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*

Advisors: Prof. Boris Jeremic and Prof. Norman Abrahamson

Established novel framework for site-specific, time domain, direct probabilistic seismic risk/hazard analysis based on ground motion prediction equation (GMPE) of Fourier amplitude spectra. Improve structure fragility analysis through developed stochastic finite element method (SFEM).

Theoretical development and implementation of high performance, linear/nonlinear, deterministic/probabilistic FEM simulator RealESSI. Perform high fidelity nonlinear earthquake soil-structure system analysis for nuclear power plants, dams and high-rise reinforced concrete and moment resisting steel frame structures under 3D seismic motions.

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

Advisors: Prof. Hongwei Huang and Prof. Dongming Zhang

Built database for crack and leakage defects of road tunnels in China. 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*

Worked within Catastrophe Engineering & Analytics (CAT E&A) team for site specific, engineering based seismic risk modeling for property insurance practices

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

Worked within Catastrophe Engineering & Analytics (CAT E&A) team for site specific, engineering based seismic risk modeling for property insurance practices

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 construction of Xiamen Metro line No. 1. Study ground displacement 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

Engineering-In-Training (EIT) and Passed Professional Civil Engineer (PE) Examination

Member of American Society of Civil Engineers (ASCE)

Member of Earthquake Engineering Research Institute (EERI)

Publications

Selected Journal Papers

9. **Hexiang Wang**, Fangbo Wang, Han Yang, and Boris Jeremic. Site Response Analysis: Uncertain Motions Propagating through Uncertain Elastoplastic Soil. In Review, *Nuclear Engineering and Design.* 2021.
8. **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, *Earthquake Spectra.* 2021.
7. **Hexiang Wang**, Han Yang, Yuan Feng, Fangbo Wang, and Boris Jeremic. Modeling and Simulation of Earthquake Soil Structure Interaction Excited by Inclined Seismic Waves. *Soil Dynamics and Earthquake Engineering.* 146(7), 2021.
6. **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(9), 2020.
5. **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.
4. Fangbo Wang, **Hexiang Wang**, Han Yang, Yuan Feng, and Boris Jeremić. A Modular Methodology for Time-domain Stochastic Seismic Wave Propagation. In Review, *Computers and Geotechnics.* 2021.
3. Yuan Feng, **Hexiang Wang**, Han Yang, Fangbo Wang. Time-Continuous Energy-Conservation Neural Network for Structural Dynamics Analysis. Accepted, *Neurocomputing.* 2021.
2. Han Yang, **Hexiang Wang**, Yuan Feng, and Boris Jeremic. Plastic energy dissipation in pressure-dependent materials. *ASCE Journal of Engineering Mechanics.* 146(3), 2020.
1. 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.

Selected Conference Proceedings

9. **Hexiang Wang**, Han Yang, and Boris Jeremic. Time Domain Probabilistic Seismic Risk Analysis for Earthquake Soil Structure Interacting Systems. *In Proceedings of the 14th World Conference on Earthquake Engineering (17WCEE).* Sendai, Japan. September 13-18, 2020.

8. 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.
7. **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.
6. **Hexiang Wang**, Fangbo Wang, Han Yang, Yuan Feng, Jeff Bayless, Marco Baglio, Norman A. Abrahamson, and Boris Jeremic. Time Domain Intrusive Stochastic 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.
5. Fangbo Wang, **Hexiang Wang**, Han Yang, Yuan Feng, and Boris Jeremic. Stochastic Earthquake Soil Structure Interaction Analysis. *In Proceedings of the 25th Structural Mechanics in Reactor Technology (SMiRT) Conference.* Charlotte, North Carolina, USA. August 04-09, 2019.
4. **Hexiang Wang**, Fangbo Wang, Han Yang, and Boris Jeremic. Novel Seismic Risk Analysis Methodology: Time Domain, Intrusive, Stochastic Elastoplastic Finite Element Method. Semiplenary lectures *In 7th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN2019)*. Crete, Greece. June 24-29, 2019.
3. **Hexiang Wang**, Yuan Feng, Han Yang, Dragan Kovacevic, Arthur Rodgers, David B McCallen and Boris Jeremic. Interface Between Earthquake Ground Motions and Structural Response: Numerical Modeling and Simulation of ESSI Behavior. *In Proceedings of Best Practices in Physics-based Fault Rupture Models for Seismic Hazard Assessment of Nuclear Installations: Issues and Challenges towards Full Seismic Risk Analysis.* Cadarache Chateau, France. May 14-16, 2018.
2. 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.
1. **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.

Softwares Applications Developed/Contributed

Real ESSI Simulator System: High performance, high fidelity, multi-physics FEM simulator for **Real**istic modeling & simulations of **E**arthquakes, and **S**oils, and **S**tructures and their **I**nteraction. Contributed to the solid fluid interaction and 3D seismic wave field modeling. (Program)

SW42ESSI: Developed interface program between regional broadband earthquake motion simulator SW4 and RealESSI based on Domain Reduction Method. (Program)

SSFI: Developed C++ library for **S**oil **S**tructure **F**luid **I**nteraction simulation based on modified Volume of Fluid method. (Program)

gmFoam: Developed integrated mesh conversion tool, which transforms general Gmsh mesh partly (solid part) into FEM (finite element method) mesh and partly (fluid part) into FVM (finite volume method) mesh to perform earthquake soil structure fluid interaction analysis.(Program)

HAZ45: Probabilistic seismic hazard analysis program originally developed by Prof. Norman Abrahamson. Contributed to earthquake scenarios info output from seismic source characterization. (Program)