KEITH A. PORTER, PE, PhD, F.SEI, F.ASCE
CURRICULUM VITAE

BIO SKETCH

I am a licensed structural engineer specializing in natural hazards and the built environment. I work to understand, model, communicate, and reduce the risk that natural hazards impose on buildings, utilities, transportation infrastructure, and the people and organizations that rely on them. I do so through interdisciplinary research as principal of the applied research firm SPA Risk LLC, as an adjoint professor at the University of Colorado Boulder, and via other scholarly and professional organizations. I helped to pioneer and standardize second-generation performance-based earthquake engineering now embodied in FEMA P-58. I led the *Natural Hazard Mitigation Saves* studies for the National Institute of Building Sciences, which FEMA believes inspired thousands of mitigation actions. I helped to envision, construct, and disseminate the US Geological Survey's revolutionary HayWired, ArkStorm, Tsunami, and ShakeOut disaster planning scenarios. ShakeOut led to global earthquake prepardeness activities by 70 million people every year--1% of the world's population. I train building professionals nationwide to evaluate post-disaster safety of infrastructure. I wrote or co-authored over 200 scholarly and professional works on natural-hazard risk management. I am a fellow of the American Society of Civil Engineers' Structural Engineering Institute and a licensed California and Colorado professional engineer. I hold civil and structural engineering degrees from UC Davis, UC Berkeley, and Stanford University.

CONTACT INFORMATION

University of Colorado Boulder, keith.porter@colorado.edu and
SPA Risk LLC, Denver CO, kporter@sparisk.com, 1-626-233-9758.

EDUCATION

STANFORD UNIVERSITY: Ph.D., Structural Engineering, 2000
UNIVERSITY OF CALIFORNIA, BERKELEY: M.Eng. Structural Engineering, 1990
UNIVERSITY OF CALIFORNIA, DAVIS: B.S. Civil Engineering, 1987

LICENSES

Professional Engineer, California (C 50402, 1991), Colorado (PE.0056699, 2019)

ACADEMIC AND PROFESSIONAL HISTORY

SPA RISK LLC, Denver CO; Principal; 2004-present (part time)
UNIVERSITY OF COLORADO BOULDER; Research Professor; 2007-2021, Adjoint Professor 2021- (part time)
CALIFORNIA INSTITUTE OF TECHNOLOGY, George Housner Senior Research Fellow; 2000-2007
EQE INTERNATIONAL, San Francisco and New York; Principal Engineer; 1990-1997 (risk management)
T.Y. LIN INTERNATIONAL, Taipei and San Francisco; Project Engineer; 1987-1988 (structural design)
CONTINENTAL HELLER CORP., Sacramento CA; Project Engineer; 1986-1987 (construction contracting)

ACADEMIC RESEARCH

I mostly pursue inter- and multi-disciplinary research into natural hazard risk for individual facilities and infrastructure systems. Added to my own structural engineering expertise, I work with and integrate the knowledge of engineering seismologists, economists, sociologists, ethicists, planners, lawyers, and others. I create coherent analytical frameworks that help society understand and manage its growing liability to earthquakes, wildfires, floods, and other perils. My doctoral research developed a second-generation performance-based earthquake engineering (PBEE-2) methodology that measures structural performance in terms of dollars, deaths, and downtime. Through postdoctoral research at Caltech, I helped the Pacific Earthquake Engineering Research (PEER) Center formulate a suite of

techniques that form the so-called PEER methodology. I served with other scholars to help FEMA standardize PEER's techniques in the analytical guideline called FEMA P-58. Meanwhile, my students, colleagues, and I improved our understanding of red-tagging, lifeline interaction, downtime, life-safety risk, uncertainty propagation, behavior of portfolios of buildings, and lifecycle cost optimization of design. I study human factors in natural disasters, such as public preferences for the seismic performance of new buildings, the time required to perform self-protective actions in earthquakes, procedures for earthquake early warning, and engineering ethical requirements for establishing building code performance objectives. I have been the chief engineer of the USGS' Science Application for Risk Reduction's (SAFRR) award-winning disaster planning scenarios: ShakeOut, ARkStorm, Tsunami Scenario, HayWired. I study miscellaneous issues in natural-hazard risk. Examples include the first scholarly engineering study of demand surge; methods to develop fragility functions for PBEE-2; model-order-reduction techniques to simplify models with nominal random variables; and legal and ethical issues of disaster resilience. Much of my research crosses the boundary between academia and professional practice. Practical problems provide meaningful goals for scholarly research, while scholarly research informs new, rigorous, innovative methods to improve professional practice. I find this approach essential to addressing the nation's impending disaster sustainability crisis.

RESEARCH SPONSORS

Notable research sponsors and consulting clients include the American Institute of Architects (AIA), Applied Technology Council (ATC), California Earthquake Authority (CEA), Cambridge Architectural Research (UK), Consortium of Universities for Research in Earthquake Engineering (CUREE), Economic Development Administration (EDA), Federal Emergency Management Agency (FEMA), U.S. Department of Housing and Urban Development (HUD), Insurance Institute for Business and Home Safety (IBHS), International Code Council (ICC), Kajima Corporation, Mitsui-Sumitomo Corporation, Multidisciplinary Center for Earthquake Engineering Research (MCEER), National Fire Protection Association (NFPA), National Institute of Building Sciences (NIBS), National Research Council of Canada (NRCC), North Atlantic Treaty Organization (NATO), Pacific Earthquake Engineering Research (PEER) Center, Southern California Earthquake Center (SCEC), Southern California Edison, Turkish Prime Ministry, US Geological Survey (USGS), Willis Ltd., and the World Bank's Global Facility for Disaster Risk Reduction (GFDRR).

PROFESSIONAL EXPERIENCE

I have worked for 30 years in professional catastrophe risk management, structural engineering, and construction contracting, with emphasis on multihazard risk management (earthquakes, fires, hurricanes, and floods). Clientele include the National Research Council of Canada, the National Institute of Building Sciences, the World Bank, FEMA, electric and water utilities, transportation infrastructure providers, and other government agencies at the international, federal, state, and local levels. My international consulting work has included multihazard risk in nine African countries, plus Japan, Kazakhstan, Kyrgyzstan, Nepal, and Turkey. Earlier in my career I designed seismic retrofit measures for commercial and industrial facilities. I designed highway and railway bridges for foreign and US state governments, and at the start of my career performed construction contracting of commercial and institutional buildings.

SERVICE TO THE UNIVERSITY, PROFESSION, & SOCIETY

American Society of Civil Engineers 1987-present
- Vice President, Structural Engineering Institute Colorado Section 2020-present
- Member, Government Affairs Committee, Colorado Section, 2020-present
- Faculty advisor, University of Colorado Boulder student chapter, 2011-present
- Member, Infrastructure Resilience Division
- Secretary, Executive Committee, Council on Disaster Risk Management (CDRM)
- Technical Council on Lifeline Earthquake Engineering chair, member, Seismic Risk Cmte

Cal OES Safety Assessment Program (SAP) trainer 2017-present, trained about 530 SAP evaluators.
Colorado Earthquake Hazard Mitigation Council, member, 2019-present

Consortium of Universities for Research in Earthquake Engineering (CUREE) 2007-2015
Earthquake Engineering and Structural Dynamics, reviewer.
Earthquake Engineering Research Institute (EERI) 1990-
Steering Committee, Collection and Management of Earthquake Data.
Securing Society against Catastrophic Earthquake Losses, a Research and Outreach Plan
Special Projects and Initiatives Committee, 2006-2008
Earthquake Spectra Editorial board 2013-2019, guest editor, reviewer.
FEMA National Earthquake Technical Assistance Program (NETAP) trainer, 2011-
National Institute of Building Sciences Multi-Hazards Mitigation Council, vice chair, member, 2005-
Natural Hazards Review guest editor, reviewer.
Nontechnical: Denver NAACP, Denver ACLU, and African Diaspora Initiative of Colorado Democrats
Structural Engineers Association of Colorado, 2021-present
Structural Engineering Institute Colorado Chapter Vice President, 2020-present
Tau Beta Pi student chapter faculty advisor, 2012-2016
University of Colorado Boulder SESM Seminar Series organizer
USGS Science Application for Risk Reduction (SAFRR), Engineering Coordinator, 2007-2019.

HONORS AND AWARDS

Fellow of the American Society of Civil Engineers, 2021
Fellow of the Structural Engineering Institute of ASCE, 2019
USGS Shoemaker Award for Communications Product Excellence, 2019
National Chi Epsilon Civil Engineering Honor Society, 2013
GW Housner Postdoctoral Fellowship (Caltech), 2000-2001
ARCS Scholar (Achievement Rewards for College Scholarships) 1999-2000
Haresh Shah Family Fellow (Stanford University) 1997-1998
Outstanding Graduate Student Instructor award (UC Berkeley) 1989-1990
Regents Fellow (UC Berkeley) 1988-1989
Tau Beta Pi (UC Davis) 1987

TEACHING EXPERIENCE

UNIVERSITY OF COLORADO BOULDER, 2010-, instructor (occasional, with various colleagues)
CALIFORNIA INSTITUTE OF TECHNOLOGY, 2000 and 2003, instructor (Statics; Survey of Earthquake Eng.)
STANFORD UNIVERSITY, 2000, teaching assistant
UNIVERSITY OF CALIFORNIA, BERKELEY, 1989-1990, graduate student instructor (Outstanding GSI award)

ADVISEES

Alhumaidi, J., 2020-present. MS student.
Alimoradi, A., 2011. postdoctoral scholar, now assistant professor, Southern Methodist University.
Beesam, V., 2013-2014. MS student, Structural Engineer at Glenn Frank Engineering, Boulder, Colorado
Bretl, D., 2013-2014. MS, Structural Engineer at Severud Associates, New York
Bullock, Z., 2016-2020. PhD (with Shideh Dashti and Abbie Liel), now Caltech postdoc.
Chahal, G., 2020-present. MS.
Cho, I.H., 2012-2014. postdoctoral scholar, now assistant professor, Iowa State University Ames
Dirksen, R., 2013-2014. MS, now Stress Analyst at Lockheed Martin
Farokhnia, K., 2010-2013. PhD, now Assistant Professor, Murray State University, Murray KY.
Ghosh, S., 2015-2017, PhD student
Hobbs, D., 2012-2013. BS/MS, now Structural Engineer at Beca, Christchurch, Canterbury, New Zealand
Isteita, M., 2014-2019. PhD.
Janowiscz, H., MS, 2010-2011 (with R. Corotis), now Structural Engineer at J.R. Harris & Co., Denver, CO
Kim, B.R., 2013. PhD student.
Mitrani-Reiser, J., 2004-2007. PhD (with James Beck). Now associate professor Johns Hopkins.
McGowan, S. 2008-2009. MS, now FEMA staff scientist.
Olsen, A., 2008-2011. postdoctoral scholar, now Engineer at RMS.

Park, G., 2014-2015. MS.
Perkins, E., 2010-2011, MS, now stay-at-home mom
Ramer, K., 2010-2011. MS, now Structural Engineer at BDI, Louisville, Colorado
Reed, Z., 2020-present MS.
Shaikhutdinov, R., 2001-2004, PhD (with J. Beck), now Vice President at AllianceBernstein, New York

PATENTS

USPTO Non-provisional Application No. 10/862,185, "Method, Computer Program Product, and System for Risk Management," a process to estimate expected annualized loss to a facility as a result of earthquakes, using a scenario loss estimate and site hazard factor.

USPTO Non-provisional Application No. 11/173,054, "A Method and Software Application for Calculating the Site Economic Hazard Coefficient and Economic-Basis Event Shaking Intensity from Gridded Hazard Data," software to implement patent 1.

PUBLICATIONS

I have published two theses (MEng and PhD), about 50 archival journal articles, about 100 items in conferences, workshops, seminars, and trade journals, and about 75 books, book chapters, reports, and other publications. A detailed though probably incomplete list follows.

Theses

1. Porter, K.A., 2000, *Assembly-Based Vulnerability of Buildings and its Uses in Seismic Performance Evaluation and Risk-Management Decision-Making,* Doctoral Dissertation, Stanford University, Stanford, CA, ProQuest Co., Ann Arbor MI, pub. 99-95274, 196 pp., http://wwwlib.umi.com/dissertations/preview/9995274
2. Porter, K.A., 1990, *Experimental Investigation of Single-Plate Shear Connectors with Short Slotted Holes*, Master's Thesis, University of California, Berkeley, 114, p., www.sparisk.com/pubs/Porter-1990-Shear-tabs.pdf

Archival Journal Articles

3. Porter, K.A., 2021. Should we build better? The case for resilient earthquake design in the United States. *Earthquake Spectra*. https://doi.org/10.1177/8755293020944186
4. Field, E.H., Milner, K.R., and Porter, K.A., 2020. Assessing the value of removing earthquake-hazard-related epistemic uncertainties, exemplified using average annual loss in California. *Earthquake Spectra*, https://doi.org/10.1177/8755293020926185
5. Bullock, Z., Liel, A. B., Dashti, S., & Porter, K. A., 2020. A suite of ground motion prediction equations for cumulative absolute velocity in shallow crustal earthquakes including epistemic uncertainty. Earthquake Spectra, 8755293020957342.
6. Porter, K., and Thomas, E., 2019. First the earthquakes then the lawsuits. American Bar Association *Probate & Property* 33 (6): 34-40, www.sparisk.com/pubs/Porter-2019-ABA-Steel-Frame.pdf
7. Scawthorn, C. and Porter, K., 2019. Enhancing resilience through risk-based design and benefit-cost analysis. *The Bridge*, 49 (2): 16-25
8. Bullock Z, Dashti S, Liel AB, Porter KA, Karimi Z., 2019. Assessment supporting the use of outcropping rock evolutionary intensity measures for prediction of liquefaction consequences. *Earthquake Spectra* 35 (4): 1899-1926.
9. Bullock Z, Karimi Z, Dashti S, Porter K, Liel AB, Franke KW, 2019. A physics-informed semi-empirical probabilistic model for the settlement of shallow-founded structures on liquefiable ground. Geotechnique. 69 (5): 406-419.
10. Bullock Z, Dashti S, Karimi Z, Liel A, Porter K, Franke K., 2019. Probabilistic models for residual and peak transient tilt of mat-founded structures on liquefiable soils. *Journal of Geotechnical and Geoenvironmental Engineering*. 145 (2): ARTN 04018108.

11. Karimi, Z., Dashti, S., Bullock, Z., Porter, K., & Liel, A., 2018. Key predictors of structure settlement on liquefiable ground: a numerical parametric study. Soil Dynamics and Earthquake Engineering, 113, 286-308.
12. Bullock, Z., Dashti, S., Liel, A., Porter, K., Karimi, Z., & Bradley, B., 2017. Ground-motion prediction equations for Arias intensity, cumulative absolute velocity, and peak incremental ground velocity for rock sites in different tectonic environments. *Bulletin of the Seismological Society of America*, 107(5), 2293-2309
13. Field, E., K. Porter, and K. Milner, 2017. A prototype operational earthquake loss model for California based on UCERF3-ETAS – A First Look at Valuation. *Earthquake Spectra* In-Press https://doi.org/10.1193/011817EQS017M
14. Porter, K., E. Field and K. Milner, 2017. Trimming a hazard logic tree with a new model-order-reduction technique. *Earthquake Spectra*, preprint, http://earthquakespectra.org/doi/pdf/10.1193/092616EQS158M
15. Davis, M., and Porter, K., 2016. The public's role in seismic design provisions. *Earthquake Spectra.* 32 (3), 1345-1361, http://dx.doi.org/10.1193/081715EQS127M
16. Porter, K.A., 2016. Safe enough? A building code to protect our cities and our lives. *Earthquake Spectra* 32 (2), 677-695. http://dx.doi.org/10.1193/112213EQS286M
17. Cho, I.H., & Porter, K., 2016. Modeling building classes using moment matching. *Earthquake Spectra*, 32(1), 285-301. http://earthquakespectra.org/doi/10.1193/071712EQS239M
18. Hariri-Ardebili, M.A., Saouma, V.E., and Porter, K.A., 2016. Quantification of seismic potential failure modes in concrete dams. *Earthquake Engineering & Structural Dynamics* 45: 979–997. http://dx.doi.org/10.1002/eqe.2697
19. Porter, K., 2016. Preparing for the big one. *Journal of the National Institute of Building Sciences,* 4 (5), 16-19
20. Porter, K., 2015. Seismic fragility of traction elevators. *Earthquake Engineering & Structural Dynamics* 45 (5) 819-833, http://dx.doi.org/10.1002/eqe.2689
21. Porter, K., and Davis, M., 2015. Not safe enough: the public's expectations of seismic performance. *Journal of the National Institute of Building Sciences* 3 (5) 22-25
22. Cho, I.H., and K.A. Porter, 2015. Three-stage multiscale nonlinear dynamic analysis platform for building-level loss estimation. *Earthquake Spectra* 31 (2), 1021-1042, http://earthquakespectra.org/doi/abs/10.1193/092712EQS293M [viewed 16 Sep 2015]
23. Cho, I. and K. Porter, 2013. Structure-independent parallel platform for nonlinear analyses of general real-scale RC structures under cyclic loading. *Journal of Structural Engineering,* http://ascelibrary.org/doi/abs/10.1061/(ASCE)ST.1943-541X.0000871
24. Cho, I.H., and K.A. Porter, 2013. Modeling building classes using moment matching. *Earthquake Spectra*. http://earthquakespectra.org/doi/abs/10.1193/092712EQS293M [viewed 11 Dec 2014]
25. Bonstrom, H., R. Corotis, and K. Porter, 2012. Overcoming public and political challenges for natural hazard risk investment decisions. *IDRiM Journal* 2 (1), 1-23, http://www.sparisk.com/pubs/Bonstrom-2012-IDRIM-Investment.pdf
26. Porter, K.A., and K. Ramer, 2012. Estimating earthquake-induced failure probability and downtime of critical facilities. *Journal of Business Continuity & Emergency Planning,* 5 (4), 352-364, http://www.sparisk.com/pubs/Porter-2012-JBCEP-Downtime.pdf
27. Porter, K.A., E.H. Field, and K. Milner, 2012. Trimming the UCERF2 hazard logic tree. *Seismological Research Letters,* 83 (5), 815-828 http://www.sparisk.com/pubs/Porter-2012-SRL-Tree-trim.pdf
28. Porter, K., G. Johnson, R. Sheppard and R. Bachman, 2011. Response to discussions of fragility of mechanical, electrical and plumbing equipment. *Earthquake Spectra*, 27 (1), 229-233
29. Porter, K.A., K. Hudnut, S. Perry, M. Reichle, C. Scawthorn, and A. Wein, 2011. Foreword. *Earthquake Spectra 27 (2), 235-237* http://www.sparisk.com/pubs/Porter-2011-ShakeOut-Foreword.pdf
30. Porter, K.A., L. Jones, D.A. Cox, J. Goltz, K. Hudnut, D. Mileti, S. Perry, D. Ponti, M. Reichle, A.Z. Rose, C.R. Scawthorn, H.A. Seligson, K.I. Shoaf, J. Treiman, and A. Wein, 2011. The ShakeOut Scenario: a hypothetical M_W7.8 earthquake on the Southern San Andreas fault. *Earthquake Spectra* 27 (2), 239-261, http://www.sparisk.com/pubs/Porter-2011-Shakeout.pdf
31. Porter, K.A., and R. Sherrill, 2011. Utility performance panels in the ShakeOut scenario. *Earthquake Spectra* 27 (2), 443-458, http://www.sparisk.com/pubs/Porter-2011-ShakeOut-Panels.pdf

32. Olsen, A., and K.A. Porter, 2011. What we know about demand surge: a brief summary. *Natural Hazards Review* 12 (2), 62-71 http://www.sparisk.com/pubs/Olsen-2011-NHR-WWKADS.pdf
33. Jaiswal, K., D. Wald, and K. Porter, 2010. A global building inventory for earthquake loss estimation and risk management. *Earthquake Spectra* 26 (3) 731-748, http://www.sparisk.com/pubs/Jaiswal-2010-PAGER-inventory.pdf
34. Porter, K.A., 2010. Cracking an open safe: uncertainty in HAZUS-based seismic vulnerability functions. *Earthquake Spectra,* 26 (3) 893-900, http://www.sparisk.com/pubs/Porter-2010-Safecrack-COV.pdf.
35. Porter, K.A., G. Johnson, R. Sheppard, and R.E. Bachman, 2010. Fragility of mechanical, electrical, and plumbing equipment. *Earthquake Spectra*, 26 (2) 451-472, http://www.sparisk.com/pubs/Porter-2010-MEP-fragility-1.pdf
36. Porter, K.A., 2009. Cracking an open safe: more HAZUS vulnerability functions in terms of structure-independent intensity. *Earthquake Spectra*, August 2009, http://www.sparisk.com/pubs/Porter-2009-Safecrack-MDF.pdf
37. Porter, K.A., 2009. Cracking an open safe: HAZUS vulnerability functions in terms of structure-independent spectral acceleration. *Earthquake Spectra*, May 2009, http://www.sparisk.com/pubs/Porter-2009-Safecrack-Casualty.pdf
38. Wald, D., K.W. Lin, K. Porter, and L. Turner, 2008. ShakeCast: automating and improving the use of ShakeMap for post-earthquake decision-making and response. *Earthquake Spectra*, 24 (2), 533-553, http://www.sparisk.com/publications.htm
39. Ching, J.Y., K.A. Porter, and J.L. Beck, 2009. Propagating uncertainties for loss estimation in performance-based earthquake engineering using moment matching. *Structure and Infrastructure Engineering*. 5 (3): 245-262. http://www.tandfonline.com/doi/abs/10.1080/15732470701298323
40. Porter, K.A., 2007. Fragility of hydraulic elevators for use in performance-based earthquake engineering. *Earthquake Spectra,* 23 (2), May 2007, http://www.sparisk.com/publications.htm
41. Porter, K.A., R.P. Kennedy, and R.E. Bachman, 2007. Creating fragility functions for performance-based earthquake engineering. *Earthquake Spectra,* 23 (2), 471-489, http://www.sparisk.com/publications.htm
42. Rose, A., K. Porter, N. Dash, J. Bouabid, C. Huyck, J.C. Whitehead, D. Shaw, R.T. Eguchi, C. Taylor, T.R. McLane, L.T. Tobin, P.T. Ganderton, D. Godschalk, A.S. Kiremidjian, K. Tierney, and C. Taylor West. 2007. Benefit-cost analysis of FEMA hazard mitigation grants. *Natural Hazards Review*, 8(4), 1-15; 2007 http://www.sparisk.com/pubs/Rose-2007-NHR-BCA.pdf
43. Goulet, C., C. Haselton, J. Mitrani-Reiser, J. Beck, G. Deierlein, K. Porter, and J. Stewart. 2007. Evaluation of the seismic performance of a code-conforming reinforced-concrete frame building - from seismic hazard to collapse safety and economic losses. *Earthquake Engineering and Structural Dynamics*. 36 (13), 1973-1997 http://www.sparisk.com/pubs/Goulet-2007-EESD-Benchmark.pdf
44. Porter, K.A., J. Mitrani-Reiser, J.L. Beck, and J.Y. Ching, 2006. Near-real-time loss estimation for instrumented buildings. *The Structural Design of Tall and Special Buildings* 15 (1): 3-20. http://www.sparisk.com/pubs/Porter-2006-SDTSP-Realtime.pdf
45. Porter, K.A., K. Shoaf, and H. Seligson, 2006. Value of injuries in the Northridge Earthquake. *Earthquake Spectra*, 22 (2): 555-563, May 2006. http://www.sparisk.com/pubs/Porter-2006-VOI.pdf
46. Porter, K.A., C.R. Scawthorn, and J.L. Beck, 2006. Cost-effectiveness of stronger woodframe buildings. *Earthquake Spectra* 22 (1), February 2006, 239-266, http://scitation.aip.org/journals/doc/EASPEF-ft/vol_22/iss_1/239_1.html [09 Mar 2006], http://spot.colorado.edu/~porterka/Porter-2006-CWF.pdf
47. Ching, J.Y., J.L. Beck, K.A. Porter, R.V. Shaikhutdinov, 2006. Bayesian state estimation method for nonlinear systems and its application to recorded seismic response. *Journal of Engineering Mechanics*, April 2006.
48. Ching, J., J.L. Beck, and K.A. Porter, 2006. Bayesian state and parameter estimation of uncertain dynamical systems. *Probabilistic Engineering Mechanics*, 21 (2006) 81-96, http://www.sparisk.com/pubs/Ching-2006-PEM-Bayesian-state-estimation.pdf
49. Porter, K.A., J.L. Beck, R.V. Shaikhutdinov, S.K. Au, K. Mizukoshi, M. Miyamura, H. Ishida, T. Moroi, Y. Tsukada, and M. Masuda, 2004. Effect of seismic risk on lifetime property value. *Earthquake*

Spectra, 20 (4), Nov 2004, 1211-1237. http://www.sparisk.com/pubs/Porter-2004-LPV.pdf [viewed 2 Dec 2012]

50. Porter, K.A., J.L. Beck, and R.V. Shaikhutdinov, 2004. Simplified performance-based earthquake engineering estimation of economic risk for buildings. *Earthquake Spectra*, 20 (4), 1239-1263, http://spot.colorado.edu/~porterka/Porter-2004-EQS-Simplified.pdf
51. Porter, K.A., J.L. Beck, and R.V. Shaikhutdinov, 2002. Sensitivity of building loss estimates to major uncertain variables. *Earthquake Spectra*, 18 (4), 719-743, http://www.sparisk.com/pubs/Porter-2002-Sensitivity.pdf
52. Porter, K.A., A.S. Kiremidjian, and J.S. LeGrue, 2001. Assembly-based vulnerability of buildings and its use in performance evaluation. *Earthquake Spectra,* 17 (2), 291-312, https://doi.org/10.1193/1.1586176, http://www.sparisk.com/pubs/Porter-2001-ABV.pdf

Conferences, Workshops, Seminars, and Trade Journals

53. Bullock, Z., Dashti, S., Liel, A. B., & Porter, K.A., 2019. Generating Synthetic Borehole Data for Applications in Site-Specific and Regional Evaluation of Liquefaction Consequences. *Proc. Geo-Congress 2019: Earthquake Engineering and Soil Dynamics, Reston, VA, March 2019*, pp. 464-472.
54. Bullock Z, Dashti S, Liel A, Porter K., 2019. Physics-informed and semi-empirical probabilistic models for structure's average and differential settlement on liquefiable ground with extensions to regional analysis. Proc. *7th International Conference on Earthquake Geotechnical Engineering* (7ICEGE)
55. Bullock Z, Dashti S, Liel A, Porter K., 2019. A framework for machine learning-assisted design and execution of numerical parametric studies in evaluating the seismic response of soil-structure systems. *Proc. 12th Canadian Conference on Earthquake Engineering*
56. Bullock Z, Porter K, Dashti S, Liel A., 2019. A framework for the evaluation of liquefaction consequences for shallow-founded structures. *Proc. 13th International Conference on Applications of Statistics and Probability in Civil Engineering (1CASP13)*
57. Bullock, Z., Karimi, Z., Dashti, S., Liel, A., & Porter, K., 2018. Key parameters for predicting residual tilt of shallow-founded structures due to liquefaction. *Proceedings of Geotechnical Earthquake Engineering and Soil Dynamics V*. 425-434
58. Porter, K.A., 2018. Ground-truthing a new model for estimating earthquake damage and planning recovery. Source, 32 (2), p. 40-43, www.sparisk.com/pubs/Porter-2018-AWWA-Source.pdf
59. Porter, K.A., McMullin, R., Terentieff, S.V., Wollbrinck, J., and Irias, X., 2018. Applying the model. Source, 32 (2), p. 43-45, www.sparisk.com/pubs/Porter-2018-AWWA-Source.pdf
60. Porter, K.A., 2018. Is life safety enough? Improvements in earthquake science and risk reduction. *American Association for the Advancement of Science 2018 Annual Meeting, February 15-19, 2018, Austin, Texas*, http://www.sparisk.com/pubs/Porter-2018-AAAS.pdf
61. Bullock, Z., Dashti, S., Liel, A., Porter, K., Karimi, Z., 2018. Efficiency, sufficiency, and predictability of intensity measures for predicting liquefaction consequences. *Proceedings of the 11th National Conference on Earthquake Engineering, Earthquake Engineering Research Institute, Los Angeles, CA 2018*.
62. Porter, K., 2017. When addressing epistemic uncertainty in a lognormal fragility function, how should one adjust the median? Paper 2617, *Proc., 16th World Conference on Earthquake Engineering,* Santiago Chile, January 9 to 13, 2017 http://www.sparisk.com/pubs/Porter-2016-16WCEE-Rotation-point.pdf
63. Karimi, Z., Bullock, Z., Dashti, S., Liel, A., and Porter, K., 2017. Influence of soil and structural parameters on liquefaction-induced settlement of foundations. *Proc. 3rd International Conference on Performance-based Design in Earthquake Geotechnical Engineering (PBD-III), Vancouver BC July 16-19, 2017*
64. Porter, K., 2016. Not safe enough: the case for resilient seismic design. *2016 SEAOC Convention Maui HI, October 12 – 15, 2016*. http://www.sparisk.com/Porter-2016-SEAOC-Resilience.pdf
65. Porter, K., 2015. 3D or median map, convincing engineers that a physics-based model can be better for earthquake scenarios. *American Geophysical Union Annual Meeting, San Francisco CA Dec 2015*

66. Porter, K., S. Hellman, and A. Hortacsu, 2015. FEMA ROVER version 2 and ROVER ATC-20, mobile earthquake safety software. *ATC & SEI Second Conference on Improving the Seismic Performance of Existing Buildings and Other Structures, San Francisco CA December 10-12, 2015*
67. Lizundia, B., S. Durphy, M. Griffin, W. Holmes, A. Hortacsu, B. Kehoe, K. Porter, and B. Welliver, 2015. Third edition update of FEMA P-154: rapid visual screening for potential seismic hazards. *ATC & SEI Second Conference on Improving the Seismic Performance of Existing Buildings and Other Structures, San Francisco CA December 10-12, 2015*
68. Porter, K., 2015. *Not Safe Enough: Consequences of the Life-Safety Seismic Design Objective for New Buildings.* CVEN 4147 University of Colorado Boulder Thu 19 Nov 2015
69. Porter, K., 2015. *Dollars, Deaths, and Downtime: Understand Your Building's Seismic Risk and How to Evaluate It.* SEAOSC Strengthening Our Cities Summit 5 Nov 2015, Los Angeles, CA
70. Porter, K., 2015. SAFRR and the HayWired Scenario. *Touro University Emergency Medicine Symposium, Vallejo CA October 11, 2015*
71. Porter, K., 2015. *Not Safe Enough: Unintended Consequences of Life-Safety Seismic Design, and Other Lessons of the HayWired Scenario*. Seminar at the Pacific Earthquake Engineering Research (PEER) Center, 7 Oct 2015
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