Yanping Zhu, PhD
Department of Civil Engineering
Montana Technological University
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Education

2018/08-2022/08 Missouri University of Science and Technology, Rolla, MO, **Ph.D. in Civil Engineering,** Advisor: Distinguished Chair and Professor Genda Chen
Dissertation: Strain and Temperature Measurement from Distributed Fiber Optic Sensors in Performance-Based Fire Engineering

2015/08-2018/08 Hunan University, Changsha, China, **M.S. (with honor) in Structural and Bridge Engineering,** Advisor: Professor Yang Zhang
Thesis: Flexural Performance Study on Concrete Bridge Deck Strengthened with Ultrahigh Performance Concrete Cured by Normal Temperature

2011/08-2015/06 Hefei University of Technology, Hefei, China, **B.S. (with honor) in Civil Engineering**
Thesis: Structural Analysis and Design of a Self-Anchored Suspension Bridge in Qiantang, Hangzhou

Research Interests

Distributed Fiber Optic Sensors (DFOS)
Ultra-high-performance concrete (UHPC)

Academic Experience

2024/07-present **Assistant Professor** at Civil Engineering, Montana Technological University, Montana

2024/05-present **Research Scientist** at Center for Intelligent Infrastructure, Missouri S&T, Missouri

2023/08-2024/07 **Assistant Professor** at Civil and Mechanical Engineering, University of Mount Union, Ohio

2023/07 **Post-doctoral Research Fellow** at Rice University, Texas

2022/08-2023/07 **Post-doctoral Research Fellow** at Center for Intelligent Infrastructure, Missouri S&T, Missouri

2018/08-2022/08 **Graduate Research Assistant**, Missouri S&T, Missouri

2015/06-2018/08 **Research Assistant**, Hunan University, China

Industrial Experience

2015/02-2015/06 **Assistant Engineer Intern,** Anhui Transport Consulting & Design Institute Co., Ltd

Teaching Experience

University of Mount Union

Assistant Professor Teaching Load for Liberal-Arts Small Class-Size Institution

2023/08 Fall Course: *Structural Analysis* (Junior)*, Introduction to Engineering* (Freshman)*, Mechanical Vibration* (Senior)*, FE Exam Review* (Senior)

2024/01 Spring Course: *Computer-Aided Design* (Freshman)*, Mechanics of Materials* (Sophomore)*, Structural Design: Concrete and Steel Structures* (Senior)

Missouri University of Science and Technology

Inaugural Franklin Y. Cheng Teaching Scholar (Course Instructor)

2022/08 Fall Course: *Structural Analysis* (CE/ArchE 3201, 3 credits, 53 students registered)

2023/01 Spring Course: *Structural Analysis* (CE/ArchE 3201, 3 credits, 38 students registered)

Graduate Teaching Assistant, 2022/08

Course: Structural Dynamics and Earthquake Engineering (CE6205, 3 credits)

Tour Guide, 2018/08–2023/08

Laboratory: Structural Engineering High-Bay Laboratory, System and Process Assessment Research Laboratory, Augmented/Virtual Reality Laboratory

Hunan University

Instructor, 2015/09–2017/12

Courses: *Structural Mechanics*, *Material Mechanics*, *Reinforced Concrete Structures*

Journal Publications

[1]. **Zhu Y** and Chen G. Fire dynamic simulation of concrete beams subjected to channel fires. *Fire Technology* 2024. (under review)

[2]. **Zhu Y**, Taffese, W, and Chen G. Explainable AI based slip prediction of steel-UHPC interface connected by shear studs. *Expert Systems With Applications* 2024. (second revision)

[3]. Taffese, W, **Zhu Y**, and Chen G. Emsemble-learning model based ultimate moment prediction of reinforced concrete members strengthened by UHPC. *Engineering Structures* 2024;305: 117705.

[4]. Taffese, W, **Zhu Y**, and Chen G. Utilizing ensemble learning in the classifications of ductile and brittle failure modes of UHPC strengthened RC members. *Archives of Civil and Mechanical Engineering* 2024;24: 86.

[5]. **Zhu Y**, Taffese, W, and Chen G. Data-driven shear capacity prediction of studs embedded in UHPC for steel-UHPC composite structures. *Journal of Structural Engineering* 2024. (under review)

[6]. Taffese, W, **Zhu Y**, and Chen G. Predicting concrete-to-concrete interfacial shear strength using explainable machine learning. *Journal of Structural Engineering* 2024. (under review)

[7]. **Zhu Y**, Taffese, W, and Chen G. FRP-concrete interface shear bond strength predictions from standalone and ensemble learning models. *Engineering Structures* 2024. (Accepted)

[8]. **Zhu Y**, Klegseth M, Bao Y, Hoehler M S, Choe L, and Chen G. Distributed fiber optic

measurements of strain and temperature in long-span composite floor beams with simple shear connections subject to compartment fires. *Fire Safety Journal* 2021;121: 103275. (***Editor-in-Chief's Featured Article***)

[9]. **Zhu Y** and Chen G. Rayleigh scattering based, thermal-induced displacement measurement along a steel plate at high temperature. *Infrastructure Intelligence and Resilience* 2022;1: 100002.

[10]. **Zhu Y** and Chen G. Quantifying thermal strain of steel plate subjected to constant temperature by distributed fiber optic sensors. *Intelligent Transportation Infrastructure* 2022;1: liac005.

[11]. **Zhu Y** and Chen G. Effect of the multilayered coating of single-mode optical fibers on distributed temperature and strain measurement in mortar specimens. *Fire Safety Journal* 2022;140: 103831.

[12]. **Zhu Y** and Chen G. Heat treatment and polymer coating effect on Rayleigh scattering based fiber optic temperature measurement. *Measurement* 2022;206: 112253.

[13]. **Zhu Y** and Chen G. Spiral deployment of optical fiber sensors for distributed strain measurement in 7-wire twisted steel cables post-tensioned against precast concrete bars. *Sensors* 2022;22: 7636.

[14]. **Zhu Y**, Meng D, Zhang Y, Hussein H H, He S, Long-term performance of a continuous box-girder bridge constructed using precast segments with wet ultra-high-performance concrete (UHPC) joints, *Case Studies in Construction Materials* 2022;17C: e01285.

[15]. **Zhu Y**, Zhang Y, Hussein H H, NC and UHPC shrinkage and creep model validation and application, *Advances in Structural Engineering* 2022;25: 1-13.

[16]. **Zhu Y**, Zhang Y, He S, Tensile testing of age-dependent HESUHPC-NSC composite at typical season temperatures, *Journal of Materials in Civil Engineering* 2022;34: 06022004. (ASCE)

[17]. **Zhu Y**, Hussein H H, Kumar A, and Chen G. A review: Material and structural properties of UHPC at elevated temperatures or fire conditions. *Cement Concrete Composite* 2021;123: 104212.

[18]. **Zhu Y**, Zhang Y, Hussein H H, Qu S. Existing inverse analysis approaches for tensile stress – strain relationship of UHPC with treated steel fibers. *Journal of Materials in Civil Engineering* 2021;33: 04021118. (ASCE)

[19]. **Zhu Y**, Zhang Y, Hussein H H, Qiu M, Meng D, and Chen G. Flexural strengthening of large-scale damaged reinforced concrete bridge slab using UHPC layer with different interface techniques. *Structure and Infrastructure Engineering*, 2022;18: 879-892.

[20]. **Zhu Y**, Zhang Y, Xu Z. Analytical investigation of long-term behavior of normal concrete filled UHPC tube composite column, *Case Studies in Construction Materials*. 2022;17: e01435.

[21]. **Zhu Y**, Zhang Y, Li X, and Chen G. Finite element model to predict structural response of predamaged RC beams reinforced by toughness-improved UHPC under unloading status. *Engineering Structures* 2021;235: 112019.

[22]. **Zhu Y**, Zhang Y, Qu S, Kumar A. Flexural and tensile strength of ultra-high-performance

concrete with ZnPh-treated steel fibers. *Journal of Materials in Civil Engineering* 2020;32: 06020013. (ASCE)

[23]. **Zhu Y**, Zhang Y, and Shi J. Finite element analysis of flexural behavior of precast segmental UHPC beams with prestressed bolted hybrid joints. *Engineering Structures* 2021;238: 111492.

[24]. **Zhu Y**, Zhang Y, Hussein H H, and Chen G. Flexural strengthening of reinforced concrete beams or slabs using ultra- high performance concrete (UHPC): A state of the art review. *Engineering Structures* 2020;205: 110035. (***In most downloaded papers list for 90 days***)

[25]. **Zhu Y**, Zhang Y, Hussein H H, Liu J, and Chen G. Experimental study and theoretical prediction on shrinkage-induced restrained stresses in UHPC-RC composites under normal curing and steam curing. *Cement and Concrete Composites* 2020;110: 103602.

[26]. **Zhu Y**, Zhang Y, Hussein H H, and Cai S. Flexural study on UHPC–steel composite beams with joints under negative bending moment. *Journal of Bridge Engineering* 2020;25: 04020084. (ASCE) **(*Editor's Choice Article*)**

[27]. **Zhu Y**, Zhang Y, Hussein H H, and Chen G. Numerical modeling for damaged reinforced concrete slab strengthened by ultra-high performance concrete (UHPC) layer. *Engineering Structures* 2019;209: 110031.

[28]. Zhang Y, **Zhu Y**, Yeseta M, Meng D, Shao X, Dang Q, and Chen G. Flexural behaviors and capacity prediction on damaged reinforcement concrete (RC) bridge deck strengthened by ultra-high performance concrete (UHPC) layer. *Construction and Building Materials* 2019;215: 347–359.

[29]. Qu S, Zhang Y, **Zhu Y**, Huang L, Qiu M. Prediction of tensile response of UHPC with aligned and ZnPh treated steel fibers based on a spatial stochastic process. *Cement Concrete Research* 2020;136: 106165. (***Equal contribution to first author***)

[30]. Guo C, Li Y, **Zhu Y**, Wu C, and Chen G. Synthesis and characterization of free-stand graphene/silver nanowire/graphene nano composite as transparent conductive film with enhanced stiffness, *Applied Sciences* 2020;10: 4802.

Conference Publications

[31]. **Zhu Y**, Chen G. Heat treatment and polymer coating effect on Rayleigh scattering-based fiber optic temperature measurement. Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2023.

[32]. **Zhu Y**, Chen G. Cable force monitoring by distributed fiber optic sensor with two installation schemes. 8th World Conference on Structural Control and Monitoring, Orlando, Florida, USA, 5-8 June 2022.

[33]. Zhang Y, Huang S, **Zhu Y**, Zhang C. An innovative concept for strengthening damaged RC beam using prestressed UHPC layer. Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and Innovations, 2021:3940–5.

[34]. Yuan X, **Zhu Y**, Chen G. SMART shear keys to prevent bridge girders from falling off during earthquaks and tsunami – preliminary numerical simulations. The Third International Bridge Seismic Workshop, 3rd IBSW (Seattle, Washington, USA – October 1st to 4th, 2019).

[35]. Yuan X, Chen G, Han J, **Zhu Y**. Experimental investigation of a novel smart shear key for earthquake and tsunami mitigation. Poster, Missouri S&T, university transportation center (UTC) annual meeting, 2020.

Google Website

https://scholar.google.com/citations?hl=en&user=qRdHG0oAAAAJ

Awards and Honors

2023	Inaugural Franklin Y. Cheng Teaching Scholar
2022	College of Engineering and Computing Dean's PhD Scholar Award at Missouri S&T
2018	Annual Graduate Research Assistantship at Missouri S&T
2015	Three-year First Graduate Academic Scholarship at Hunan Univeristy
2012	Third Prize of Structure Design Competition at Hefei University of Technology
2012	First Prize in ZHOU PEIYUAN Mechanical and Experimental Competition
2012	Third Prize of National Math Competition (non-mathematics group)
2011	Four-year Undergraduate Academic Scholarship

Professional Service

Associate Editorial Board Member in the journal "Current Chinese Science - Structural Engineering" 2022-present

Guest Editor: Journal of Distributed Sensor Networks, topic - "Smart Sensors for Structural Health Monitoring of Reinforced Concrete Structures" (2022)

Guest Editor: Buildings Journal, topic - "Structural Health Monitoring of Buildings, Bridges and Dams" (2022)

Guest Editor: Buildings Journal, topic - "3D Printing and Low-Carbon Technologies in Cementitious Composites" (2023)

Guest Editor: Frontiers in Built Environment Journal, topic - "Advancements and Developments of Ultra-High-Performance Concrete (UHPC) and UHPC Structures" (2024)

Technical Services Support for FHWA's Long Term Bridge Performance (LTBP) Program - an Indefinite Delivery Indefinite Quantity (IDIQ) Contract Proposal (2022)

Editorial Board Member in the "Journal of Material Science and Technology Research" 2023-2025.

Reviewers for the Following Journals

2023 TRB Annual Meeting
ACI Structural and Materials
Advances in Concrete Construction
Advances in Structural Engineering
Applied Sciences
Buildings
Construction and Building Materials
Computers and Concrete
Cleaner Materials

Defence Technology
Engineering Structures
International Journal of Structural Engineering
Journal of Building Engineering
Journal of Materials in Civil Engineering (ASCE)
Journal of Concrete Structures and Materials
Journal of Computational Methods in Sciences and Engineering
Journal of Civil Structural Health Monitoring
Optics (Science Publishing Group)
Scientia Iranica
Sensors
Scientific Reports
Structural Engineering and Mechanics
Structural Concrete
Sustainability
Multidiscipline Modeling in Materials and Structures
Mechanics of Time-Dependent Materials
Materials
Waves in Random and Complex Media

Professional Societies Involved

American Concrete Institute (ACI) membership
American Society of Civil Engineers (ASCE) member
American Society for Testing and Materials (ASTM) International member
American Ceramic Society (ACerS) member
American Society of Engineering Education (ASEE) member
American Society of Mechanical Engineers (ASME)
International Society of Structural Health Monitoring of Intelligent Infrastructure (ISHMII)
Society of Photo-Optical Instrumentation Engineers (SPIE)
Transportation Research Board (TRB)

Conference Attended

Workshop "Rheology and 3D Printing of Concrete" - Missouri S&T, August 5 - 7, 2024
14th Advances in Cement-Based Materials meeting June 19-21, 2024, at Missouri S&T in Rolla, MO, USA
Missouri Digital Twin Symposium, Missouri S&T Center for Intelligent Infrastructure, Rolla, USA, June 25, 2024
SPIE Smart Structures + Nondestructive Evaluation, CA, Long Beach, 2023
9th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-9), 2019, St. Louis, USA (Presentation and Poster)
Center for Infrastructure Engineering Studies (CIES) Annual Conference-April 22, 2019

"Sustainable and Resilient Transportation Infrastructure"
Center for Infrastructure Engineering Studies (CIES) Annual Conference-March 24-25, 2021
"Sustainable and Resilient Transportation Infrastructure"
8th World Conference on Structural Control and Monitoring (8WCSCM)-June 5-8, 2022, Orlando, Florida, USA
2022 Missouri Concrete Conference, Missouri University of Science & Technology – Havener Center, April 26-27, 2022
2022 Battery Electric Vehicles (BEVs) Fire Safety Workshop, Kennedy Experimental Mine Building, 12350 Spencer Rd, Rolla, MO, June 16th, 2022
Bi-weekly dynamic cross-learning group meetings to be involved in different projects in Engineering Research Lab at MS&T

Newsletter

An overview of fire-induced bridge damage for INSPIRE university transportation center newsletter Fall 2020

Projects Involved

The fire experiments were funded by the National Institute of Standards and Technology, National Fire Research Laboratory, USA (grant no. 70NANB13H183). Data processing and preparation was supported with funding by the U.S. Department of Transportation, Office of Assistant Secretary for Research and Technology under the auspices of Mid-America Transportation Center at the University of Nebraska, Lincoln (grant no. 00059709).

Mid-America Transportation Center Project:
Condition Evaluation of Precast post-tensioned Concrete Girder Bridges During Fires from Distributed Fiber Optics Sensors
Sensor-Assisted Condition Evaluation of Steel and Prestressed Concrete Girder Bridges Subjected to Fire - Phase 3
Sensor-Assisted Condition Evaluation of Steel and Prestressed Concrete Girder Bridges Subjected to Fire - Phase 2
Sensor-Assisted Condition Evaluation of Steel and Prestressed Concrete Girder Bridges Subjected to Fire - Phase 1

Funding Applied

- A proposal for airport cooperative research program 2022-2023 graduate research award program
- An NSF 23-533 program solicitation proposal - Strengthening American Infrastructure (SAI)
- A proposal related to deep learning for infrastructure inspection application

Reports Submitted

2019-2023 Four Mid-America Transportation Center reports

External Evaluation

"We recently spoke to Federal Highway Administration (FHWA) regarding your paper and findings, and we would like to use some of your figures to explain the approach that you developed with your colleagues. We hope to use the figures in the attached permission form for Everyday Counts (EDC-6) UHPC for Bridge Preservation and Repair in the center for accelerating innovation, FHWA, U.S. Department of Transportation. If you in agreement with us using your figures, please sign the attached form. Also, please let us know your preferred attribution (e.g., MO DOT)." From Jordy Padilla, PE, Structural Engineer, WSP, USA.

Grade Point Average of 34 Credit Hours

3.618/4.0

Professional references

Dr. Genda Chen, Professor and Robert W. Abbett Distinguished Chair in Civil Engineering, Director, INSPIRE University Transportation Center, MS&T, Rolla, MO 65409-0030, tel:573-341-4462, gchen@mst.edu

Dr. Aditya Kumar, Associate Professor and Associate Chair for Research (ACR), Materials Science and Engineering, 223 McNutt, MS&T, Rolla, MO 65409-0030, tel:573-341-6994, cell:310-433-1827, kumarad@mst.edu

Dr. Husam H Hussein, Research Scholar at Ohio Research Institute for Transportation, and the Environment (ORITE), Dept. of Civil Engineering, Ohio Univ., Athens, OH 45701-2979, tel:740-331-1912, hh236310@ohio.edu; Senior Bridge Engineer at 2LMN, Inc. Email: Husam.Hussein@2lmn.com