanical Effect," *Canadian Geotechnical Journal*, Vol. 49, pp. 98-120, 2012.

Zhang, X., Briaud, J.L., "Three Dimensional Numerical Simulation of Residential Building on Shrink-Swell Soils in Response to Climatic Conditions," *International Journal for Numerical and Analytical Methods in Geomechanics*, Vol. 39, No. 13, pp. 1369-1409, DOI: 10.1002/nag.2360, 2015.

Adjunct Faculty

Daniel Abbott
MECHANICS
Engineering mechanics: statics, materials testing, introduction to engineering design

Robert Holmes Jr.
WATER RESOURCES/USGS
P.E., F.ASCE, F.EWRI, D.WRE
Chief, Hydrodynamics Branch, U.S. Geological Survey (USGS)
water resources engineering, hydrologic modeling

Mary Ann Koen
MECHANICS
Engineering mechanics: statics

Polly Scott-Showalter
GREEN CONSTRUCTION
P.E., LEED AP
Construction engineering and management, sustainable design and construction

Mike Sneed
TRANSPORTATION ENGINEERING
Traffic Engineer, P.E.
Highway design, analysis, and planning

Robert Tucker
ENVIRONMENTAL ENGINEERING AND GEOLOGY
Tunnel detection in Iraq; deployable baffled bioreactors for army trials of new equipment; adobe blocks for theater building materials

More Faculty Kudos

KHAYAT CHOSEN FOR PRESIDENT'S AWARD

Dr. Kamal Khayat, (pictured above) the Vernon and Maralee Jones Professor of Civil Engineering and director of the Center for Infrastructure Engineering Studies, was selected with six other S&T faculty members to receive a 2020 UM System President's Award for Sustained Career Excellence.

ASCE REGION 7 AWARD GOES TO BURKEN

Dr. Joel Burken was named Outstanding Faculty/Practitioner Advisor by the American Society of Civil Engineers (ASCE) Region 7 in September. Region 7 includes Kansas, Colorado, Wyoming, South Dakota, Nebraska, Iowa and Missouri.

HU RECOGNIZED BY INTERNATIONAL JOURNAL

Dr. XianBiao Hu, assistant professor of transportation engineering, received a 2019 Outstanding Reviewer Award at the editorial board meeting of the *International Journal of Transportation Science and Technology*.

LIBRE INVITED TO SERVE AS ASCE PANELIST

Dr. Nicolas Ali Libre, associate teaching professor, was invited to serve as a panelist in a series of seminars and panel discussions sponsored by the American Society of Civil Engineers (ASCE) that moved online due to COVID-19. He talked about the use of educational technology in effective online teaching and shared some practical online teaching techniques.

OERTHER HONORED BY AAEES

Dr. Daniel Oerther, professor of environmental health engineering, was selected as the 2020 Kappe Lecturer by the American Academy of Environmental Engineers and Scientists (AAEES). This is an extremely competitive award that is granted annually by the AAEES to a leader in the environmental engineering field whose excellence in research and professional service inspires students. Oerther also received a 2020 Honor Award in Environmental Sustainability as part of the annual Excellence in Environmental Engineering and Science competition hosted by AAEES.

ZHANG DELIVERS KEYNOTE PRESENTATION

Dr. Xiong Zhang, professor of geotechnical engineering, gave the keynote speech on "Use of Wicking Fabric to Dehydrate Road Embankment Under Unsaturated Conditions" at GEO-Omaha 2020 – the 37th Annual Geotechnical Conference organized by the American Society of Civil Engineers (ASCE) Nebraska Section in Omaha, Nebraska, on Friday, Feb. 21, 2020.

Sunderland donates $1 million to complete Clayco ACML Lab

Missouri S&T received a $1 million gift from the Sunderland Foundation to complete construction of the Clayco Advanced Construction and Materials Laboratory (ACML). Their donation will make a lasting impact on next-generation construction materials and methods, changing the lives of many S&T students today, tomorrow and for years to come. Additionally, the new infrastructure materials and design methods developed here will benefit Missouri's infrastructure needs.

The lab expands the existing high bay structures lab in Butler-Carlton Civil Engineering Hall with 16,000 square feet of new space for research on sustainable, cost-effective, and green solutions to our nation's infrastructure. More than 35 pieces of Center for Infrastructure Engineering Studies (CIES) testing equipment previously located in buildings across campus have been consolidated at the new research lab.

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