Hexiang Wang

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Education

University of California Davis (GPA 4.0/4.0) **California, USA**
PhD, Civil Engineering *2016 - 2021*

University of California Davis (GPA 4.0/4.0) **California, USA**
Master, Applied Mathematics *2017 - 2019*

Tongji University (GPA 4.91/5.0) **Shanghai, China**
Bachelor, Civil Engineering *2012 - 2016*

Research Experience

Research Assistant, University of California at Davis *Sep 2016 - Mar 2021*

- Core team member for the multimillion project "A Modern Computational Framework for the Nonlinear Seismic Analysis of Nuclear Facilities and Systems" funded by the United States Department of Energy (DOE). Theoretical development and implementation of high performance, linear/nonlinear, deterministic/probabilistic FEM simulator RealESSI.
- Performed high fidelity modeling of nonlinear earthquake soil-structure systems, including nuclear power plants, dams and high-rise reinforced concrete and moment resisting steel frame structures under 3D seismic motions.
- Established a novel framework for site-specific probabilistic seismic risk/hazard analysis based on time domain stochastic ground motion modeling. Improved structure fragility analysis through developed stochastic finite element method (SFEM).

Undergraduate Researcher, Tongji University *Jan 2016 - June 2016*

Built database for crack and leakage defects of road tunnels. Identified key factors for road tunnels defects from statistical analysis and established corresponding probabilistic models

Professional Experience

Engineer, Catastrophe Modeling, Berkshire Hathaway Specialty Insurance *Apr 2021 - present*

Site specific, engineering based catastrophe modeling and risk analysis for building structures and energy facilities.

Intern, Catastrophe Modeling, Berkshire Hathaway Specialty Insurance *July 2020 - Sep 2020*

Investigated time domain intrusive methodology for seismic risk analysis of special moment resisting frame building.

Visiting Scholar, The University of Hong Kong under Prof. Zhongqi Yue *Jul 2015 - Aug 2015*

Investigated tensile-shearing soil failure mechanism and its implication for slope stability

Intern, China Railway 17th Bureau Group Co., Ltd, Xiamen, China *Jun 2015 - Jul 2015*

Participated in the construction of Xiamen Metro line No. 1. Studied ground deformation and its influence on nearby Wenyuan bridge. Structural design of steel excavation support system.

Honors and Awards

Travel Award, Department of Civil and Environmental Engineering, UC Davis *Oct 2019*
Elected to Phi Kappa Phi Honor Society, top 7.5%, UC Davis *Mar 2018*
Outstanding Graduates Awards, Shanghai Municipal People's Government *Jun 2016*
National Scholarship, Ministry of Education of China, awarded 2 times *Oct 2013/2015*
HKU Civil Centennial Future Scholars The University of Hong Kong *Aug 2015*

Professional Qualification and Affiliations

Associate Member of American Society of Civil Engineers (ASCE)
Member of Multihazard Mitigation technical committee of ASCE
Member of Earthquake Engineering and Soil Dynamics technical committee of ASCE
Member of Earthquake Engineering Research Institute (EERI)
Engineering-In-Training (EIT) and Passed Professional Civil Engineer (PE) Examination

Publications

Books

1. Boris Jeremic, Zhaohui Yang, Zhao Cheng, Guanzhou Jie, Nima Tafazzoli, Matthias Preisig, Panagiota Tasiopoulou, Federico Pisano, Jose Abell, Kohei Watanabe, Yuan Feng, Sumeet Kumar Sinha, Fatemah Behbehani, Han Yang, and **Hexiang Wang**. Nonlinear Finite Elements: Modeling and Simulation of Earthquakes, Soils, Structures and their Interaction. University of California, Davis, CA, USA; and Lawrence Berkeley National Laboratory, Berkeley, CA, USA, 1989-2021. ISBN: 978-0-692-19875-9 (PDF)

Journal Papers

1. **Hexiang Wang**, Fangbo Wang, Han Yang, and Boris Jeremic. Site Response Analysis: Uncertain Motions Propagating through Uncertain Elastoplastic Soil. In Revision, *Nuclear Engineering and Design.* 2021.
2. **Hexiang Wang**, Fangbo Wang, Han Yang, Yuan Feng, and Boris Jeremic. Time Domain Intrusive Probabilistic Seismic Risk Analysis using Ground Motion Prediction Equations of Fourier Amplitude Spectra. In Review, *Soil Dynamics and Earthquake Engineering.* 2021.
3. Han Yang, **Hexiang Wang**, and Boris Jeremic. A Modern Energy-Based Design Framework for Soil Structure Interaction System. In Revision, *Computers & Structures.* 2021.
4. **Hexiang Wang**, Han Yang, Yuan Feng, and Boris Jeremic. Modeling and Simulation of Earthquake Soil Structure Interaction Excited by Inclined Seismic Waves. *Soil Dynamics and Earthquake Engineering.* 146:106720, 2021.
5. **Hexiang Wang**, Fangbo Wang, Han Yang, Yuan Feng, Jeff Bayless, Norman A. Abrahamson, and Boris Jeremic. Time Domain Intrusive Probabilistic Seismic Risk Analysis of Nonlinear Shear Frame Structure. *Soil Dynamics and Earthquake Engineering.* 136:106201, 2020.
6. **Hexiang Wang**, Hongwei Huang, Yuan Feng and Dongming Zhang. Characterization of Crack and Leakage Defects of Concrete Linings of Road Tunnels in China. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering,* 4(4), 2018.
7. Fangbo Wang, **Hexiang Wang**, Han Yang, Yuan Feng, and Boris Jeremić. A Modular Methodology for Time-domain Stochastic Seismic Wave Propagation. *Computers and Geotechnics.* 139:104409, 2021.

8. Yuan Feng, **Hexiang Wang**, Han Yang, Fangbo Wang. Time-Continuous Energy-Conservation Neural Network for Structural Dynamics Analysis. *Neurocomputing.* 456, 450-460, 2021.
9. Han Yang, **Hexiang Wang**, Yuan Feng, and Boris Jeremic. Plastic energy dissipation in pressure-dependent materials. *ASCE Journal of Engineering Mechanics.* 146(3), 2020.
10. Yuan Feng, Kaveh Zamani, Han Yang, **Hexiang Wang**, Fangbo Wang, and Boris Jeremic. Procedure to Build Trust in Nonlinear Elastoplastic Integration Algorithm: Solution and Code Verification. *Engineering with Computers,* 36(4), 2020.
11. Han Yang, Yuan Feng, **Hexiang Wang** and Boris Jeremić. Energy Dissipation Analysis for Inelastic Reinforced Concrete and Steel Beam-Columns. *Engineering Structures,* 197:109431, 2019.
12. Han Yang, **Hexiang Wang**, Yuan Feng, Fangbo Wang and Boris Jeremic. Energy Dissipation in Solids due to Material Inelasticity, Viscous Coupling, and Algorithmic Damping.*ASCE Journal of Engineering Mechanics,* 145(9), 2019.

Conference Proceedings & Presentations

1. **Hexiang Wang**, Han Yang, and Boris Jeremic. Time Domain Probabilistic Seismic Risk Analysis for Earthquake Soil Structure Interacting Systems. *In Proceedings of the 17th World Conference on Earthquake Engineering (17WCEE).* Sendai, Japan. September 27-October 2, 2021.
2. **Hexiang Wang**, Han Yang, and Boris Jeremic. Time Domain Intrusive Seismic Risk Analysis with Stochastic Elastic Plastic Finite Element Method. *Technical Presentation at the 14th WCCM & ECCOMAS Congress.* Virtual Congress, January 11-15, 2021.
3. Han Yang, **Hexiang Wang**, Jerzy W. Salamon, and Boris Jeremic. Earthquake Soil Structure Interaction Analysis of a Gravity Dam. *In ICOLD International Benchmark Workshop on Numerical Analysis of Dams (ICOLD-BW).* Milan, Italy. September 9-11, 2019.
4. **Hexiang Wang**, Yuan Feng, Han Yang, Fangbo Wang, and Boris Jeremic. Stress Test Seismic Motions for Nuclear Installations. *In Proceedings of the 25th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Charlotte, North Carolina, USA. August 04-09, 2019.
5. **Hexiang Wang**, Fangbo Wang, Han Yang, Yuan Feng, Jeff Bayless, Norman A. Abrahamson, and Boris Jeremic. Time Domain Seismic Risk Analysis Framework for Nuclear Installations. *In Proceedings of the 25th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Charlotte, North Carolina, USA. August 04-09, 2019.
6. Han Yang, Yuan Feng, **Hexiang Wang**, Fangbo Wang, and Boris Jeremic. Seismic Energy Flow Calculation for Earthquake Soil Structure Interaction System. *In Proceedings of the 25th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Charlotte, North Carolina, USA. August 04-09, 2019.
7. Fangbo Wang, **Hexiang Wang**, Han Yang, Yuan Feng, and Boris Jeremic. Stochastic Site Response Analysis through Uncertain Elastoplastic Soil. *In Proceedings of the 25th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Charlotte, North Carolina, USA. August 04-09, 2019.
8. **Hexiang Wang**, Fangbo Wang, Han Yang, and Boris Jeremic. Novel Seismic Risk Analysis Methodology: Time Domain, Intrusive, Stochastic Elastoplastic Finite Element Method. Semiplenary lecture *In 7th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN2019).* Crete, Greece. June 24-29, 2019.
9. Yuan Feng, Sumeet Kumar Sinha, Han Yang, **Hexiang Wang**, David B McCallen, and Boris Jeremic. 3D Nonlinear Earthquake Soil Structure Interactions (ESSI) for Nuclear Power Plants (NPP). *In Proceedings of the 11th U.S. National Conference on Earthquake Engineering (NCEE).* Los Angeles, California, USA. June 25-29, 2018.

10. Han Yang, Yuan Feng, Sumeet Kumar Sinha, **Hexiang Wang**, and Boris Jeremic. Energy Dissipation in Soil Structure Interaction System. *In Proceedings of the 5th Geotechnical Earthquake Engineering and Soil Dynamics (GEESD).* Austin, Texas, USA. June 10-13, 2018.
11. Sumeet Kumar Sinha, Yuan Feng, Han Yang, **Hexiang Wang**, and Boris Jeremic. 3-D Nonlinear Modeling and Its Effects in Earthquake Soil-Structure Interaction. *In Proceedings of the 24th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Busan, Korea. August 20-25, 2017.
12. **Hexiang Wang**, Han Yang, Sumeet Kumar Sinha, Chao Luo, and Boris Jeremic. 3-D Nonlinear Earthquake Soil-Structure Interaction Modeling of Embedded Small Modular Reactor (SMR). *In Proceedings of the 24th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Busan, Korea. August 20-25, 2017.

Journal Reviewer

1. Research on Engineering Structures and Materials
   - Technical paper: A Bayesian Regression Framework for Concrete Creep Prediction Improvement: Application to Eurocode 2 model
2. ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering
   - Technical paper: Vibration-based damage detection for a prestressed concrete box girder by means of subspace analysis
3. International Journal for Numerical and Analytical Methods in Geomechanics
   - Technical paper: A novel insight into vertical ground motion modelling in earthquake engineering
4. ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering
   - Technical paper: Copula-based Probabilistic Approaches for Predicting Debris-flow Runout Distances in the Wenchuan Earthquake Zone
5. ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering
   - Technical paper: Reliability Analysis of Controlled Structures Based on Probabilistic Active Controller
6. Journal of Low Frequency Noise, Vibration & Active Control
   - Technical paper: Gaussian closure technique for a simple tank model with non-zero mean random load and elasto-plasticity
7. Structural Engineering and Mechanics, An International Journal
   - Technical paper: Attenuation of quasi-Lamb waves in a hydroelastic system "elastic plate + compressible viscous fluid + rigid wall"