Xijin (Emma) ZHANG, Ph.D., A.M. ASCE
Assistant Professor
Sid and Reva Dewberry Department of Civil, Environmental and Infrastructure Engineering
George Mason University
Email: xzhang50@gmu.edu; Office: 703-993-8832

Education

Case Western Reserve University — Cleveland, OH
Ph.D. in Civil and Environmental Engineering — *Sep. 2017-Aug. 2022*

Hebei University of Technology — Tianjin, China
M.S. in Architectural and Civil Engineering — *Sep. 2014-Jun. 2017*
Summer break (Jul.2017-Aug. 2017)

Hebei University of Technology — Tianjin, China
B.S. in Civil Engineering — *Sep. 2010-Jun. 2014*
Summer break (Jul.2014-Aug. 2014)

Academic Positions

Assistant Professor at George Mason University — *Aug.2023 - Present*
Adjunct Assistant Professor at Case Western Reserve University — *Jan. 2023-May.2023*
Postdoctoral Scholar at Case Western Reserve University — *Aug.2022-Jul. 2023*
Research Assistant at Case Western Reserve University — *Sep. 2017-Aug. 2022*

Publications

14. **Xijin Zhang**, Xudong Fan, Min Li, Anna Samia, Xiong Yu. Study on the Behaviors of Fungi-Concrete Surface Interactions and Theoretical Assessment of Its Potentials for Durable Concrete with Fungal-mediated Self-healing. *Journal of Cleaner Production*, 2021: 125870.
13. **Xijin Zhang**, Jianying Hu, Xudong Fan, Xiong Yu. Naturally Grown Mycelium-composite as Sustainable Building Insulation Materials. *Journal of Cleaner Production*, 2022, 342: 130784.
12. **Xijin Zhang**, Xudong Fan, Chen Wang, Xiong Yu. A Novel Method to Improve the Soil Erosion Resistance with Fungi. *Acta Geotechnica*, 2023, 10.1007/s11440-022-01673-8.
11. **Xijin Zhang**, Xudong Fan, Chanjuan Han, Yanjun Li, Gray Wnek, Ya-Ting T. Liao, Xiong Yu. Novel Strategies to Grow Natural Fibers with Improved Thermal Stability and Fire Resistance. *Journal of Cleaner Production*, 2021, 320: 128729.
10. **Xijin Zhang**, Yanjun Li, Xudong Fan, Gray Wnek, Ya-Ting T. Liao, Xiong Yu. Development and Characterization of Novelly Grown Fire-resistant Fungal Fibers. *Scientific Reports*, 2022, 12: 1-19.
9. Xudong Fan, **Xijin Zhang**, Xiong Yu, A Graph Convolution Network-Deep Reinforcement Learning Model for Resilient Water Distribution Network Repair Decisions. *Computer Aided Civil and Infrastructure*, 2022.
8. Xudong Fan, **Xijin Zhang**, Xiong Yu. Machine Learning Model and Strategy for Fast and Accurate Detection of Leaks in Water Supply Network. *Journal of Infrastructure Preservation and Resilience*, 2021, 2(1): 1-21.
7. Xudong Fan, **Xijin Zhang**, Xiong Yu. Uncertainty quantification of a deep learning model for failure rate prediction of water distribution networks. *Reliability Engineering & System Safety*, 2023, *236*, 109088.
6. Xudong Fan, **Xijin Zhang**, Xiaowei Wang, Xiong Yu. A deep reinforcement learning model for resilient road network recovery under earthquake or flooding hazards. *Journal of Infrastructure Preservation and Resilience* 4.1, 2023: 8.
5. Xudong Fan, **Xijin Zhang**, Allen Yu, Matthew Speitel, Xiong Yu. Assessment of the Impacts of Climate Change on Water Supply Pipe Failures. *Scientific Reports,* 13.1, 2023: 7349.
4. Qingxiang Xiong, Qingfeng Liu, **Xijin Zhang**, Chuan Chen. Chloride Penetration Prediction in Concrete

through Mathematical Models Based on Time-dependent Diffusion Coefficient and Surface Chloride Concentration. *Journal of Materials in Civil Engineering*, 2022.

3. Xudong Fan, Xiaowei Wang, **Xijin Zhang**, Xiong Yu. Machine Learning based Water Pipe Failure Prediction: The Effects of Engineering, Geology, Climate and Socio-Economic Factors. *Reliability Engineering & System Safety*, 2022, 108185.
2. Jianying Hu, Liqun Zhang, **Xijin Zhang**, Yuan Guo, Xiong Yu. Comparative evaluation of moisture susceptibility of modified/foamed asphalt binders combined with different types of aggregates using surface free energy approach. *Construction and Building Materials*, 2020, 256: 119429.
1. Zhuoying Jiang, Jiajie Hu, **Xijin Zhang**, Yihang Zhao, Xudong Fan, Huichun Zhang, Xiong Yu. A generalized predictive model for TiO2-Catalyzed photo-degradation rate constants of water contaminants through artificial neural network. *Environmental Research*, 2020 Aug;187:109697.

Scholarships & Fellowships

2019-2022	Saada Family Graduate Fellowship
2021	Women's Transportation Seminar (WTS) Helene M. Overly Memorial Scholarship
2019	Graduate Teaching Fellowship (CWRU)
2019	CWRU Fellowship Course for DSCI 432 (Geostatistics for Subsurface Modeling)
2016	National Scholarship (China)

Honors & Awards

2024	Mitigation Matters Research Award (Natural Hazards Center)
2024	TallWood Design Institute Mass Timber Design Build Workshop Travel Grant (OSU)
2022	Top 20 Early Career Women in CEE Rising Star Workshop (CMU)
2022	WSOM Executive Education Grant in Career Success for Women in Leadership
2022	Graduate Studies Travel Grant (CWRU)
2021	Waheed Uddin Student Diversity Travel Grant (TriDurLE National Center)
2021	Kenneth M. Haber Award (CWRU)
2021	Civil Engineering Student Leadership Award
2021	Finalist of Geo-Poster Competition at Geo-Institute (ASCE) Annual Conference
2020	Craig J. Miller Memorial Award (CWRU)
2019	NSF Bio-inspired Geotechnical Workshop Travel Grant
2019	IACIP Student Poster Competition Second Prize
2018-2021	Sears think[box] Student Project Fund Award (CWRU)
2018-2020	Professional Development Fund (CWRU)

Teaching Experience

George Mason University Fairfax, VA

ASSISTANT PROFESSOR *Aug. 2023-Present*

- Statics (CEIE210); Mechanics of Materials (CEIE310)
- Managed courseware, curriculum, and instructional design: Orchestrated the coordination of course materials and curriculum while actively planning and designing lectures, in-class discussions, and assignments for enhanced student engagement.
- Evaluated and optimized student performance: Proactively assessed and analyzed student data to refine teaching methodologies and improve learning outcomes.

Case Western Reserve University Cleveland, OH

CERTIFICATE IN ADVANCED PROFESSIONAL DEVELOPMENT FOR UNIVERSITY TEACHING *May 2021*

ADJUNCT ASSISTANT PROFESSOR *Jan. 2023-May. 2023*

- Soil Mechanics (ECIV 430)
- Coordinate courseware and curriculum with department chair; plan and design lectures, in-class discussions, and assignments; assess students' performance; analyze student data

GRADUATE TEACHING ASSISTANT *Aug. 2019-Dec. 2021*

- Foundation Engineering (ECIV 430; Fall 2020, 2021)
- Elasticity, Theory and Applications (ECIV 411; Fall 2019, 2020)
- Assisted course instructor in designing class content with emphasis on inclusive teaching and active learning strategies

GRADUATE LAB INSTRUCTOR *Aug. 2018-Dec. 2021*

- Pavement Design and Analysis (ECIV 437; Fall 2018, 2019, 2021)
- Collaborated with course instructor to lead lab sessions and hold office hours
- Contacted industrial partners and organized student field trips

GRADUATE TEACHING FELLOW *Jan. 2019-May 2022*

- Soil Mechanics (ECIV 330; Spring 2019, 2022)
- Instructor of record for a semester-long lab; evaluated students; assisted with ABET accreditation

GUSET LECTURE *Jan. 2019-May 2021*

- Intelligent Infrastructure Systems (ECIV 456, Spring 2019, 2020, 2021)

Presentations

18. **Xijin Zhang**, Fungi-based Mineralization for Sustainable Infrastructure, Biomineralization, Gordon Research Conference, New England, 2024. (Invited)
17. **Xijin Zhang**, Fungi-mediated and Fungi-sourced Materials, Advanced Materials for Sustainable Infrastructure, Gordon Research Conference, Ventura, 2024. (Invited)
16. **Xijin Zhang**, Fungi-mediated Soil Improvement: Towards Flooding Mitigation, Geoshanghai 2024, Shanghai, China, 2024. (Invited)
15. **Xijin Zhang**, Fungi-mediated and Fungi-sourced Materials, National Institute of Standards and Technology (NIST), Gaithersburg, MD, USA, 2024. (Invited)
14. **Xijin Zhang**, Fungi-mediated and Fungi-sourced Materials: Towards Sustainable Infrastructure, Academic Seminar at Missouri Science & Technology, 2024. (Invited)
13. **Xijin Zhang**, Yusheng Jiang, Xudong Fan, Xiong Yu. Experimental Study of Mitigation of Frost Heave in Pavements. The 103rd TRB Annual Conference, Washington D.C., USA, 2024. (Oral)
12. **Xijin Zhang**, Fungi-mediated Soil Improvement: Towards Sustainable Infrastructure, IACIP Annual Workshop, Washington D. C., USA, 2024. (Invited)
11. **Xijin Zhang**, Yusheng Jiang, Xudong Fan, Chanjuan Han, Xiong Yu. Evaluation of naturally grown hydrophobic coating to mitigate water infiltration to concrete. The 101st TRB Annual Conference, Washington D.C., USA, 2022. (Poster)
10. **Xijin Zhang**, Xudong Fan, Anna Samia, Xiong Yu. Fungi-mediated self-healing concrete. 2021 TriDurLE Symposium, Washington State University, 2021. (Invited)
9. **Xijin Zhang**, Xudong Fan, Chanjuan Han, Chen Wang, Xiong Yu. Improving Soil Surface Erosion Resistance by Fungal Mycelium. Geo-Congress 2020: Foundations, Soil Improvement, and Erosion. Reston, VA: American Society of Civil Engineers, 2020: 523-531. (Poster)
8. **Xijin Zhang**, Xiong (Bill) Yu. Preliminary study of fungi-mediated self-healing concrete. The 99th TRB Annual Conference, Washington D.C., USA, 2020. (Oral)
7. **Xijin Zhang**, Xiong (Bill) Yu. Improving soil surface erosion resistance by fungal mycelium. The 99th TRB Annual Conference, Washington D.C., USA, 2020. (Oral)
6. **Xijin Zhang**, Yuan Guo, Xiong Yu. Bacteria mediated self-healing of concrete cracks. Engineering Mechanics Institute Conference 2019 (EMI 2019), June 2019, Pasadena, CA, USA. (Oral)
5. **Xijin Zhang**, Xiong Yu. Phenotype and biomechanics of trees and their inspirations for geo/infrastructure engineering. 1st International Workshop on Bioinspired Geotechnics, May 2019, Monterey, CA, USA. (Poster)
4. **Xijin Zhang**, Xiong Yu, Yuan Guo, Xudong Fan. Behaviors of expansive soils mixed with polymeric

stabilizing foams. Geo-Congress 2019: Soil Improvement. Reston, VA: American Society of Civil Engineers, 2019: 289-297. (Oral)

3. **Xijin Zhang**, Xiong Yu. Analysis on the effect of expansive soils using polymeric stabilizing agents. In: Proceedings of Materials Science & Technology Conference 2018. (Poster)
2. Xudong Fan, **Xijin Zhang**, Xiong Yu. Slime mold inspired adaptive transformation of transportation networks, Washington D.C., USA, 2024. (Poster)
1. Chanjuan Han, Jessica A. Thomas, Zhuoying Jiang, **Xijin Zhang**, Xiong (Bill) Yu. Bio-mediated Soil Improvement by Fungal Mycelium. The 98th TRB Annual Conference, Washington D.C., USA, 2019. (Oral presenter)

Mentor & Service

Peer Review (60+)

- The Czech Science Foundation, Journal of Testing and Evaluation, Journal of Materials in Civil Engineering, Applied Sciences, Journal of Geotechnical and Geoenvironmental Engineering, Geotechnical Testing Journal, Transportation Research Record, International Journal of Pavement Research and Technology, Transportation Research Board — *Oct. 2017-Present*

Graduate and Undergraduate Mentor — *May. 2020- Present*

- Junyi Wang (PhD) — *Jan. 2024-Present*
- Abdulla Abu-khalifa (GMU-OSCAR Undergraduate Scholar) — *Oct. 2023-Present*
- Beachwood Middle School Shadow Day Observation (Leo Zheng and Tim Wang) — *May 2022*
- Undergraduate students summer research (Andrea Chakraborty, Brahaan Singh) — *Summer 2021*
- High school students summer research (Timothy Toliver and Allen Yu) — *Summer 2021*
- Undergraduate students summer research (Joel Tyson and Yingning Ma) — *Summer 2020*

Membership in Professional Organizations

- American Society of Civil Engineers, Associate Member — *2023-Present*
- Standing Committee on Geo-Environmental and Climatic Impacts on Geomaterials (TRB-AKG30), Member — *2019-Present*
- Committee on Engineering Geology and Site Characterization (G-I), Member — *2019-Present*
- International Association of Chinese Infrastructure Professionals, Member — *2017-Present*
- American Society of Civil Engineers, Student Member — *2017-2022*

Leadership in Student Organization

- Vice President of Civil Engineering Graduate Student Association (CEGSA) — *2020-2021*

Editorial Board Member

- ASTM Journal of Testing and Evaluation — *2024*
- Frontier of Built Environment — *2023*

Service in Department

- Student Assistant of main office, CEE Department — *2019-2021*

Outreach Activities

- Research in Progress Part 2, ACI Concrete Convention, Judger — *Mar. 2024*
- Student Poster Competition, ACI Concrete Convention, Judger — *Mar.2024*
- Aspire Engineering panel at Hathaway Brown School, Co-organizer — *Jul. 2022*
- Undergraduate summer research (SOURCE) for intersections event, Judger — *May 2021*
- Undergraduate summer research (SOURCE) application, Reviewer — *Mar. 2021*

Research Projects

- 4-VA@Mason Collaborative Research Grants, *George Mason University*, PI, $20,000, Funded, Jul. 2024-Jun. 2025
- Mitigation Matters Research Award, *Natural Hazards Center*, PI, $10,000, Funded, Jan. 2024-Jul. 2024
- Decarbonaized Bio-infrastructure Materials, *U.S. Army Engineer Research and Development Center,* PI,

$450,000, Not funded.