



**Exponent**<sup>®</sup>  
Engineering & Scientific Consulting

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

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### Professional Profile

Dr. Shokrabadi specializes in performance-based earthquake engineering, seismic hazard recognition and mitigation, and nonlinear modeling and analysis of various structural systems. Dr. Shokrabadi's work has focused on the design and implementation of efficient algorithms to tackle large-scale problems, improving the current seismic risk analysis methodologies and adoption of machine learning techniques for rapid post-disaster damage assessment.

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

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

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

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

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

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.

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

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