

Bingzhe Zhang

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EDUCATION

Visiting Ph.D. scholar McMaster University, ON, Canada ※Bridge Seismic and Machine Learning Application	Mar.2022 – Present
Ph.D. in Civil Engineering Southeast University, Nanjing, China ※Bridge and Earthquake Engineering	Sep.2018 – Present
M.S. in Civil Engineering China Agricultural University, Beijing, China ※Structural Engineering	Sep.2016 - Jun.2018
B.S. in Civil Engineering China Agricultural University, Beijing, China ※Civil Engineering (with an emphasis on Structural Engineering)	Sep.2012 - Jun.2016

PUBLICATIONS

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- **Zhang, B.**, Wang, K., Lu, G., et al. Seismic Response Analysis and Evaluation of Laminated Rubber Bearing Supported Bridge Based on the Artificial Neural Network. *Shock and Vibration*, 2021.
 - **Zhang, B.**; Wang, K.; Lu, G., et al. Experimental and Seismic Response Study of Laminated Rubber Bearings Considering Different Friction Interfaces. *Buildings*, 2022, 12, 1526.
 - **Zhang, B.**, Wang, K. Seismic response analysis of small-to-medium-span bridges considering aging laminated rubber bearing. *17th WCEE*, 2019.
 - **Zhang, B.**, Song, Y., Wang, K., et al. Study of influence of bearing types on seismic responses of Linyi Yellow River bridge. *Bridge Construction*, 2021, 51(3)-85-08. (in Chinese)
 - Guo, W, Wang K, Yin W, **Zhang, B.**, et al. Research on seismic excitation direction of double-deck curved bridges: A probabilistic method based on the random forest algorithm. *Structures*, 2022, 39: 705-719.

RESEARCH EXPERIENCES

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- Seismic damage assessment and importance factor analysis of laminated rubber bearings based on Convolutional Neural Network. (To be submitted)** Sep.2022 - Jan.2023
- Parametric modeling based on the geometric and loading characteristics of bearings by ANSYS.
 - High-precision damage pixel segmentation of stress distribution plot using U-net and VGG-based models.
 - Quantifying the impact of various factors on the damage index of bearings through SHAP interpretation learning.
- Life-cycle seismic performance analysis of an offshore small-to-medium span bridge based on Long Short-Term Memory model. (To be submitted)** Jan.2022 - Sep.2022
- Constructing the bridge aging characteristic time series based on an existing chloride ion erosion model.
 - Training and predicting the life-cycle seismic performance of the bridge using LSTM models.
 - Investigating the impact of each aging characteristic on the long-term seismic performance.

Seismic response analysis and evaluation of laminated rubber bearing supported bridge based on the Artificial Neural Network. Sep.2020 - Sep.2021

- Establishing a constitutive model for laminated rubber bearings using an ANN model based on experimental data.
- Developing a seismic demand model through ANN, and applying it to rapid seismic damage evaluation of bridges.
- Utilizing partial dependence to investigate the effect of bearing parameters on the bridge seismic demand.

INTERNSHIP EXPERIENCES

Consulting project of seismic isolation design of Shanxi Yellow River Bridge Jul.2019 - Sep.2020

Research Institute of Highway Ministry of Transport

- Performed FEA to figure out the high-pier bridge seismic response by OpenSees.
- Optimized the seismic isolation systems of high-pier bridges.

Structural design project of a hospital in Anhui May.2017 - Aug.2017

China IPPR International Engineering CO., LTD.

- Participated in the structural design of a hospital by AutoCAD, especially coordinated with the architectural designer to complete stairs structural design.

PROFESSIONAL EXPERIENCE

Participate in writing of the industry specification of the Ministry of Transport of China May.2020-May.2021

Guidelines for Seismic Performance Evaluation of Highway Bridges (JTG/T 2231-02—2021)

Participate in translation of the professional book May.2018-Jan.2019

Bridge Engineering Handbook — Seismic Design (2nd Edition)

Graduate Teaching Assistant Sep.2016-Jan.2017

Steel Structure Theory and Application, China Agricultural University

ACADEMIC SKILLS

Programming Languages Python, MATLAB

Math Background Linear Algebra, ODE, PDE, Probability and Statistics

Technological Tools ANSYS, OpenSees, SAP2000, AutoCAD

AWARDS

Merits Student Award, Southeast University Jun.2019

Scholarship for Academic Excellence, China Agricultural University Oct.2015

ACTIVITIES

Second Prize, the campus singer competition of McMaster University Chinese Student Association Nov.2022

Top ten singer & most popular prize, campus singing competition in Southeast University Oct.2018