

GAOFENG JIA

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Education

- Ph.D. Civil Engineering, specializing in natural hazard risk assessment/mitigation, University of Notre Dame (05/2014)
Dissertation title: Kernel and Metamodel Based Methods for Analysis and Optimization of Systems under Uncertainty; *Advisor:* Alexandros A. Taflanidis
- M.S. Disaster Prevention and Mitigation, specializing in Earthquake Engineering, Beijing Jiaotong University (07/2009)
Thesis title: Finite Element Method to Calculate the Band Gap of Two-dimensional Periodic Structures; *Advisor:* Zhifei Shi
- B.Eng. Civil Engineering, Beijing Jiaotong University (07/2007)

Positions Held

- 07/2023-present Associate Professor, Department of Civil & Environmental Engineering, Colorado State University
- 07/2016-06/2023 Assistant Professor, Department of Civil & Environmental Engineering, Colorado State University
- 07/2015-07/2016 Postdoctoral Research Associate, Department of Civil & Environmental Engineering, University of Illinois at Urbana-Champaign
- 06/2014-06/2015 Postdoctoral Research Associate, Department of Civil & Environmental Engineering & Earth Sciences, University of Notre Dame
- 08/2009-05/2014 Research Assistant, Department of Civil & Environmental Engineering & Earth Sciences, University of Notre Dame
- 08/2009-12/2011 Teaching Assistant, Department of Civil & Environmental Engineering & Earth Sciences, University of Notre Dame, Notre Dame, IN
- 02/2008-07/2008 Teaching Assistant, School of Civil Engineering, Beijing Jiaotong University, Beijing, China
- 10/2006-12/2006 Bridge Evaluation Engineer, Beijing Jiutongqu Road and Bridge Engineering Technology Company, Beijing, China

Research Interests

- Natural hazard risk assessment and mitigation, risk-informed decision making
- Surrogate modeling and machine learning for efficient analysis and design of complex engineering systems
- Robust analysis and design optimization of renewable energy harvesting systems (wave farms, wind farms)
- Uncertainty quantification, advanced stochastic simulation, stochastic optimization
- Multi-fidelity approaches for uncertainty quantification
- Life-cycle cost analysis and design of high-performance engineering systems
- Aging and deterioration of infrastructure systems
- Multi-hazard resilience of infrastructure systems
- Earthquake engineering, structural dynamics, seismic protective systems
- Bayesian approaches for model validation, condition assessment of critical infrastructure

Honors and Awards

- Best Student Paper Award, Probabilistic Methods Committee Student Paper Competition in *ASCE Engineering Mechanics Institute Conference*, 2021, for the paper “Generative adversarial network guided topology optimization of periodic structures via Subset Simulation”. Author: Li, M. (advisee), Advisor: **Jia. G.**
- ASCE ExCEED Teaching Fellow, American Society of Civil Engineers, 2017
- Young Researcher Best Paper Award in the *Third International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering*, 2013, Cagliari, Italy, for the paper "Non-Parametric Stochastic Subset Optimization for System Design Optimization under Uncertainty".
- Best Student Paper Award in the *2012 Joint Conference of the Engineering Mechanics Institute and 11th ASCE Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability (EMI/PMC 2012)*, Notre Dame, IN, for the paper "Efficient Hurricane Risk Assessment using Kriging Metamodel". Author: **Jia. G.**
- Beijing Jiaotong University, Outstanding Graduate Student Cadre (2008).
- Beijing Municipal Commission of Education, Outstanding Graduate in Beijing (2007) for Outstanding Overall Undergraduate Performance.
- Second Prize in the Fifth “Lizheng Cup” Architectural and Structural Design Contest in Beijing, 2006.

Scholarships and Fellowships

- University of Notre Dame, Professional Development Award Scholarship (2013).
- ICOSAR 2013, Registration Scholarship (2013).

- University of Notre Dame, GSU Conference Presentation Grant (2013).
- University of Notre Dame, Tuition and Stipend Scholarship (2009-2014).
- Beijing Jiaotong University, Scholarships for Outstanding Academic Performance (2003-2006).
- Chinese Ministry of Education, National Scholarship for Outstanding Academic Performance (2004).

Funded Projects

(2022-2024) "Optimization of Soil Water Content and Deficit Products from Soil Water Sensor Data," **Jia, G.** (PI), Chavez, J. L. (CoPI), Sponsored by Agricultural Experiment Station (CSU), National Institute of Food and Agriculture (USDA), \$60,000.00.

(2022 - 2022). "Collaborative Research: Decision Support Tool to Safeguard Tsunami Coastal Evacuation for the City of Valparaiso (Chile)," **Jia, G.** (PI), Sponsored by Florida International University (USAID), \$62,823.00.

(2021-2023) "An Improved Redundancy Measure for the Colorado State Hwy System," **Jia, G.** (PI), Sponsored by Colorado Department of Transportation, State of Colorado, \$42,013.00.

(2021-2023) "Probabilistic Performance Assessment and Control Co-design of Wave Farms," **Jia, G.** (PI), Mahmoud, H. N. (CoPI), Herber, D. R. (CoPI), Sponsored by NSF-National Science Foundation, \$529,225.

(2020 - 2025) "Center for Risk-Based Community Resilience Planning," John van de Lindt (PI and Co-Director), Bruce Ellingwood (CoPI and Past Co-Director), Jamie B. Kruse (Co-Director), 30 additional investigators across 13 additional universities. CSU is the lead institution, where **Jia, G.** (CSU CoPI), Sponsored by the U.S. National Institute of Standards and Technology, \$20,000,000.00. (**Jia, G.** share \$138,901.00)

(2020 - 2023) "MPC: Visible and Thermal Imaging in a Deep-Learning Approach to Robust Automated Pothole Detection and Highway Maintenance Prioritization," **Jia, G.** (PI), Sponsored by North Dakota State University, Other Domestic Higher Education, \$48,000.00.

(2017 - 2022) "MPC: Development of age and state dependent stochastic model for improved bridge deterioration prediction," **Jia, G.** (PI), Sponsored by North Dakota State University, Other Domestic Higher Education, \$53,000.00.

(2018 - 2019) "Development of a multi-fidelity modeling and optimization framework for layout optimization of large-scale wave farms in random seas," **Jia, G.** (PI), Mahmoud, H. N. (CoPI), Sponsored by Colorado Energy Research Collaboratory, Domestic Non-Profit (other than Domestic Foundations), \$25,000.00.

Journal Publications

Note: *corresponding author, advisees

Citations: 1442 citations (as of February 18, 2024) and an h-index of 20 and i10-index of 31 on [Google Scholar](#).

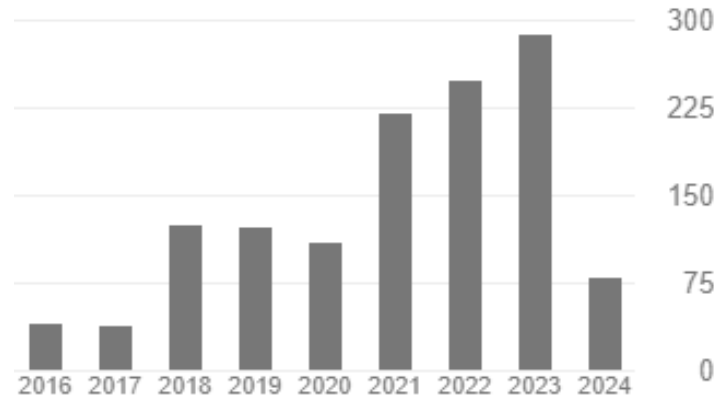


Figure 1. Citation count from Google Scholar per year as of February 18, 2024.

1. Naderi, L., and **Jia, G. *** (2024). “Multi-fidelity sampling-based approach for uncertainty quantification.” *Reliability Engineering and System Safety* (to be submitted).
2. Naderi, L., and **Jia, G. *** (2024). “Multi-fidelity Subset Simulation for Rare Event Simulation.” *Reliability Engineering and System Safety* (to be submitted).
3. Chulahwat, A., **Jia, G. ***, Mahmoud, H. & Tom, N. (2024). “Life-cycle Performance Analysis and Optimization of Wave Energy Converter (WEC) Arrays under Climate Change.” *Energy* (to be submitted).
4. Xiong, Z., Chen, S. *, and **Jia, G.** (2024). “Developing Risk-Informed Speed Limits against Single-Vehicle Crashes by Exploiting an Augmented Reliability Problem with Multi-Fidelity Enhancement”, *IEEE Transactions on Intelligent Transportation Systems*, DOI: 10.1109/TITS.2024.3363677.
5. Li, M., **Jia, G. ***, Mahmoud, H., Yu, Y.-H., Tom, N. (2023). “Physics-Constrained Gaussian Process Model for Prediction of Hydrodynamic Interactions Between Wave Energy Converters in an Array.” *Applied Mathematical Modeling*, 119, 465-485.
6. Wang, Z., and **Jia, G.*** (2023). “Extended sample-based approach for efficient sensitivity analysis of group of random variables.” *Reliability Engineering and System Safety*, 231, 108991. DOI: 10.1016/j.ress.2022.108991.
7. Wang, Z., and **Jia, G.*** (2022). “Risk-informed evaluation of tsunami evacuation risk mitigation strategies.” *Sustainable and Resilient Infrastructure*, 7(6), 1008-1027. DOI: 10.1080/23789689.2022.2127270.

8. Ma, H., Cheng, Z.*, **Jia, G.**, and Shi, Z. (2022). “Energy analysis of an inerter-enhanced floating floor structure (In-FFS) under seismic loads.” *Earthquake Engineering and Structural Dynamics*, 51(13), 3111-3130. DOI: 10.1002/eqe.3716. Impact factor: 4.1. Times cited: 0.
9. Wang, Z., and **Jia, G.*** (2022). “Sensitivity analysis of tsunami evacuation risk with respect to epistemic uncertainty.” *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 8(3), 04022037. DOI: 10.1061/AJRUA6.0001257. Impact factor: 2.0. Times cited: 0.
10. Cheng, Z.*, Ma, H., Shi, Z., and **Jia, G.** (2022). “An Inerter Enhanced Floating Floor Structure for Seismic Hazard Mitigation.” *Journal of Building Engineering*, 52, 104353. DOI: 10.1016/j.jobbe.2022.104353. Impact factor: 5.3. Times cited: 1.
11. Tabandeh, A.*, **Jia, G.**, and Gardoni, P. (2022). “A Review and Assessment of Importance Sampling Methods for Reliability Analysis.” *Structural Safety*, 97, 102216. DOI: 10.1016/j.strusafe.2022.102216. Impact factor: 5.0. Times cited: 2.
12. Poblete, A., Ruiz, R.O.*, and **Jia, G.** (2022). “Hierarchical Bayesian Approach for Model Parameter Updating in Piezoelectric Energy Harvesters.” *Mechanical Systems and Signal Processing*, 172, 108942. DOI: 10.1016/j.ymssp.2022.108942. Impact factor: 6.8. Times cited: 0.
13. Cheng, Z., Li, M., **Jia, G.***, and Shi, Z. (2022). “Adaptive Gaussian Process with PCA for prediction of complex dispersion relations for periodic structures.” *European Journal of Mechanics / A Solids*, 93, 104547. DOI: 10.1016/j.euromechsol.2022.104547. Impact factor: 4.2. Times cited: 0.
14. Wang, Z., and **Jia, G.*** (2022). “Simulation-based and risk-informed assessment of the effectiveness of tsunami evacuation routes using agent-based modeling: a case study of Seaside, Oregon.” *International Journal of Disaster Risk Science*, 13, 66-86. DOI: 10.1007/s13753-021-00387-x. Impact factor: 4.7. Times cited: 1.
15. Wang, Z., and **Jia, G.*** (2021). “Tsunami evacuation risk assessment and probabilistic sensitivity analysis using augmented sample-based approach.” *International Journal of Disaster Risk Reduction*, 63, 102462. DOI: 10.1016/j.ijdr.2021.102462. Impact factor: 4.3. Times cited: 6.
16. **Jia, G.***, Tabandeh, A., and Gardoni, P. (2021). “A density extrapolation approach to estimate failure probabilities.” *Structural Safety*, 93, 102128. DOI: 10.1016/j.strusafe.2021.102128. Impact factor: 5.0. Times cited: 5.
17. Sonwani, J. K., **Jia, G.***, Mahmoud, H., and Wang Z. (2021) “Seismic Collapse Risk Assessment of Braced Frames under Near-Fault Earthquakes.” *Metals*, 11(8), 1271. DOI: 10.3390/met11081271. Impact factor: 2.4. Times cited: 0.
18. Li, M., **Jia, G.***, Cheng, Z., and Shi, Z. (2021). “Generative adversarial network guided topology optimization of periodic structures via Subset Simulation.” *Composite Structures*, 260, 113254. DOI: 10.1016/j.compstruct.2020.113254. Impact factor: 5.4. Times cited: 7.
19. **Jia, G.***, Gardoni, P., Trejo, D., and Mazarei, V. (2021). “Stochastic modelling of deterioration and time-variant performance of reinforced concrete structures under joint effects of earthquakes, corrosion, and ASR.” *Journal of Structural Engineering*, 147(2),

04020314. DOI: 10.1061/(ASCE)ST.1943-541X.0002884. Impact factor: 3.8. Times cited: 5.
20. Wang, Z., and **Jia, G.*** (2021). “A novel agent-based model for tsunami evacuation simulation and risk assessment.” *Natural Hazards*, 105, 2045–2071. DOI: 10.1007/s11069-020-04389-8. Impact factor: 3.7. Times cited: 15.
21. Li, M., and **Jia, G.*** (2020). “Bayesian updating of bridge condition deterioration models using complete and incomplete inspection data.” *Journal of Bridge Engineering*, 25(3), 04020007. DOI: 10.1061/(ASCE)BE.1943-5592.0001530. Impact factor: 3.3. Times cited: 10.
22. Wang, Z., and **Jia, G.*** (2020). “Augmented sample-based approach for efficient evaluation of risk sensitivity with respect to epistemic uncertainty in distribution parameters.” *Reliability Engineering and System Safety*, 197, 106783. DOI: 10.1016/j.ress.2019.106783. Impact factor: 6.2. Times cited: 10.
23. Li, M., and **Jia, G.*** (2020). “Multi-fidelity Gaussian Process Model Integrating Low- and High-Fidelity Data Considering Censoring.” *Journal of Structural Engineering* 146(3), 04019215. DOI: 10.1061/(ASCE)ST.1943-541X.0002531. Impact factor: 3.8. Times cited: 8.
24. Li, M., Wang, R-Q., and **Jia, G.*** (2020). “Efficient dimension reduction and surrogate-based sensitivity analysis for expensive models with high-dimensional outputs.” *Reliability Engineering and System Safety*, 195, 106725. DOI: 10.1016/j.ress.2019.106725. Impact factor: 6.2. Times cited: 20.
25. Wang, Z., and **Jia, G.*** (2020). “Efficient sample-based approach for effective seismic risk mitigation of transportation networks.” *Sustainable and Resilient Infrastructure*, 5(6), 349-364. DOI: 10.1080/23789689.2019.1598756. CiteScore: 8.7. Times cited: 11.
26. Li, M., Cheng, Z., **Jia, G.***, and Shi, Z. (2019). “Dimension reduction and surrogate based topology optimization of periodic structures.” *Composite Structures*, 229, 111385. DOI: 10.1016/j.compstruct.2019.111385. Impact factor: 5.4. Times cited: 15.
27. Atadero, R.A.*, **Jia, G.**, Abdallah, A., Ozbek, M.E. (2019). “An Integrated Uncertainty-Based Bridge Inspection Decision Framework with Application to Concrete Bridge Decks.” *Infrastructures*, 4(3), 1–26. DOI: 10.3390/infrastructures4030050. CiteScore: 3.4. Times cited: 8.
28. Wang, Z., and **Jia, G.*** (2019). “Non-parametric stochastic subset optimization for reliability-based importance ranking of bridges in transportation networks.” *Applied Mathematical Modeling*, 76, 348-361. DOI: 10.1016/j.apm.2019.06.010. Impact factor: 5. Times cited: 4.
29. **Jia, G.***, Wang, R-Q., and Stacey, M. (2019). “Investigation of Impact of Shoreline Alternation on Coastal Hydrodynamics using Dimension Reduced Surrogate based Sensitivity Analysis.” *Advances in Water Resources*, 126, 168-175. DOI: 10.1016/j.advwatres.2019.03.001. Impact factor: 5.1. Times cited: 1.
30. **Jia, G.***, and Gardoni, P. (2019). “Stochastic Life-Cycle Analysis: Renewal-Theory Life-Cycle Analysis with State-Dependent Deterioration Stochastic Models.” *Structure and*

- Infrastructure Engineering*, 15(8), 1001-1014. DOI: 10.1080/15732479.2019.1590424. Impact factor: 3.1. Times cited: 21.
31. **Jia, G.***, and Gardoni, P. (2018). "Simulation-based approach for estimation of the stochastic performance of deteriorating engineering systems." *Probabilistic Engineering Mechanics*, 52, 28-39. DOI: 10.1016/j.probengmech.2018.03.001. Impact factor: 3.4. Times cited: 35.
32. **Jia, G.***, and Gardoni, P. (2018). "State-dependent Stochastic Models: A general stochastic framework for modeling deteriorating engineering systems considering multiple deterioration processes and their interactions." *Structural Safety*, 72, 99-110. DOI: 10.1016/j.strusafe.2018.01.001. Impact factor: 5.0. Times cited: 72.
33. **Jia, G.**, and Taflanidis, A. A.* (2016) "Efficient evaluation of Sobol' indices utilizing samples from an auxiliary probability density function." *Journal of Engineering Mechanics*, 142(5), 04016012:1-11. DOI: 10.1061/(ASCE)EM.1943-7889.0001061. Impact factor: 2.6. Times cited: 17.
34. **Jia, G.**, Taflanidis, A. A.*, Nadal-Caraballo, N. C., Melby, J. A., Kennedy, A. B., and Smith, J. M. (2016) "Surrogate modeling for peak or time-dependent storm surge prediction over an extended coastal region using an existing database of synthetic storms." *Natural Hazards*, 81(2), 909-938. DOI: 10.1007/s11069-015-2111-1. Impact factor: 3.7. Times cited: 55.
35. **Jia, G.**, Taflanidis, A. A.*, and Beck, J. L. (2015) "Non-parametric stochastic subset optimization for design problems with reliability constraints." *Structural and Multidisciplinary Optimization*, 52(6), 1185-1204. DOI: 10.1007/s00158-015-1300-6. Impact factor: 4.3. Times cited: 9.
36. **Jia, G.**, Taflanidis, A. A.*, and Beck, J. L. (2015) "A new adaptive rejection sampling method using kernel density approximations and its application to Subset Simulation." *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 3(2): D4015001. DOI: 10.1061/AJRUA6.0000841. Impact factor: 2.0. Times cited: 29.
37. **Jia, G.**, and Taflanidis, A. A.* (2015) "Non-parametric stochastic subset optimization utilizing multivariate boundary kernels and adaptive stochastic sampling." *Advances in Engineering Software*, 89, 3-16. DOI: 10.1016/j.advengsoft.2015.06.014. Impact factor: 4.3. Times cited: 12.
38. **Jia, G.**, Gidaris, I., Taflanidis, A. A.*, and Mavroeidis, G. P. (2014). "Reliability-based assessment/design of floor isolation systems." *Engineering Structures*, 78, 41-56. DOI: 10.1016/j.engstruct.2014.07.031. Impact factor: 5.6. Times cited: 54.
39. **Jia, G.**, and Taflanidis, A. A.* (2014). "Sample-based evaluation of global probabilistic sensitivity measures." *Computers & Structures*, 144, 103-118. DOI: 10.1016/j.compstruc.2014.07.019. Impact factor: 5.4. Times cited: 33.
40. **Jia, G.**, and Taflanidis, A. A.* (2013). "Non-parametric stochastic subset optimization for optimal-reliability design problems." *Computers & Structures*, 126, 86-99. DOI: 10.1016/j.compstruc.2012.12.009. Impact factor: 5.4. Times cited: 29.

41. **Jia, G.**, and Taflanidis, A. A.* (2013). “Kriging metamodeling for approximation of high-dimensional wave and surge responses in real-time storm/hurricane risk assessment.” *Computer Methods in Applied Mechanics and Engineering*, 261–262, 24–38. DOI: 10.1016/j.cma.2013.03.012. Impact factor: 6.6. Times cited: 151.
42. Lamprou, A., **Jia, G.**, and Taflanidis, A. A.* (2013). “Life-cycle seismic loss estimation and global sensitivity analysis based on stochastic ground motion modeling.” *Engineering Structures*, 54, 192–206. DOI: 10.1016/j.engstruct.2013.04.001. Impact factor: 5.6. Times cited: 24.
43. Taflanidis, A. A.*, **Jia, G.**, Kennedy, A. B., and Smith, J. M. (2013). “Implementation /optimization of moving least squares response surfaces for approximation of hurricane /storm surge and wave responses.” *Natural Hazards*, 66(2), 955–983. DOI: 10.1007/s11069-012-0520-y. Impact factor: 3.7. Times cited: 33.
44. Taflanidis, A. A.*, and **Jia, G.** (2011). “A simulation-based framework for risk assessment and probabilistic sensitivity analysis of base-isolated structures.” *Earthquake Engineering & Structural Dynamics*, 40(14), 1629–1651. DOI: 10.1002/eqe.1113. Impact factor: 4.1. Times cited: 69.
45. **Jia, G.**, and Shi, Z.* (2010). “A new seismic isolation system and its feasibility study.” *Earthquake Engineering & Engineering Vibration*, 9(1), 75–82. DOI: 10.1007/s11803-010-8159-8. Impact factor: 2.8. Times cited: 104.

Book Chapters

1. **Jia, G.**, and Gardoni, P. (2019) “Stochastic Life-Cycle Analysis and Optimization of Deteriorating Engineering Systems using State-Dependent Deterioration Stochastic Models.” In: Paolo Gardoni P (Ed) *Handbook on Sustainable and Resilient Infrastructure*. Routledge.
2. **Jia, G.**, Tabandeh, A., and Gardoni, P. (2017) “Life-Cycle Analysis of Engineering Systems: Modeling Deterioration, Instantaneous Reliability, and Resilience.” In: Paolo Gardoni P (Ed) *Risk and Reliability Analysis: Theory and Application*. Springer.
3. Taflanidis, A.A., **Jia, G.**, Gidaris, I (2016) “Natural Hazard Probabilistic Risk Assessment Through Surrogate Modeling.” In: Gardoni P, LaFave JM (eds) *Multi-hazard Approaches to Civil Infrastructure Engineering*. Springer International Publishing, Cham, pp 59–86

Conference Proceedings

Refereed

1. Azad, S., Herber, D. R., Khanal, S., and **Jia, G.** (2024). “Site-dependent solutions of wave energy converter farms with surrogate models, control co-design, and layout optimization”, *2024 American Control Conference*, July 8-12, Toronto, Canada.
2. Tabandeh, A., **Jia, G.**, and Gardoni, P. (2023). “Langevin Dynamics for Importance Sampling in Reliability Analysis.” *14th International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP14*, July 9-13, Trinity College Dublin, Dublin, Ireland.

3. Li, M., **Jia, G.**, Mahmoud, H., Yu, Y.-H., Tom, N. (2022). "Convolution-fed Gaussian Process with Active Learning for Probabilistic Power Prediction of Large-scale Wave Farm." *ICOSSAR 2021-2022: 13th International Conference on Structural Safety & Reliability*, September 13-17, Shanghai, China.
4. Li, M., Wang, Z., **Jia, G.** (2022). "Multi-fidelity surrogate model for efficient tsunami evacuation risk assessment." *ICOSSAR 2021-2022: 13th International Conference on Structural Safety & Reliability*, September 13-17, Shanghai, China.
5. Wang, Z., **Jia, G.** (2022). "Augmented sample-based approach for efficient tsunami evacuation risk assessment." *ICOSSAR 2021-2022: 13th International Conference on Structural Safety & Reliability*, September 13-17, Shanghai, China.
6. Li, M., Wang, Z., **Jia, G.** (2021). "Dimension reduction and surrogate based approach for optimal seismic risk mitigation of large-scale transportation network." *10th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020)*, April 11-15, Sapporo, Hokkaido, Japan.
7. Li, M., and **Jia, G.** (2021). "Age, state, and environment dependent non-homogeneous stochastic model for improved bridge deterioration prediction." *10th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020)*, April 11-15, Sapporo, Hokkaido, Japan.
8. Li, M., **Jia, G.**, and Wang, R-Q. (2019). "Surrogate modeling for sensitivity analysis of models with high-dimensional outputs." *13th International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP13*, May 26-30, Seoul, South Korea.
9. Wang, Z., and **Jia, G.** (2019). "Stochastic Sampling for Efficient Seismic Risk Assessment of Transportation Network." *13th International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP13*, May 26-30, Seoul, South Korea.
10. **Jia, G.**, Gardoni, P., and Trejo, D. (2017). "Stochastic modelling of deterioration of reinforced concrete structures considering joint effects of earthquakes, corrosion and ASR." *ICOSSAR 2017: 12th International Conference on Structural Safety & Reliability*, August 6-10, Vienna, Austria.
11. Taflanidis, A. A., **Jia, G.**, Kijewski-Correa, T.L., and Kennedy, A.B. (2015). "Hurricane risk rapid assessment and cyber-implementation." *The Twenty-fifth International Offshore and Polar Engineering Conference (ISOPE-2015)*, June 21-26, Kona, Hawaii.
12. **Jia, G.**, Taflanidis, A. A., and Scruggs, J.T. (2015). "Layout optimization of Wave Energy Converters in a random sea." *The Twenty-fifth International Offshore and Polar Engineering Conference (ISOPE-2015)*, June 21-26, Kona, Hawaii.
13. **Jia, G.**, Taflanidis, A. A., and Beck, J. L. (2014). "Non-parametric stochastic subset optimization for design problems with reliability constraints." *EURODYN 2014: 9th International Conference on Structural Dynamics*, June 30- July 2, Porto, Portugal.
14. **Jia, G.**, Taflanidis, A. A., and Beck, J. L. (2014). "Adaptive stochastic sampling using kernel density approximations." *CSM-7: Proc. of the 7th International Conference on Computational Stochastic Mechanics*, June 15-18, Santorini, Greece.

15. Taflanidis, A. A., **Jia, G.**, and Gidaris, I. (2013). “Reliability-based assessment/design of floor isolation systems for protection of critical structural contents.” *Vienna Congress on Recent Advances in Earthquake Engineering and Structural Dynamics*, August 28-30, Vienna, Austria.
16. **Jia, G.**, and Taflanidis, A. A. (2013). “Real-time hurricane risk assessment through surrogate modeling.” *ICOSSAR 2013: 11th International Conference on Structural Safety & Reliability*, June 16-20, New York, NY.
17. Taflanidis, A. A., **Jia, G.**, and Gidaris, I. (2013). “Reliability-based optimal design of floor isolation systems for protection of critical structural contents.” *ICOSSAR 2013: 11th International Conference on Structural Safety & Reliability*, June 16-20, New York, NY.

Non-Refereed

1. Taflanidis, A. A., **Jia, G.**, Nadal-Caraballo, N. C., Kennedy, A. B., Melby, J. A., and Smith, J. M. (2014). “Development of Real-Time Tools for Hurricane Risk Assessment.” *The Second International Conference on Vulnerability and Risk Analysis and Management (ICVRAM2014)*, July 13-16, University of Liverpool, UK.
2. Taflanidis, A. A., **Jia, G.**, and I. Gidaris (2014). “Probabilistic assessment/design of floor isolation systems through reliability criteria.” *Structures Congress*, April 3-5, Boston, MA.
3. **Jia, G.**, and Taflanidis, A. A. (2013). “Non-Parametric Stochastic Subset Optimization for System Design Optimization under Uncertainty.” *The Third International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering*, September 3-6, Cagliari, Sardinia, Italy.
4. **Jia, G.**, Taflanidis, A. A., and Gidaris, I. (2013). “A Simulation-Based and Reliability-Based Design Framework for Floor-Isolation Protective Systems.” *The Third International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering*, September 3-6, Cagliari, Sardinia, Italy.
5. **Jia, G.**, and Taflanidis, A. A. (2011). “Relative Entropy Estimation through Stochastic Sampling and Stochastic Simulation Techniques.” *The Second International Conference on Soft Computing Technology in Civil, Structural and Environmental Engineering*, September 6-9, Chania, Crete, Greece.

Conference Abstracts

1. Naderi, L., and **Jia, G.** (2023) “Augmented sample-based approach for multi-fidelity uncertainty quantification.” *ASCE Engineering Mechanics Institute Conference 2023*, June 6-9, Georgia Institute of Technology, Atlanta, GA, USA.
2. Khanal, S., and **Jia, G.** (2023) “Graph Neural Network for Power Prediction in Wave Energy Converters.” *ASCE Engineering Mechanics Institute Conference 2023*, June 6-9, Georgia Institute of Technology, Atlanta, GA, USA.

3. Li, M., and **Jia, G.** (2023) “Data-driven non-homogeneous Markov deterioration models for bridges.” *ASCE Engineering Mechanics Institute Conference 2023, June 6-9*, Georgia Institute of Technology, Atlanta, GA, USA.
4. Ruiz, R.O., Poblete, A., and **Jia, G.** (2023) “Hierarchical Bayesian Approach for Electromechanical Properties Updating in Piezoelectric Energy Harvesters.” *ASCE Engineering Mechanics Institute Conference 2023, June 6-9*, Georgia Institute of Technology, Atlanta, GA, USA.
5. Wang, Z., and **Jia, G.** (2022) “Simulation-based and Risk-informed Assessment of the Effectiveness of Tsunami Evacuation Routes Using Agent-based Modeling.” *ASCE Engineering Mechanics Institute Conference 2022, May 31-June 3*, Baltimore, Maryland, USA.
6. Li, M., Hurst, C., Gao, X., and **Jia, G.** (2022) “Adaptive multi-fidelity Gaussian Process model for efficient Bayesian inference.” *ASCE Engineering Mechanics Institute Conference 2022, May 31-June 3*, Baltimore, Maryland, USA.
7. Li, M., **Jia, G.**, Mahmoud, H., Yu, Y.-H., Tom, N. (2022) “Physics-constrained Gaussian Process Model through Kernel Design for Prediction of Hydrodynamic Interactions between Wave Energy Converters in an Array.” *ASCE Engineering Mechanics Institute Conference 2022, May 31-June 3*, Baltimore, Maryland, USA.
8. Wang, Z., and **Jia, G.** (2021) “Augmented sample-based approach for efficient evaluation of risk sensitivity with respect to epistemic uncertainty.” *ASCE Engineering Mechanics Institute Conference 2020 and Probabilistic Mechanics & Reliability Conference 2020 (EMI 2020/PMC 2020)*, May 25-28, New York, USA.
9. Li, M., and **Jia, G.** (2021) “Non-homogeneous Markov Model for Improved Bridge Deterioration Prediction.” *ASCE Engineering Mechanics Institute Conference 2020 and Probabilistic Mechanics & Reliability Conference 2020 (EMI 2020/PMC 2020)*, May 25-28, New York, USA.
10. Wang, Z., **Jia, G.**, and Gardoni, P. (2019) “Sample-based life-cycle analysis and optimization of deterioration engineering systems.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, CalTech, Pasadena, CA.
11. Li, M., and **Jia, G.** (2019) “Improved bridge deterioration prediction using Bayesian updating considering incomplete data.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, CalTech, Pasadena, CA.
12. Li, M., and **Jia, G.** (2019) “Multi-fidelity Gaussian process model integrating low-fidelity data and high-fidelity data considering censoring.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, CalTech, Pasadena, CA.
13. Li, M., and **Jia, G.** (2019) “Surrogate based sensitivity analysis of models with high-dimensional outputs.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, CalTech, Pasadena, CA.
14. Wang, Z., and **Jia, G.** (2018) “Sample-based approach for identification of critical links in seismic risk assessment of large-scale transportation networks.” *ASCE Engineering Mechanics Institute Conference*, May 29-June 1, M.I.T., Cambridge, MA.

15. **Jia, G.**, and Gardoni, P. (2016) “A general formulation for modeling impacts of deterioration on reliability of infrastructure systems.” *ASCE Engineering Mechanics Institute Conference and Probabilistic Mechanics and Reliability Conference*, May 22-25, Nashville, TN.
16. Taflanidis, A. A., **Jia, G.**, and Gidaris, I. (2015). “Seismic risk assessment for isolated bridges exposed to near-fault excitations.” *Proceedings of the ASCE 2015 Structures Congress*, April 23-25, Portland, OR.
17. Taflanidis, A. A., and **Jia, G.** (2011). “Evaluation of stochastic simulation based methodologies for estimation of relative information entropy.” *2011 Conference of the ASCE Engineering Mechanics Institute*, June 2-4, Boston, MA.

Conference Presentations

1. “Data-driven non-homogeneous Markov deterioration models for bridges.” *ASCE Engineering Mechanics Institute Conference 2023*, June 6-9, Georgia Institute of Technology, Atlanta, GA, USA.
2. “Adaptive multi-fidelity Gaussian Process model for efficient Bayesian inference,” *ASCE Engineering Mechanics Institute Conference*, May 31-June 3, 2022, Johns Hopkins University, Baltimore, Maryland, United States.
3. “Non-homogeneous Markov Model for Improved Bridge Deterioration Prediction.” *ASCE Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2021)*, May 25-28, 2021, New York, USA (Virtual).
4. “Sample-based life-cycle analysis and optimization of deterioration engineering systems.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, 2019, CalTech, Pasadena, CA.
5. “Improved bridge deterioration prediction using Bayesian updating considering incomplete data.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, 2019, CalTech, Pasadena, CA.
6. “Surrogate based sensitivity analysis of models with high-dimensional outputs.” *ASCE Engineering Mechanics Institute Conference*, June 18-21, 2019, CalTech, Pasadena, CA.
7. “Stochastic modelling of deterioration of reinforced concrete structures considering joint effects of earthquakes, corrosion and ASR.” *ICOSSAR 2017: 12th International Conference on Structural Safety & Reliability*, August 6-10, Vienna, Austria.
8. “A general formulation for modeling impacts of deterioration on reliability of infrastructure systems.” *ASCE Engineering Mechanics Institute Conference and Probabilistic Mechanics and Reliability Conference*, May 22-25, 2016, Nashville, TN.

Symposia Organized

1. Mini-symposium: “Surrogate Modeling for Uncertainty Quantification, Optimization, and Statistical Inference in Engineering Applications”, *Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2024)*, May

- 28-31, 2024, Chicago, Illinois, United States. Chair: Li, M.; Co-Chairs: Jia, G.; Taflanidis, A., and Shafieezadeh A.
2. Mini-symposium: “Surrogate Modeling for Uncertainty Quantification, Optimization, and Statistical Inference in Engineering Applications”, *ASCE Engineering Mechanics Institute Conference*, June 6-9, 2023, Georgia Institute of Technology, Atlanta, United States. Chair: Jia, G.; Co-Chair: Abdollah Shafieezadeh.
 3. Mini-symposium: “Surrogate Modeling for Uncertainty Quantification, Optimization, and Statistical Inference in Engineering Applications”, *ASCE Engineering Mechanics Institute Conference*, May 31-June 3, 2022, Johns Hopkins University, Baltimore, Maryland, United States. Chair: Jia, G.; Co-Chair: Abdollah Shafieezadeh.
 4. Mini-symposium: “Modeling deterioration of structures and infrastructure”, *ASCE Engineering Mechanics Institute Conference*, May 31-June 3, 2022, Johns Hopkins University, Baltimore, Maryland, United States. Chair: Jia, G.; Co-Chairs: Paolo Gardoni, Alessandro Contento.
 5. Mini-symposium: “Modeling deterioration of structures and infrastructure”, *ASCE Engineering Mechanics Institute Conference*, May 25-28, 2021, Columbia University, New York, United States (online). Co-Chair: Jia, G.; Chair: Abdollah Shafieezadeh.
 6. Mini-symposium: “Surrogate Modeling for Uncertainty Quantification, Optimization, and Statistical Inference in Engineering Applications”, *ASCE Engineering Mechanics Institute Conference*, May 25-28, 2021, Columbia University, New York, United States (online). Chair: Jia, G.; Co-Chair: Paolo Gardoni.
 7. Mini-symposium: “Life-cycle analysis: Probabilistic modeling of the deterioration and recovery of bridges and transportation infrastructure, and the optimal allocation of resources”, *10th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020)*, April 11-15, 2021, Sapporo, Hokkaido, Japan (online). Co-Chair: Jia, G.; Chair: Paolo Gardoni; Co-Chairs: Mauricio Sanchez Silva, Mahesh Pandey.
 8. Mini-symposium: “Modeling deterioration of structures and infrastructure”, *ASCE Engineering Mechanics Institute Conference*, June 18-21, 2019, Pasadena, CA, United States. Chair: Jia, G.; Co-Chair: Paolo Gardoni.

Invited Talks

1. “Tsunami evacuation risk assessment and mitigation for coastal communities.” *Resilience Seminar Series, Stanford University*. November 16th, 2022.
2. “Simulation-based evacuation risk assessment and risk-informed mitigation for coastal communities under earthquake-induced tsunamis.” *Civil Engineering Lijiang Forum, Guilin University of Technology*. November 2nd, 2022.
3. “Topology Optimization of Metamaterials: Surrogate Modeling and Machine Learning Driven Approaches.” *Smart Materials and Structures Lab Seminar, Beijing Jiaotong University*. October 16th, 2021.

4. “Enabling efficient uncertainty quantification for complex engineering systems: soft computing and simulation driven approaches.” *Young Scholar Forum of Chinese Society for Vibration Engineering-Stochastic Dynamics and Reliability*. September 20th, 2020.
5. “Enabling efficient uncertainty quantification for complex engineering systems: soft computing and simulation driven approaches.” *Department of Statistics, Colorado State University*. October 7th 2019. Fort Collins, CO.
6. “Enabling efficient uncertainty quantification for complex engineering systems: soft computing and simulation driven approaches.” *National Wind Technology Center (NWTC) at National Renewable Energy Laboratory (NREL)*. September 26th, 2019. Boulder, CO.
7. “Enhancing infrastructure resilience to natural hazards: addressing modeling complexity through soft computing and simulation driven approaches.” *Colorado State University*. March 8th 2016. Fort Collins, CO.
8. “Risk assessment/mitigation against natural hazards: addressing modeling complexity through soft computing and simulation driven approaches.” *Ohio State University*. March 19th 2015. Columbus, OH.

Student Advising

Current Students

- Suraj Khanal, PhD, 2022-present
- Leila Naderi, PhD, 2022-present
- Ziluo Xiong, PhD, 2023-present
- Emily Brightbill, MS (Plan A), 2024-present

Postdoc

- Akshat Chulawat, November 2021-September 2023 (jointly mentored with Dr. Hussam Mahmoud)
- Zhenqiang Wang, August 2021-August 2022

Graduated Students

- Min Li, PhD in Civil Engineering, 2021
 - Dissertation: “Surrogate Modeling for Efficient Analysis and Design of Engineering Systems”
- Zhenqiang Wang, PhD in Civil Engineering, 2021
 - Dissertation: “Simulation-based Tsunami Evacuation Risk Assessment and Risk-informed Mitigation”
- Wei-Hsiang Chen, MS in Civil Engineering, 2023
 - Thesis: “Visible & Thermal Imaging and Deep Learning Based Approach for Automated Robust Detection of Potholes to Prioritize Highway Maintenance”
- Kenny Bui, MS in Civil Engineering, 2022
 - Thesis: “Development of Improved Redundancy Measure for the Colorado State Highway System”
- Jeet Kuman Sonwani, MS in Civil Engineering, 2019 (as main advisor jointly advised with Dr. Hussam Mahmoud)

- Thesis: “Seismic Collapse Risk Assessment and Probabilistic Sensitivity Analysis of Braced Frames under Near-Fault Earthquakes”

Graduate Students Committees

- Megan Bates, PhD
- Mojtaba Harati, PhD
- Rasel Mahmud, PhD
- Ifeanyi Oramulu, PhD
- LaTasha Starr, PhD
- Kellan Sullivan, PhD
- Athul Sundarrajan, PhD
- Mohammad Teymour Moogooee, PhD
- Jarrett Wendell, PhD
- Yangyang Wu, PhD (graduated June 2023)
- Leandro Iannacone, PhD (UIUC) (graduated May 2022)
- Avpreet Singh Othee, PhD (graduated 2021)
- Abdelrahman Medhat Kamal Abdallah, PhD (graduated 2021)

Undergraduate Student Mentoring

I have mentored undergraduates on independent studies, undergraduate research experiences, and honors thesis.

Independent Studies

I served as faculty advisor in Fall 2019 for one senior undergraduate student in civil engineering. The mentoring activities mainly include mentoring them to read literature, practice MATLAB coding, and apply learned methods to solve practical engineering problems. The name of the student is: Adjijitaksono, and the topic is: “Investigation of Impact of Seismic Hazards on Probabilistic Performance of Transportation Network”.

Student Undergraduate Research Experience (SURE) Program

I served as faculty advisor for the Student Undergraduate Research Experience (SURE) program in the college of engineering, and advised three first-generation students (one in Spring 2019, one in Spring 2020, one in Spring 2022) to work on research, trained them in reading literature, programming, use software to do modeling, and presentation of results. The activities help undergraduates get a sense of what graduate school is like and at the same time motivate their interests in STEM and also offer some training that would be helpful to their undergraduate study and beyond. Brief information is provided in the table.

Name of Student	Research Topic	Year
Aidan Briggs	Modeling the Power Generation of Arrays of Wave Energy Converters using WEC-Sim	2022
Maria Aguilar	Use NetLogo to Simulate Tsunami Evacuation	2020
Michael Foster	Identification of Critical Bridges to Improve Seismic Performance of Transportation Network	2019

Honors Thesis

I served as faculty advisor for the honors thesis for one senior undergraduate student in Spring 2022 by providing advice and feedback for the thesis, planning, and the application of fund to support the thesis. The name of the student is: Eryn Lum, and the topic is: “Colorado State University Steel Bridge Team– Student Steel Bridge Competition”.

Graduate Student Mentoring

I have mentored outstanding graduate students that have been successful in earning multiple awards and accolades, including:

- One of three finalist in ASCE EMI Probabilistic Methods Committee Student Paper Competition, for the paper “Augmented sample-based approach for multi-fidelity uncertainty quantification”, 2023. (Leila Naderi, PhD)
- NTU FOUNDATION GRADUATE FELLOWSHIP, Colorado State University, 2023. (Suraj Khanal, PhD)
- Honorable mention in the Great Minds in Research Award in the Graduate Student Showcase, Colorado State University, 2023. (Suraj Khanal, PhD)
- Best Student Paper Award, Probabilistic methods committee student paper competition, ASCE Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2021), New York, USA, for the paper “Generative Adversarial Network Guided Topology Optimization of Periodic Structures via Subset Simulation”, 2021. (Min Li, PhD)
- Structural Engineering Institute Student Scholarship, Structures Congress, ASCE, 2021. (Min Li, PhD)
- Participant (competitive selection) of Princeton Pathways into the Academy program (PPIA). PPIA is a year-long career development program preparing early-stage researchers for faculty careers in engineering and computer science. Quote from the selection letter, “There were many competitive applicants and you are among those selected on the basis of your preparation, your record of research and your potential to do cutting-edge research and teach. These qualities reinforce our belief in your promise for a successful career in the academy”, 2021-2022. (Min Li, PhD)
- Anthony P. Chrest Memorial Graduate Scholarship, Colorado State University, 2018. (Min Li, PhD)
- Kenneth G Medearis Scholarship, Colorado State University, 2018. (Zhenqiang Wang, PhD)

Teaching

- CIVE 562: Fundamentals of Vibration, Colorado State University, Spring 2024
- CIVE 566: Intermediate Structural Analysis, Colorado State University, Fall 2023
- ENGR665: Stochastic Simulation in Engineering Applications, Colorado State University, Spring 2020, Spring 2021, Spring 2022, Spring 2023

- CIVE680B1: Stochastic Simulation in Engineering Applications, Colorado State University, Spring 2018, Spring 2019
- CIVE 367: Structural Analysis, Colorado State University, Fall 2016, 2017, 2018, 2019, 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022, Fall 2023
- CIVE 261: Engineering Mechanics - Dynamics, Colorado State University, Fall 2021
- Reliability Analysis, University of Illinois at Urbana-Champaign, Fall 2015 (Guest lecturer for topics on “Advanced Stochastic Simulation Methods”)

University Committees

- CEE Accreditation Committee, Fall 2023-present
- Department Representative to the Faculty Grievance Panel, 2023-present
- CEE Graduate Admission Committee, Fall 2017 – Spring 2021
- CEE Scholarship Committee, Spring 2021 – Spring 2022

Professional Committees

- ASCE Probabilistic Methods Committee, July 2018 – present

Services/Outreach

- Judge for ASCE Probabilistic Methods Committee Student Paper Competition (2019, 2020/2021, 2022, 2023)
- Judge for CSU Graduate Student Showcase (2017, 2019, 2022)
- Judge for AISC Student Steel Bridge Competition (2021)
- Faculty Advisor for Student Undergraduate Research Experience (SURE) Program at CSU (2019, 2020, 2022)

Workshops Attended

- ReACt Computational Mechanics & Sciences Workshop, University of Utah, October 10-11, 2019.
- NSF NHERI EF+RAPID Workshop, Oregon State University, July 31-August 1, 2019.
- ARPA-E Workshop, University of Colorado Boulder, Boulder, CO, November 28, 2017
- NSF NHERI Coastal Hazards Engineering New User Workshop, Oregon State University, July 19-20, 2017
- ASCE ExCEEEd Teaching Workshop, Florida Gulf Coast University, Fort Myers, FL, June 18-23, 2017
- Writing Successful Grants Workshop, University of Notre Dame, Notre Dame, IN, September 25-26, 2014.
- Modeling and Numerical Methods for Uncertainty Quantification (MNMUQ2014), Porquerolles Island, France, September 1-5, 2014.

Some of the covered topics are:

- Reliability assessment by simulation methods
- Surrogate models (Kriging, SVM, polynomial chaos, applications to reliability assessment and global sensitivity analysis)
- High Performance Computing (HPC) for stochastic analysis
- Decision under uncertainty, robust optimization

Professional Memberships

- Editorial Board Member, *Reliability Engineering and System Safety*
- American Society of Civil Engineers (ASCE)
- American Society for Engineering Education (ASEE)
- Bridge Engineering Institute (BEI)

Proposal Reviewer

- French National Research Agency (ANR), 2022
- FONDECYT Program, Chilean National Science and Technology Commission, 2018
- National Science Foundation, 2018

Journal Reviewer

I have reviewed more than 100 manuscripts for more than 30 peer-review journals. Some of the journals are listed below:

- *Reliability Engineering and System Safety*
- *Structure and Infrastructure Engineering*
- *Structural Safety*
- *ASCE Journal of Structural Engineering*
- *ASCE Journal of Bridge Engineering*
- *ASCE Journal of Engineering Mechanics*
- *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*
- *Engineering Structures*
- *Mechanical Systems and Signal Processing*
- *Sustainable and Resilient Infrastructure*
- *Applied Mathematical Modeling*
- *Construction & Building Materials*
- *Structural and Multidisciplinary Optimization*
- *Applied Energy*
- *Natural Hazards*
- *Journal of Civil Structural Health Monitoring*
- *Composite Structures*
- *International Journal of Disaster Risk Reduction*
- *Infrastructures*
- *Structures*
- *Frontiers Built Environment*
- *Journal of Statistical Computation and Simulation*
- *Journal of Sound and Vibration*

- *Journal of Wind Engineering & Industrial Aerodynamics*
- *Wind and Structures*
- *International Journal of Structural Stability and Dynamics*
- *Journal of Infrastructure Preservation and Resilience*
- *IEEE Transactions on Systems, Man and Cybernetics: Systems*
- *International Journal of Geographical Information Science*
- *Earthquake Engineering and Structural Dynamics*