Weiwei Zhan, Ph.D.

Postdoctoral Scholar, Tufts University
Department of Civil and Environmental Engineering
200 College Ave, Medford, Massachusetts, USA 02155
Tel: +1 (864) 556 1193 | E-mail: weiwei.zhan@tufts.edu
Website: https://weiwei-zhan.github.io

Education

Clemson University, Clemson, USA
Ph.D., Civil Engineering, 2017-2020
M.S., Civil Engineering, 2017-2019

Chengdu University of Technology, Chengdu, China
B.S., Engineering Geology, 2010-2014

Research Interests

Geotechnical Earthquake Engineering, Engineering Seismology, Engineering Geology, Remote Sensing, Signal Processing, Geospatial Modeling, Artificial Intelligence, Computational Geomechanics

Dissertations

Ph.D. in Civil Engineering
"Data-driven assessment of site responses at liquefiable sites"

B.S. in Engineering Geology
"Statistical modeling of coseismic landslide mobility"

Publications

*Journal Articles (*corresponding author)*

12. Li W, **Zhan W***, Lu H, Xu Q, Pei X, Wang D, Huang R, Ge D (2022). Precursors to large rockslides visible on optical remote-sensing images and their implications for landslide early detection. *Landslides,* DOI 10.1007/s10346-022-01960-1.
11. Lu J, Li W*, **Zhan W**, Tie Y (2022). Distribution and mobility of co-seismic landslides triggered by the 2018 Hokkaido earthquake in Japan. *Remote Sensing,* 14, 3957.
10. **Zhan W**, Chen Q***** (2022). Nonlinear site response on liquefiable sites: insights from downhole seismic observations. *Engineering Geology*, Article 106610.
9. Luo Y, Xu Q, **Zhan W**, Grelle G (2022). Seismic hazard prediction using multispectral amplification maps in a complex topographic area: A case study of Qiaozhuang town, Sichuan Province, Southwest China. *Journal of Mountain Science*, 19: 726–739.
8. Shan S, Pei X, **Zhan W*** (2021). Estimating deformation modulus and bearing capacity of deep soils from dynamic penetration test. *Advances in Civil Engineering*, Article 1082050.
7. **Zhan W**, Chen Q* (2021). Accelerogram-based method for quick assessment of liquefaction occurrence. *Journal of Geotechnical and Geoenvironmental Engineering*, 147 (8): 04021060.
6. Gao G, Meguid MA, Chouinard LE, **Zhan W** (2021). Dynamic disintegration processes accompanying transport of an earthquake-induced landslide. *Landslides*, 18 (3):

909-933.

5. Fan X, **Zhan W***, Dong X, van Westen C, Xu Q, Dai L, Yang Q, Huang R, Havenith HB (2018). Analyzing successive landslide dam formation by different triggering mechanisms: The case of the Tangjiawan landslide, Sichuan, China. *Engineering Geology*, 243: 128-144.
4. Fan X*, Scaringi G, Xu Q, **Zhan W**, Dai L, Li Y, Pei X, Yang Q, Huang R (2018). Coseismic landslides triggered by the 8th August 2017 M s 7.0 Jiuzhaigou earthquake (Sichuan, China): factors controlling their spatial distribution and implications for the seismogenic blind fault identification. *Landslides*, 15(5): 967-983.
3. Meng X, Pei X*, Huang R, Cui S, Zhu L, **Zhan W** (2018). Shear behaviors of rock mass in the interlayer fault zone of Daguangbao landslide. *Journal of Engineering Geology*, 26 (2): 309-318. (in Chinese)
2. **Zhan W**, Fan X*, Huang R, Pei X, Xu Q, Li W (2017). Empirical prediction for travel distance of channelized rock avalanches in the Wenchuan earthquake area. *Natural Hazards & Earth System Sciences*, 17(6): 833-844.
1. **Zhan W**, Huang R, Pei X, Li W (2017). Empirical prediction model for movement distance of gully-type rock avalanches. *Journal of Engineering Geology*, 25 (1): 154-163. (in Chinese)

Submitted Articles

3. **Zhan W***, Baise LG, Kaklamanos J. A geospatial model for site response complexity. *Bulletin of the Seismological Society of America.* (Under revision)
2. **Zhan W***, Chen Q, Baise LG. Coseismic and long-term changes of site response on liquefiable sites. *Engineering Geology* (Under revision)
1. **Zhan W***, Cochran E. Reducing aleatory uncertainty of ground-motion modeling using gradient boosting model and feature selection techniques. *Bulletin of the Seismological Society of America.* (Under revision)

Conference Papers

5. **Zhan W**, Baise LG, Kaklamanos J (2023). Predicting Within-Site Variability of Seismic Site Response Using a Geospatial Modeling Approach, *Geo-Risk 2023*, Arlington, Virginia, July 23-26, 2023. (under review)
4. **Zhan W**, Zhang L, Wang L (2023). Probabilistic Assessment of Earthen Levees Considering Soil Spatial Variability, *Geo-Risk 2023*, Arlington, Virginia, July 23-26, 2023. (under review)
3. **Zhan W**, Chen Q (2022). Accelerogram-based method for quick assessment of liquefaction occurrence. *GeoCalgary 2022*, Calgary, Canada, October 2-5, 2022.
2. **Zhan W**, Chen Q (2021). Assessment of liquefaction effects on ground motion frequency parameters for accelerogram-based liquefaction detection, *American Society of Civil Engineers (ASCE) Geotechnical Engineering for Extreme Events (GeoExtreme) 2021*, Savannah, GA, USA, November 7-10, 2021.
1. **Zhan W**, Baise LG, Chen Q, Juang CH, Miao F (2021). Effects of liquefaction-affected ground motions on building fragility curves, *17th World Conference on Earthquake Engineering*, Sendai, Japan, September 27-October 2, 2021.

Presentations

Oral presentations

7. **Zhan W**, Baise LG, Moaveni B (2022). Quantifying epistemic uncertainty for global geospatial liquefaction models, *2022 SimCenter Symposium*, Austin, Texas, USA, November 3-4, 2022.
6. **Zhan W**, Baise LG, Kaklamanos J (2022). A geospatial model for predicting site response complexity. *Seismological Society of America (SSA) 2022 Annual Meeting*, Bellevue, Washington, USA, April 19-23, 2022.
5. **Zhan W**, Chen Q (2021). Assessment of liquefaction effects on ground motion frequency parameters for accelerogram-based liquefaction detection, *American Society of Civil Engineers (ASCE) Geotechnical Engineering for Extreme Events (GeoExtreme) 2021*, Savannah, GA, USA, November 7-10, 2021.
4. Gong, W, **Zhan W**, Wang L, Juang CH (2021). Design of Stabilizing Piles in Earth Slopes Considering Design Robustness, *Engineering Mechanics Institute Conference/Probabilistic Mechanics and Reliability (EMI/PMC) 2021 Conference*, Columbia University, New York City, USA, May 25-28, 2021. (Virtual oral presentation)
3. **Zhan W**, Chen Q (2020). Quick detection of subsoil liquefaction using accelerograms. *2020 AGU Fall Meeting*, San Francisco, CA, USA, December 7-11, 2020. (Virtual oral presentation)
2. **Zhan W**, Chen Q (2020). Coseismic and long-term changes of site response on liquefiable sites: a case study of Onahama Port Array in Japan. *2020 Eastern Section of the Seismological Society of America (ES-SSA) Annual Meeting*, Atlanta, GA, USA, October 12-16, 2020. (Virtual oral presentation)
1. **Zhan W**, Huang R, Pei X (2015). Study on the Site Effects of Large-scale Landslide movement triggered by Wenchuan Earthquake, *Engineering Geological Disaster Prevention Academic Conference*, Shanghai, China, October 12-14, 2015. (in Chinese)

Poster presentations

3. **Zhan W**, Baise LG, Moaveni B (2022). Uncertainty quantification for global geospatial liquefaction models, *Natural Hazards Research Summit 2022*, Washington, DC, USA, October 6-7, 2022.
2. **Zhan W**, Baise LG, Kaklamanos J (2022). Ground-motion modeling using machine learning techniques and geospatial proxies. *Seismological Society of America (SSA) 2022 Annual Meeting*, Bellevue, Washington, USA, April 19-23, 2022.
1. **Zhan W**, Baise LG, Chen Q, Juang CH, Miao F (2021). Effects of liquefaction-affected ground motions on building fragility curves, *17th World Conference on Earthquake Engineering*, Sendai, Japan, September 27-October 2, 2021. (Virtual poster presentation)

Research Experience

2021– now: Postdoctoral Scholar, Tufts University
Geohazards Research Lab advised by Prof. Laurie Baise

- Develop machine learning models to predict ground motions
- Geospatial modeling of seismic site response complexity
- Uncertainty quantification of global geospatial liquefaction model
- Image-based landslide and liquefaction detection

2017 – 2020: Graduate Research Assistant, Clemson University
Computational Geomechanics Lab advised by Prof. Qiushi Chen

- Develop accelerogram-based liquefaction detection method
- Evaluate seismic site response nonlinearity using borehole ground motion records
- Assess seismic site response temporal changes
- Develop machine learning models for single-station ground motion prediction
- Use OpenSees and effective stress analysis to simulate liquefaction behaviors
- Implement geotechnical models to assess liquefaction triggering and consequence
- Performance-based framework for liquefaction risk assessment
- Mechanical test of Lunar and Martian regolith simulants
- Use CT scan and image processing to characterize Martian regolith simulants

2014 – 2016: Graduate Research Assistant, Chengdu University of Technology
Geohazards Mitigation Lab advised by Prof. Xuanmei Fan

- Geological and geomorphological landslide mapping
- Slope monitoring using UAV, 3D Laser Scanner, and GBSAR
- GIS-based landslide susceptibility assessment
- Spatial distribution pattern analysis of co-seismic landslides
- In-situ and laboratory tests of geomaterials
- Use shaking table and centrifuge tests to study landslide initiation mechanism
- Empirical modeling of rock avalanche runout
- Discrete element modeling of landslide dynamic process
- Slope stability assessment using analytical and finite element models

Teaching and Mentoring Experience

Teaching

- Instructor, *CE3211 Soil Mechanics Lab*, Fall 2018 – Spring 2020
- Teaching Assistant, *CE3210 Geotechnical Engineering*, Spring 2020
- Teaching Assistant, *CE4240/6240 Earth Slopes and Retaining Structures*, Fall 2018 & 2019
- Teaching Assistant, *CE4210/6210 Geotechnical Design*, Spring 2019
- Teaching Assistant, *CE8450 Data Mining for System Analytics*, Fall 2018
- Teaching Assistant, *CE8570 Uncertainty Modeling in Risk Engineering*, Spring 2018
- Teaching Assistant, *CE8580 Fundamentals of Risk Engineering*, Spring & Fall 2017

Mentoring

- Mentor, PhD student research programs "*Uncertainty quantification of global geospatial liquefaction model*", "*Image-based landslide and liquefaction detection*", 2021 & 2022

- Mentor, Undergraduate student research program "*Characterization of Lunar Regolith Simulants and Their Feasibility for In Situ Resource Utilization*", Summer 2020
- Mentor, Undergraduate student research program "*Image-Based Characterization of Martian Regolith Simulants*", Spring 2020
- Mentor, High school student summer internship program "*Compression Strength Measurements of Bio-Cemented Martian Regolith Simulant*", Summer 2019

Professional Membership & Academic Services

Professional Membership

- Vice President, ASCE Geo-Institute Clemson University Graduate Student Organization
- Member, American Society of Civil Engineers Geo-Institute (ASCE G-I)
- Member, Earthquake Engineering Research Institute (EERI)
- Member, Seismological Society of America (SSA)
- Member, American Geophysical Union (AGU)

Academic Services

- Corresponding convener for the Session "Advances in Geospatial Modeling of Seismic Hazards", *Seismological Society of America (SSA) 2022 Annual Meeting*, April 19-23, 2022.
- Convener for the Special Interest Group Discussion "Modeling of Seismic Site Amplification using AI", *Seismological Society of America (SSA) 2022 Annual Meeting*, April 19-23, 2022.
- Reviewer for ASCE 2023 Geo-Risk Conference
- Reviewer for international journals: *Engineering Geology*, *Landslides*, *Lithology*, *Natural Hazards*, *Frontiers in Earth Science*, *Bulletin of Engineering Geology and the Environment*, *Arabian Journal of Geosciences*, *Advances in Civil Engineering*, *Stochastic Environmental Research and Risk Assessment, etc.*

Honors & Awards

- Travel Grant for 2022 SimCenter Symposium, NHERI SimCenter at UC Berkeley, 2022
- Registration and Travel Grants for the 12NCEE Conference, Earthquake Engineering Research Institute, 2022
- National Scholarship, Ministry of Education of China, 2016
- Travel Grant to AGU International Summer School on Rockslides (Kyrgyzstan), Chengdu University of Technology, 2016
- Meritorious Mention in Certificate Authority Cup Mathematical Contest in Modeling, www.madio.net, 2014
- Top 10 Excellent Thesis for Bachelor's Degree, Chengdu University of Technology, 2014
- Honorable Mention in the International Mathematics Modeling Competition (MCM/ICM), Consortium for Mathematics and Its Application in USA, 2013
- Excellent volunteer, Sichuan provincial environmental protection department, 2012

Languages & Skills

- Languages: English (fluent), Chinese (native)
- Programming: Python, R, Matlab, Tcl, C/C++, Git
- Earthquake Waveform Acquisition and Processing: ObsPy
- Numerical Analysis Tools: OpenSees, FLAC, Abaqus, PFC
- Visualization: Google Earth Engine, ArcGIS, AutoCAD, Origin, LaTeX
- Remote-Sensing Techniques: Unmanned Aerial Vehicle (UAV) Mapping, 3D Laser Scanning, Ground-based Synthetic Aperture Radar (GBSAR)
- Geotechnical Tests: Scanning Electron Microscope (SEM), Energy Dispersive X-ray, Computerized Tomography (CT) Scan, Direct Shear Test, Cyclic Triaxial Test

References

Laurie G. Baise, Ph.D.
Professor and Chair
Department of Civil and Environmental Engineering, Tufts University
Tel: +1 (617) 627-2211
Email: laurie.baise@tufts.edu

Qiushi Chen, Ph.D.
Associate Professor
Glenn Department of Civil Engineering
Clemson University
Tel: +1 (864) 656-3330
Email: qiushi@clemson.edu

Elizabeth Cochran, Ph.D.
Research Geophysicist
Earthquake Science Center
United States Geological Survey
Tel: +1 (626) 583-7238
Email: ecochran@usgs.gov

Charng Hsein Juang, Ph.D., ASCE Fellow
Professor Emeritus
Glenn Department of Civil Engineering
Clemson University
Tel: +1 (864) 656-3322
Email: hsein@clemson.edu

Xuanmei Fan, Ph.D.
Professor and Deputy Director
State Key Laboratory of Geohazard Prevention & Geoenvironment Protection
Chengdu University of Technology
Tel: +86 (182) 0816-1586
Email: fxm_cdut@qq.com