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Shangjia Dong

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EDUCATION

2018 PhD Civil Engineering, Minor Computer Sciences, Oregon State University

2015 MSc Civil Engineering, Oregon State University

2013 BSc Information and Computational Science, University of Electronic Science and Technology of China

ACADEMIC APPOINTMENT

2026 – now Affiliated Faculty, Data Science Institute, University of Delaware

2024 – now Bentley Systems Early Career Professor, Department of Civil, Construction, and Environmental Engineering, University of Delaware

2023 – now Affiliated Faculty, Center for Cybersecurity, Assurance and Privacy (CCAP), University of Delaware

2020 – now Assistant Professor, Department of Civil, Construction, and Environmental Engineering
Core Faculty, Disaster Research Center (DRC)
Affiliated Faculty, Sociotechnical System Center (SCC)
University of Delaware

2018 – 2020 Postdoctoral Research Associate, Zachry Department of Civil and Environmental Engineering, Texas A&M University

2014 – 2018 Research Assistant, School of Civil and Construction Engineering, Oregon State University

2013 – 2014 Teaching Assistant, School of Civil and Construction Engineering, Oregon State University

RESEARCH INTERESTS

- Analyzing human behavior in response to infrastructure failures and service outages during disasters.
- Developing algorithmic frameworks to model and simulate the interdependencies within socio-technical systems to characterize system vulnerabilities.
- Utilizing data-driven system analytics and applying advanced AI and network-based methodologies to provide actionable insights for informed decision-making.
- Strengthening resilience planning with a focus on community health and equity, particularly in preparing for and adapting to climate change.
- Safeguarding critical infrastructure through robust disaster preparedness and response strategies.

PUBLICATIONS

advisees: postdoc, graduate student, undergraduate student***

Peer-reviewed Journal Articles

Count: 45 Citations: 2630 (Google) h-index: 30 (Google)

2026 Qian, X.*, Gangwal, U.*, **Dong, S.,** & Davidson, R. (2026). A Deep Generative Framework for Joint Households and Individuals Population Synthesis. *Journal Applied Soft Computing* 188, 114375. [J45]

2025 Qian, X.*, **Dong, S.,** & Davidson, R. (2025). Deep Contrastive Learning for Feature Alignment: Insights from Housing-Household Relationship Inference. *Computers, Environment, and Urban Systems*. 121, 102328. [J44]

Bauman, P., Moreau, L., Hall, J., **Dong, S.** & Horney, J. (2025) Characterizing Perceptions of Opioid Treatment Program Access Barriers During Disasters, *Disaster Medicine and Public Health Preparedness*. *19, e113*. [J43]

Gangwal, U.*, Shi, F., & **Dong, S.** (2025). Living with and without water: Resource disparity assessment during flooding through an interdependent system dynamic modeling approach. *Urban Informatics*, 4(1), 1-21. [J42]

Gangwal, U.*, Dulam, R., **Dong, S.,** Davidson, R., Kendra, J., Ewing, B., & Andresen, A. (2025). Lights out, decisions on: How households adapt to power outages across regions and events. *Energy Research & Social Science,* 127, 104162. [J41]

Dulam, R., Gangwal, U.*, Davidson, R., **Dong, S.,** Ewing, B., Kendra, J., & Andresen, A. (2025). Characterizing and predicting household adaptations to electric power outages. Urban Informatics 4, 20. [J40]

2024 Horney, J., Gangwal, U.*, & **Dong, S.** (2024) Flood inundation and isolation differentially impact access to dialysis care, *American Journal of Disaster Medicine*. 19(3), 265-269. [J39]

2023 Rajput, A. A., Nayak, S., **Dong, S.,** & Mostafavi, A. (2023). Anatomy of perturbed traffic networks during urban flooding. *Sustainable Cities and Society*, 104693. [J38]

Horney, J. A., Scales, S. E., Gangwal, U.*, & **Dong, S.** (2023). Ensuring Access to Opioid Treatment Program Services Among Delawareans Vulnerable to Flooding. *Delaware Journal of Public Health*, 9(2), 130. [J37]

Dong, S., Gao, X., Mostafavi, A., Gao, J., & Gangwal, U*. (2023). Characterizing resilience of flood-disrupted dynamic transportation network through the lens of link reliability and stability. *Reliability Engineering & System Safety*, 232, 109071. [J36]

Yuan, F., Lee, C. C., Mobley, W., Farahmand, H., Xu, Y., Blessing, R., **Dong, S.** Mostafavi, A., & Brody, S. D. (2023). Predicting road flooding risk with crowdsourced reports and fine-grained traffic data. *Computational Urban Science*, 3(1), 15. [J35]

Gangwal, U.*, Siders, A. R., Horney, J., Michael, H. A., & **Dong, S.** (2023). Critical facility accessibility and road criticality assessment considering flood-induced partial failure. *Sustainable and Resilient Infrastructure*, 8(sup1), 337-355. [J34]

2022 Lee, C. C., Rajput, A. A., Hsu, C. W., Fan, C., Yuan, F., **Dong, S.,** Esmalian, A., Farahmand, H., Patrascu, F.I., Liu, C.F. and Li, B. & Mostafavi, A. (2022). Quantitative measures for integrating resilience into transportation planning practice: Study in Texas. *Transportation Research Part D: Transport and Environment*, 113, 103496. [J33]

Dong, S., Yu, T., Farahmand, H., & Mostafavi, A. (2022). Predictive multi-watershed flood monitoring using deep learning on integrated physical and social sensors data. *Environment and Planning B: Urban Analytics and City Science*, 49(7), 1838-1856. [J32]

Gangwal, U.*, & **Dong, S.** (2022). Critical facility accessibility rapid failure early-warning detection and redundancy mapping in urban flooding. *Reliability Engineering & System Safety*, 224, 108555. [J31]

Yuan, F., Fan, C., Farahmand, H., Coleman, N., Esmalian, A., Lee, C. C., Patrascu, F.I., Zhang, C., **Dong, S.** & Mostafavi, A. (2022). Smart flood resilience: Harnessing community-scale big data for predictive flood risk monitoring, rapid impact assessment, and situational awareness. *Environmental Research: Infrastructure and Sustainability*, 2(2), 025006. [J30]

Farahmand, H., Liu, X., **Dong, S.,** Mostafavi, A., & Gao, J. (2022). A network observability framework for sensor placement in flood control networks to improve flood situational awareness and risk management. *Reliability Engineering & System Safety*, 221, 108366. [J29]

Esmalian, A., Yuan, F., Rajput, A. A., Farahmand, H., **Dong, S.,** Li, Q., Gao, X., Fan, C., Lee, C.C., Hsu, C.W. & Mostafavi, A. (2022). Operationalizing resilience practices in transportation infrastructure planning and project development. *Transportation Research Part D: Transport and Environment*, 104, 103214. [J28]

Dong, S., Gao, X., Mostafavi, A., & Gao, J. (2022). Modest flooding can trigger catastrophic road network collapse due to compound failure. *Communications Earth & Environment*, 3(1), 38. [J27]

2021 **Dong, S.,** Malecha, M., Farahmand, H., Mostafavi, A., Berke, P. R., & Woodruff, S. C. (2021). Integrated infrastructure-plan analysis for resilience enhancement of post-hazards access to critical facilities. *Cities*, 117, 103318. [J26]

Farahmand, H., **Dong, S.,** & Mostafavi, A. (2021). Network analysis and characterization of vulnerability in flood control infrastructure for system-level risk reduction. *Computers, Environment and Urban Systems*, 89, 101663. [J25]

Li, Z., Yu, H., Zhang, G., **Dong, S.,** & Xu, C. Z. (2021). Network-wide traffic signal control optimization using a multi-agent deep reinforcement learning. *Transportation Research Part C: Emerging Technologies*, 125, 103059. [J24]

Dong, S., Yu, T., Farahmand, H., & Mostafavi, A. (2021). A hybrid deep learning model for predictive flood warning and situation awareness using channel network sensors data. *Computer-Aided Civil and Infrastructure Engineering*, 36(4), 402-420. [J23]

Esmalian, A., **Dong, S.,** & Mostafavi, A. (2021). Susceptibility curves for humans: Empirical survival models for determining household-level disturbances from hazards-induced infrastructure service disruptions. *Sustainable Cities and Society*, 66, 102694. [J22]

Esmalian, A., **Dong, S.,** Coleman, N., & Mostafavi, A. (2021). Determinants of risk disparity due to infrastructure service losses in disasters: a household service gap model. *Risk Analysis*, 41(12), 2336-2355. [J21]

2020 **Dong, S.,** Li, Q., Farahmand, H., Mostafavi, A., Berke, P. R., & Vedlitz, A. (2020). Institutional connectedness in resilience planning and management of interdependent infrastructure systems. *Journal of Management in Engineering*, 36(6), 04020075. [J20]

Dong, S., Yu, T., Farahmand, H., & Mostafavi, A. (2020). Probabilistic modeling of cascading failure risk in interdependent channel and road networks in urban flooding. *Sustainable Cities and Society*, 62, 102398. [J19]

Dong, S., Yu, T., Farahmand, H., & Mostafavi, A. (2020). Bayesian modeling of flood control networks for failure cascade characterization and vulnerability assessment. *Computer-Aided Civil and Infrastructure Engineering*, 35(7), 668-684. [J18]

Farahmand, H., **Dong, S.,** Mostafavi, A., Berke, P. R., Woodruff, S. C., Hannibal, B., & Vedlitz, A. (2020). Institutional congruence for resilience management in interdependent infrastructure systems. *International Journal of Disaster Risk Reduction*, 46, 101515. [J17]

Dong, S., Mostafizi, A., Wang, H., Gao, J., & Li, X. (2020). Measuring the topological robustness of transportation networks to disaster-induced failures: A percolation approach. *Journal of Infrastructure Systems*, 26(2), 04020009. [J16]

Li, Q., **Dong, S.,** & Mostafavi, A. (2020). Metanetwork framework for analysis of actor-plan-task-infrastructure networks in resilience planning and management. *Natural Hazards Review*, 21(2), 04020016. [J15]

Dong, S., Esmalian, A., Farahmand, H., & Mostafavi, A. (2020). An integrated physical-social analysis of disrupted access to critical facilities and community service-loss tolerance in urban flooding. *Computers, Environment and Urban Systems*, 80, 101443. [J14]

Dong, S., Wang, H., Mostafizi, A., & Song, X. (2020). A network-of-networks percolation analysis of cascading failures in spatially co-located road-sewer infrastructure networks. *Physica A: Statistical Mechanics and its Applications*, 538, 122971. [J13]

2019 Li, Q., **Dong, S.,** & Mostafavi, A. (2019). Modeling of inter-organizational coordination dynamics in resilience planning of infrastructure systems: A multilayer network simulation framework. *PloS one*, 14(11), e0224522. [J12]

Mostafizi, A., Wang, H., & **Dong, S.** (2019). Understanding the multimodal evacuation behavior for a near-field tsunami. *Transportation Research Record*, 2673(11), 480-492. [J11]

Dong, S., Wang, H., Mostafavi, A., & Gao, J. (2019). Robust component: a robustness measure that incorporates access to critical facilities under disruptions. *Journal of the Royal Society Interface*, 16(157), 20190149. [J10]

Mostafizi, A., Wang, H., Cox, D., & **Dong, S.** (2019). An agent-based vertical evacuation model for a near-field tsunami: Choice behavior, logical shelter locations, and life safety. *International Journal of Disaster Risk Reduction*, 34, 467-479. [J9]

2018 **Dong, S.,** Mostafizi, A., Wang, H., & Li, J. (2018). A stochastic analysis of highway capacity: Empirical evidence and implications. *Journal of Intelligent Transportation Systems*, 22(4), 338-352. [J8]

2017 Mostafizi, A., **Dong, S.,** & Wang, H. (2017). Percolation phenomenon in connected vehicle network through a multi-agent approach: Mobility benefits and market penetration. *Transportation Research Part C: Emerging Technologies*, 85, 312-333. [J7]

Anderson, J. C., & **Dong, S.** (2017). Heavy-vehicle driver injury severity analysis by time of week: a mixed logit approach using HSIS crash data. Institute of Transportation Engineers. *ITE Journal*, 87(9), 41. [J6]

Mostafizi, A., Wang, H., Cox, D., Cramer, L. A., & **Dong, S.** (2017). Agent-based tsunami evacuation modeling of unplanned network disruptions for evidence-driven resource allocation and retrofitting strategies. *Natural Hazards*, 88, 1347-1372. [J5]

2016 Wang, H., Liu, L., **Dong, S.,** Qian, Z., & Wei, H. (2016). A novel work zone short-term vehicle-type specific traffic speed prediction model through the hybrid EMD–ARIMA framework. *Transportmetrica B: Transport Dynamics*, 4(3), 159-186. [J4]

2015 **Dong, S.,** Wang, H., Hurwitz, D., Zhang, G., & Shi, J. (2015). Nonparametric modeling of vehicle-type-specific headway distribution in freeway work zones. *Journal of Transportation Engineering, Part A: Systems*, 141(11), 05015004. [J3]

2014 Wang, H., Liu, L., Qian, Z., Wei, H., & **Dong, S.** (2014). Empirical mode decomposition–autoregressive integrated moving average: hybrid short-term traffic speed prediction model. *Transportation Research Record*, 2460(1), 66-76. [J2]

2013 Chen, L., Li, B., **Dong, S.,** & Pan, H. (2013). A combined CFAHP-FTOPSIS approach for portfolio selection. *China Finance Review International*, 3(4), 381-395 [J1]

Conference Proceedings

Count: 16 *advisees: postdoc, graduate student*, undergraduate student***

2026 Chen Y. **, Qian, X.*, & **Dong, S.** (2026). Large Language Models Capture Risk Distributions, Not Individual Risk Perception in Hurricane Evacuation. In the 3rd International Conference on Urban Science and Intelligence (*In press*). [16]

2023 Ma, J.**, Gangwal, U.*, & **Dong, S.** (2023). Fire Station Accessibility, Assessment, and Improvement Considering Probabilistic Road Failure in Facing Flooding. In ASCE Inspire 2023 (pp. 831-838). [15]

Liu, J., **Dong, S.,** Morris, T., & Fang, Y. (2023, July). Social Equality-Aware Resource Allocation for Post-Disaster Communication Restoration. In 2023 32nd International Conference on Computer Communications and Networks (ICCCN) (pp. 1-10). IEEE. [14]

2022 Esmalian, A., **Dong, S.,** & Mostafavi, A. Survival Functions of the Shelter-in-Place Households for Disruptions in Infrastructure Services. In Lifelines 2022 (pp. 423-433). [13]

Dong, S., Wang, H., Olsen, M. J., Barbosa, A. R., & Bunn, M. D. An Integrative Framework to Measure the Impacts of Earthquake-Induced Landslides on Transportation Network Mobility and Accessibility. In Lifelines 2022 (pp. 133-142). [12]

Esparza, M., Esmalian, A., **Dong, S.,** & Mostafavi, A. (2021). Examining spatial clusters for identifying risk hotspots of communities susceptible to flood-induced transportation disruptions. In Computing in Civil Engineering 2021 (pp. 482-489). [11]

2020 Li, Q., **Dong, S.,** & Mostafavi, A. (2020). Community detection in actor collaboration networks of resilience planning and management in interdependent infrastructure systems. In Construction Research Congress 2020 (pp. 675-683). Reston, VA: American Society of Civil Engineers. [10]

Esmalian, A., **Dong, S.,** & Mostafavi, A. (2020). Empirical assessment of household susceptibility to hazards-induced prolonged power outages. In Construction Research Congress 2020 (pp. 933-941). Reston, VA: American Society of Civil Engineers. [9]

Farahmand, H., **Dong, S.,** & Mostafavi, A. (2020, March). Vulnerability assessment in co-located flood control and transportation networks. In Construction Research Congress 2020 (pp. 751-760). Reston, VA: American Society of Civil Engineers. [8]

2019 Li, Q., **Dong, S.,** & Mostafavi, A. (2019). Modeling of inter-organizational coordination dynamics in resilience planning of infrastructure systems: A multilayer network simulation framework. PloS one, 14(11), e0224522. [7]

2018 Mostafizi, A., Wang, H., **Dong, S.,** & Cox, D. (2018). An Agent-Based Model of Vertical Tsunami Evacuation Behavior and Shelter Locations: A Multi-Criteria Decision-Making Problem (No. 18-06293). [6]

2016 **Dong, S.,** Mostafizi, A., Wang, H., & Bosa, P. (2016). Post-disaster mobility in disrupted transportation network: Case study of Portland, Oregon. In Seventh China-Japan-US trilateral symposium on lifeline earthquake engineering (pp. 501-507). Reston, VA: American Society of Civil Engineers. [5]

2015 **Dong, S.,** Wang, H., & Li, J. (2015). Short-Term Forecasting of Highway Capacity through Wavelet Transform and Dynamic Neural Time Series: A Stochastic Analysis (No. 15-5048). [4]

2014 **Dong, S.,** Wang, H., Hurwitz, D., & Heaslip, K. (2014, January). Vehicle-type specific headways distribution in freeway work zone: A non-parametric approach. In Proc. Transportation Research Board Annual Meeting, Washington DC. [3]

Wang, H., Li, J., Yu, Y., & **Dong, S.** (2014). Modelling and Analysis of Bottleneck Breakdown on Freeways with Multiple On-Ramps: a Copula Approach (No. 14-0987). [2]

2012 Liu, S., & **Dong, S.** (2012). Combine Duration and" Select the Priority Trip" to Improve the Number of Boats. International Journal of Environmental and Ecological Engineering, 6(12), 744-748. [1]

Other Publications

2025 **Dong, S.,** & Siders, A. (2025). Prioritizing Road Flood Mitigation for Access to Critical Services. Delaware Department of Transportation (DelDOT) project report. [5]

Dong, S., & Horney, J. (2025). Improve Acute Care Accessibility in Facing Changing Flood Risk. Delaware Department of Transportation (DelDOT) project report. [4]

2022 Mostafavi, A., Padgett, J., Dueñas-Osorio, L., Sutley, E., Norton, T., Lester, H., Wang, H., **Dong, S.,** Sichani, M., Farahmand, H., Jimenez, E., Esmalian, A., Coleman, N., Dargin, J., Zhou, X., & Lee, C. (2022). Hurricane Harvey Infrastructure Resilience Investigation. [3]

2017 Wang, H., **Dong, S.,** & Mostafizi, A. (2017). Understanding Interdependencies Between Systems Toward Resilient Critical Lifeline Infrastructure in the Pacific Northwest. Pacific Northwest Transportation Consortium (PacTrans) Project Report. [2]

2016 McMullen, B. S., Wang, H., Ke, Y., Vogt, R., & **Dong, S.** (2016). Road usage charge economic analysis (No. FHWA-OR-RD-16-13). Oregon. Dept. of Transportation. Research Section. [1]

CONFERENCES / PRESENTATIONS

Scholarly Presentations ***Bold** meetings: invited presentations*

2025 Mohite, S.*, Dong, S., Horney, J Predictive Modeling of Dialysis Access and Resilience using Mobility Data, Society of Risk Analysis Annual Meeting, Dec 7-10, 2025. Washington DC. USA [48]

Qian, X.*, Dong, S., Davidson, R. A Joint Synthetic Housing-Household Inventory, Society of Risk Analysis Annual Meeting, Dec 7-10, 2025. Washington DC. USA [47]

Dong, S. Geospatial and Mobility Insights into Disaster-disrupted Dialysis Access International Climate Resilience Conference, Oct 26-29, 2025. Munich, Germany [46]

Dong, S. Large Language Models Capture Risk Distributions, Not Individual Risk Perception in Hurricane Evacuation, The 3rd International Conference on Urban Science and Intelligence, Aug 22-24, 2025. Bali, Indonesia [45]

Dong, S. GenAI-enabled Joint Households and Individuals Population Synthesis, **The 25th COTA International Conference of Transportation Professionals (CICTP 2025)**, Jul 21-25, 2025. Guangzhou, China [44]

Dong, S. Understanding Human-Infrastructure Dynamics for Managing Disaster Risk, **UCLA Samueli Civil & Environmental Engineering Seminar**, Jun 3, 2025. Los Angeles, CA, USA [43]

Dong, S. Understanding Human-Infrastructure Network Dynamics, **Rice University Qian Group Research Seminar**, Jan 17, 2025. Houston, TX, USA [42]

Mohite, S.*, Dong, S., Horney, J. Enhancing Disaster Resilience of Dialysis Care Through Geospatial Risk Mapping and Mobility Analytics, 2025 Climate Health Frontiers Symposium, Jan 16-17, 2025. Houston, TX, USA **(Best Poster Presentation Award)** [41]

Dong, S. Mohite, S.*, Horney, J. Strengthening Flood Resilience for Dialysis Care Through Geospatial Risk Mapping and Mobility Analysis, **Research Forum on Sea Level Rise and Flooding**, Jan 09, 2025. Dover, DE, USA [40]

2024 Dong, S. Building Resilient and Equitable Smart City, **Coastal Resilience Workshop** (lightening talk), Oct 24, 2024. Newark, DE, USA [39]

Horney, J., Dong, S., Gangwal, U., Are opioid treatment programs ready for disaster? the growing risk of flood-associated isolation, APHA 2024 Annual Meeting and Expo, Oct 29, 2024. Minneapolis, MN, USA [38]

Dong, S., Horney, J. Disaster Resilient Acute Care: Protecting Infrastructures from Changing Flood Risk. **NIST-NSF Disaster Resilience Research Grant Symposium (Virtual)**, August 21, 2024. USA [37]

Gangwal, U., Dong, S. Interdependent human-infrastructure system modeling for resource disparity assessment. NEHRI Natural Hazard Summit, May 14, 2024 **(Best Poster Presentation Award),** College Park, MD, USA [36]

Dong, S. Characterizing resilience of flood-disrupted dynamic transportation network through the lens of link reliability and stability. **The 24th COTA International Conference of Transportation Professionals (CICTP)** Shenzhen Technology University, Jul 24, 2024. Shenzhen, China [35]

Dong, S. Improving Healthcare Accessibility and Equity During Flooding, **Introduction to Emergency Management Seminar.** Oklahoma State University, Apr 2024. Stillwater, OK, USA. [34]

Dong, S. Improving Healthcare Accessibility and Equity During Flooding, **Transportation Planning Seminar.** Drexel University, Feb 2024. Philadelphia, PA, USA [33]

2023 Dong, S., Gangwal, U. Assessing the impact of flood disruption on healthcare facility access equity, Transportation Resilience 2023. Nov. 2023, Washington D.C., USA [32]

Lee, C. C., Rajput, A. A., Hsu, C. W., Fan, C., Yuan, F., Dong, S. & Mostafavi, A. Integrating Quantitative Resilience Measures into Transportation Planning Practices: Study in Texas. Transportation Research Board 2023 Annual Meeting. Jan, 2023. Washington D.C., USA [31]

Gangwal, U., Dong, S. Community Resilience Modeling Using Dynamic System Approach, ASCE Inspire 2023. Nov 2023, Washington D.C., USA [30]

Gangwal, U., Dong, S. Road Criticality Assessment for Communities Access to Critical Facilities in Delaware, Natural Hazards Workshop. Jul 2023. Boulder, CO, USA [29]

Dong, S. Disaster-resilient healthcare: Improving critical facility access equity in changing climate, **COTA International Conference of Transportation Professionals (CICTP 2023)** Beijing University of Technology (BJUT), Jul 2023. Beijing, China [28]

Dong, S. Risk and Resilience Modeling in the Human-Disaster-Built Environment Nexus, **COTA International Conference of Transportation Professionals (CICTP 2023)** Beijing University of Technology (BJUT), Beijing. Jul 2023, China [27]

Dong, S. Improving Critical Facility Accessibility and Equity During Flooding, **International Research Symposium: Resilient City and Digital Transportation.** Yangzhou University, Yangzhou. Jul 2023, China [26]

Dong, S. Improving Critical Facility Accessibility and Equity in Coastal Communities, **Oregon State University Keiweit Center for Infrastructure and Transportation Research Seminar**, Apr 2023. Corvallis, OR, USA [25]

2022 Dong, S. An Integrative Framework to Measure the Impacts of Earthquake-induced Landslides on Transportation Network Mobility and Accessibility, ASCE Lifelines Conference 2021-22, (Virtual) 2022. Los Angeles, CA., USA [24]

Esmalian, A., Yuan, F., Rajput, A. A., Farahmand, H., Dong, S., Li, Q., Mostafavi, A. Operationalizing Resilience Practices in Transportation Infrastructure Planning and Project Development, Transportation Research Board 2022 Annual Meeting. Jan 2022. Washington D.C., USA [23]

Gangwal, U., Dong, S. Road Criticality and Resource Redundancy Mapping in Delaware Coastal Community, Natural Hazards Workshop. Online, Jul 2022 [22]

Dong, S. Beyond Floodplain: Flood-disrupted Access to Critical Facilities, **Field Seminar, Delaware Floodplain: Impacts of Sea Level Rise, Severe Storms, and Hurricanes in a Low-Lying State**, Jul 2022. Lewes, DE, USA [21]

Dong, S. An Introduction of Network Science in Engineering Research, **NSF REU in Sustainable Resilient Transportation Systems Seminar**, Newark, DE. Jun 2022 [20]

Dong, S. Flood-disrupted Transportation Network and Community Well-being, **Delaware Coastal Flooding Workshop**, Newark, DE. May 2022 [19]

2019 Dong, S. Assessment and Modeling of Water Infrastructure Resilience, ASCE Infrastructure Resilience Division (IRD) Research Forum: Enabling Resilient and Sustainable Communities, May 2019. Reston, VA, USA [18]

Dong, S. Assessing and Modeling of the Societal Impacts of Infrastructure Disruptions in Disasters, ASCE Infrastructure Resilience Division (IRD) Research Forum: Enabling Resilient and Sustainable Communities, May 2019. Reston, VA, USA [17]

Dong, S. Risk and Resilience Modeling in the Human-Disaster-Built Environment Nexus, University of Delaware, Department of Civil and Environmental Engineering, **Disaster Research Center**, Nov 2019. Newark, DE, USA [16]

Dong, S. Anatomy of Coupled Human-Infrastructure Systems Resilience to Urban Flooding: Integrated Assessment of Social, Institutional, and Physical Networks, **Urban Flooding Open Knowledge Network (UFOKN)**, Nov 2019. Raleigh, NC, USA [15]

Dong, S. An Integrated Physical-Social Analysis on Disrupted Access to Critical Facilities in Urban Flooding, **Oregon State University, School of Civil and Construction Engineering Seminar**, Jun 2019, Corvallis, OR, USA [14]

Dong, S. Disrupted Access to Critical Facilities and Its Societal Impacts in Urban Flooding, **ASCE Infrastructure Resilience Division (IRD) 2019 Research Forum: Enabling Resilient and Sustainable Communities**. May 2019, Reston, VA, USA [13]

Dong, S. Towards a Smart and Resilient City of Connected Autonomous Vehicle and Interdependent Infrastructure Networks, **University of Hawaii at Manoa, Department of Civil and Environmental Engineering**. Apr 2019, Honolulu, HI, USA [12]

Dong, S. Towards a Resilient and Sustainable Urban System: Percolation Modeling of Interdependent Infrastructure Networks, **Ohio State University, Department of Civil, Environmental, and Geodetic Engineering**, Feb 2019. Columbus, OH, USA [11]

Dong, S. Complex Infrastructure Network Modeling and Simulation, **Texas A&M University, Zachry Department of Civil and Environmental Engineering, CVEN 641,** Mar 2019. College Station, TX, USA [10]

2016 Dong, S. Understanding Interdependencies between Systems towards Resilient Critical Lifeline Infrastructures, Engineering Mechanics Institute and Probabilistic Mechanics & Reliability Conference (EMI & PMC). July 2016. Nashville, TN, USA [9]

Dong, S. Wang, H. Post-disaster Mobility in Disrupted Transportation Network: Case Study of Portland, Oregon. **Portland Metro**. Jun 2016, Portland, OR, USA [8]

Dong, S. Mostafizi, A. Network-Wide Impacts of Connected Vehicles On Mobility: An Agent-Based Modeling Approach, **U.S. DOT T3e Webinar (Virtual)**. Aug 2016 [7]

2015 Dong, S. Wang, H. Post-Earthquake Mobility: Portland, PacTrans Regional Transportation Conference Presentation Competition. **(2nd Place)**, 2015, Seattle, WA, USA [6]

Dong, S. Wang, H. Stochastic Modeling of Lifeline Infrastructure Interdependency: A Copula Approach, 2nd Annual Oregon State University College of Engineering Graduate Student Research Exposition. **(1st Place)**, 2015. Portland, OR, USA [5]

Dong, S. Wang, H. Short-term Forecasting of Highway Capacity through Wavelet Transform and Dynamic Neural Time Series: A Stochastic Analysis, Transportation Research Board 94rd Annual Meeting. Jan 2015. Washington D.C., USA [4]

2014 Dong, S. Wang, H. A Time-Series Analysis of Highway Capacity: Case Study of Georgia 400, Traffic Flow Theory and Characteristic Committee Summer Symposium, Aug 2014. Portland, OR, USA [3]

Dong, S. Wang, H. Modeling and Analysis of Bottleneck Breakdown on Freeway with Multiple On-Ramps: A Copula Approach, Transportation Research Board 93rd Annual Meeting, Jan 2014. Washington D.C., USA [2]

Dong, S. Wang, H. Vehicle-Type Specific Headway Distribution in Freeway Work Zones: A Nonparametric Approach, Transportation Research Board 93rd Annual Meeting, Jan 2014. Washington D.C., USA [1]

HONORS & AWARDS

2024 Bentley Systems Early Career Professor

2022 Travel Award, NHERI Computational Modeling and Simulation Center (SimCenter) Symposium

2017 1st Place, Highway Safety Information System Research Paper 2017 Competition

2015 1st Place, OSU College of Engineering Graduate Student Research Exposition

2nd Place, PacTrans Student Conference Student Research Poster Competition

2015 Richard and Lilo Smith Fellowship Award

TEACHING

Uni. of Delaware CIEG351: Transportation Engineering (undergrad.) (2022-2026)
CIEG451: Transportation Engineering Lab (undergraduate) (2022)
CIEG641: Risk Analysis (graduate) (2020-2025)

ADVISING & MENTORING

PhD Students

Principal advisor:

- Utkarsh Gangwal, PhD Candidate (2021.09 -- *Expected* 2026.06): *Resilient and Equitable Design of Human-Infrastructure Network*.
- Saurabh Mohite, PhD Student (2023.09 -- *Expected* 2028.06): *Disaster Resilient Healthcare*.
- Xiao Qian, PhD student (2023.09 -- *Expected* 2028.06): *Generative AI for Human-Built Environment Data Synthesis*
- Farshad Hesamfar, PhD student (2024.02 -- 2024.08): *Green Infrastructure for Flood Risk Mitigation*
- Zhenhua Zhang, PhD student (2025.01 -- *Expected* 2029.12): *Synthetic Utility Network generation & Agent-based Modeling Simulation of Human-Infrastructure System*

Co-advisor:

- Steve Beattie, PhD Student (2024.02 -- *Expected* 2026.06): *Engineering stakeholder-accessible energy simulations to support public engagement in municipal-scale grid decarbonization planning (*Principal advisor: Yao Hu)

Committee member:

- Maria Porada, Ph.D. Candidate (2022.09 -- *Present*) Principal advisor: Rachel Davidson. "*Examining Household Decision-Making for Structural Retrofit Decision Processes"*.
- Abel Ayele, Ph.D. Candidate (2024.08 -- *Present*) Principal advisor: Allan Zarembski. "*Development of a Comprehensive Classification Model for Railway Track Geometry Condition Severity Based on Both Safety and Ride Quality"*.
- Dyala Aljagoub, Ph.D. Candidate (2023.11 -- *Present*) Principal advisor: Ri Na. "*Enhancing Concrete Bridge Deck Delamination Detection: A Comprehensive Performance Evaluation of Consumer-Grade UAV Infrared Cameras"*.
- Farah Nibbs, Ph.D. Candidate (2022.09 – 2024.06) Principal advisor: Joe Trainor. "*Developing an Adaptive Framework to Manage Natural Hazard Risk to Road Infrastructure using a DAPP-Light Model: A Case Study of Caribbean SIDS"*.

- Kenza Soufiane, Ph.D. (2022.08 -- 2023.11) Principal advisor: Allan Zarembski. "*The Dynamic Interactions of Adjacent Crossties Degradation Rates: A Theory Guided Machine Learning Framework"*.
- Michael Palese, PhD (2021.05 -- 2023.06) Principal advisor: Allan Zarembski. "*Artificial Intelligence for Advanced Landslide Warning along Railroad Tracks*".
- Caroline Williams, PhD (2022.01 -- 2023.06) Principal advisor: Rachel Davidson. "*Regional Hurricane Risk Modelling: Incorporating a Dynamic Building Inventory Model*".
- Sina Naeimi Dafchahi, PhD (2022.01 -- 2023.06) Principal advisor: Rachel Davidson. "*Modeling the Functionality of Water Distribution Network System*".
- Maryam Shaygan, PhD (2020.10 -- 2023.08) Principal advisor: Mark Nejad. "*Equilibrium Analysis in Mixed Traffic Environments*".
- Dian Yuan, PhD (2020.10 -- 2022.12) Principal advisor: Arde Faghri. "*A Simulation Framework for Exploring the Impacts Of Vehicle Platoons On Mixed Traffic Under Connected And Autonomous Environment*".
- Nafiseh Soleimani, PhD (2020.10 -- 2022.06) Principal advisor: Rachel Davidson. "*Earthquake Risk to Civil Infrastructure System*".
- Wanxin Li, PhD (2020.10 -- 2022.04) Principal advisor: Mark Nejad. "*Frontiers in Blockchain for Secure Information Sharing in Connected Vehicle Environments*".

Master Students

Committee member:

- Nii Otu Tackie-Otoo, M.S. (2022.09 – 2024.07) Principal advisor: Rachel Davidson. "*Hurricane Wind Loss Modeling using Insurance Claims Data"*.
- Osman Mohamed, MS (2022.10 -- 2023.07) Principal advisor: Allan Zarembski. "*Development of a Multi-Dimensional Time-Based Track Safety and Quality Index (TSQI) and Defect Risk Model in Support of Autonomous Track Geometry Inspection*".
- Mohammed Ahmed, MS (2022.10 -- 2023.07) Principal advisor: Allan Zarembski. "*Predicting track geometry using machine-learning methods*".

Undergraduate Research Assistant

- Yihong Chen, University of Delaware (2023.12 – 2025.06). "Large Language Model for Social Behavioral Analysis"
- Mina Gorani, University of Virginia (2024.06 – 2024.08) "Equitable Infrastructure Resilience Operationalization"
- Aiden Pape, Middlebury College (2023.06 -- 2023.09). "*Generating Geolocated Synthetic Population to Assess Travel Need to Access Opioid Treatment Centers*".
- Jack Kingham, University of Delaware (2023.06 -- 2023.09). "*Predicting Travel Patterns to Delaware Healthcare Facilities During Flooding*".

- Annabelle Dorsett, University of Delaware (2022.04 -- 2022.12). "*Behavior Analysis of Infrastructure Service Usage during Disasters*".
- Jiaji Ma, University of Virginia (2022.06 -- 2023.06). "*Fire Station Accessibility, Assessment, and Improvement Considering Probabilistic Road Failure in Facing Flooding*".

SERVICE TO THE PROFESSION

Journal Editorial Service

Associate Editor: Transportation Research Interdisciplinary Perspectives (2025.04 – Present)
Associate Editor: ASCE OPEN: Multidisciplinary Journal of Civil Engineering (2025.05 – Present)

Grant Review

National Science Foundation (NSF) (2021, 2022, 2024)
Transportation Consortium of South-Central States (Tran-SET) (2021)
National Academies of Sciences, Engineering, and Medicine Gulf Research Program (2024, 2025, 2026)

Conference Committee

2025 International Conference on Computing in Civil Engineering (i3ce 2025), Louisiana State University. Technical Committee of Sustainable and Resilient Infrastructure Systems.
2025 World Transportation Convention (WTC), Suzhou. Technical Committee of Traffic Risk Assessment
2023 COTA International Conference of Transportation Professionals (CICTP), Technical Committee of Transportation System Risk and Resilience Analysis Track

Peer Review

ASCE Journal of Infrastructure Systems
Sustainable Cities and Society
International Journal of Disaster Risk Reduction
Journal of the Royal Society Interface
ASCE Natural Hazards Review
Natural Hazards
Current Opinion in Environmental Sustainability
Transportation Research Part D: Transport and Environment
Transportation Research Part C: Emerging Technologies
Sustainable and Resilient Infrastructure
Journal of Management in Engineering
Journal of Emergency Management
Journal of Transport Geography
Computer, Environment, and Urban System
Environmental Modeling and Software

Reliability Engineering & System Safety
Nature Physics Review
Scientific Reports
Engineering Research and Social Science
ASCE OPEN

SERVICE TO THE DEPARTMENT

2023 - 2024 Search Committee, Director of Constructure Engineering Management, University of Delaware

2021 - 2026 Graduate Policy Committee, University of Delaware

2021 - 2022 George W. Laird Fellowship Review Committee, University of Delaware

2021 - 2022 Undergraduate Showcase Recruitment Committee, University of Delaware

SERVICE TO THE COLLEGE

2021 - 2026 Grand Challenge Scholar Program Mentor, University of Delaware

SERVICE TO THE DISASTER RESEARCH CENTER

2021 - 2026 Disaster Science and Management (DISA) PhD Qualifying Exam Committee, University of Delaware

2022 - 2024 Space Committee, University of Delaware

SERVICE TO THE UNIVERSITY

2023 - 2026 Advisor, Outing Club (2000+ active members), University of Delaware

Led six trips to Great Smoky Mountains (Mar 2023), Washington National Forest (Oct 2024), California (Jan 2024), Maine (Mar 2024), Adirondack Mountains (Apr 2024), Adirondack Mountains (Oct 2025).

IN THE NEWS

2024 UD Magzine: *Masters of Disasters: UD's world-renowned center works to change lives for the better* (Link)

2024 UDaily: *Harnessing Data to Inform Disaster-Related Decisions* (Link)

2022 UDaily: *Costal Community Resilience: UD's Disaster Research Center awarded $16.5 million to study interplay between resilience, equity and economic prosperity*. (Link)

WHYY News: *University of Delaware Disaster Research Center gets $16.5 million to study equity in disaster recovery*. (Link)

2020 UDaily: *Data Boost to Battle Floods: UD team partners with national research group dedicated to addressing America's flood risk*. (Link)