Lei Zhang

Ph.D. Candidate | zhang.lei1@northeastern.edu | 857-302-8616 | LinkedIn

Education

Ph.D. in Civil (Structural) Engineering - Northeastern University 2019/09 - Present

- Research Interest: *Performance-based Wind Engineering, Fragility Analysis, Life-Cycle Cost Analysis*
- CS Related Courses: *Algorithms; Data Structures, Algorithms & Applications in Computer Systems; Database Management System; Concepts of Object-Oriented Design; Introduction to Machine Learning and Pattern Recognition; Engineering Probability and Statistics*

M.E. in Architectural and Civil Engineering - Tongji University 2016/09 - 2019/06

- Thesis: *Modal Participation and Degree of Freedom Coupling Effects in Bridge Flutter Analysis*

B.E. in Civil Engineering - Tongji University 2012/09 - 2016/07

Skills

- Java, Python, MATLAB, R, SQL, C++, LaTex, AutoCAD, ANSYS

Projects

E-store website built on Java Spring Boot - Spring Boot, MyBatis, MySQL 2022/01

- Created an online shopping website that allows user management (register/login, profile editing, adding/modifying address), shopping cart and order management
- Implemented a multi-layered architecture consisting of persistence layer, service layer and controller layer
- Used MyBatis to connect to database in MySQL through SQL mapping

A Data Warehouse for Bird Strike Incidents on National Flights - R, SQLite 2021/08

- Created a normalized relational OLTP database and populated it with data from an XML document of journal publications
- Transformed the normalized schema to a star schema with necessary dimension and transaction fact tables suitable for analysis

A Live Demo for Biological Growth Simulation - Java AWT, Swing 2021/04

- Created supporting classes for implementation of underlying Biological Growth simulation and user interaction
- Developed a GUI application to visualize the results with components to initialize and control simulation

Experience

Graduate Research Assistant - Northeastern University 2019/09 - Present

- Develop a performance-based wind engineering framework based on Monte Carlo simulation for the risk and life-cycle cost assessment of vertical structures subjected to mixed-climate wind loads
- Apply stochastic methods and deep learning techniques (e.g. artificial neural network) for fast and computationally efficient fragility analysis of vertical structures induced by wind

Teaching Assistant - Northeastern University 2021/09 - 2021/12

- Provided assistance for *Steel Structure Design* with grading, office hour holding and lecturing

Graduate Research Assistant - Tongji University 2016/09 - 2019/06

- Performed FEM modeling of long-span cable-stayed/suspension bridges for dynamic property examination
- Designed and conducted sectional/full-model wind tunnel tests of extra long-span bridges on aerodynamic properties and solutions to vibration mitigation/suppression due to flutters and vortex-induced vibrations

Publications

- Zhang, L.; Caracoglia, L. (2021). "Wind-induced fragility of a monopole tower via Artificial Neural Network based surrogate analysis." *Engineering Structures*. (Under review)
- Zhang, L.; Caracoglia, L. (2021). "Layered Stochastic Approximation Monte-Carlo method for tall building and tower fragility in mixed wind load climates." *Engineering Structures*, 239: 112159. (DOI: 10.1016/j.engstruct.2021.112159)
- Yang, Y.; Zhang, L.; Ding, Q.; Ge, Y. (2018). "Flutter performance and improvement for a suspension bridge with central-slotted box girder during erection." *Journal of Wind Engineering and Industrial Aerodynamics*, 179: 118-124. (DOI: 10.1016/j.jweia.2018.05.016)

Awards and Honors

- College of Engineering Dean's Fellowship - Northeastern University 2019/05
- Excellent Graduate - Tongji University 2019/04