



01 Jan 2019

## 2019 Scholarly Productivity Report

Missouri University of Science and Technology

Follow this and additional works at: [https://scholarsmine.mst.edu/care-scholarly\\_productivity\\_reports](https://scholarsmine.mst.edu/care-scholarly_productivity_reports)



Part of the [Architectural Engineering Commons](#), and the [Civil and Environmental Engineering Commons](#)

---

### Recommended Citation

Missouri University of Science and Technology, "2019 Scholarly Productivity Report" (2019). *Civil, Architectural and Environmental Engineering Scholarly Productivity Reports*. 1.  
[https://scholarsmine.mst.edu/care-scholarly\\_productivity\\_reports/1](https://scholarsmine.mst.edu/care-scholarly_productivity_reports/1)

This Report is brought to you for free and open access by Scholars' Mine. It has been accepted for inclusion in Civil, Architectural and Environmental Engineering Scholarly Productivity Reports by an authorized administrator of Scholars' Mine. This work is protected by U. S. Copyright Law. Unauthorized use including reproduction for redistribution requires the permission of the copyright holder. For more information, please contact [scholarsmine@mst.edu](mailto:scholarsmine@mst.edu).



MISSOURI  
**S&T**  
care.mst.edu



# 2019 Scholarly Productivity

Civil, Architectural and Environmental Engineering







# Changing the World

Shaping the future of  
built and natural  
environments of our  
global society through  
creative research  
and education.

## Dear Friends,

As we close the door on 2019 and head into 2020, the Civil, Architectural and Environmental Engineering Department notes considerable pride over last year's accomplishments and anticipates new possibilities for the future. The year 2020 is special to us, as it marks the 150th anniversary of the founding of the Missouri School of Mines (MSM), as the charter was signed on Feb. 24, 1870. Following the founding of MSM, two of the first three graduates earned civil engineering degrees. Those two initial 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.

The end of calendar year 2019, marked the target for our aggressive Vision 2020 Strategic Plan. We began this venture in 2011 and will continue to move closer to completing our efforts to advance the CArEE Department. We achieved notable goals, including an increase in scholarly output that led S&T in growth and accomplishment. Our team realized increased productivity in most aspects of our scholarly work. We present our accomplishments here with pride, but we also know our work is not done. As a team, the faculty, staff and students made contributions in productivity that saw increases in publications, research expenditures, capabilities and national visibility. We advanced in these areas at the same time our 2019 enrollment topped 600 students!

We celebrated a strong year of production, with more than 163 peer-reviewed journal articles written, as well as many notable international keynote talks and presentations given. Research productivity increased to \$4.7M — a 74% increase over 2017 — and new awards for fiscal year 2018 topped \$5.98M. Our faculty were honored with many national and international awards, ranging from notable research breakthroughs to recognition for career accomplishments in teaching, service and research (page 6).

Our talented team and our research and educational facilities will undoubtedly create more opportunities for our graduates to go out and **Change the World** in their career as Miner alumni. If you have any questions about the exciting things going on in Rolla or our future vision in the Civil, Architectural and Environmental Engineering Department at Missouri S&T, please contact me.

Sincerely,



## Joel G. Burken

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

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

[burken@mst.edu](mailto:burken@mst.edu)

# CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING BY THE NUMBERS

care.mst.edu

## 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 (2021)

**31** Full-time  
faculty  
members

**610+**

CArEE student enrollment

**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.)

**\$6M**

New research awards (FY'18)

**14,800** ft<sup>2</sup>

NEW LAB SPACE IN 2020

CLAYCO ACML

Advancing S&T's leadership  
in infrastructure engineering

**35%**

CArEE department  
undergraduate  
female engineers

Undergraduate  
female  
environmental  
engineers

**53%**

**\$4.7M** Research  
expenditures  
(CY'19)

**\$377K**

Annual scholarships awarded

# COLLEGE OF ENGINEERING AND COMPUTING

cec.mst.edu

**249** CEC  
faculty  
members

Bachelor's  
degrees  
awarded **1,050**

**One of 20**

LARGEST ENGINEERING  
COLLEGES IN U.S

**\$34M**

New research awards  
(FY'19)

## HIGHLIGHTS



### Envisioning digital cities

**Dr. Genda Chen**, the Robert W. Abbett Distinguished Professor of Civil Engineering, wants to make the city of the future more intelligent – able to build and repair its roads, bridges, electrical grids, power plants and other infrastructure through a network of robotics, sensors and data analytics that diagnose and identify the community's needs.

His team of researchers at the Center for Intelligent Infrastructure (CII) are working to create new infrastructure capabilities on a grand scale to lower construction and maintenance costs and improve worker safety. His team at the INSPIRE University Transportation Center is already developing robotics technology that focuses on inspection and maintenance of bridges. Chen, director of both centers, envisions a future where a digital stream of data from sensors could be used to run scenarios and help public officials determine policy and plan for potential infrastructure problems before they happen.



### New research facility in construction phase

Missouri S&T will soon augment work underway through a new research facility – the Clayco Advanced Construction and Materials Laboratory (ACML). When completed in summer 2020, the ACML will expand Missouri S&T's infrastructure research capabilities to develop and test new construction materials and methods, which can make repaired bridges last longer. The addition of this premier facility will position S&T as a global leader in infrastructure research and will help realize our long-term vision of making civil infrastructure safer, more durable and longer lasting.

Follow the construction through time-lapse videos at [rol.la/ACML-live](http://rol.la/ACML-live).

### Planning for future climate changes in the Arctic

As global temperatures warm, communities in the Arctic regions of Alaska face long-term changes to their way of life. Missouri S&T researchers are working as part of a five-year, \$3 million National Science Foundation (NSF) project to help those communities plan for the future.



**Dr. Xiong Zhang and his team**

**Dr. Xiong Zhang**, associate professor of geotechnical engineering, is working with Dr. Ming Xiao, associate professor of civil engineering at Penn State University, to develop a geotechnical hazard map to predict the effects of warming and thawing of permafrost. When frozen, permafrost provides a solid foundation for roads, airports, oil pipelines and railroads. But as the soil warms and softens, infrastructure can be damaged and possibly destroyed. Along Alaska's coastline, thawing permafrost can cause a loss of land mass, which in turn could force entire communities to relocate. Zhang's research will help determine where and how much damage could occur.

"The Arctic is very sensitive to climate change," Zhang says. "It's estimated that by 2050, 30% of permafrost could be affected."

Navigating the New Arctic is one of NSF's 10 Big Ideas. The NSF project is intended to document and understand rapid changes in the Arctic, gauge possible effects on U.S. national security and economic development, and enable sustainable Arctic communities.



## New consortium aims at an integrated construction industry vision

Leading companies from the construction industry in Missouri are joining forces with academia at Missouri S&T to optimize corporate performance and project life cycle through an integrated construction engineering and management (CEM) vision directed at student development, research and professional development.



MISSOURI CONSORTIUM for  
**CONSTRUCTION**  
INNOVATION

various seminars by CEM academic and industry experts, and develop plans, strategies, and priorities for future activities.

To learn more about this new consortium, visit the website at [mo-cci.mst.edu](http://mo-cci.mst.edu). If you have any questions or would like to become a member, contact **Dr. Islam El-adaway**, Hurst-McCarthy Professor and Director of MO-CCI by email at [eladaway@mst.edu](mailto:eladaway@mst.edu).

The new Missouri Consortium for Construction Innovation (MO-CCI), officially launched in 2019, is composed of both the contractor side (i.e. contractors, sub-contractors, suppliers, etc.) and the owner side of the state of Missouri.

Together with the consortium's growing membership, the initial MO-CCI members — ARCO Construction, BJC Healthcare, Brinkmann Constructors, Clayco, Greensfelder and McCarthy Building Companies — will collaborate to help solve some of the needs of Missouri's construction industry.

MO-CCI will organize an annual conference to report and disseminate results and findings related to all activities in the prior year, provide

## New transportation center to address aging infrastructure in Missouri

Aging infrastructure in Missouri – such as crumbling roads and bridges – affects Missourians every day and can impede the state's economic growth. A new transportation research center announced in December will combine the research of Missouri S&T and the other University of Missouri (UM) System campuses with industry and government leaders to develop new strategies to address the state's infrastructure issues.

The Missouri Center for Transportation Innovation (MCTI) will be led by the University of Missouri-Columbia (MU) for its first three years. Dr. Bill Buttlar, the Glen Barton Chair in Flexible Pavement Systems at the MU College of Engineering, will serve as the center's director, joined by **Dr. John Myers** of Missouri S&T as the deputy director.

"The MCTI is an exciting opportunity to help Missouri address infrastructure challenges now and into the future," says Myers. "The MCTI will also provide an opportunity for our students to gain real-world experience as they prepare for civil engineering careers."

The MCTI will share research from all four UM System campuses with the Missouri Department of Transportation (MoDOT), which is providing base funding for the project through the state's planning and research dollars. The MCTI hopes to attract federal funding as well.

## Forged in Gold, Missouri S&T's first 150 years



Missouri S&T was chartered in 1870 as the University of Missouri School of Mines and Metallurgy. Known more commonly as the Missouri School of Mines or MSM, it was one of the nation's first technological schools and the first mining school west of the Mississippi River. The first classes at MSM were held Nov. 6, 1871, in the Rolla Building, which still stands today as the oldest structure on campus.

S&T is planning several public events to commemorate its sesquicentennial, beginning with "S&T Day at the Capitol" in Jefferson City in February 2020 to mark the 150th anniversary of Missouri Gov. Joseph W. McClurg's signing of the legislation that called for a "school of mines" to be created in southern Missouri. Missouri S&T will kick off a 13-month celebration of its founding during Homecoming Weekend (Oct. 16-17, 2020). Sesquicentennial events will continue through November 2021, which will mark the 150th anniversary of the first day of classes at S&T.

### FORGED IN GOLD BOOK ORDERS

Pre-order by May 15, 2020 and save!

- Get \$10 off the regular retail price of \$49.99
- Be automatically entered for prizes
- Get a free commemorative gift pack\*

For more information about the university's 150th anniversary, or to purchase the book, visit [150.mst.edu](http://150.mst.edu).

## Faculty Achievements



### And the UM System and S&T awards go to...

Several faculty members were honored with awards in 2019 for excellence and achievement in teaching, research and service.

Pictured from left to right with **Dr. Joel Burken**, Department Chair:

- **Dr. Jenny Liu**, Missouri S&T Faculty Research Award
- **Dr. Lesley Sneed**, Missouri S&T Outstanding Teaching Award
- **Dr. Mark Fitch**, UM System President's Award for Service
- **Dr. Daniel Oerther**, UM System Ratchford Award
- **Dr. Eric Showalter**, Missouri S&T Faculty Achievement Award
- **Dr. Hongyan Ma**, Missouri S&T Faculty Research Award

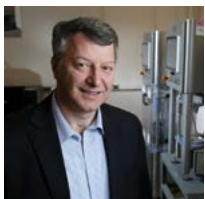
## International lifetime recognition

### Milton P. Gordon Award for Excellence in Phytoremediation



The International Phytotechnology Society (IPS) awarded **Dr. Joel Burken** the Milton P. Gordon Award for Excellence in Phytoremediation during the society's annual conference in Changsha, Hunan Province, China. IPS recognizes one leader every year in the field of phytoremediation – a process that uses various types of plants to remove, stabilize or destroy contaminants in soil and groundwater. The award was established in 2007, two years after Gordon's death, to honor his excellence in research, promotion of technology, and teaching and mentoring undergraduate and graduate students. Burken is only the fourth American recipient of the award.

### Lifetime Achievement Award in the Field of Self-consolidating Concrete



**Dr. Kamal H. Khayat**, Vernon and Maralee Jones Professor of Civil Engineering, was honored for his lifetime achievements in the field of self-consolidating concrete. The 2nd International RILEM Conference on Rheology and Processing of Construction Materials (RheoCon2) was held in conjunction with the 9th International RILEM Symposium on Self-Compacting Concrete (SCC9) in Dresden, Germany Sept. 8-11. RILEM is the International Union of Laboratories and Experts in Construction Materials, Systems and Structures, and Khayat is one of only 64 named Fellows in the RILEM organization.

## Faculty appointments, awards and promotions

**Dr. Genda Chen**, professor and Robert W. Abbett Distinguished Chair in Civil Engineering, received one of two 2019 Person of the Year Awards given by the *Structural Health Monitoring (SHM) Journal* at its 12th International Workshop on Structural Health Monitoring.

**Dr. Islam El-adaway** was promoted to professor. He is the Hurst/McCarthy Professor of Construction Engineering and Management. He joined Missouri S&T in 2018 after two prior appointments with the University of Tennessee – Knoxville and Mississippi State University. He was selected a 2019 ENR Top Young Professional and his work with his graduate students was selected for two ASCE Editor Choice journal papers in 2018.

**Dr. Dimitri Feys** was promoted to associate professor with tenure. He joined S&T in 2013 and earned his Ph.D. from Ghent University, Belgium in 2009. He works on rheology of cement-based materials, design and placement of high-performance concrete. Feys was also recognized in 2018 with the ACI Young Member Award for Professional Achievement.

**Dr. Daniel B. Oerther**, professor of environmental health engineering, received the Education Excellence award from the National Society of Professional Engineers for, "linking engineering education with the promotion of professional practice."

**Dr. Lesley Sneed**, associate professor of civil engineering, was appointed to serve on American Concrete Institute (ACI) Committee 318-25, Structural Concrete Building Code. This committee develops and maintains building code requirements for structural concrete. The ACI 318 Building Code Requirements for Structural Concrete is adopted, either directly or as a main reference, in the national code of more than 30 countries.

**Dr. Yang Wang** recently earned the a Ph.D. Award from the Gesellschaft für Aerosolforschung (GAeF), or Association for Aerosol Research, based in Germany. An assistant professor of environmental engineering, Wang received the award at the association's General Assembly in Sweden in August.

## Student Recognition



Wesam Mohammed Ali is pictured in the center with Dr. Joel Burken, department chair (left) and Dr. Cesar Mendoza, his advisor (right).

## Digital Water Works Fellowship awarded to Ph.D. student in water resources

**Wesam Mohammed Ali**, a Ph.D. candidate in civil engineering, was presented a certificate for receiving the Digital Water Works Excellence in Water Fellowship. During the Stueck Lecture held this spring, Dr. Paul F. Boulos, a global water resources and wastewater industry expert, shared leadership lessons with students, faculty and members of the S&T Academy of Civil Engineers. After spending a few days with people in the department, Boulos helped facilitate a fellowship offered by Digital Water Works ([digital-ww.com](http://digital-ww.com)), an engineering services provider where he serves as CEO. This new fellowship was offered to support an outstanding graduate student pursuing a degree in water resources.

Read more at: [econnection.mst.edu/2019/11/boulos-delivers-stueck-lecture-establishes-fellowship](http://econnection.mst.edu/2019/11/boulos-delivers-stueck-lecture-establishes-fellowship).

## The Masonry Society honors Jemison



**Sarah Jemison**, ArchE and CE'18, MS CE'18, was awarded the 2019 Outstanding Master's Thesis Award from The Masonry Society (TMS) for her work "Compressive Behavior of Masonry Columns Confined with Steel Reinforced Grout (SRG) Composite" under the direction of **Dr. Lesley Sneed**.

While at S&T, Jemison was a Greenberg Scholar, a mechanics of material lab assistant, and she was also involved with the Steel Bridge Design Team and Chi Epsilon. Since graduation, she has been working at KPFF Consulting Engineers in St. Louis as a structural engineer.



## Students sweep conference awards

Missouri S&T civil engineering students swept the 2019 Oklahoma Transportation Research Day Conference. They won two out of the three awards given. **Amro Ramadan** took first place and a team made up of students **Binod Shrestha**, **Mohanad Abdulazeez** and **Ahmed Gheni**, took second place.

## Ph.D. student scholarships

**Javad (Jay) Galinmoghdam**, a Ph.D. student in geotechnical engineering, was awarded a \$5,000 Geosynthetics Institute (GSI) Fellowship grant for his research proposal "Use of Wicking Geotextile to Mitigate Frost Action in Cold Regions: a Numerical Study."

**Beshoy Riad**, a Ph.D. student in civil engineering, was awarded the ASCE 2019 GeoConfluence Research Scholarship. His research is focused on developing a landslide warning system for rainfall-induced landslides for natural slopes.

**Xingxing Zou**, a Ph.D. student in civil engineering, was awarded the Great Plains Chapter of the International Concrete Repair Institute Scholarship in the amount of \$1,500 for the 2019-20 school year. His research focuses on the subject of strengthening and repairing concrete structures using advanced composite materials.



## An ultimate adventure

**Scott Grier**, a senior in civil engineering and engineering management, spent the fall semester in Hong Kong as a recipient of the Benjamin A. Gilman International Scholarship to study abroad. The scholarship allowed Grier to participate in academic and cultural experiences while studying structural engineering at Hong Kong University of Science and Technology.



## Magdy Abdelrahman



**Missouri Asphalt  
Pavement Association  
Endowed Professor  
MATERIALS  
ENGINEERING**

Ph.D., energy, environmental  
and chemical engineering,  
Washington University

### 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
- Researcher of the Year, North Dakota State University, 2009
- College of Engineering and Architecture 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), 2018-20
- CAREER: A Program of Research Focused on Understanding of Interaction of Recycled Materials with Asphalt, Outreach, Academic and Engineering Development, NSF, 2009-15

### Selected Publications and Presentations

Ragab, M., **Abdelrahman, M.**, and 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 (1): pp. 105-116, 2020, DOI: 10.1520/ACEM20190157.

**Abdelrahman, M.**, and Saboori, A., "Utilization of Waste Materials in Construction," in Robert A. Meyers (ed.) *Encyclopedia of Sustainability Science and Technology*, Springer Verlag: pp. 11773-11782, 2012.

**Abdelrahman, M.**, "Controlling Performance of Crumb Rubber Modifier (CRM) Binders through Addition of Polymer Modifiers," *Journal of the Transportation Research Board (TRB)*, No. 1962: pp. 64-70, 2006.

## 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, 2018-2019
- 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), 2013-2014

### Selected Publications and Presentations

Stanley, R.J., **Baur, S.W.**, "Extended Targeted Academic Performance Assessments From Missouri University of Science and Technology Students with Project Lead The Way Course Experience," *Transactions on Techniques for STEM Education*, Vol. 4, No. 1, pages 60-70, October-December 2018, ISSN:2381-649X.

**Baur, S.W.**, Stanley, R.J., "Assessing Missouri University of Science and Technology Student Academic Performance from 2014-2017 based on Project Lead The Way College Credit Course Experience," *Transactions on Techniques for STEM Education*, Vol. 4, No. 1, pages 75-85, October-December 2018, ISSN:2381-649X.

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

**Baur, S.W.**, Lamson J.A., "Thermal Performance of a Solar Thermal Electric Panel (STEP) System," *Journal of Energy Engineering*, Vol. 138, No. 3, pp. 130-135, September, 2012.

# 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

- Plant Uptake of Emerging and Fugitive Compounds: A Sustainable Approach to Exposure Assessment, NSF, 2016-20
- The Missouri Transect: Climate, Plants, and Community – EPSCOR, NSF, 2014-20
- Collaborative: Cellphone-Enabled Water Citizen Science for Data and Knowledge Generation, and Sharing, WatCitSci, NSF, 2018-20

## 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.

Al-Lami, M., Gonzalez, E., Oustriere, N., **Burken, J.G.**, "Amendment-assisted Revegetation of Mine Tailings: Improvement of Tailings and Biomass Production," *International Journal of Phytoremediation*, Vol. 21, No. 5, pp. 425-434, 2019.

Wilson J.L., Limmer, M.A., Samaranayake, V.A., **Burken, J.G.**, "Phytoforensics: Trees as Bioindicators of Potential Indoor Exposure via Vapor Intrusion," *PLoS ONE*, Vol. 13, No. 2, 2018.

Limmer, M.A., **Burken, J.G.**, "Plant Translocation of Organic Compounds: Physicochemical Predictors," *Environmental Science and Technology Letters*, Vol. 1, No. 2, pp. 156-161. (Also highlighted in *Science*, Vol. 343, pp. 1291), 2014.

# 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

Fan, L., Bao, Y., Meng, W., and **Chen, G.**, "In-situ Monitoring of Corrosion-induced Expansion and Mass Loss of Steel Bar in Steel Fiber Reinforced Concrete Using a Distributed Fiber Optic Sensor," *Composites B: Engineering*, Vol. 165, pp. 679-689, May 2019.

Qu, H., Li, T., and **Chen, G.**, "Multiple Analytical Mode Decompositions for High Accuracy Parameter Identification of Nonlinear Oscillators from Free Vibration," *Mechanical Systems and Signal Processing*, Vol. 117, pp. 483-497, February 2019.

Bao, Y., Huang, Y., Hoehler, M., and **Chen, G.**, "Review of Fiber Optic Sensors for Structural Fire Engineering," *Sensors* 2019, 19,877, February 2019, DOI: 10.3390/s19040877.

**Chen, G.**, Keynote Speaker, "SHM Roles in Autonomous Inspection and Preventive Maintenance of Bridges," The 8th International Conference on Structural Health Monitoring of Intelligent Infrastructure, Brisbane, Australia, December 2017.



# Wen Deng



## Assistant Professor GEOTECHNICAL ENGINEERING

Ph.D., geosciences,  
Iowa State University

### Scholarly Focus, Teaching or Research Areas

Seismic wave and ground fluids interaction, soft matter physics in constricted pores, bio-inspired soil/rock mediation, multiphase flow, microfluidics, geoenvironmental engineering, geotechnical asset management

### Selected Publications and Presentations

Zeng C., **Deng W.**, Fan J., Zhang Y., "Effect of Flow Profiles on the Flow Subjected to Oscillation Forcing: An Example of Droplet Mobilization in Constricted Tubes," *Journal of Hydrology*, 124295, 2019, DOI: 10.1016/j.jhydrol.2019.124295.

Zhang Y., Zeng C., Bai B., **Deng W.**, "Experimental Investigation of the Dynamics of Trapped Nonwetting Droplets Subjected to Seismic Stimulation in Constricted Tubes," *Journal of Geophysical Research: Solid Earth*, Vol. 124, No. 12, pp. 12722-12735, 2019, DOI: 10.1029/2019JB018387.

Zeng C., Wu C., **Deng W.**, "Thermal Mechanical Analysis of Porous Granite Asperities in Contact Using Probabilistic Damage Model," *International Journal of Rock Mechanics and Mining Sciences*, Vol. 124, 104130, 2019, DOI: 10.1016/j.ijrmms.2019.104130.

Cao J., Bate B., Bouazza A., **Deng W.**, "Measuring Retardation Factors of 133-Cesium and 88-Strontium Cations Using Column Test," *Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 145, No. 9, 06019009, 2019, DOI: 10.1061/(ASCE)GT.1943-5606.0002107.

Zheng L., Wang L., **Deng W.**, "Seismicity Enhances Macrodispersion in Finite Porous and Fractured Domains: A Pore-Scale Perspective," *Journal of Geophysical Research - Solid Earth*, Vol. 124, No. 3, pp. 2844-285, 2019, DOI: 10.1029/2018JB016921.

Shi D., Wang J., **Deng W.**, "Smart Building and Construction Materials," *Advances in Materials Science and Engineering*, 2432915, 2019, DOI: 10.1155/2019/2432915.

# 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
- Top Professional, *Engineering News Record (ENR)*, 2019
- Editor's Choice Peer-Reviewed Journal Paper, (2 different times), ASCE
- Best Peer-Reviewed Journal Paper, ASCE, 2017
- Outstanding Reviewer (7 different 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

**El-adaway, I.**, Ali G., Assaad, R., Elsayegh, A. and Abotaleb, I., "Analytic Overview of the Citation Metrics in the Civil Engineering Domain with Focus on the Construction Engineering and Management Specialty Area and its Sub-Disciplines," *Journal of Construction Engineering and Management*, ASCE, Vol. 145, No. 10, 04019060, pp. 1-14, 2019.

Eid, M. and **El-adaway, I.**, "Decision Making Framework for Holistic Sustainable Disaster Recovery: An Agent Based Approach for Decreasing Vulnerabilities of the Associated Communities," *Journal of Infrastructure Systems*, ASCE, Vol. 24, No. 3, 0401800, pp. 1-24, 2018.

Abotaleb, I. and **El-adaway, I.**, "First Attempt towards a Holistic Understanding of the Interdependent Rippled Impacts Associated with Out-of-Sequence Work in Construction Projects: A System Dynamics Modeling Approach," *Journal of Construction Engineering and Management*, ASCE, Vol. 144, No. 9, 0001539, pp. 1-21, 2018.

# 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

- 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

- 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
- Retrofitting of Metal Roofs Using Single Ply, GAF Material LLC
- 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

Darwish, Y., **ElGawady, M.A.**, "Analysis of Metamaterial Bi-stable Elements as Energy Dissipation Systems," *Bridge Structures*, Vol. 15, No. 4, pp. 151-159, 2019.

Abdulazeez, M., **ElGawady, M.A.**, and Abdelkarim, O., "Bending and Buckling Behavior of Hollow-core FRP-concrete-steel Columns," *Journal of Bridge Engineering*, ASCE, Vol. 24, No. 8, 2019.

Wang, S., and **ElGawady, M.A.**, "Durability of Hollow-core GFRP-concrete-steel Columns under Severe Weather Conditions," *Journal of Composites for Construction*, ASCE, Vol. 23, No. 1, 04018078-1:23, 2019.

# 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<sub>3</sub>S and C<sub>3</sub>A, UMRB

## Selected Publications and Presentations

Galvez-Moreno, D., **Feys, D.**, and 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.

**Feys, D.**, and Asghari, A., "Influence of Maximum Applied Shear Rate on the Measured Rheological Properties of Flowable cement pastes," *Cement and Concrete Research*, Vol. 117, pp. 69-81. DOI: 10.1016/j.cemconres.2018.12.003, 2019.

Ley-Hernandez, A.M., **Feys, D.**, and 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.

**Feys, D.**, Sonebi, M., Amziane, S., Djelal, C., El Cheikh, K., Fabbri, F., Fataei, S., Greim, M., Ivanova, I., Keller, H., Khayat, K., Libessart, L., Mechtcherine, V., Navarette, I., Perrot, A., Secrieru, E., Vanhove, Y., "Overview of Round-Robin Tests on Concrete Rheometers in Bethune, France, May 2018," 2nd International RILEM Conference on Rheology and Processing of Construction Materials and 9th International RILEM Symposium on Self-Compacting Concrete, Dresden, Germany, September 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

- Fitch was honored for advising the Missouri S&T Engineers Without Borders (EWB) chapter. EWB is very active, with four separate teams doing projects in Guatemala, where a team completed a well, pump, and water tower system for a community of 3,000, and now is designing a 400-student school building; Ecuador, where a team is implementing a combination of rainwater catchment and slow-sand filtered river water for a community of 150 people – that team had remotely finished upgrading a water system for a 10,000-person community in Honduras after travel was prohibited due to safety concerns; Bolivia, where a team completed a well water system for a community of about 100 and moved across the river to work on a similar project; and also in Bolivia, the fourth team upgraded a disperse spring collection system for a small village to include sedimentation, slow sand filtration, and a 60-m piping bridge and then moved to a community on the shoulder of a mountain and is designing a water piping system to bring glacial melt water down a two-mile long 30-40% grade. To support all these projects, the chapter annually raises \$70K- \$150K.
- Fitch led the S&T campus through the Higher Learning Commission accreditation process. He also served a five-year rotation as an officer of the S&T Faculty Senate, which included three years of service on the UM System Intercampus Faculty Council.

### Selected Publications and Presentations

Deef-Allah, E., Abdelrahman, M., **Fitch, M.**, Ragab, M., Bose, M., and 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.

# 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

- Outstanding Professional Engineer in Higher Education, Missouri Society of Professional Engineers, St. Louis Chapter, 2015

### Selected Publications and Presentations

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

**Gillis, W.** and Cudney, E., "A New Methodology for Eco-Friendly Construction: Utilizing Quality Function Deployment to Meet LEED Requirements," Azevedo, S., Brandenburg, M., Carvalho, H., and 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.**, and Cudney, E., "Applying the House of Quality to the New-Building Construction Commissioning Process," Freund, L., and 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

- 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

Qi H., **Hu X.**, "Monte Carlo Tree Search-Based Intersection Signal Optimization Model with Channelized Section Spillover," *Transportation Research Part C: Emerging Technologies*, Vol. 106, pp. 281-302, 2019, <https://doi.org/10.1016/j.trc.2019.07.017>.

**Hu X.**, Yuan Y., Zhu X., Yang H., Xie K., "Behavioral Responses to Pre-Planned Road Capacity Reduction Based on Smartphone GPS Trajectory Data – A Functional Data Analysis Approach," *Journal of Intelligent Transportation Systems: Technology, Planning, and Operations*, Vol. 23, pp. 133-143, 2019, <https://doi.org/10.1080/15472450.2018.1488133>.

**Hu X.**, Zhu X., Ma Y.L., Chiu Y. C., Tang Q., "Advancing Usage Based Insurance – A Contextual Driving Risk Modeling and Analysis Approach," *IET Intelligent Transport Systems*, Vol. 13, pp. 453-460, 2019, <https://doi.org/10.1049/iet-its.2018.5194>

Yu X., Gao S., **Hu X.**, Park H., "A Markov Decision Process Approach to Vacant Taxi Routing with E-hailing," *Transportation Research Part B: Methodological*, Vol. 121, pp. 114-134, 2019, <https://doi.org/10.1016/j.trb.2018.12.013>.

# 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; materials for 3D printing; sustainable hydraulic binders; recycled materials for concrete

### Honors or Awards

- Lifetime Achievement Award, 2nd International RILEM Conference on Rheology and Processing of Construction Materials and 8th International Symposium RILEM Symposium on Self-Compacting Concrete Conference Organized in Honor of Khayat, Germany, 2019
- Fellow, RILEM, 2015
- Fellow, 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.**, 2019 Keynote Speaker, International Conference on Innovative materials for Sustainable Civil Engineering (IMSCE), Nanjing, China, August 2019.

**Khayat, K.H.**, 2019 Keynote Speaker, 9th International RILEM Symposium on Self-Compacting Concrete, Dresden, Germany, September 2019.

**Khayat, K.H.**, 2019 Keynote Speaker, International Congress on the Chemistry of Cement, ICC2019, Prague, Czech Republic, September 2019.

**Khayat, K.H.**, 2019 Keynote Speaker, 10th Alexandria International Conference on Structural, Geotechnical Engineering and Management, AICSGE-10, Alexandria, Egypt, December 2019.



# Nicolas Ali Libre



## Assistant 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

- UM System President's Award for Innovative Teaching
- FTTC Teaching with Technology Award, UMSL
- Faculty Achievement Award, S&T
- Joseph H. Senne, Academy of Civil Engineering Faculty Teaching and Service Achievement Award, S&T Academy of Civil Engineers

### 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

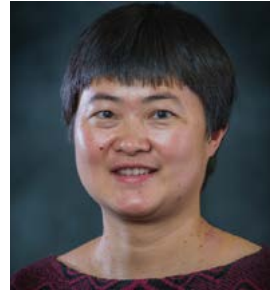
### Selected Publications and Presentations

**Libre, N.A.**, "Affordable Learning Solutions and Interactive Content in Engineering Mechanics," 126th ASEE Annual Conference and Exposition, Tampa, Florida, June 2019.

**Libre, N.A.**, Baur, S.W., "Introduce High School Students to Engineering Disciplines: Activities and Assessment," ASEE Midwest Section Conference, September 2019, Wichita, KS.

Kuchem, J., and **Libre, N.A.**, "Implementation of Problem Based Learning into Materials Testing Lab," ASEE Midwest Section Conference, September 2019, Wichita, KS.

# 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

- Associate Editor, *ASCE Journal of Materials in Civil Engineering*
- Associate Editor, *ASCE Journal of Transportation Engineering Part B: Pavements*
- Faculty Research Award, S&T, 2019
- Elected Board Member and Treasurer, International Association of Chinese Infrastructure Professionals, 2019

### Selected Academic Activities or Research Projects

- Snow and Ice Treatment Products Evaluation, MoDOT
- National Center for Transportation Infrastructure and Life-Extension (TriDurLE) – S&T Program, USDOT
- Laboratory and Field Evaluation of Modified Asphalt Binder in Alaskan Pavements, Funded by Alaska Department of Transportation and Public Facilities (AKDOT&PF), Emulsion Products, and USDOT
- High Abrasion-resistant and Long-lasting Concrete, Funded by AKDOT&PF, Alaska Basic Industries, and USDOT

### Selected Publications and Presentations

Li, L., **Liu, J.**, Zhang, X., Li, P., and Saboundjian, S., "Characterizing Permanent Deformation of Alaskan Granular Base Course Materials," *ASCE Journal of Materials in Civil Engineering*, Vol. 31, No. 11, 04019267, [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0002911](https://doi.org/10.1061/(ASCE)MT.1943-5533.0002911), 2019.

**Liu, J.**, Yan, K., Liu, J., and Guo, D., "Evaluation of the Characteristics of Trinidad Lake Asphalt and Styrene-butadiene-rubber Compound Modified Binder," *Construction and Building Materials*, Vol. 202, pp. 614-621, 2019.

**Liu, J.**, and Wu, H., "Improved Ground Penetrating Radar Data Processing Method for Railroad Ballast Inspection," 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, St. Louis, August 2019.

Wu, H., Zhao, H., and **Liu, J.**, "In Situ Experimental Study of FFT-based Bridge Weigh-in-motion System on a Continuous Box Girder Bridge," 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, St. Louis, August 2019.

# 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; energy storage; mechanics of materials

### Honors or Awards

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

### Selected Academic Activities or Research Projects

- 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, 2017-20
- Hyperspectral Image Analysis for Mechanical and Chemical Properties of Concrete and Steel Surfaces, INSPIRE UTC

### Selected Publications and Presentations

Liao, W., Kumar, A., Khayat, K, **Ma, H.**, "Multifunctional Lightweight Aggregate Containing Phase Change Material and Water for Damage Mitigation of Concrete," *ES Materials and Manufacturing*, Vol. 6, pp. 49-61, 2019, DOI: 10.30919/esmm5f606.

Hou, D., Zhang, W., Wang, P., **Ma, H.**, "Microscale Peridynamic Simulation of Damage Process of Hydrated Cement Paste Subjected to Tension," *Construction and Building Materials*, Vol. 228, 117053, 2019, DOI: 10.1016/j.conbuildmat.2019.117053.

Cook, R., Lapeyre, J., **Ma, H.**, Kumar, A., "Prediction of Compressive Strength of Concrete: A Critical Comparison of Performance of a Hybrid Machine Learning Model with Standalone Models," *ASCE Journal of Materials in Civil Engineering*, Vol. 31, No. 11, 04019255 (15 pages), 2019, DOI: 10.1061/(ASCE)MT.1943-5533.0002902.

Sun, X., Du, Y., Liao, W., **Ma, H.**, Huang, J., "Measuring the Heterogeneity of Cement Paste by Truly Distributed Optical Fiber Sensors," *Construction and Building Materials*, Vol. 225, pp. 765-771, 2019, DOI: 10.1016/j.conbuildmat.2019.07.187.

# 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

- J.H. Senne Academy of Civil Engineers Faculty 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

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

**Mendoza, C.** and Zhou, D., "Energetics of Sediment-laden Stream Flows," *Water Resources Research*, Vol. 33, No. 1, pp. 227-234, 1997.

**Mendoza, C.** and Zhou, D., "Effects of Porous Bed on Turbulent Stream Flow Above Bed," *Journal of Hydraulic Engineering*, ASCE, Vol. 118, No. 9, pp. 1222-1240, 1992.

# John 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, IIFC and TMS
- National Outstanding Educator Award, AEI
- Professional Recognition Award, ASCE

## Selected Academic Activities or Research Projects

- GAANN Program for Doctoral Training in Civil Infrastructure Condition Assessment, Sustainability, and Resiliency, U.S. Dept. of Education, 2016-20
- Ultra-high Performance Fiber-Reinforced Concrete (UHPC) for Infrastructure Rehabilitation, USDOT, 2014-19
- Strengthening and Repair of Structural Concrete with a Fabric-reinforced-cementitious-matrix (FRCM): Laboratory Studies and Field Implementation, USDOT, 2014-19

## Selected Publications and Presentations

Al-Jaberi, Z.K., **Myers, J.J.**, ElGawady, M.A., "Experimental and Analytical Approach for Prediction of Out-Of-Plane Capacity of Reinforced Masonry Walls Strengthened with Externally Bonded FRP," *ASCE Journal of Composites for Construction*, August, 2019, Vol. 23, No. 4, [https://doi.org/10.1061/\(ASCE\)CC.1943-5614.0000947](https://doi.org/10.1061/(ASCE)CC.1943-5614.0000947).

Hernandez, E., **Myers, J.J.**, "Load Distribution of a Prestressed Self-Consolidating Concrete Bridge," *Frontiers in Built Environment Journal*, Manuscript 438154, Vol. 5, Article 96, July 2019, pp. 1-12, <https://doi.org/10.3389/fbuil.2019.000966>.

Al-Jaberi, Z.K., **Myers, J.J.**, Chandrashekhara, K., "Effect of Direct Service Temperature Exposure on the Bond Behavior between Advanced Composites and CMU Using NSM and EB Techniques," *Elsevier's Composite Structures Journal*, Vol. 211, March 2019, pp. 63-75, <https://doi.org/10.1016/j.compstruct.2018.11.085>.

# 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

- C. Brice Ratchford Fellowship, University of Missouri System, 2019
- Lillian Wald Humanitarian Award, National League for Nursing, 2019
- Robert G. Quinn Award, American Society for Engineering Education, 2019
- Engineering Education Excellence Award, National Society of Professional Engineers, 2019

## Selected Academic Activities or Research Projects

- Elected, Vice President of the American Academy of Environmental Engineers and Scientists, Annapolis
- Appointed, Trustee of the Chartered Institute of Environmental Health, London
- Appointed, International Editorial Advisory Board, *Journal of Perspectives in Public Health*, published by the Royal Society for Public Health, London

## Selected Publications and Presentations

**Oerther, D.B.**, Voth-Gaeddert, L.E., Divelbiss, D.D., "Improving Environmental Health Practice and Policy Through Convergence Research: Case Study of Linked Food Water Systems Enhancing Child Health," *Environmental Engineering Science*, Vol. 36, pp. 820-832, 2019.

Squires, A., Chavez, F.S., Hilfinger, M.D.K., Narsavage, G.L., **Oerther, D.B.**, Premji, S.S., Rosa, W.E., Ambani, Z., Castañeda-Hidalgo, H. Lee, H., Pallangyo, E.S., Thumm, E.B., "Sustainable Development and the Year of the Nurse and Midwife: 2020," *International Journal Nursing Studies*, Vol. 94, A3, 2019.

Voth-Gaeddert, L.E., Torres, O., Maldonado, J., Krajmalnik-Brown, R., Rittmann, B.E., **Oerther, D.B.**, "Aflatoxin Exposure, Child Stunting, and Dysbiosis in the Intestinal Microbiome Among Children in Guatemala," *Environmental Engineering Science*, Vol. 36, pp. 958-968, 2019.

Oerther, S.E., **Oerther, D.B.**, "A Population Health Perspective on America's Opioid Addiction," *Persp. Pub. Heal.*, Vol. 139, pp. 184-185, 2019.



# 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 ExCEEed 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., and 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.

# 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

- Fulbright Distinguished Chair, Advanced Science and Technology, U.S. State Department, 2018
- Distinguished Scientist Award, Hypervelocity Impact Society, 2015
- Honor Award, NASA Engineering and Safety Center, 2010
- Fraunhofer Bessel Research Award, Humboldt Foundation, 2007
- Manuel T. Pacheco Academic Leadership Award, University of Missouri System, 2007
- Fellow, ASME 2005, ASCE, 2003

### Selected Academic Activities or Research Projects

- Assessment of Spacecraft Passivation Requirements, NASA, 2019
- Improved Prediction of Terminal Ballistic Events Using Advanced Penetration Algorithms, DST Group, Melbourne, Australia, 2019
- Rupture of Composite Overwrapped Pressure Vessels, NASA, 2017
- Lightweight Installable Micrometeoroid and Orbital Debris Shield Concepts for International Space Station (ISS) Modules, NASA, 2011

### Selected Publications and Presentations

**Schonberg, W.P.**, “Rupture of a Cryogenic Composite Overwrapped Pressure Vessel Following a High-Speed Particle Impact,” *Aerospace*, Vol. 5, Paper No. 20, 2018.

**Schonberg, W.P.**, “Using Modified Ballistic Limit Equations in Spacecraft Risk Assessments,” *Acta Astronautica*, Vol. 126, pp. 199-204, 2016.

**Schonberg, W.P.**, Schaefer, F., and Putzar, R., “Some Comments on the Protection of Lunar Habitats Against Damage from Meteoroid Impacts,” *ASCE Journal of Aerospace Engineering*, Vol. 33, No. 1, pp. 90-97, 2010.

# 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



## Associate 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., Focacci, F., **Sneed, L.H.**, and 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., and 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., and 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.**, and Pellegrino, C., "Matrix-Fiber Bond Behavior in PBO FRCM Composites – A Fracture Mechanics Approach," *Engineering Fracture Mechanics*, Vol. 117, pp. 94-111, 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
- GATE Graduate Research Fellowship, India, 2000

### Selected Academic Activities or Research Projects

- 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., and **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., and **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.**, and 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 Excellence in Teaching, Missouri State University, 2018
- Faculty Achievement Award, Missouri S&T, 2011
- Missouri S&T eFellow, 2010

### 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, 2500 Problems, 1100 Tutorials and 770 videos.

Educational Websites used by 630,000 people from 204 Countries.

More than 4.4 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

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, 115570, 2020.

Campbell, K., **Wang, J.**, Liu, G., Daigger, G., "Activated Sludge Morphology Significantly Impacts Oxygen Transfer at the Air-Liquid Boundary," *Water Environment Research*, Vol. 91, pp. 500-509, 2019.

Liu, G., **Wang, J.**, "Enhanced Removal of Total Nitrogen and Total Phosphorus by Applying Intermittent Aeration to the Modified Ludzack-Ettinger (MLE) Process," *Journal of Cleaner Production*, Vol. 166, pp. 163-171, 2017.

Liu, G., **Wang, J.**, "Long-Term Low DO Enriches and Shifts Nitrifier Community in Activated Sludge," *Environmental Science Technology*, Vol. 47, pp. 5109-5117, 2013.

Liu, G., **Wang, J.**, "Probing the Stoichiometry of the Nitrification Process Using the Respirometric Approach," *Water Research*, Vol. 46, pp. 5954-5962, 2012.

# 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, particulate matter, aerosol  
measurement, instrumentation development,  
functional nanoparticle synthesis, combustion

### Honors or Awards

- Ph.D. Award, Gesellschaft für Aerosolforschung (GAeF), European Aerosol Assembly, 2019

### Selected Academic Activities or Research Projects

- Measurement of Sub 3 nm Particles From High Temperature Aerosol Sources, University of Helsinki, Tsinghua University, and University of Connecticut
- Rapid Measurement of Aerosol Size Distribution During Transient Aerosol Processes, Washington University, St. Louis, and Brookhaven National Laboratory
- Combustion Synthesis of Functional Nanomaterials, Washington University in St. Louis

### Selected Publications and Presentations

**Wang Y.**, Zheng G., Spielman S.R., Pinterich T., Hering S., Wang J., "Retrieval of High Time Resolution Growth Factor Probability Density Function From a Humidity-controlled Fast Integrated Mobility Spectrometer," *Aerosol Science Technology*, Vol. 53, No. 9, pp. 1092-1106, 2019.

Sharma G., **Wang Y.**, Chakrabarty R., Biswas P., "Modeling Simultaneous Coagulation and Charging of Nanoparticles at High Temperatures Using the Method of Moments," *Journal of Aerosol Science*, Vol. 132, pp. 70-82, 2019.

Zhang H., Sharma G., **Wang Y.**, Li S., Biswas P., "Numerical Modeling of the Performance of High Flow DMAs to Classify Sub-2 nm Particles," *Aerosol Science Technology*, Vol. 53, No. 1, pp. 106-118, 2019.

Oxford C., Rapp C., **Wang Y.**, Kumar P., Watson D., Portelli J., Sussman E., Dhawan S., Jiang J., Williams B., "Development and Qualification of a VH-TDMA for the Study of Atmospheric Aerosols," *Aerosol Science Technology*, Vol. 53, No. 2, pp.120-132, 2019.

Li Z., **Wang Y.**, Lu Y., Biswas P., "Investigation of Aerosol and Gas Emissions from a Coal-fired Power Plant Under Various Operating Conditions," *Journal of Air Waste Management Association*, Vol. 69, No. 1, pp. 34-46, 2019.

# 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," Vol. 283, pp. 334-342, *Sensor and Actuator B: Chemical*, 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



## Assistant Professor STRUCTURAL ENGINEERING

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

### Scholarly Focus, Teaching or Research Areas

Computational wind engineering, improvement of risk awareness and decision-making of natural hazards through virtual reality animation, wind hazard mitigation and community resilience, structural health monitoring and condition assessment

### Honors or Awards

- Missouri Accelerated Research Award, 2019
- UTEP Outstanding Research Performance Award, 2014
- NSF Fellow for ENHANCE, 2013
- TRB Minority Faculty Mentor, 2013
- ASCE ExCEEed Fellow, 2016

### Selected Academic Activities or Research Projects

- 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
- Graduate Assistance in Areas of National Need (GAANN): Doctoral Training in Civil Infrastructure Condition Assessment, Sustainability and Resiliency, DOE

### Selected Publications and Presentations

Li, T., **Yan, G.R.**, Yuan, F. and 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. and 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. and Isaac, K.M., Zhao, M. and 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



## Associate 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., and 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.** and 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.** and 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



## Heath Pickerill ARCHITECTURAL ENGINEERING

Director, Missouri Local Technical  
Assistance Program and Rural  
Transit Assistance Program



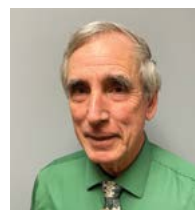
## Polly Scott-Showalter GREEN CONSTRUCTION

P.E., LEED AP  
Construction engineering and  
management, sustainable design  
and construction



## Mike Sneed TRANSPORTATION ENGINEERING

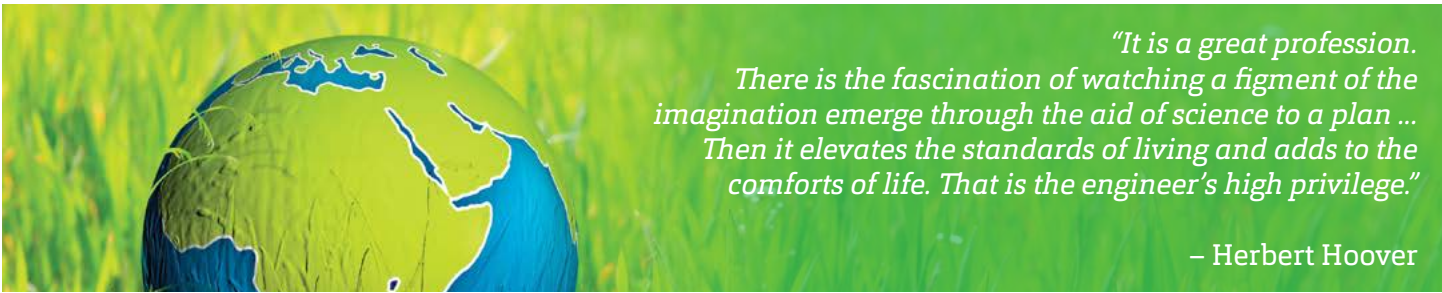
Traffic Engineer, P.E.  
Highway design, analysis,  
and planning



## 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





*"It is a great profession. There is the fascination of watching a figment of the imagination emerge through the aid of science to a plan ... Then it elevates the standards of living and adds to the comforts of life. That is the engineer's high privilege."*

– Herbert Hoover



## Assessing tornado damage to improve building codes

In the wake of a tornado outbreak that devastated communities across Missouri in 2019, Missouri S&T structural engineer **Dr. Guirong (Grace) Yan**, assistant professor of structural engineering, and three of her Ph.D. students traveled to Jefferson City to assess the damage of the EF3 tornado that swept through that community. Yan's research on the wind pressure of tornadoes is helping develop new models for more tornado-resistant building design. She hopes her research will be used to strengthen building codes for municipalities. She is director of the Wind Hazards Mitigation Laboratory (WHAM) at Missouri S&T.

## Schonberg named Fulbright Specialist



The U.S. Department of State's Bureau of Educational and Cultural Affairs and World Learning named **Dr. William Schonberg**, professor of civil, architectural and environmental engineering at Missouri S&T, to the roster of Fulbright Specialists. Schonberg's three-year tenure as a Fulbright Specialist runs through Oct. 11, 2022.

Fulbright specialists are recognized experts in their fields who are matched with projects designed by host institutions in more than 150 countries around the world.

When the host institutions identify a national need and apply to the Fulbright Commission and U.S. Embassy in their country, they can name a specialist to work on their project. If no one specific is requested, the specialists themselves can express interest in the projects. All Fulbright Specialist projects must be a minimum of 14 days and a maximum of 42 days.

This is not Schonberg's first involvement with Fulbright. In 2018, he was named a Fulbright Distinguished Chair in Advanced Science and Technology. Under that appointment, Schonberg worked for several months with scientists at the Defence Science and Technology group, a government agency in Australia, researching the effects of physical attacks on land vehicles.

## Oerther elected chair of ASEE policy division

**Dr. Daniel Oerther**, professor of environmental health engineering, was elected to a three-year term as the chair of the Engineering and Public Policy Division of the American Society for Engineering Education (ASEE).

The primary objectives of the division include promoting an understanding of:

- public policy fundamentals
- the implications of public policy on emerging technologies
- the process of developing public support for emerging technological solutions to societal grand challenges.

Additional objectives include promoting interaction between public policy decision makers and engineering faculty, encouraging faculty to contribute to policy, and promoting public policies that are supportive of engineering education.



**Keep up to date!**  
Follow along for department news, lectures and important events:

[facebook.com/MissouriSandTCARe](https://facebook.com/MissouriSandTCARe)

[twitter.com/JGB\\_Burken](https://twitter.com/JGB_Burken)

[linkedin.com/school/missouri-s-t-civil-architectural-and-environmental-engineering](https://linkedin.com/school/missouri-s-t-civil-architectural-and-environmental-engineering)



**Civil, Architectural and  
Environmental Engineering**  
211 Butler-Carlton Hall, 1401 N. Pine St.  
Rolla, MO 65409-0030

**Connect with us.**  
[care@mst.edu](mailto:care@mst.edu)



## CLAYCO ACML LAB BUILDING PROGRESS

The Clayco Advanced Construction and Materials Lab (ACML), a 14,800-square-foot expansion of the High Bay Structures Lab, is scheduled to be completed summer 2020.

A special thank you to Nucor-Yamato Steel Co. for their donation of more than 85 tons of structural steel, produced and supplied by three company facilities; the beams and channel from Nucor-Yamato Steel in Blytheville, Ark.; the tube from Nucor Tubular Products in Marseilles, Ill.; and the joist and decking from Nucor Vulcraft in Fort Payne, Ala.

Tom Sieckhaus, CE'88, (above left) executive vice president of Clayco Inc., the lab's naming donor, toured the construction site with Dr. Joel Burken, Curators' Distinguished Professor and chair of the CAEE department (above right).

**CHANGING THE  
WORLD**

