

Exponent®
Engineering & Scientific Consulting

Mehrdad Shokrabadi, Ph.D., P.E.

Managing Engineer | Civil and Structural Engineering
Irvine
+1-949-242-6026 | mshokrabadi@exponent.com

Professional Profile

Dr. Shokrabadi specializes in probabilistic risk analysis for utility providers, evaluation of design and construction defects, investigation of structural failures for domestic and international arbitration disputes, research of building code requirements for accessibility to sites, facilities, buildings, and elements, seismic hazard recognition and mitigation, and nonlinear modeling and analysis of various structural systems.

Dr. Shokrabadi has investigated issues related to the design and construction of bridges, roads, subways and housing projects. He has developed risk analysis platforms for major utility providers to characterize the risk of wildfires along their network and their corresponding financial consequences. Dr. Shokrabadi has led numerous cause and origin damage assessments for single- and multi-family residential and light commercial structures, as well as accident investigations at the built environment including pedestrian trip and fall injury cases.

While earning his Ph.D., Dr. Shokrabadi developed a probabilistic framework that allows explicit consideration of aftershocks in seismic risk analysis. The proposed framework integrates heightened seismic hazard following a major mainshock event with the increased vulnerability due to mainshock damage.

Prior to joining Exponent, Dr. Shokrabadi was a post-doctoral scholar at the University of California Los Angeles where he characterized seismic risk in tall structures located in the subduction zone of Pacific Northwest using 3-dimensional fully-nonlinear models of the core-wall buildings located in this region. Dr. Shokrabadi developed a platform for selecting ground motions for nonlinear response history analysis utilizing the latest findings in parallel computing. This novel approach allows more comprehensive selection of ground motion suites by reducing computational effort by a factor of up to 200.

Dr. Shokrabadi is involved in various professional associations including American Society of Civil Engineers (ASCE), Earthquake Engineering Research Institute (EERI) and The Structural Engineers Association of California (SEAOC).

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, University of California, Los Angeles (UCLA), 2018

M.S., Statistics, University of California, Los Angeles (UCLA), 2018

M.S., Civil Engineering, University of California, Los Angeles (UCLA), 2014

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M.S., Civil Engineering, Amirkabir University of Technology, Iran, 2012

B.S., Civil Engineering, Amirkabir University of Technology, Iran, 2010

Licenses and Certifications

Professional Engineer Civil, California, #95080

Prior Experience

Post-doctoral scholar, University of California Los Angeles, 2018-2020

Professional Affiliations

American Society of Civil Engineers (ASCE)

Earthquake Engineering Research Institute (EERI)

The Structural Engineers Association of California (SEAOC)

Languages

Farsi

Publications

Shokrabadi, M., Shusto, L., Hunt, J., Jokar, A., & Osteraas, J. Investigation Techniques and Analysis of Damage Patterns in Building Structures due to Wildfires. In Forensic Engineering 2024 (pp. 390-400).

Guan, X., Burton, H., Shokrabadi, M., & Yi, Z. (2021). Seismic drift demand estimation for steel moment frame buildings: From mechanics-based to data-driven models. Journal of Structural Engineering, 147(6), 04021058.

Guan M. EERI, X., Burton M. EERI, H., & Shokrabadi, M. (2021). A database of seismic designs, nonlinear models, and seismic responses for steel moment-resisting frame buildings. Earthquake Spectra, 37(2), 1199-1222.

Yi, Z., Burton, H. V., Shokrabadi, M., & Issa, O. (2020). "Multi-scale cost-benefit analysis of the Los Angeles Soft-Story Ordinance". Engineering Structures, 214, 110652.

Shokrabadi, M. and Burton, H. V. (2019). "Regional short-term and long-term risk and loss assessment under sequential seismic events". Engineering Structures, 185, 366-376.

Zhang, Y., Burton, H. V., Shokrabadi, M., & Wallace, J. W. (2019). "Seismic Risk Assessment of a 42-Story Reinforced Concrete Dual-System Building Considering Mainshock and Aftershock Hazard". Journal of Structural Engineering, 145(11), 04019135.

Shokrabadi, M. and Burton, H. V. (2018). "Risk-based assessment of aftershock and mainshock-aftershock seismic performance of reinforced concrete frames". Structural Safety, 73, 64-74.

Shokrabadi, M. and Burton, H. V. (2018). “Building service life economic loss assessment under sequential seismic events". Earthquake Engineering and Structural Dynamics, 47 (9), 1864-1881.

Shokrabadi, M., Burton, H. V. and Stewart, Jonathan P. (2018). “Impact of sequential ground motion

pairing on mainshock-aftershock structural response and collapse performance assessment". Journal of Structural Engineering, 144 (10), 04018177.

Zhang, Y., Burton, H. V., Sun H. and Shokrabadi, M. (2018). “A machine learning framework for assessing post-earthquake structural safety". Structural Safety 17, 1-16.

Shokrabadi, M. and Burton, H. V. (2017). “Ground motion intensity measures for rocking building systems". Earthquake Spectra, 33(4), 1533-1554.

Shokrabadi, M., Banazadeh, M., Shokrabadi, M. and Mellati, A. (2015). “Assessment of seismic risks in code conforming reinforced concrete frames". Engineering Structures 98, 14-28.

Presentations

Shokrabadi, M. and Burton, H. V. (2018). “Building Service Life Loss Assessment under Sequential Seismic Events". Proceedings, 11th National Conference on Earthquake Engineering, Los Angeles, California.

Shokrabadi, M. and Burton, H. V. (2017). “Aftershock Seismic Risk in Reinforced Concrete Frames". Proceedings, SEI Structures Congress 2017, Denver, Colorado.

Shokrabadi, M., Banazadeh, M., Shokrabadi, M. and Mellati, A. (2015). “Assessment of seismic risks in code conforming reinforced concrete frames". Engineering Structures 98, 14-28.

Shokrabadi, M. and Burton, H. V. (2017). “Ground motion intensity measures for rocking building systems". Earthquake Spectra, 33(4), 1533-1554.

Zhang, Y., Burton, H. V., Sun H. and Shokrabadi, M. (2018). “A machine learning framework for assessing post-earthquake structural safety". Structural Safety 17, 1-16.

Shokrabadi, M., Burton, H. V. and Stewart, Jonathan P. (2018). “Impact of sequential ground motion pairing on mainshock-aftershock structural response and collapse performance assessment". Journal of Structural Engineering, 144 (10), 04018177.

Shokrabadi, M. and Burton, H. V. (2018). “Building service life economic loss assessment under sequential seismic events". Earthquake Engineering and Structural Dynamics, 47 (9), 1864-1881.

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Yi, Z., Burton, H. V., Shokrabadi, M., & Issa, O. (2020). "Multi-scale cost-benefit analysis of the Los Angeles Soft-Story Ordinance". Engineering Structures, 214, 110652.

Zhang, W., Shokrabadi, M., Bozorgnia, Y., & Taciroglu, E. (2020). A methodology for fragility analysis of buried water pipes considering coupled horizontal and vertical ground motions. Computers and Geotechnics, 126, 103709.

Guan M. EERI, X., Burton M. EERI, H., & Shokrabadi, M. (2021). A database of seismic designs, nonlinear models, and seismic responses for steel moment-resisting frame buildings. Earthquake

Spectra, 37(2), 1199-1222.

Guan, X., Burton, H., Shokrabadi, M., & Yi, Z. (2021). Seismic drift demand estimation for steel moment frame buildings: From mechanics-based to data-driven models. Journal of Structural Engineering, 147(6), 04021058.

Zhang, W., Liu, S., Shokrabadi, M., Dehghanpoor, A., & Taciroglu, E. (2022). Nonlinear seismic fragility assessment of tall buildings equipped with tuned mass damper (TMD) and considering soil-structure interaction effects. Bulletin of Earthquake Engineering, 1-15.

Peer Reviews

Earthquake Engineering and Structural Dynamics

Journal of Structural Engineering

Reliability Engineering and System Safety

Earthquake Engineering and Engineering Vibration

Natural Hazards

Bulletin of Earthquake Engineering

Engineering Structures

The Structural Design of Tall and Special Buildings