

Meng Wu
Ph.D. Candidate, Graduate Research Assistant.
Dow 825, Civil, Environmental, and Geospatial Engineering
Michigan Technological University
Houghton, MI 49931, U.S.A.
Email: mewu@mtu.edu
Telephone: +1 9062814039
Personal website: <https://wumao352-cpu.github.io/>



Objective and Intended Area of Research:

My research direction is the multi-scale analysis of polymer-modified asphalt's aging and rejuvenation mechanism. Become an engineer who works to improve the design and evaluation of asphalt pavement materials.

Education Background:

Michigan Technological University Since August 2022

Major: Civil Engineering Supervisor: Zhanping You

GPA: 3.94/4.0

Research interests: Asphalt binder performance; Polymer-modified asphalt; Superpave volumetric mix design and balanced mix design; Molecular simulation of asphalt material

Southeast University September 2019 - July 2022

Major: Road and Railway Engineering Supervisor: Tao Ma, Weiguang Zhang

GPA: 90.3/100

Master's Thesis: Multi-scale Research on Strength Formation Mechanism of Emulsified Cold Recycled Mixture based on molecular dynamics simulation

RWTH Aachen University October.2018-April.2019

Grade: Very good

Research project: EDEM Academic- Simulating Granular Materials Behaviors

Chang'an University August.2015- July.2019

GPA: 90/100 Rank: 2/155

Publication:

Wu, M., L. Yin, M. Li, Z. You, D. Jin, and K. Xin (2025), A state-of-the-art review of asphalt aging behavior at macro, micro, and molecular scales. *Construction and Building Materials*, 2025. 460: p. 139738 DOI: 10.1016/j.conbuildmat.2024.139738

Wu, M., Li, M., & You, Z. (2024). Asphalt property prediction through high-throughput molecular dynamics simulation. *Computer-Aided Civil and Infrastructure Engineering*, 1–15. DOI: 10.1111/mice.13325

Wu, M., You, Z., Jin, D., Yin, L., & Xin, K. (2024). Aging effects on asphalt adhesive properties: molecular dynamics simulation of chemical composition and structural changes. *Molecular Simulation*, 1–19.
DOI:10.1080/08927022.2024.2359568

Wu, M. and Z. You. (2023). Molecular dynamics models to investigate the diffusion behavior of emulsified asphalt. *Construction and Building Materials*, 2023. 409: p. 134061. DOI:10.1016/j.conbuildmat.2023.134061.

Wu, M., You, Z., & Jin, D. (2023). Adhesion Performance of Rubber Modified Asphalt in Chip Seal: A Molecular Dynamic Study. *Materials*, 16(18), 6324.
DOI:10.3390/ma16186324

Wu, M., Xu, G., Luan, Y., Zhu, Y., Ma, T., & Zhang, W. (2022). Molecular dynamics simulation on cohesion and adhesion properties of the emulsified cold recycled mixtures. *Construction and Building Materials*, 333, 127403.
DOI:10.1016/j.conbuildmat.2022.127403

Xu, G., Yao, Y., **Wu, M.**, & Zhao, Y. (2023). Molecular simulation and experimental analysis on co-aging behaviors of SBS modifier and asphalt in SBS-modified asphalt. *Molecular Simulation*, 49(7), 629-642. DOI:10.1080/08927022.2023.2182134
(Corresponding author)

Zhang, W., Ahmad, K. N., Tong, Z., Hu, Z., Wang, H., **Wu, M.**, ... & Mohammad, L. N. (2023). In-Time Density Monitoring of In-Place Asphalt Layer Construction via Intelligent Compaction Technology. *Journal of Materials in Civil Engineering*, 35(1), 04022386. DOI:10.1061/(ASCE)MT.1943-5533.0004558 (Corresponding author)

Yin, L., Jin, D., **Wu, M.**, Liu, Z., & You, Z. (2025). Performance of high-rubber-content modified asphalt chip seal in wet-freezing environments. *Journal of Cleaner Production*, 519, 145993. DOI:10.1016/j.jclepro.2025.145993

Xin, K.; **Wu, M.**; Jin, D.; You, Z. A Case Study of Pavement Construction Materials for Wet-Freeze Regions: The Application of Waste Glass Aggregate and High-Content Rubber Modified Asphalt. *Buildings* 2025, 15, 1637. DOI:10.3390/buildings15101637

Yao, Y., G. Xu, M. Wu, and M. Zhao. (2023). Exploring the influence of cement and cement hydration products on strength and interfacial adhesion in emulsified cold recycled mixture: A molecular dynamics and experimental investigation. *Construction and Building Materials*, 409: p. 134050.
DOI:10.1016/j.conbuildmat.2023.134050

Zhu, Y., Ma, T., Xu, G., Fan, J., Zhang, Y., & **Wu, M.** (2023). Study of the Mixing between Asphalt and Rejuvenator in Hot In-Place Recycled Layer. *Journal of Transportation Engineering, Part B: Pavements*, 149(2), 04023005.
DOI:10.1061/JPEODX.PVENG-1033

Luan, Y., Ma, T., Wang, S., Ma, Y., Xu, G., & **Wu, M.** (2022). Investigating mechanical performance and interface characteristics of cold recycled mixture: Promoting sustainable utilization of reclaimed asphalt pavement. *Journal of Cleaner Production*, 369, 133366. DOI:10.1016/j.jclepro.2022.133366

Fu, Y., **Wu, M.**, Hei, T., Dong, Z., Hu, J., & Zhang, W. (2022). Research on the Adhesion and Self-healing Properties of Bio-asphalt Based on Molecular Simulation. *Advance Researches in Civil Engineering*, 4(2), 24-43. DOI:10.30469/arce.2022.157270

Zhang, W., Luan, Y., Ma, T., Wang, S., Chen, J., Li, J., & **Wu, M.** (2021). Multilevel analysis of the aging mechanisms and performance evolution of rubber-modified asphalt. *Journal of Materials in Civil Engineering*, 33(12), 04021365. DOI:10.1061/(ASCE)MT.1943-5533.0004000

Zhang, W., Lee, J., Ahn, H. J., Le, Q., **Wu, M.**, Zhu, H., & Zhang, J. (2019). Field Investigation of Clay Balls in Full-Depth Asphalt Pavement. *Materials*, 12(18), 2879. DOI:10.3390/ma12182879

Academic Conference Activity:

Poster: 104th TRB Annual Meeting, Washington, DC, January 5–9, 2025. Poster Title: Laboratory Evaluation of Mixture Performance of High-Content Rubber Asphalt Using Wet Process.

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Poster: 2024 AAPT Annual Meeting, Chicago, Illinois, September 9–12. Poster Title: Asphalt Property Prediction through High-Throughput Molecular Dynamics Simulation.

Peer Review Service:

Review activity for Construction & Building Materials: 31 reviews
Review activity for Journal of Building Engineering: 4 reviews
Review activity for Journal of Materials in Civil Engineering: 9 reviews
Review activity for Journal of Molecular Liquids: 2 reviews
Review activity for Case Studies in Construction Materials: 6 reviews
Review activity for Results in Engineering: 1 review
Review activity for Colloids and surfaces: 1 review
Review activity for Cleaner Materials: 1 review
Review activity for Journal of Cleaner Production: 1 review
Review activity for Colloids and Surfaces A: Physicochemical and Engineering Aspects: 1 review

Google scholar citation:

<https://scholar.google.de/citations?user=67O3Z3YAAAAJ&hl=en>

Citations 238

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