

ABDOLMAJID (MAZI) ERFANI

Curriculum Vitæ

Civil and Environmental Engineering
133B More Hall
Box 352700
Seattle, WA 98195

Phone: (206) 685-0228
Fax: (206) 543-1543
Email: acrfani@uw.edu

EDUCATIONAL HISTORY

University of Maryland, College Park, MD
Ph.D., Civil Engineering
Aug 2023

Dissertation: Data-Driven Risk Modeling for Infrastructure Projects Using Artificial Intelligence Techniques

University of Tehran, Iran

M.S., Civil Engineering (Focus: Construction Engineering and Management)

Jun 2019

Thesis: Developing a Framework to Facilitate Investment Decision-Making in Renewable Energy Projects

University of Tehran, Iran

B.S., Civil Engineering

Jun 2017

EMPLOYMENT HISTORY

University of Washington

Seattle, WA, USA

Assistant Professor, Department of Civil & Environmental Engineering, 09/2026 - Present

Michigan Technological University

Houghton, MI, USA

Assistant Professor, Department of Civil & Environmental Engineering, 08/2023 - 08/2026

University of Maryland

College Park, MD, USA

Graduate Research Assistant, Department of Civil & Environmental Engineering, 09/2019 - 07/2023

AWARDS AND HONORS

- Graduate student's paper selected as Editor's Choice, 2026, Journal of Legal Affairs & Dispute Resolution in Engineering and Construction (ASCE)
- Outstanding Reviewer Award, 2026, American Society of Civil Engineers (ASCE) Journal of Management in Engineering
- Top 10% Teaching Award, 2025, Michigan Technological University
- Outstanding Reviewer Award, 2025, American Society of Civil Engineers (ASCE) Journal of Management in Engineering
- Arthur M. Wellington Prize, 2024, American Society of Civil Engineers (ASCE)
- Thomas Fitch Rowland Prize, 2024, American Society of Civil Engineers (ASCE)
- Outstanding Reviewer Award, 2024, American Society of Civil Engineers (ASCE) Journal of Management in Engineering
- ASCE ExCEED Teaching Fellow, 2024, American Society of Civil Engineers (ASCE)
- Best Peer-reviewed Paper Award, 2023, American Society of Civil Engineers (ASCE) Journal of Management in Engineering
- YPI Fellowship, 2023, Young Professional in Infrastructure
- Paper selected as Editor's Choice, 2022, Journal of Management in Engineering (ASCE)
- Paper selected as Editor's Choice, 2021, Journal of Management in Engineering (ASCE)
- W. Morris Graduate Fellowship, 2021, University of Maryland

AFFILIATIONS AND OTHER APPOINTMENTS

None.

PUBLICATIONS

[H-Index=16 (GS); 15 (WoS). Citations=786 (GS; as of 09/2026); Footnote: 1- graduate student advised as major advisor; 2- students advised for independent study or non-degree projects; 3-post-doctoral associate; 4-corresponding author]

Refereed archival journal publications

35. Mahmoudi, N., Yousefi, M., Ilbeigi, M., **Erfani, A.** Rashidi, A., (2026). Bridging Vision and Language in Construction: A Scoping Review of Image Captioning, *Journal of Computing in Civil Engineering*. **Accepted.**

34. Naghdi, M.¹, **Erfani, A.**⁴, Geary, G., Ashuri, B. (2026). Stakeholder Perspectives on Price Adjustment Clauses in U.S. Highway Construction: Benefits, Fairness, and Implementation, *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*. **Accepted.**

33. Hosseini, M. Reza., **Erfani, A.** Khodabakhshian, A., Rahimian, F. (2026). Megawatts, but Few Permanent Jobs? An Agent-Assisted Evidence Review of the Data-Centre Construction Cliff, *Smart and Sustainable Built Environment*. 1-24, <https://doi.org/10.1108/SASBE-07-2026-0710>

32. Babaei, S., Naghdi, M.¹, Mansouri, A.¹, **Erfani, A.**⁴ (2026). Generative AI in Transportation Analytics: Foundations, Deep Generative Models, and Practical Use Cases, *Infrastructure*. 11(8), 270. <https://doi.org/10.3390/infrastructures11080270>
31. Naghdi, M.¹, **Erfani, A.**⁴ (2026). Multimodal and Temporal Modeling of Highway–Rail Grade Crossing Crash Severity Using Explainable AI, *Reliability Engineering & System Safety*, **113081**. <https://doi.org/10.1016/j.ress.2026.113081>
30. Naghdi, M.¹, Mahmoudi, N., **Erfani, A.**⁴, Ilbeigi, M. (2026). Explainable AI for Construction: A Review of Use Cases, Trends, and Opportunities, *Automation in Construction*, 190, 107112. <https://doi.org/10.1016/j.autcon.2026.107112>
29. Khanjar, H.¹, **Erfani, A.**⁴ (2026). Explainable and Hybrid Machine Learning for Predicting Fatal Crash Risk. *IATSS Research*. 50(2), 1011-1021. <https://doi.org/10.1016/j.iatssr.2026.06.004>
28. Qin, R., Mansouri, A.¹, Zhen, D., **Erfani, A.**, Cui, Q., (2026). LLMs as Research Instruments for Problems in Engineering Management: A Context Modeling Framework. *Journal of Management in Engineering*, 42(5), 04026029. <https://doi.org/10.1061/JMENEAE.MEENG-7519>
27. Mansouri, A.¹, Shayesteh, N., **Erfani, A.**⁴ (2026). Pavement Condition Classification: Empirical Evidence from Machine Learning Models with Data Augmentation, *International Journal of Pavement Research and Technology*, 1-16. <https://doi.org/10.1007/s42947-026-00785-8>
26. Shaheen, Q., **Erfani, A.**, Zheng, D., Mohammed, M., Cui, Q., (2026). ChatGPT as a Training Coach: Pattern-Specific Outcomes in Build America Buy America Act Training. *Journal of Management in Engineering*, 42(4), 04026012. <https://doi.org/10.1061/JMENEAE.MEENG-7190>
25. **Erfani, A.**⁴, Naghdi, M.¹, (2026). What Drives Risk Similarity Across Construction Projects? An Explainable Machine Learning Analysis Using GPT-Based Embeddings. *Advanced Engineering Informatics*, 73, 104543, <https://doi.org/10.1016/j.aei.2026.104543>
24. Naghdi, M.¹, **Erfani, A.**⁴, Geary, G., Ashuri, B. (2026). Price Adjustment Clauses in Highway Construction: State-of-the-Practice, *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 18(2), <https://doi.org/10.1061/JLADAH.LADR-1485>
23. Sadeghi, M., Mansouri, A.¹, **Erfani, A.**⁴ (2026) Vision Language Models Application for Highway Roadside Safety analysis, *Journal of Management in Engineering*. 42(1), <https://doi.org/10.1061/JMENEAE.MEENG-7141>
22. **Erfani, A.**⁴, Mansouri, A.¹, (2026). Applications of multimodal large language models in construction industry. *Advanced Engineering Informatics*, 69, 103909. <https://doi.org/10.1016/j.aei.2025.103909>
21. **Erfani, A.**⁴, Mansouri, A.¹, (2025). Uncertainty-Aware Pavement Roughness Forecasting Using Adaptive Conformal Prediction, *International Journal of Pavement Research and Technology*, 1-19, <https://doi.org/10.1007/s42947-025-00689-z>
20. Adnan, T.¹, & **Erfani, A.**⁴ (2025). Explainable AI for Predicting Pavement Roughness under Maintenance and No-Maintenance Scenarios. *Results in Engineering*, 108666. <https://doi.org/10.1016/j.rineng.2025.108666>

19. Erfani, A.⁴, Khanjar, H.¹ (2025). Large Language Models for Construction Risk Classification: A Comparative Study. *Buildings*, 15(18), 3379. <https://doi.org/10.3390/buildings15183379>
18. Erfani, A.⁴, Shayesteh, N., Adnan, T.¹ (2025). Data Augmented Explainable AI for Pavement Roughness Prediction, *Automation in Construction*, 176, 106307. <https://doi.org/10.1016/j.autcon.2025.106307>
17. Adnan, T.¹, Erfani, A.⁴, Cui, Q. (2025). Paving Equity: Unveiling Socioeconomic Patterns in Pavement Conditions Using Data Mining. *Journal of Management in Engineering*, 41(5), 04025041. <https://doi.org/10.1061/JMENEA.MEENG-6708>
16. Mansouri, A.¹, & Erfani, A.⁴. (2025). Machine Learning Prediction of Urban Heat Island Severity in the Midwestern United States. *Sustainability*, 17(13), 6193. <https://doi.org/10.3390/su17136193>
15. Mansouri, A.¹, Naghdi, M.¹, & Erfani, A.⁴ (2025). Machine Learning for Leadership in Energy and Environmental Design Credit Targeting: Project Attributes and Climate Analysis Toward Sustainability. *Sustainability*, 17(6), 2521 <https://doi.org/10.3390/su17062521>
14. Naghdi, M.¹, Lautala, P., Erfani, A.⁴ (2024). Assessing visibility at highway-rail grade crossings using light detection and ranging (LiDAR) technology. *Heliyon*, 10(22), <https://doi.org/10.1016/j.heliyon.2024.e40347>
13. Mansouri, A.¹, Erfani, A.⁴ (2024). Gender Disparity and Self-Presentation on Social Media among AEC Industry Leaders. *Journal of Management in Engineering*, 40(5), <https://doi.org/10.1061/JMENEA.MEENG-6121>
12. Erfani, A.⁴, Frias-Martinez, V. (2023). A fairness assessment of mobility-based COVID-19 prediction models. *PLOS one*, 18(10), e0292090. <https://doi.org/10.1371/journal.pone.0292090>
11. Erfani, A., Cui, Q., Baecher, G., & Kwak, Y., (2023). Data-driven approach to risk identification in major transportation projects: a common risk breakdown structure, *IEEE Transactions on Engineering Management*, 71, 6830-684. <https://doi.org/10.1109/TEM.2023.3279237>
10. Erfani, A., Hickey, P., Cui, Q., (2023). Likeability vs. Competence dilemma: A Text Mining approach using LinkedIn data. *Journal of Management in Engineering*, 39(3). <https://doi.org/10.1061/JMENEA.MEENG-5213>
9. Erfani, A., Ma, Z., Cui, Q., Baecher, G. (2023). Ex post Project Risk Assessment: Method, and Empirical Study. *Journal of Construction Engineering and Management*, 149(2). <https://doi.org/10.1061/JCEMD4.COENG-12588>
8. Hickey, P., Erfani, A., Cui, Q., (2022). Use of LinkedIn Data and Machine Learning to Analyze Gender Differences in Construction Career Paths. *Journal of Management in Engineering*, 38(6), 04022060. [https://doi.org/10.1061/\(ASCE\)ME.1943-5479.0001087](https://doi.org/10.1061/(ASCE)ME.1943-5479.0001087)
7. Erfani, A., Cui, Q. (2022). Predictive Risk Modeling for Major Transportation Projects using Historical data., *Automation in Construction*, 139, 104301. <https://doi.org/10.1016/j.autcon.2022.104301>

6. Zhang, K., **Erfani, A.**, Beydoun, O., Cui., Q., (2022). Procurement Benchmarks for Major Transportation Projects. *Transportation Research Record*, 2676(11), 363-376.
<https://doi.org/10.1177/03611981221092722>

5. **Erfani, A.**, Cui, Q., & Cavanaugh, I. (2021). An Empirical Analysis of Risk Similarity among Major Transportation Projects Using Natural Language Processing. *Journal of Construction Engineering and Management*, 147(12), 04021175. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0002206](https://doi.org/10.1061/(ASCE)CO.1943-7862.0002206)

4. **Erfani, A.**, Zhang, K., & Cui, Q. (2021). TAB bid irregularity: Data-driven model and its application. *Journal of Management in Engineering*, 37(5).
[https://doi.org/10.1061/\(ASCE\)ME.1943-5479.0000958](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000958)

3. Li, L., **Erfani, A.**, Wang, Y., & Cui, Q. (2021). Anatomy into the battle of supporting or opposing reopening amid the COVID-19 pandemic on Twitter: A temporal and spatial analysis. *PLOS one*, 16(7), e0254359. <https://doi.org/10.1371/journal.pone.0254359>

2. **Erfani, A.**, Tavakolan, M., Mashhadi, A. H., & Mohammadi, P. (2021). Heterogeneous or homogeneous? A modified decision-making approach in renewable energy investment projects. *AIMS Energy*, 9(3). <https://doi.org/10.3934/energy.2021027>

1. **Erfani, A.**, & Tavakolan, M. (2020). Risk evaluation model of wind energy investment projects using modified fuzzy group decision-making and Monte Carlo simulation. *Journal of Economic Theory and Practice*, 22(1), 7-33. <https://doi.org/10.1177/0976747920963222>

Conference proceedings and other non-journal articles

- ***Fully refereed publications***

26. Zhen, D., Qin, R., Mansouri, A.¹, **Erfani, A.**, Cui, Q., (2026). Context Modeling for LLM-Based Behavioral Simulation. *Findings of the Association for Computational Linguistics (ACL): EMNLP 2026*. Accepted.

25. Khanjar, H.¹, **Erfani, A.** (2026). Binary and Multi-Class Crash Severity Prediction: A Cross-Algorithm Analysis, *International Conference on Transportation & Development*.
<https://doi.org/10.1061/9780784487013.051>

24. Naghdi, M.¹, **Erfani, A.**, Ashuri, B. (2026). Data-Driven Assessment of Fuel Price Adjustment Clauses and Bid Pricing Patterns in Highway Construction. *International Conference on Transportation & Development*. <https://doi.org/10.1061/9780784487020.086>

23. Naghdi, M.¹, **Erfani, A.** (2026). Tabular Fields and Narrative Text for Highway-Rail Grade Crossing Severity Assessment. *International Conference on Transportation & Development*.
<https://doi.org/10.1061/9780784487020.053>

22. **Erfani, A.**, Mansouri, A.¹, Naghdi, M.¹ (2026). Large Language and Vision Models for Construction Workflows: A Literature Review, *Construction Research Congress*, pp. 421-431.
<https://doi.org/10.1061/9780784486962.041>

21. Adnan, T.¹, & **Erfani, A.** (2026). Comparative AI-Based Forecasting of Pavement Conditions Under Maintenance and No-Maintenance Scenarios, *Construction Research Congress*, pp. 308-317. <https://doi.org/10.1061/9780784486962.030>
20. Soroush, M., **Erfani, A.** (2026). A Literature Review on Artificial Intelligence application in Construction Legal Issues, *Construction Research Congress*, pp. 368-378. <https://doi.org/10.1061/9780784486986.036>
19. Sadeghi, M., Mansouri, A.¹, **Erfani, A.** (2026). Guardrail Detection in Rural Roads Using Zero- and Few-Shot Learning with Vision Language Models. *Construction Research Congress*, pp. 359-369. <https://doi.org/10.1061/9780784486962.035>
18. **Erfani, A.**, Erfani, M. (2026). Comparing NLP and LLM Approaches for Risk Classification using Unstructured Data. *Construction Research Congress*, pp. 379-389. <https://doi.org/10.1061/9780784486986.037>
17. Mansouri, A.¹, **Erfani, A.** (2025). Career Mobility in Construction Leadership: Insights from LinkedIn Recommendations and data-driven Analysis. *Computing in Civil Engineering 2025*. <https://doi.org/10.1061/9780784486436.015>
16. Ahmadi, F., Naghdi, M.¹, **Erfani, A.** (2025). Minorities Representation in State Department of Transportation: A Descriptive Analysis. *International Conference on Transportation & Development*. <https://doi.org/10.1061/9780784486207.084>
15. Adnan, T.¹, **Erfani, A.** (2025). Equitable Infrastructure Management: A Systematic Literature Review. *International Conference on Transportation & Development*. <https://doi.org/10.1061/9780784486207.076>
14. Naghdi, M.¹, Lautala, P., **Erfani, A.** (2025). Remote Sightline Inspection at Highway-Rail Grade Crossings Using LiDAR Data and Geospatial Analysis. *International Conference on Transportation & Development*. <https://doi.org/10.1061/9780784486207.075>
13. Adnan, T.¹, **Erfani, A.** (2024). Uncovering Socioeconomic Features in Pavement Conditions Through Data Mining: A Two-step Clustering Model. *IEEE Winter simulation*, <https://doi.org/10.1109/WSC63780.2024.10838835>
12. **Erfani, A.**, Mansouri, A.¹, Shoib, K.¹ (2024). Unconscious bias in self-presentation: Gender inequality in Transportation Leadership, *International Conference on Transportation & Development*, <https://doi.org/10.1061/9780784485521.040>
11. **Erfani, A.** Cui, Q. & DeCorla-Souza, P. (2024). Exploring the Potential of a Crowdfunding Program to Achieve Equitable EV Charging Infrastructure. *TRB Annual Meeting Presentation*
10. **Erfani, A.**, Mahmoudi, J. & Cui, Q. (2024). Measuring Social Equity in Pavement Conditions Using Big Data. *Proceedings Construction Research Congress*. <http://dx.doi.org/10.1061/9780784485262.003>
9. **Erfani, A.**, Zhang, K. & Cui, Q. (2024). A Stakeholder-Centered Approach to Measure the Market Resiliency in Infrastructure Projects using Social Network Analysis. *Proceedings Construction Research Congress* <http://dx.doi.org/10.1061/9780784485286.005>

8. Erfani, A., & Cui, Q. (2023). Application of LinkedIn data and Image processing to analyze construction career paths: Does race matter? *Proceedings Computing in Civil Engineering* <https://ascelibrary.org/doi/abs/10.1061/9780784485248.106>
7. Erfani, A., Ma, M., Cui, Q., & Baecher, G. (2023). Data-drive evaluation of project risk registers: theory, method, and case studies. *Proceedings Geo-risk*. <https://ascelibrary.org/doi/10.1061/9780784484975.017>
6. Erfani, A., Villeda, V. H., & Cui, Q. (2022). Artificial Intelligence Application for Risk Template Generation in Major Transportation Projects. *Proceedings Construction Research Congress*. <https://doi.org/10.1061/9780784483961.003>
5. Mohammadi, P., Ramezaniapour, A. M., & Erfani, A. (2022). Identifying and Prioritizing Criteria for Selecting Sustainable Façade Materials of High-Rise Buildings. *Proceedings Construction Research Congress*. <https://doi.org/10.1061/9780784483978.060>
4. Hickey, P. J., Hercules, V., Johnson, A., Erfani, A., & Cui, Q. (2022). A Gender Analysis of Construction Executive Career Path Progression Using LinkedIn Data. *Proceedings Construction Research Congress*. <https://doi.org/10.1061/9780784483985.072>
3. Erfani, A., & Cui, Q. (2021). Natural Language Processing Application in Construction Domain: An Integrative Review and Algorithms Comparison. *Proceedings Computing in Civil Engineering* <https://doi.org/10.1061/9780784483893.004>
2. Cui, Q., & Erfani, A. (2021). Automatic detection of construction risks. *Proceedings of the 13th European Conference on Product & Process Modelling (ECPPM 2021)* (pp. 184-189). CRC Press. <https://doi.org/10.1201/9781003191476>
1. Erfani, A., Tavakolan, M., (2019). Challenges in renewable energy investment projects: identification of the main criteria and risks. *Proceeding of 3rd international conference on applied researchers in Structural Engineering and construction management*, Tehran, Iran

Journal publications In revision/review

16. Adnan, T.¹, Erfani, A.⁴ (2026). Evaluating Zero-Shot Vision-Language Models for Highway–Rail Grade Crossing Visual Analytics. *Plos One*. Under-review.
15. Hosseini, M. Reza., Rahimian, F., Elghaish, F., Arashpour, M., Gheisari, M., Erfani, A., (2026). Mapping the AI talent landscape in construction: an LLM-driven knowledge graph analysis of job advertisements in Australia/New Zealand. *Engineering, Construction and Architectural Management*. **In-revision**.
14. Naghdi, M.¹, Erfani, A.⁴ (2026). Fuel Usage Rates and Contractor Bid Pricing in Highway Construction: A Case Study, *Construction Management and Economics*, **In-revision**.
13. Qin, R., Mansouri, A.¹, Zhen, D., Erfani, A., Cui, Q., (2026). From Rider Voices to Route-Level Evidence: A Traceable LLM Framework for Transit Co-Planning. *Advanced Engineering Informatics*, Under-review.

12. Vosoughkhosravi, S., **Erfani, A.**, (2026). Developing AI Occupant Agents for Occupant Behavior Modeling in Residential Buildings. *Journal of Computing in Civil Engineering*. Under-review.
11. **Erfani, A.**⁴, Mansouri, A.¹, Hosseini, M. R (2026). Agentic AI in Construction: A Taxonomy of Agency, Capability, and Interaction. *Automation in Construction*. Under-review.
10. Hosseini, M. Reza., Khodabakhshian, A., **Erfani, A.**⁴ (2026). Confidence-Based Governance of AI-Assisted Construction Text Classification Using LLMs, *Journal of Management in Engineering*. **In-revision**.
9. **Erfani, A.**⁴, Vosoughkhosravi, S., Hosseini, M. Reza. (2026). Agentic AI with Large Language Models for Sustainable Construction: Linking Autonomy, Operational Mechanisms, and ESG Outcomes, *Smart and Sustainable Built Environment*, **In-revision**.
8. Naghdi, M.¹, **Erfani, A.**⁴, Ashuri, B. (2026). Fuel Price Adjustment Clauses and Bid Prices in Highway Construction: Empirical Analysis with Double Machine Learning, *Built Environment Project and Asset Management*, **In-revision**.
7. **Erfani, A.**⁴, Naghdi, M.¹, Hosseini, M. Reza. (2026). What Skills Signal Leadership in the AEC Industry? A Large-Scale Career Data Analysis. *Engineering, Construction and Architectural Management*, **In-revision**.
6. Mansouri, A.¹, Zhen, D., Qin, R., **Erfani, A.**⁴, Cui, Q., (2026). Can Interpretable Surrogate Models Explain LLM Agent Responses? A Public Opinion Highway Design Case Study. *Advanced Engineering Informatics*, Under-review.
5. Adnan, T.¹, Naghdi, M.¹, Mansouri, A.¹, **Erfani, A.**⁴ (2026). Human-Artificial Intelligence Collaboration in Maintenance Decision-making Using Large Language Models, *Engineering Applications of Artificial Intelligence*, Under-review.
4. Adnan, T.¹, Naghdi, M.¹, Mansouri, A.¹, **Erfani, A.**⁴, Ilbeigi, M. (2026). Agentic AI for Autonomous Pavement Condition Analytics: A Multi-Agent LLM Framework, *Results in Engineering*, Under-review.
3. Naghdi, M.¹, **Erfani, A.**⁴ (2026). Learning from Pavement Condition Transitions for Future Maintenance Decisions, *International Journal of Pavement in Engineering*, Under-review.
2. Mansouri, A.¹, **Erfani, A.**⁴ (2026). Digital Professional Signaling and Career Mobility in Construction Leadership. *Engineering, Construction and Architectural Management*. **In-revision**
1. Behrooz, H., Ilbeigi, M., **Erfani, A.** (2025). A Natural-Gradient Boosted LogNormal Distributional Framework for Probabilistic Prediction of Pavement Roughness. *International Journal of Pavement in Engineering*. Under-review.

- **Refereed by abstract only**

None.

Complete books written

None.

Parts of books (chapters in edited books)

None.

Books edited

None.

Journal issues edited

Multimodal Large Language Models Application in AEC industry, American Society of Civil Engineers (ASCE), Journal of Management in Engineering, 2026

Patents submitted and/or awarded

None.

Abstracts, letters, non-refereed papers, technical reports

None.

Other significant research dissemination (web sites, software, Wikis, etc.)

Erfani, A. (2023). Data-driven risk modeling for infrastructure projects using artificial intelligence techniques (Doctoral dissertation, University of Maryland, College Park).

MISCELLANEOUS

Outside Professional Work for Compensation (1460s)

Name of Organization	Start Date	End Date	Number of Days	Description of Activity

OTHER SCHOLARLY ACTIVITY

Invited lectures and seminars.

1. Build America Center Future Cities Distinguished Speaker Seminar (University of Maryland), *LLMs as Research Instruments for Problems in Engineering Management: A Context Modeling Framework*, October 16, 2026.
2. eScience Institute (University of Washington), *Human–AI Collaboration for Infrastructure Systems: Agentic AI for Forecasting and Behavioral Simulation*, April 29, 2026.
3. University of Washington, *Human–AI Collaboration for Infrastructure Systems: Integrating Data-Driven Analysis and Context-Aware LLM Agents*, March 31, 2026.
4. University of North Carolina, Charlotte, *Human–AI Collaboration for Infrastructure Systems: Integrating Data-Driven Analysis and Context-Aware LLM Agents*, March 24, 2026.

5. Michigan Tech University (Graduate Seminar), *Explainable and Responsible AI for Engineering Decision-Making*, March 09, 2026.
6. Colorado State University, *AI for Infrastructure Decision-Making: Data-Driven, Multimodal, and Human-in-the-Loop Systems*, Feb 12, 2026.
7. University of Sydney (School of Project Management), *Bridging the Gap: Data-Driven Diversity Analysis in AEC Industry*, May 28, 2024.
8. University of Maryland, College Park, *Ex-post Project Risk Assessment*, Feb 02, 2024.
9. Young Professionals in Infrastructure, *Gender Diversity in AEC Leadership*, Dec 21, 2023.
10. Georgia Southern University, *Bridging the Gap: Integrating Data-Driven Infrastructure Management and Diversity in AEC Industry*, March 27, 2023.
11. Michigan Tech University, *Bridging the Gap: Integrating Data-Driven Infrastructure Management and Diversity in AEC Industry*, March 22, 2023.
12. Project Management Institute (PMI), *The Future of AI and Project Management*, Augst 17, 2021.

Presentations given at conferences.

1. **Naghdi, M.**, Erfani, A., Ashuri, B. "Data-Driven Assessment of Fuel Price Adjustment Clauses and Bid Pricing Patterns in Highway Construction." *International Conference on Transportation & Development (ICTD)*, Detroit, Michigan, 2026 Jun.
2. Sadeghi, M., **Mansouri, A.**, Erfani, A. "Guardrail Detection in Rural Roads Using Zero- and Few-Shot Learning with Vision Language Models." *Construction Research Congress (CRC)*, San Antonio, Texas, 2026 March.
3. **Erfani, A.**, Erfani, M. "Comparing NLP and LLM Approaches for Risk Classification using Unstructured Data." *Construction Research Congress (CRC)*, San Antonio, Texas, 2026 March.
4. **Naghdi, M.**, Lautala, P., Erfani, A. Remote Sightline Inspection at Highway-Rail Grade Crossings Using LiDAR Data and Geospatial Analysis. *International Conference on Transportation & Development (ICTD)*, Glendale, Arizona, 2025 Jun.
5. **Adnan, T.**, Erfani, A. "Uncovering Socioeconomic Features in Pavement Conditions Through Data Mining: A Two-step Clustering Model." *IEEE Winter simulation (WSC)*, Orlando, Florida, 2024 December
6. **Erfani, A.**, Mahmoudi, J. & Cui, Q. "Measuring Social Equity in Pavement Conditions Using Big Data." *Construction Research Congress (CRC)*, Des Moines, Iowa, 2024 March.
7. **Erfani, A.**, Zhang, K. & Cui, Q. "A Stakeholder-Centered Approach to Measure the Market Resiliency in Infrastructure Projects using Social Network Analysis", *Construction Research Congress (CRC)*, Des Moines, Iowa, 2024 March.
8. **Erfani, A.**, & Cui, Q. "Application of LinkedIn data and Image processing to analyze construction career paths: Does race matter?" *Computing in Civil Engineering*, Corvallis, Oregon, June 2023.
9. Erfani, A., **Ma, M.**, Cui, Q., & Baecher, G. "Data-drive evaluation of project risk registers: theory, method, and case studies." *Geo-risk*. Arlington, Virginia, 2023 July.
10. **Erfani, A.**, Villeda, V. H., & Cui, Q. "Artificial Intelligence Application for Risk Template Generation in Major Transportation Projects." *Construction Research Congress*, Arlington, Virginia, 2022 March.
11. **Mohammadi, P.**, Ramezaniapour, A. M., & Erfani, A. Identifying and Prioritizing Criteria for Selecting Sustainable Façade Materials of High-Rise Buildings. *Construction Research Congress*, Arlington, Virginia, 2022 March.
12. **Hickey, P. J.**, Hercules, V., Johnson, A., Erfani, A., & Cui, Q. "A Gender Analysis of Construction Executive Career Path Progression Using LinkedIn Data." *Construction Research Congress*, Arlington, Virginia, 2022 March.

13. **Erfani, A., & Cui, Q.** “Natural Language Processing Application in Construction Domain: An Integrative Review and Algorithms Comparison.” *Computing in Civil Engineering*, Orlando, Florida, 2021 September.

Professional society memberships.

American Society of Civil Engineers (ASCE), 2019-present
Transportation Research Board (TRB), 2019-present
Construction Research Council (CRC), 2024-present
Technical Council on Computing and Information Technology, 2023-present

Other

Review made

Peer-reviewed Journal Articles	Number of reviews (approx.)
Journal of Construction Engineering and Management	44
Journal of Management in Engineering	34
Advanced Engineering Informatics	14
Transportation Research Record	9
Automation in Construction	6
Computer-Aided Civil and Infrastructure Engineering	12
Expert Systems with Applications	6
Renewable and Sustainable Energy Reviews	18
Transactions on Engineering Management	5
Smart and Sustainable Built Environment	8
International Journal of Pavement Research and Technology	11
Energy & Buildings	4
Others: • Journal of Legal Affairs and Dispute Resolution in Engineering and Construction • International Journal of Construction Management • Scientific Review • Communication • Humanities and Social Sciences Communication • Information Processing & Management • Computer in Industry • Journal of Cleaner Production • Social Sciences & Humanities • Construction and Building Materials • Cities • Road Engineering • Women's Studies International Forum • PloS One • Advances in Civil Engineering • International Journal of Green Energy • Journal of Economic Policy Reform • Journal of Civil Engineering Education	

Conferences Proceedings/Abstracts	Years
Transportation Research Board (TRB) conference	2021-2027
Construction Research Congress	2022, 2024, 2026
International Conference on Computing in Civil Engineering	2025

GRADUATE STUDENTS

Chaired Doctoral Degrees

Student Name	Role	Dissertation	Graduation Year	Current Employer
Mohsen Naghdi at MTU	Chair	Price Adjustment in Highway Construction	2026	Staff Engineer at Terracon
Tamim Adnan at MTU	Chair	Predictive Pavement Analytics	2026	-

Current Doctoral Students

Student Name	Role	Dissertation	Dates (Status)
Ali Mansouri at UW	Chair	LLMs Application in Highway Construction	Spring 2025- present
Hussein Khanjar at MTU	Chair	AI for Crash severity modeling	Spring 2024-present (PhD candidate)

Master Students & Chaired Masters Degrees

Student Name	Level of supervision	Thesis/Paper Title (Research Topic)	Dates
Shoib Khan	Coursework	Unconscious Bias in Online Self-Presentation	2023- 2024
Dona Djoffon	Coursework	Common Risks Allocation in Major Transportation Infrastructures in the US	2024-2025
Primrose Makwiranzou	Coursework	Public Participation in Transportation Planning	2025-2026

Current Masters Students

Student Name	Level of supervision	Thesis/Paper Title (Research Topic)	Dates
Yongjin Jeon	Coursework	N/A	2026-

Other significant student supervision

Ph.D. Committees:

Student Name	<i>Dissertation</i>	<i>Dates</i>
Kwadwo Boateng	Effect of Recycling of Aged Crumb Rubber Modified Asphalt Pavement on Binder and Mixture Performance	2023-2026
Yifan Jeff Wang	Cognition-Aware Task Allocation and Scheduling in Human-Robot Collaboration for Modular Construction	2025-
Songjie Jia	Robotic Adaptive Structures: Bridging Robots and Civil Structures	2025-
Zhongqi Fan	Deployable Bridges: Simulation, Experiments, and Inverse Design	2025-
Fnu Raliba Hinga Roseline	Contrast-Enhanced Ultrafast Ultrasound for High-Resolution quantitative Characterization of Surface-connected Rail Cracks	2026-
Khashayar Ghorab	Enhancing and Evaluating Risk Reasoning and Decision Support in Construction Safety using Generative AI and XR Agent	2026-

Undergraduate Research Supervision:

Student Name	<i>Research Project Title</i>	<i>Dates</i>
Andrew Hamilton	Data-Driven Calibration of Highway Safety Manual Crash Prediction Models (NSF-REU)	2025-2026
Laretta Boburka	AI application for Infrastructure Co-planning (NSF)	2025-2026

RESEARCH ACTIVITIES

Funded Research

Funding Agency	<i>Title</i>	Your role with other PI's and co-PI's	Total Amount, Your Amount, (Subcontracts if any, University Matching if any)	Dates (start - finish)
MnDOT	<i>Mapping Heat Vulnerability and Transportation Impacts</i>	Co-PI (PI, Khani UMN)	Total amount \$161k, my amount \$74k	9/2026 - present
Hatch Ltd	<i>AI-Augmented Construction Schedule Intelligence</i>	PI	Total amount \$90k, my amount \$90k	5/2026 - present
MnDOT	<i>Transportation Investments for Economic Development and Wealth Building</i>	Co-PI (PI, Khani UMN)	Total amount \$257k, my amount \$96k	8/2025 - present
NCHRP	<i>Price Adjustment Clauses to Balance Risk Sharing in Construction Projects</i>	PI	Total amount \$450k, my amount \$285k	11/2024 - present
NSF	<i>Gen-AI Community-Driven Street Designs</i>	Co-PI (PI, Cui UMD)	Total amount \$150k, my amount \$50k	9/2025 - 9/2026

Hatch Ltd	<i>Scope and Predictability in Construction</i>	PI	Total amount \$10k, my amount \$10k	5/2026 - 08/2026
Bentely	<i>Construction Scheduling - SYNCHRO Pro</i>	PI	Total amount \$16k, my amount \$16k	5/2025 - 08/2025
FRA	<i>Promoting Railroading Careers</i>	Co-PI (PI, Lautala MTU)	Total amount \$1.2M, my amount \$350k	11/2024 - present
CISR	<i>Pavement Resiliency in an Era of Climate Change</i>	PI	Total amount \$7k, my amount \$7k	1/2024- 9/2024

*Note:

MnDOT: Minnesota Department of Transportation
NCHRP: National Cooperative Highway Research Program
NSF: National Science Foundation
FRA: Federal Railroad Administration
CISR: Center for Innovation in Sustainability and Resilience

Un-sponsored research.

DOCUMENTATION OF TEACHING EFFECTIVENESS

Courses Taught & Student Evaluations

Course	Title	Quarter	Credit Hrs	Enrollment	Evaluations? Response	Item 1	Item 3	Item 4	Overall Adj. Median
CEE 307	Construction Engineering	Winter, 2027	3			-	-	-	-

Michigan Technological University

Course	Title	Semester	Credit Hrs	Enrollment	Overall Adj. Median
CEE 4990/5890	AI for Civil Engineers	Spring 2026	3	7	4.77
CEE 3332	Construction Engineering	Fall 2025	3	69	4.33
CEE 4990/5890	AI for Civil Engineers	Spring 2025	3	16	4.92
CEE 3332	Construction Engineering	Fall 2024	3	64	4.39
CEE 4990/5890	AI for Civil Engineers	Spring 2024	3	20	4.84
CEE 3332	Construction Engineering	Fall 2023	3	65	4.31

Supervision of independent study (design projects and research).

Independent Study

Course	Title or Student Name	Quarter	# of Students (Total Credit Hrs)

List of other teaching contributions

New Courses Developed

CEE 4990/5880: AI for Civil Engineers

Other supporting documents

None.

Teaching Awards, Nominations for Teaching Awards

- Teaching Award (Top 10% of Instructors based on students' evaluation), Michigan Technological University, 2025

SERVICE

Departmental service

Member, Diversity, Equity, and Inclusion (DEI) Committee, *Michigan Technological University, Department of Civil, Environmental and Geospatial Engineering*, 2023-2025

College service

None.

University service

None.

Professional society and other service

- Associate Editor and Member, Editorial Board of the American Society of Civil Engineers (ASCE) Journal of Management in Engineering, *Sept 2024- present*
- Member, Editorial Board of the Journal of Smart and Sustainable Built Environment, *Feb 2026- present*
- Handling Editor and Member, Editorial Board of the Nature Scientific Report, *Aug 2026- present*
- Guest Editor – ASCE Journal of Management in Engineering Special Collection on [*Multimodal Large Language Models Application in AEC industry*](#)
- Session Chair, “Data Driven Infrastructure Management” session at *2024 IEEE Winter simulation Conference, Dec 2024*
- Poster session competition Judge, 2025 I3CE International computing in civil engineering conference, Louisiana, *May 2025*
- Committee member, National Science Foundation Workshop “Research Data Management in Construction”, *May 2026*, <Award number: 2541825>
- Decade Award Committee Member, ASCE Journal of Management in Engineering, *May 2025*

Community service

Faculty Advisor, Iranian Community (IrC), Michigan Technological University, *2025–2026*

International, national or governmental service

None.

All other service

- USDOT Build America Center; Technical Assistance to Public Agencies and Communities, University of Maryland — FTA Low- or No-Emission Vehicle Program (~\$40M award)
- USDOT Build America Center; Technical Assistance to Public Agencies and Communities, State of Louisiana — Regional Infrastructure Accelerator Program: (\$2M award)
- USDOT Build America Center; Technical Assistance to Public Agencies and Communities, Maryland Clean Energy Center — FHWA Charging and Fueling Infrastructure Program (\$15M award)
- USDOT Build America Center; Technical Assistance to Public Agencies and Communities, Cow Creek Band of Umpqua Tribe of Indians — Consolidated Rail Infrastructure and Safety Improvements Program Grant Application (\$5M proposal)