
Leonardo Dueñas-Osorio

6100 Main Street, MS-318 • Houston, TX 77005-1827 • United States
Office (713) 348-5292 • Fax (713) 348-5268 • Home (404) 918-1683
E-mail: leonardo.duenas-osorio@rice.edu
URL: <http://duenas-osorio.rice.edu>

Academic Preparation

Ph.D., Civil and Environmental Engineering, Minor: Industrial Engineering, 2005
Georgia Institute of Technology, Atlanta, Georgia, USA.

M.Eng., Civil and Environmental Engineering, High Performance Structures, 2001
Massachusetts Institute of Technology, Cambridge, Massachusetts, USA.

Professional Master, Civil and Environmental Engineering, Project Management, 2000
Pontificia Universidad Javeriana, Bogotá, Colombia.

Master of Science, Civil and Environmental Engineering, Structural Engineering, 1998.
Universidad de Los Andes, Bogotá, Colombia.

Bachelor of Science, Civil and Environmental Engineering, 1996
Universidad de La Salle, Bogotá, Colombia.

Current Research Interests

- Quantum algorithms for engineered network reliability and resilience quantification
- Formal methods and algorithmic logic for the functional assessment of infrastructure networks
- Exact and heuristic optimization methods for the restoration analysis of infrastructure systems
- Resilience quantification tools for geographically distributed smart networks under contingencies
- Uncertainty quantification in seismic and hurricane risk assessment for interdependent networks
- Severe weather risk management including institutional and citizen behavior in coastal cities

Professional Experience

07/2013 – Present	Associate Professor	Rice University, Department of Civil and Environmental Engineering, Houston, Texas.
07/2006 – 06/2013	Assistant Professor	Rice University, Department of Civil and Environmental Engineering, Houston, Texas.
01/2006 – 06/2006	Post-Doctoral Fellow	Georgia Institute of Technology, School of Civil and Environmental Engineering, Atlanta, Georgia.
08/2001 – 12/2005	Graduate Research Assistant	Georgia Institute of Technology, Mid-America Earthquake (MAE) Center, Atlanta, Georgia.

05/2003 – 09/2003	Research Engineer (Internship)	Post, Buckley, Schuh and Jernigan (PBS&J), Atlanta, Georgia.
08/2000 – 06/2001	M.Eng Project Assistant	Massachusetts Institute of Technology, Cambridge, Massachusetts.
01/1997 – 07/2000	Structural Engineer	Società Tecnica Internazionale (Sotecni), Bogotá, Colombia.
08/1998 – 07/2000	Structural Engineer	Respil Limitada, Bogotá, Colombia.

Publications

Pending Manuscripts

- Alemzadeh, S., H. Talebian, M. Mesbahi, and L. Dueñas-Osorio. "Resource Allocation in Infrastructure Networks Restoration: A Data-Guided Perspective." *Computer-Aided Civil and Infrastructure Engineering*, pending submission.
- Dudek, Jeffrey M., Leonardo Dueñas-Osorio, and Moshe Y. Vardi, (2019). "Efficient Contraction of Large Tensor Networks for Weighted Model Counting through Graph Decompositions." *ArXiv:1908.04381* [Cs], August. <http://arxiv.org/abs/1908.04381>. *Artificial Intelligence Journal*, pending submission.
- Fu, B., N. Vishnu, L. Dueñas-Osorio, J.E. Padgett, and R. Stein. "Socio-Technical Ranking of Bridges in Transportation Networks." *Structure and Infrastructure Engineering*, pending submission.
- González, A.D., L. Dueñas-Osorio, A. Schaefer, A. Medaglia, and M. Sánchez-Silva. "Resilience Optimization and the Stochastic Interdependent Network Design Problem." *European Journal of Operations Research*, pending submission.
- Lu, L., E. Lopez, L. Dueñas-Osorio, L. Stadler, Y. Xie, P.J.J. Alvarez, Q. Li, (2019). "Decentralized Direct Potable Water Reuse: The Importance of System Configuration." *Nature Sustainability*, in review.
- Paredes, R. and L. Dueñas-Osorio. "Discussion of 'Probability Propagation Method for Reliability Assessment of Acyclic Directed Networks.'" *Journal of Risk and Uncertainty in Engineering Systems*, pending submission.
- Paredes, R. and L. Dueñas-Osorio. "The Stochastic State Space Partition Method for Highly Reliable Networks." *Reliability Engineering and System Safety*, pending submission.
- Sundar, B., R. Paredes, D. T. Damanik, L. Dueñas-Osorio, and K. R. A. Hazzard, (2019). "A Quantum Algorithm to Count Weighted Ground States of Classical Spin Hamiltonians." *ArXiv:1908.01745* [Quant-Ph], August. <http://arxiv.org/abs/1908.01745>. *Quantum Science and Engineering*, in review.
- Talebian., H., and L. Dueñas-Osorio. "Congestion and Observability across Interdependent Power and Telecommunication Networks under Seismic Hazards." *Earthquake Spectra*, pending submission.
- Talebian., H., A. Gonzalez, J. Wu, L. Dueñas-Osorio, and J. Baker. "Interdependent Infrastructure Network of Shelby County, TN: Database." *Earthquake Spectra*, pending submission.
- Vishnu, N., J.E. Padgett, and L. Dueñas-Osorio. "Risk-Based Bridge Component Importance Measures under Seismic Loads." *Earthquake Spectra*, pending submission.

Published Papers

- Matheny, M.H., J. Emenheiser, W. Fon, A. Chapman, A. Salova, M. Rohden, J. Li, M.H. de Bady, M. Posfai, L. Dueñas-Osorio, M. Mesbahi, J.P. Crutchfield, M.C. Cross, R. D'Souza, and M.

- Roukes, (2019). "Exotic States in a Simple Network of Nanoelectromechanical Oscillators." *Science* 363 (6431): eaav7932.
- Paredes, R., L. Dueñas-Osorio, K.S. Meel, and M.Y. Vardi, (2019). "Principled Network Reliability Approximation: A Counting-Based Approach." *Reliability Engineering & System Safety*, Early view: DOI:10.1016/j.res.2019.04.025.
- Smith, A., M. Pósfai, M. Rohden, A. González, L. Dueñas-Osorio, and R. D'Souza, (2019). "Competitive Percolation Strategies for Network Recovery." *Scientific Reports*, 9(1): 1–12.
- Talebiyan, H. and L. Dueñas-Osorio, (2019). "Decentralized Decision-Making for the Restoration of Interdependent Networks." *Journal of Risk and Uncertainty in Engineering Systems*, Accepted for publication.
- Azzolin, A., L. Dueñas-Osorio, F. Cadini, and E. Zio, (2018). "Electrical and Topological Drivers of the Cascading Failure Dynamics in Power Transmission Networks." *Reliability Engineering & System Safety*, 175 (July): 196–206.
- Dueñas-Osorio, L., D. Subramanian, and R.M. Stein, (2018). "This Way Out." *Scientific American*, 319 (4): 74–79.
- Dueñas-Osorio, L., M.Y. Vardi, and J. Rojo, (2018). "Quantum-Inspired Boolean States for Bounding Engineering Network Reliability Assessment." *Structural Safety*, 75 (November): 110–18.
- Li, J., C. Shi, C. Chen, and L. Dueñas-Osorio, (2018). "A Cascading Failure Model Based on AC Optimal Power Flow: Case Study." *Physica A: Statistical Mechanics and Its Applications*, 508 (October): 313–23.
- Paredes, R., L. Dueñas-Osorio, and I. Hernandez-Fajardo, (2018). "Decomposition Algorithms for System Reliability Estimation with Applications to Interdependent Lifeline Networks." *Earthquake Engineering & Structural Dynamics*, 47 (13): 2581–2600.
- González, A., A. Chapman, L. Dueñas-Osorio, M. Mesbahi, and R. D'Souza, (2017). "Efficient Infrastructure Restoration Strategies using the Recovery Operator." *Computer-Aided Civil and Infrastructure Engineering*, 32 (12): 991–1006.
- Li, J., L. Dueñas-Osorio, C. Chen, and C. Shi, (2017). "AC Power Flow Importance Measures Considering Multi-Element Failures." *Reliability Engineering & System Safety*, 160 (April): 89–97.
- Smith, A., A. González, L. Dueñas-Osorio, and R. D'Souza, (2017). "Interdependent Network Recovery Games." *Risk Analysis*, October.
- Torres, J., L. Dueñas-Osorio, Q. Li, and A. Yazdani, (2017). "Exploring Topological Effects on Water Distribution System Performance Using Graph Theory and Statistical Models." *Journal of Water Resources Planning and Management*, 143 (1).
- Zodrow, K.R., Q. Li, R.M. Buono, W. Chen, G.T. Daigger, L. Dueñas-Osorio, M. Elimelech, X. Huang, G. Jiang, J.-H. Kim, B.E. Logan, D.L. Sedlak, P. Westerhoff, and P.J.J. Alvarez, (2017). "Advanced Materials, Technologies and Complex Systems Analyses: Emerging Opportunities to Enhance Urban Water Security." *Environmental Science & Technology*, 51 (18): 10274–81.
- Ghosn, M., L. Dueñas-Osorio, D. Frangopol, T. McAllister, P. Bocchini, L. Manuel, B. Ellingwood, S. Arangio, F. Bontempi, M. Shah, M. Akiyama, F. Biondini, S. Hernandez, and G. Tsiatas, (2016). "Performance Indicators for Structural Systems and Infrastructure Networks." *Journal of Structural Engineering*, 142(9): F4016003.
- González, A.D., L. Dueñas-Osorio, M. Sánchez-Silva, and A.L. Medaglia, (2016). "The Interdependent Network Design Problem for Optimal Infrastructure System Restoration." *Computer-Aided Civil and Infrastructure Engineering*, 31(5): 334–50.

- Krishnamurthy, V., A. Kwasinski, and L. Dueñas-Osorio, (2016). "Comparison of Power and Telecommunications Dependencies and Interdependencies in the 2011 Tohoku and 2010 Maule Earthquakes." *Journal of Infrastructure Systems*, 22(3): 4016013.
- Li, J., L. Dueñas-Osorio, C. Chen, B. Berryhill, and A. Yazdani, (2016). "Characterizing the Topological and Controllability Features of U.S. Power Transmission Networks." *Physica A: Statistical Mechanics and Its Applications*, 453(July): 84–98.
- Li, J., L. Dueñas-Osorio, C. Chen, and C. Shi, (2016). "Connectivity Reliability and Topological Controllability of Infrastructure Networks: A Comparative Assessment." *Reliability Engineering & System Safety*, 156 (December): 24–33.
- Mensah, A. and L. Dueñas-Osorio, (2016). "Efficient Resilience Assessment Framework for Electric Power Systems Affected by Hurricane Events." *Journal of Structural Engineering*, 142(8): C4015013.
- Siraj, T., S. Tesfamariam, and L. Dueñas-Osorio, (2015). "Seismic Risk Assessment of High-Voltage Transformers Using Bayesian Belief Networks." *Structure and Infrastructure Engineering*, 11(7): 929–43.
- Wang, Z., L. Dueñas-Osorio, and J.E. Padgett, (2015). "A New Mutually Reinforcing Network Node and Link Ranking Algorithm." *Scientific Reports*, 5(October): 15141.
- Ghosh, J., K. Rokneddin, J.E. Padgett, and L. Dueñas-Osorio, (2014). "Seismic Reliability Assessment of Aging Highway Bridge Networks with Field Instrumentation Data and Correlated Failures, I: Methodology." *Earthquake Spectra*, 30(2): 795–817.
- Gómez, C., M. Sánchez-Silva, and L. Dueñas-Osorio, (2014). "An applied complex systems framework for risk-based decision-making in infrastructure engineering." *Structural Safety*, 50: 66-77.
- Mensah, A.F. and L. Dueñas-Osorio, (2014). "Improved Reliability of Wind Turbine Towers with Tuned Liquid Column Dampers (TLCDs)." *Structural Safety*, 47: 78–86.
- Ouyang, M. and L. Dueñas-Osorio, (2014). "Multi-Dimensional Hurricane Resilience Assessment of Electric Power Systems." *Structural Safety*, 48(May): 15–24.
- Reséndez de Lozano, L., L. Dueñas-Osorio, and J.E. Padgett, (2014). "The Social Sustainability Index for Small Infrastructure Projects: A Proposition." *The International Journal of Social Sustainability in Economic, Social and Cultural Context*, 11(1): 25–38.
- Rokneddin, K., J. Ghosh, L. Dueñas-Osorio, and J.E. Padgett, (2014). "Seismic Reliability Assessment of Aging Highway Bridge Networks with Field Instrumentation Data and Correlated Failures, II: Application." *Earthquake Spectra*, 30(2): 819–843.
- Stein, R., B. Buzcu-Guven, L. Dueñas-Osorio, and D. Subramanian, (2014). "The Private and Social Benefits of Preparing For Natural Disasters." *International Journal of Mass Emergencies and Disasters*, 32(3): 459-483.
- Subramanian, D., J. Salazar, L. Dueñas-Osorio, and R. Stein, (2014). "Building and Validating Geographically Refined Hurricane Wind Risk Models for Residential Structures." *Natural Hazards Review*, 15(3): 04014002.
- Wang, Z., L. Dueñas-Osorio, and J.E. Padgett, (2014). "Influence of Scour Effects on the Seismic Response of Reinforced Concrete Bridges." *Engineering Structures*, 76 (October): 202–14.
- Wang, Z., L. Dueñas-Osorio, and J.E. Padgett, (2014). "Influence of Soil-Structure Interaction and Liquefaction on the Isolation Efficiency of a Typical Multispan Continuous Steel Girder Bridge." *Journal of Bridge Engineering*, 19 (8): A4014001.
- Wang, Z., J.E. Padgett, and L. Dueñas-Osorio, (2014). "Risk-Consistent Calibration of Load Factors for the Design of Reinforced Concrete Bridges under the Combined Effects of Earthquake and Scour Hazards." *Engineering Structures*, 79 (November): 86–95.

- Wang, Z., J.E. Padgett, and L. Dueñas-Osorio, (2014). "Toward a Uniform Seismic Risk Design of Reinforced Concrete Bridges: A Displacement-Based Approach." *Structural Safety*, 50 (September): 103–12.
- Christian, J., L. Dueñas-Osorio, A. Teague, Z. Fang, and P. Bedient, (2013). "Uncertainty in Floodplain Delineation: Expression of Flood Hazard and Risk in a Gulf Coast Watershed." *Hydrological Processes*, 27(19): 2774-2784.
- Ghosh, J., J.E. Padgett, and L. Dueñas-Osorio, (2013). "Surrogate Modeling and Failure Surface Visualization for Efficient Seismic Vulnerability Assessment of Highway Bridges." *Probabilistic Engineering Mechanics*, 34 (October): 189–99.
- Gómez, C., M. Sánchez-Silva, L. Dueñas-Osorio, and D. Rosowsky, (2013). "Hierarchical Infrastructure Network Representation Methods for Risk-Based Decision-Making." *Structure and Infrastructure Engineering*, 9(3): 260-274.
- Hernández-Fajardo, I. and L. Dueñas-Osorio, (2013). "Probabilistic Study of Cascading Failures in Complex Interdependent Lifeline Systems." *Reliability Engineering and System Safety*, 111: 260-272.
- Padgett, J.E., J. Ghosh, and L. Dueñas-Osorio, (2013). "Effects of Liquefiable Soil and Bridge Modeling Parameters on the Seismic Reliability of Critical Structural Components." *Structure and Infrastructure Engineering*, 9(1): 59-77.
- Rokneddin, K., J. Ghosh, L. Dueñas-Osorio, and J.E. Padgett, (2013). "Bridge Retrofit Prioritisation for Ageing Transportation Networks Subject to Seismic Hazards." *Structure and Infrastructure Engineering*, 9(10): 1050–66.
- Stein, R., B. Buzcu-Guven, L. Dueñas-Osorio, D. Subramanian, and D. Kahle (2013). "How Risk Perceptions Influence Evacuations from Hurricanes and Compliance with Government Directives." *Policy Studies Journal*, 41(2): 319-342.
- Wang, Z., L. Dueñas-Osorio, and J.E. Padgett, (2013). "Seismic Response of a Bridge-Soil-Foundation System under the Combined Effect of Vertical and Horizontal Ground Motions." *Earthquake Engineering and Structural Dynamics*, 42(4): 545-564.
- Wang, Z., J.E. Padgett, and L. Dueñas-Osorio, (2013). "Influence of Vertical Ground Motions on the Seismic Fragility Modeling of a Bridge-Soil-Foundation System." *Earthquake Spectra*, 29(3): 937–62.
- ⊗Wu, J., and L. Dueñas-Osorio, (2013). "Calibration and Validation of a Seismic Damage Propagation Model for Interdependent Infrastructure Systems." *Earthquake Spectra*, 29(3): 1021–41.
⊗**Best paper award.**
- Yazdani, A., L. Dueñas-Osorio, and Q. Li, (2013). "A Scoring Mechanism for the Rank Aggregation of Network Robustness." *Communications in Nonlinear Science and Numerical Simulation*, 18(10): 2722–32.
- Dueñas-Osorio, L., and A. Kwasinski, (2012). "Quantification of Lifeline System Interdependencies after the 27 February 2010 M_w 8.8 Offshore Maule, Chile Earthquake." *Earthquake Spectra*, 28(S1): S581-S603.
- Dueñas-Osorio, L., B. Buzcu-Guven, R. Stein, and D. Subramanian, (2012). "Engineering-Based Hurricane Risk Estimates and Comparison to Perceived Risks in Storm-Prone Areas." *Natural Hazards Review*, 13(1): 1-12.
- Mensah, A., and L. Dueñas-Osorio, (2012). "A Closed-Form Technique for the Reliability and Risk Assessment of Wind Turbine Systems." *Energies*, 5: 1734-1750.
- Ouyang, M., and L. Dueñas-Osorio, (2012). "Time-Dependent Resilience Assessment and Improvement of Urban Infrastructure Systems." *Chaos*, 22(3), 033122, 11p.

- Ouyang, M., L. Dueñas-Osorio, and X. Min, (2012). "A Three-Stage Resilience Analysis Framework for Urban Infrastructure Systems." *Structural Safety*, 36-37: 23-31.
- Seo, J., L. Dueñas-Osorio, J. I. Craig, and B. J. Goodno, (2012). "Metamodel-Based Regional Vulnerability Estimates of Irregular Steel Moment-Frame Structures Subjected to Earthquake Events." *Engineering Structures*, 45: 585-597.
- Aygun, B., L. Dueñas-Osorio, J. Padgett, and R. DesRoches, (2011). "Efficient longitudinal seismic fragility assessment of a multi-span continuous steel bridge on liquefiable soils." *Journal of Bridge Engineering*, 16(1): 93-107.
- Dueñas-Osorio, L. and J. Padgett, (2011). "Seismic reliability assessment of bridges with user-defined system failure events." *Journal of Engineering Mechanics*, 137(10): 680-690.
- Dueñas-Osorio, L. and J. Rojo, (2011). "Reliability assessment of lifeline systems with radial topology." *Computer-Aided Civil and Infrastructure Engineering*, 26(2): 111-128.
- Gómez, C., J. Buriticá, M. Sánchez-Silva, and L. Dueñas-Osorio, (2011). "Optimization-based decision-making for complex networks in disastrous events." *International Journal of Risk Assessment and Management*, 15(5/6): 417-436.
- Hernández, I. and L. Dueñas-Osorio, (2011). "Sequential propagation of seismic fragility across interdependent lifeline systems." *Earthquake Spectra*, 27(1): 23-43.
- Ouyang, M., and L. Dueñas-Osorio, (2011). "An approach to design interface topologies across interdependent urban infrastructure systems." *Reliability Engineering and System Safety*, 96(11): 1462-1473.
- Ouyang, M., and L. Dueñas-Osorio, (2011). "Efficient approach to compute generalized interdependent effects between infrastructure systems." *Journal of Computing in Civil Engineering*, 25(5): 394-406.
- Winkler, J., L. Dueñas-Osorio, R. Stein, and D. Subramanian, (2011). "Interface network models for complex urban infrastructure systems." *Journal of Infrastructure Systems*, 17(4): 138-150.
- Stein, R., L. Dueñas-Osorio, and D. Subramanian, (2010). "Who evacuates when hurricanes approach? The role of risk, information, and location." *Social Science Quarterly*, 91(3): 816-834.
- Winkler, J., L. Dueñas-Osorio, R. Stein, and D. Subramanian, (2010). "Performance assessment of topologically diverse power systems subjected to hurricane events." *Reliability Engineering and System Safety*, 95(4): 323-336.
- Dueñas-Osorio, L., and S. M. Vemuru, (2009). "Cascading failures in complex infrastructure systems." *Structural Safety*, 31(2): 157-167.
- Dueñas-Osorio, L., and B. Basu, (2008). "Unavailability of wind turbines due to wind-induced accelerations." *Engineering Structures*, 30(4): 885-893.
- Dueñas-Osorio, L., J. I. Craig, and B. J. Goodno, (2007). "Seismic response of critical interdependent networks." *Earthquake Engineering and Structural Dynamics*, 36(2): 285-306.
- Dueñas-Osorio, L., J. I. Craig, B. J. Goodno, and A. Bostrom, (2007). "Interdependent response of networked systems." *Journal of Infrastructure Systems*, 13(3): 185-194.
- Dueñas-Osorio, L., J. Park, P. Towashiraporn, J. I. Craig, B. J. Goodno, A. Bostrom, and D. Frost, (2004). "Fragility reduction using passive response modification in a Consequence Based

Engineering (CBE) framework.” *International Journal of Structural Engineering and Mechanics (JSEM)*, 17(3-4), 11p.

Dueñas-Osorio, L., (2001). In Spanish: “Aislamiento de cimentaciones para mejorar la respuesta sísmica de estructuras.” *Revista de la Universidad de La Salle*, 22(32): 51-61. Bogotá, Colombia: Unisalle.

Dueñas-Osorio, L., (2001). In Spanish: “Control activo: innovación en el control del movimiento sísmico de las edificaciones.” *Revista Noticreto*, 61: 70-74. Bogotá, Colombia: Asociación Colombiana de Productores de Concreto (ASOCRETO).

Conference Papers (* denotes presenter)

Fu, B.* and L. Dueñas-Osorio, (2019). “Recovery of infrastructure networks via importance-based multicentric percolation processes.” *13th international conference on applications of statistics and probability in civil engineering (ICASP13)*, May 26-30, Seoul, South Korea.

Paredes, R., L. Dueñas-Osorio*, K.S. Meel, and M.Y. Vardi, (2019). “A weighted model counting approach for critical infrastructure reliability.” *13th international conference on applications of statistics and probability in civil engineering (ICASP13)*, May 26-30, Seoul, South Korea.

Talebiyan, H. and L. Dueñas-Osorio, (2019). “Probabilistic assessment of decentralized decision-making for interdependent network restoration.” *13th international conference on applications of statistics and probability in civil engineering (ICASP13)*, May 26-30, Seoul, South Korea. Presented by B. Fu*

González, A.D.*, M. Sánchez-Silva, L. Dueñas-Osorio, A. Medaglia, (2018). “Beyond the Interdependent Network Design Problem.” *6th International Symposium on Reliability Engineering and Risk Management (ISRERM)*, May 31-June 1, Singapore.

Chapman, A.*, A. González, M. Mesbahi, L. Dueñas-Osorio, and R. D’Souza, (2018). “Data-guided Control: Clustering, Graph Products, and Decentralized Control.” *56th IEEE Conference on Decision and Control*, December 12-15, Melbourne, Australia, pp. 493-98.

Dueñas-Osorio, L., K.S. Meel, R. Paredes*, and M.Y. Vardi, (2017). “Counting-Based Reliability Estimation for Power-Transmission Grids.” *31st Annual Conference of the Association for the Advancement of Artificial Intelligence (AAAI)*, February 4-9, San Francisco, CA, USA, p. 4488.

Fu, B.*, and L. Dueñas-Osorio, (2017). “Improvement of a fully polynomial randomized approximation scheme (FPRAS) for infrastructure system reliability assessment.” *12th International Conference on Structural Safety and Reliability (ICOSSAR 2017)*, August 6-10, Vienna, Austria.

Gonzalez, A., L. Dueñas-Osorio*, M. Sanchez-Silva, A. Medaglia, and A. Schaefer, (2017). “Optimizing the Resilience of Infrastructure Systems under Uncertainty using the Interdependent Network Design Problem.” *12th International Conference on Structural Safety and Reliability (ICOSSAR 2017)*, August 6-10, Vienna, Austria.

Ghosh, J.*, J.E. Padgett, and L. Dueñas-Osorio, (2017). “Differential Impact of Input Parameter Uncertainties on the Seismic Fragility of Highway Bridge Components.” *12th International Conference on Structural Safety and Reliability (ICOSSAR 2017)*, August 6-10, Vienna, Austria.

Paredes, R.* and L. Dueñas-Osorio, (2017). “Reliability Assessment of Interdependent Lifeline Systems (RAILS) and Systemic Importance Measures Using a Non-Simulation Method.” *12th International Conference on Structural Safety and Reliability (ICOSSAR 2017)*, August 6-10, Vienna, Austria.

Rokneddin, K., J. Ghosh*, L. Dueñas-Osorio, and J.E. Padgett, (2017). “Surrogate Models for Highway Bridge Networks and the Impact of their Uncertainty on Seismic Risk Estimates.” *12th*

International Conference on Structural Safety and Reliability (ICOSSAR 2017), August 6-10, Vienna, Austria.

⊗González, A. D.*, L. Dueñas-Osorio, A. Medaglia, and M. Sánchez-Silva, (2016). "The time-dependent interdependent network design problem (td-INDP) and the evaluation of multi-system recovery strategies in polynomial time." *6th Asian-Pacific Symposium on Structural Reliability and its Applications (APSSRA6)*, May 28-30, Shanghai, China.

⊗*Best paper award*

Gómez, C.*, M. Sánchez-Silva, L. Dueñas-Osorio, (2015). "Resource allocation and uncertainty when modeling infrastructure networks as socio-technical systems." *12th international conference on applications of statistics and probability in civil engineering (ICASP12)*, July 12-15, Vancouver, Canada.

González, A.D.*, L. Dueñas-Osorio, M. Sánchez-Silva, and A. Medaglia, (2015). "The Computational Complexity of Probabilistic Interdependent Network Design Problems." *12th international conference on applications of statistics and probability in civil engineering (ICASP12)*, July 12-15, Vancouver, Canada.

Li, J.*, L. Dueñas-Osorio, and C. Chen, (2015). "Reliability and controllability of infrastructure networks: Do they match?" *12th international conference on applications of statistics and probability in civil engineering (ICASP12)*, July 12-15, Vancouver, Canada.

Mensah, A.F.* and L. Dueñas-Osorio, (2015). "A data fusion probabilistic model for hurricane-induced outages in electric power grids." *12th international conference on applications of statistics and probability in civil engineering (ICASP12)*, July 12-15, Vancouver, Canada.

Paredes, R.* and L. Dueñas-Osorio, (2015). "A time-dependent seismic resilience analysis approach for networked lifelines." *12th international conference on applications of statistics and probability in civil engineering (ICASP12)*, July 12-15, Vancouver, Canada.

Rokneddin, K.*, J. Ghosh, L. Dueñas-Osorio, and J. E. Padgett, (2015). "Uncertainty propagation in seismic reliability evaluation of aging transportation networks." *12th international conference on applications of statistics and probability in civil engineering (ICASP12)*, July 12-15, Vancouver, Canada.

González, A.D.*, M. Sánchez-Silva, L. Dueñas-Osorio, and A. Medaglia, (2014). "Mitigation Strategies for Lifeline Systems Based on the Interdependent Network Design Problem." *2nd International Conference on Vulnerability and Risk Analysis and Management (ICVRAM) and the 6th International Symposium on Uncertainty, Modeling, and Analysis (ISUMA)*, July 13-16, Liverpool, UK, pp. 762–771.

Mensah, A.F.* and L. Dueñas-Osorio, (2014). "Outage Predictions of Electric Power Systems under Hurricane Winds by Bayesian Networks." *13th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, Durham, UK, July 7-10.

Paredes-Toro R.*, L. Dueñas-Osorio, and G.P. Cimellaro, (2014). "Uncovering the heterogeneity of spatial lifeline system interdependencies." *10th National Conference in Earthquake Engineering (10NCEE): Frontiers of Earthquake Engineering*, Anchorage, Alaska, USA, July 21-25.

Tang, A. K., J. Li*, and L. Dueñas-Osorio, (2014). "Lifeline System Interdependencies —Key for Resilience in Practice." *2nd International Conference on Vulnerability and Risk Analysis and Management (ICVRAM) and the 6th International Symposium on Uncertainty, Modeling, and Analysis (ISUMA)*, Liverpool, UK, July 13-16.

- Wang, Z, L. Dueñas-Osorio, and J. E. Padgett*, (2014). "Risk-Based Combination of Earthquake and Scour Hazards for the Design of Reinforced Concrete Bridges." *6th international conference on bridge maintenance, safety and management (IABMAS 2014)*, Shanghai, China, July 7-11. London: CRC Press, pp. 732–39.
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- Talebiyan, H.* and L. Duenas-Osorio. "Multi-agent decision-making for interdependent network restoration via decentralized optimization." *Annual Conference of the Institute of Industrial and Systems Engineers (IISE)*, Orlando, FL, USA, May 19-22, 2018.
- Fu, B.*, and L. Dueñas-Osorio. "An adaptive-biased Fully Polynomial Randomized Approximation Scheme for infrastructure systems reliability assessment." *International School and Conference on Network Science (NetSci)*, Indianapolis, Indiana, June 19-23, 2017.
- González, A. D.*, L. Dueñas-Osorio, A. Medaglia, M. Sánchez-Silva, and A. Schaefer. "Optimizing the Resilience of Interdependent Infrastructure Networks under Pre-and Post-event Uncertainty." *Annual meeting of the Institute for Operations Research and the Management Sciences (INFORMS)*, Houston, Texas, October 22-25, 2017.
- Paredes, R.*, L. Dueñas-Osorio, K. Meel, and M. Vardi. "Network Reliability Estimation: Latest Methods and Benchmarks for a Hard Computational Problem." *Rice 2017 Data Science Conference*, Houston, Texas, October 9-10, 2017.
- Vishnu, N.*, J. E. Padgett, and L. Dueñas-Osorio. "Risk-informed bridge component importance measures under seismic loads." *Annual Meeting of the Earthquake Engineering and Research Institute (EERI)*, Portland, Oregon, March 7-10, 2017.
- González, A. D.*, L. Dueñas-Osorio, M. Sánchez-Silva, and A. Medaglia. "A hybrid algorithm to solve the time-dependent Interdependent Network Design Problem." *Probabilistic Mechanics & Reliability Conference*, Nashville, Tennessee, May 22-25, 2016.
- González, A. D.*, L. Dueñas-Osorio, A. Medaglia, M. Sánchez-Silva, and A. Schaefer. "The Stochastic Interdependent Network Design Problem." *Annual meeting of the Institute for Operations Research and the Management Sciences (INFORMS)*, Nashville, Tennessee, November 15th, 2016.
- Paredes, R.*, L. Dueñas-Osorio, K. Meel, and M. Vardi. "A New Strongly Probably Approximately Correct (SPAC) Method For Network Reliability." *Symposium on Probabilistic Modeling in Engineering and Science*, Lehigh University, Bethlehem, Pennsylvania, October 31st, 2016.
- González, A. D.*, L. Dueñas-Osorio, A. Medaglia, and M. Sánchez-Silva. "Efficient resilience optimization of interdependent networks." *Annual meeting of the Institute for Operations Research and the Management Sciences (INFORMS)*, Philadelphia, Pennsylvania, November 1-4, 2015.
- González, A. D.*, L. Dueñas-Osorio, M. Sánchez-Silva, and A. Medaglia. "Recovery Dynamics based on the simultaneous use of System Identification and the Interdependent Network Design Problem." *Workshop on Information Engines and Control of Interdependent Networks*. Santa Fe, NM, June 23-26, 2015.
- González, A. D.*, L. Dueñas-Osorio, A. Medaglia, and M. Sánchez-Silva. "Resilience Optimization as an Interdependent Network Design Problem." *MPE 2013+ Workshop on Natural Disasters*, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS). Atlanta, GA, May 13-15, 2015.

- Mensah, A.* , and L. Dueñas-Osorio. "Resilience Assessment for Electric Power Systems in Hurricane-Prone Regions." *Structures Congress*, ASCE Structural Engineering Institute (SEI), Portland, Oregon, April 24th, 2015.
- Paredes, R.* , and L. Dueñas-Osorio. "Spatio-Temporal Simulation and Quantification of Lifeline Interdependencies." *67th Annual Meeting of the Earthquake Engineering Research Institute (EERI)*, Boston, Massachusetts, March 31st-April 3rd 2015.
- Dueñas-Osorio, L.* "Resilience-Based Design and Reconnaissance Principles for Structures and Infrastructures." *Structures Congress*, ASCE Structural Engineering Institute (SEI), Boston, Massachusetts, April 4th, 2014.
- González, A. D.* , L. Dueñas-Osorio, A. Medaglia, and M. Sánchez-Silva. "Improving the Computational Efficiency of the Interdependent Network Design Problem MIP Model." *Annual meeting of the Institute for Operations Research and the Management Sciences (INFORMS)*, San Francisco, California, November 9-12, 2014.
- Li, J.* , and L. Dueñas-Osorio. "Characterizing the Topological Controllability Conditions of U. S. Power Transmission Networks." *International School and Conference on Network Science (NetSci)*, Berkeley, California, June 2-6, 2014.
- Wang, Z.* , J.E. Padgett, and L. Dueñas-Osorio. "Closed-form Time-dependent Life-cycle Risk and Life-cycle Cost Analyses." *Structures Congress*, ASCE Structural Engineering Institute (SEI), Boston, Massachusetts, April 3-5, 2014.
- Dueñas-Osorio, L.* , D. Subramanian, B. Stein, and B. Guven. "Assessing and Communicating Hurricane Risk to Houston Residents." *Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED) Conference*, Houston, Texas, September 24-25, 2013.
- Ghosh, J.* , J.E. Padgett, and L. Dueñas-Osorio. "Efficient seismic vulnerability assessment of aging highway bridges using multi-dimensional fragility models." *Annual Meeting of the Earthquake Engineering Research Institute*, Seattle, Washington, February 12-15, 2013.
- Gomez, C.* , M. Sánchez-Silva, and L. Dueñas-Osorio. "Life Cycle Analysis of Infrastructure Networks through a Complex Distributed Agent Network framework." *Engineering Mechanics Institute Conference*, Evanston, Illinois, August 5th, 2013.
- González, A. D.* , L. Dueñas-Osorio, A. Medaglia, M. Sánchez-Silva, and C. Gomez. "The Interdependent Network Design Problem applied to Infrastructure Recovery." *Annual meeting of the Institute for Operations Research and the Management Sciences (INFORMS)*, Minneapolis, Minnesota, October 6-9, 2013.
- Guven, B.* , L. Dueñas-Osorio, R. Stein, D. Subramanian, J. Salazar, and A. Mensah. "The influence of source information and messaging on responses to hurricanes and a new hurricane risk information system for Houston, Texas." *38th Annual Natural Hazards Research and Applications Workshop*, Broomfield, Colorado, July 13-16, 2013.
- Guven, B.* , R. Stein, L. Dueñas-Osorio, and D. Subramanian. "The efficacy of preparing for natural disasters." *National Hurricane Conference*, New Orleans, Louisiana, March 27th, 2013.
- Rokneddin, K.* , L. Dueñas-Osorio, and J. Padgett. "Ranking Bridge Criticalities in Seismic Risk Assessment of Highway Bridge Networks." *Engineering Mechanics Institute Conference*, Evanston, Illinois, August 5th, 2013.

- Wang, Z.*, J.E. Padgett, and L. Dueñas-Osorio. "Toward a uniform risk design philosophy: Quantification of uncertainties for highway bridge portfolios." *7th National Seismic Conference on Bridges and Highways*, Oakland, California, May 20-22, 2013.
- Castiblanco, D.*, C. Gómez, M. Faber, M. Sánchez-Silva, and L. Dueñas-Osorio. "Organizational issues in decision-making for temporary activities of transportation infrastructure systems." *Sixth international forum of engineering decision making (IFED)*, Lake Louise, Alberta, Canada, January 26-29, 2012.
- Dueñas-Osorio, L.*, M. Ouyang, D. Subramanian, R. Stein, and B. Guven. "Probabilistic response and resilience assessment model for power systems under hurricane hazards." *ATC and SEI advances in hurricane engineering conference*, Miami, Florida, USA, October 24-26, 2012.
- Guven, B.*, L. Dueñas-Osorio, R. Stein, D. Subramanian, and J. Salazar. "The new Rice University and City of Houston online storm risk calculator." *Gulf Coast hurricanes: mitigation and response conference*, Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED), Houston, Texas, USA, April 10-11, 2012.
- Guven, B.*, L. Dueñas-Osorio, R. Stein, D. Subramanian, J. Salazar, and D. Kahle. "The storm risk calculator for the City of Houston." *National hurricane conference*, Orlando, Florida, USA, March 26-29, 2012.
- Guven, B.*, R. Stein, L. Dueñas-Osorio, D. Subramanian, and D. Kahle. "The influence of type and severity of perceived risk in predicting evacuations from hurricanes." *National evacuation conference*, New Orleans, Louisiana, USA, February 7-9, 2012.
- Mensah, A.* and L. Dueñas-Osorio. "Reliability-based design of a vibration control system for wind turbines." *WindPower 2012, conference and exhibition*, American Wind Energy Association (AWEA), Atlanta, Georgia, USA, June 3-6, 2012.
- Padgett, J. E., L. Dueñas-Osorio, J. Ghosh, and K. Rokneddin*. "IT-enabled continuous risk assessment of road networks for customized and actionable multi-hazard interventions." *Engineering transformation through partnerships*. NSF CMMI research and innovation conference, Boston, Massachusetts, USA, July 9-12, 2012.
- Reséndez, L.*, L. Dueñas-Osorio, and J. E. Padgett. "The social sustainability index for small infrastructure projects: A proposition." *Eight international conference of environmental, cultural, economic, and social sustainability*, Vancouver, British Columbia, Canada, January 10-12, 2012.
- Rokneddin, K.* and L. Dueñas-Osorio. "Evaluating the unconditional probability of exceeding network-level performances in highway bridge networks subject to seismic hazards." *Annual Meeting 2012, Society for Risk Analysis (SRA)*, San Francisco, California, USA, December 9-12, 2012.
- Wu, J.*, L. Dueñas-Osorio, and I. Hernández-Fajardo. "Probabilistic and statistical approaches to quantify interdependent lifeline network response to natural hazards." *Engineering transformation through partnerships*. NSF CMMI research and innovation conference, Boston, Massachusetts, USA, July 9-12, 2012.
- Yazdani, A.* L. Dueñas-Osorio, and Q. Li. "Quantifying uncertainty to support sustainable planning and management of water supply infrastructures." *Uncertainty quantification transition workshop*, Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle Park, North Carolina, USA, May 21-23, 2012.

- Christian, J.*, K. Rokneddin, M. Ouyang, and L. Dueñas-Osorio. "Water system reliability under hurricane impact considering electrical grid interdependency." *2011 annual meeting of the society for risk analysis (SRA)*, Charleston, South Carolina, USA, December 4–7, 2011.
- Dueñas-Osorio, L.* "Reliability assessment and design principles for smart interdependent infrastructure systems." *Engineering opening workshop of the 2011-12 program on uncertainty quantification*, Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle Park, North Carolina, USA, September 19-21, 2011.
- Dueñas-Osorio, L., B. Buzcu-Guven*, R. Stein, and D. Subramanian. "Mismatch between engineering-based hurricane risk estimates and perceived risks." *2011 National Hurricane Conference*, Atlanta, Georgia, USA, April 18-22, 2011.
- Dueñas-Osorio, L.*, and J. Padgett. "Resources-based bridge system reliability assessment." *Structures congress 2011: Don't gamble on your future*, ASCE Structural Engineering Institute (SEI), Las Vegas, Nevada, USA, April 14-16, 2011.
- Hernández-Fajardo, I.*, and L. Dueñas-Osorio. "Probabilistic study of cascading failures in complex interdependent lifeline systems." *Engineering for Sustainability and Prosperity*. NSF CMMI research and innovation conference, Atlanta, Georgia, USA, January 4-7, 2011.
- Kahle, D.*, L. Dueñas-Osorio, D. Subramanian, and R. Stein. "A comparison of hurricane-induced power outage models: Component versus statistical models." *2011 National Hurricane Conference*, Atlanta, Georgia, USA, April 18-22, 2011.
- Mensah, A.* and L. Dueñas-Osorio. "Reliability assessment of wind turbines subjected to normal winds and extreme events." *WindPower 2011, conference and exhibition*, American Wind Energy Association (AWEA), Anaheim, California, USA, May 22-25, 2011.
- Buriticá, J.*, C. Gómez, M. Sánchez-Silva, and L. Dueñas-Osorio. "Optimal resource allocation for disaster management." *Fifth international forum of engineering decision making (IFED)*, St. Gallen, Switzerland, December 7-11, 2010.
- Dueñas-Osorio, L.*, and B. Basu. "Acceleration-induced failure and risk assessment for wind turbines." *Structures congress 2010: Building a better tomorrow*, ASCE Structural Engineering Institute (SEI), Orlando, Florida, USA, May 12–14, 2010.
- Ouyang, M.*, and L. Dueñas-Osorio. "Resilience Assessment and Improvement of Urban Infrastructure Systems." *2010 annual meeting of the institute for operations research and management sciences (INFORMS)*, Austin, Texas, USA, November 7–10, 2010.
- Rokneddin, K.*, and L. Dueñas-Osorio. "Topological Bounds for Reliability Assessment of Large Lifeline Systems." *2010 annual meeting of the society for risk analysis (SRA)*, Salt Lake City, Utah, USA, December 5–8, 2010.
- Stein, R.*, L. Dueñas-Osorio, and D. Subramanian. "Who evacuates when hurricanes approach? The role of risk and information." *National evacuation conference*, New Orleans, Louisiana, USA, February 3-5, 2010.
- Dueñas-Osorio, L.*, R. Stein, and D. Subramanian. "Avoiding Disaster When Disaster Strikes: Planning for Evacuations." *Severe storm prediction and global climate impact in the Gulf Coast conference*, Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED), Houston, Texas, USA, October 29-31, 2008.

Invited Talks and Panels

- “Verifiable Reliability and Resilience Assessment for Complex Infrastructure Systems.” Seminar Speaker, **Princeton University**, Princeton, NJ, USA, November 6th, 2019.
- ⊗ “Computer-aided Reliability and Resilience Verification for Infrastructure Networks.” **13th international conference on applications of statistics and probability in civil engineering (ICASP13)**, Seoul, South Korea, May 29th, 2019.
⊗ *Keynote speaker.*
- “How Will Quantum Computing Impact Energy - and When?” Panelist, **Cambridge Energy Research Associates (CERA)**, Houston, TX, USA, March 13th, 2019.
- “Decentralized Reliability and Resilience for Infrastructure Networks.” **School of Industrial and Systems Engineering, University of Oklahoma**, Norman, OK, USA, December 10th, 2018.
- “Towards guaranteed reliability and resilience computation for complex networks.” **Center for Informatics and Computational Science, University of Notre Dame**, Notre Dame, IN, USA, November 14th, 2018.
- “After Cascades: Optimal Restoration Processes for Interdependent Networks.” **International Conference on Complex Systems, Workshop on Network Cascades: Unfolding, Modeling, and Control**, Boston, MA, USA, July 23rd, 2018.
- “Quantum Engineering.” **Army Research Laboratory (ARL) South – Rice Day**, Houston, TX, USA, April 26th, 2018.
- “An Algorithmic Lens for Infrastructure Performance Assessment.” **Department of Civil and Environmental Engineering, Rice University**, Houston, Texas, USA, September 29th, 2017.
- “From Reliability to Resilience-Based Analysis and Design of Engineered Infrastructure Systems.” **HNTB Corporation**, Houston, Texas, USA, July 11th, 2017.
- “Computing infrastructure performance metrics: From reliability to resilience to reliability!” **Department of Civil and Environmental Engineering, Carnegie Mellon University**, Pittsburgh, Pennsylvania, USA, December 2nd, 2016.
- “The Advent of Community Resilience: Can it be Quantified?” **Kinder Institute for Urban Research at Rice University**, Houston, Texas, USA, September 19th, 2016.
- “From Reliability to Resilience-Based Analysis and Design of Engineered Systems.” **Schlumberger Reliability and Maintainability Workshop**, Katy, Texas, USA, August 30th, 2016.
- “Measuring the Performance of Human-Technical Power Systems.” **Workshop on the Nature of Technological Transition and Innovation in the Electricity Industry, The Santa Fe Institute**, Santa Fe, New Mexico, USA, March 29-31, 2016.
- “Engineering infrastructure resilience through a computational and statistical lens.” **Department of Mathematics and Statistics, University of Nevada, Reno**, USA, October 8th, 2015.
- “Smart infrastructure networks as computable socio-technical systems.” **Reinventing the Grid: Designing Resilient, Adaptive and Creative Power Systems, The Santa Fe Institute**, Santa Fe, New Mexico, USA, April 12-17, 2015.

- “The computational challenge of assessing critical infrastructure performance.” **Computer-Aided Verification and Reasoning Group, Rice University**, Houston, Texas, USA, March 11th, 2015.
- “Performance and Restoration Assessment of Interdependent Infrastructure Systems Subjected to Seismic Hazards.” **Earthquake Engineering Research Institute (EERI), Rice University Chapter**, Houston, Texas, USA, October 16th, 2014.
- “Modeling the Reliability and Resilience of Interdependent Infrastructure Systems.” **Transmission Lines for the 21st Century, Centre for Energy Advancement through Technological Innovation (CEATI)**, Niagara Falls, Ontario, Canada, October 2-3, 2014.
- “Interdependencies of Lifeline Systems: Forum Synthesis.” **Forum on Lifeline Systems Challenges and Collaborations, Resilience Network, University of Canterbury**, Christchurch, New Zealand, December 6th, 2013.
- “Taming Complex Infrastructure Systems.” **New Professors Lectures Series, Rice University**, Houston, Texas, October 2nd 2013.
- “Performance and Restoration Assessment of Interdependent Infrastructure Systems.” **Civil and Environmental Engineering Seminar, Rensselaer Polytechnic Institute**, Troy, New York, September 18th, 2013.
- “Modeling and Analysis of Complex Infrastructure Systems.” **Workshop on Rethinking Network Science for Critical Infrastructure, MITRE Corporation**, McLean, Virginia, September 10th, 2013.
- “A Synthesis of the Effects of Interdependencies on the Seismic Risk Assessment of Infrastructure Systems.” **Workshop on Seismic Risk of Civil Infrastructures, Università degli Studi di Napoli Federico II and Università degli Studi di Roma La Sapienza**, Anacapri, Italy, June 9-10, 2013.
- “Quantification of Spatio-Temporal Interdependencies across Infrastructure Networks.” **Networks of Networks: Systemic Risk and Interdependencies, Annual Conference on Network Science**, Copenhagen, Denmark, June 4, 2013.
- “Complex systems pathways to risk-based decision support in infrastructure engineering.” **ETH Zurich Risk Center**, Zurich, Switzerland, December 18, 2012.
- “Understanding interdependent infrastructure systems: Modeling insights and practical challenges.” **Society for Hispanic Professional Engineers (SHPE)**, Fort Worth, Texas, USA, November 17, 2012.
- “The role of interdependencies in the probabilistic risk assessment of infrastructure systems.” **Networks of Networks: Systemic Risk and Infrastructural Interdependencies, Annual Conference on Network Science**, Evanston, Illinois, USA, June 19, 2012.
- “Probabilistic resilience assessment of critical infrastructures enabled by complex systems tools.” **The Santa Fe Institute, Power Grids as Complex Networks**, Santa Fe, New Mexico, USA, May 17-19, 2012.
- “Lifeline system interdependencies: Field observations and modeling challenges.” **Lifelines Council of the City and County of San Francisco**, San Francisco, California, USA, April 25, 2012.
- “Understanding interdependent infrastructure systems: Modeling challenges and practical applications.” **Northern California Chapter of the Earthquake Engineering Research Institute (EERI)**, San Francisco, California, USA, April 25, 2012.

- “Understanding interdependent infrastructure systems: Modeling insights and practical challenges.” **Earthquake Engineering Research Institute (EERI), Annual Meeting 2012**, Memphis, Tennessee, USA, April 12, 2012.
- “Dealing with critical infrastructure systems: Computation, theory, and challenges.” **Structural Engineering, Mechanics and Materials Seminar, Department of Civil and Environmental Engineering, Georgia Institute of Technology**, Atlanta, Georgia, USA, March 16, 2012.
- “Computationally efficient reliability assessment of smart utility systems with radial topology.” **Department of Computational and Applied Mathematics, Rice University**, Houston, Texas, USA, March 28, 2011.
- “Quantification of lifeline systems coupling strength.” **Workshop on Challenges and opportunities for lifeline systems engineering, Technical Council on Lifeline Earthquake Engineering (TCLEE) and the Earthquake Engineering Research Institute (EERI)**, San Diego, California, USA, February 9, 2011.
- In Spanish: “Confiabilidad de turbinas de viento ante aceleraciones estructurales.” **Facultad de Ingeniería Civil, Universidad Santo Tomas**, Tunja, Colombia, October 19, 2010.
- “Reliability assessment of power distribution systems for real-time decision making.” **Society for the Advancement of Chicanos and Native Americans (SACNAS)**, Anaheim, California, USA, October 1, 2010.
- “Climate change effects on infrastructure systems.” **The Keston Institute for Public Finance and infrastructure Policy at the University of Southern California**, Los Angeles, California, USA, February 25, 2010.
- “Complex Networks: The Key to Resilient Infrastructure Systems.” **Scientia Institute, Rice University**, Houston, Texas, USA, January 26, 2010.
- “Reliability of power systems and the human condition.” **Society for the Advancement of Chicanos and Native Americans (SACNAS)**, Dallas, Texas, USA, October 16, 2009.
- “The present and future of critical infrastructure systems in Houston, Texas.” **Glasscock School of Continuing Studies, Rice University**, Houston, Texas, USA, March 30, 2009.
- “Interdependencies across critical infrastructure systems: Power and telecommunication.” **Department of Electrical and Computer Engineering, Texas A&M University**, College Station, Texas, USA, March 24, 2009.
- “Utility system interdependencies and transportation networks.” **Pacific Earthquake Engineering Research (PEER) Center, University of California, Berkeley**, Berkeley, California, USA, March 18, 2009.
- “Quantification of perceived and objective risk discrepancies in hurricane prone areas.” **Hazard Reduction and Recovery Center, Texas A&M University**, College Station, Texas, USA, March 6, 2009.
- “Critical infrastructure cascades: Intradependence, interdependence, and socio-technical coupling.” **Disasters Roundtable, The National Academies**, Irvine, California, USA, February 26, 2009.
- “Research directions for the reliability and risk assessment of interdependent infrastructures.” **Workshop on the vulnerability of critical infrastructure systems with emphasis on power**

systems and dams, University of Wisconsin-Madison, Madison, Wisconsin, USA, January 14, 2009.

“Time-dependent tolerance of interdependent civil infrastructures to natural hazards and intentional disruptions.” **Department of Geography and Environmental Engineering, Johns Hopkins University**, Baltimore, Maryland, USA, December 3, 2008.

“Perceived and objective risk discrepancies among shadow evacuees.” **Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED) Conference**, Houston, Texas, USA, October 29, 2008.

“Quantification of perceived and objective risk discrepancies in hurricane prone areas.” **Department of Mechanical Engineering and Materials, Rice University**, Houston, Texas, USA, October 29, 2008.

“Perceived and objective risk discrepancies among shadow evacuees.” **Texas Hurricane Conference**, Galveston, Texas, USA, May 21, 2008.

“Leonardo da Vinci: contributions to systems engineering.” **Houston Museum of Natural Science**, Houston, Texas, USA, April 15, 2008.

“Unavailability of wind turbines from wind-induced accelerations.” **The Baker Institute for Public Policy, Rice University**, Texas offshore wind roundtable, Houston, Texas, USA, February 13, 2008.

In Spanish: “Tolerancia de las redes de infraestructura civil a desastres naturales y ataques malintencionados.” **Corporación Universitaria de la Costa**, Barranquilla, Colombia, November 9, 2007.

“Performance of critical infrastructure systems subjected to natural hazards and intentional disruptions.” **Computer and Information Technology Institute (CITI), Rice University**, Houston, Texas, USA, November 2, 2007.

“Risk assessment of complex infrastructures.” **Society for the Advancement of Chicanos and Native Americans (SACNAS)**, Kansas City, Missouri, USA, October 12, 2007.

“Interdependent response of urban infrastructures to natural and intentional hazards.” **Department of Civil Engineering, Purdue University**, West Lafayette, Indiana, USA, April 10, 2007.

“Tolerance of interdependent civil infrastructures to natural hazards and intentional disruptions.” **Department of Statistics, Rice University**, Houston, Texas, USA, September 25, 2006.

“Effects of soil liquefaction on the seismic vulnerability of highway bridges.” **Department of Civil and Environmental Engineering, Universidad de Los Andes**, Bogotá, Colombia, August 11, 2006.

“Reliability of electric power grids under low-frequency/high-consequence seismic hazards.” **Department of Civil and Environmental Engineering, Universidad de Los Andes**, Bogotá, Colombia, August 10, 2006.

“Review of seismic risk mitigation decisions under uncertainty, by Robin McGuire.” **NSF-Sponsored workshop on “Strategic directions for seismic risk modeling and decision support”**, Boulder, Colorado, USA, July 14-15, 2006.

“Response of interdependent civil infrastructures to natural hazards and intentional disruptions.” **Department of Civil and Environmental Engineering, Colorado State University**, Fort Collins, Colorado, USA, March 30, 2006.

“Interdependent response of critical infrastructures.” **Department of Civil and Environmental Engineering, University of California at Davis**, Davis, California, USA, February 16, 2006.

“Tolerance of interdependent civil infrastructures to natural hazards and intentional disruptions.” **Department of Civil and Environmental Engineering, Rice University**, Houston, Texas, USA, February 3, 2006.

“Interdependent response of networked systems to perturbations.” **School of Aerospace Engineering, Georgia Institute of Technology**, Atlanta, Georgia, USA, September 30, 2005.

“The performance of interacting infrastructures.” **California Institute for Energy and Environment**, Sacramento, California, USA, August 9, 2005.

“Tolerance of civil infrastructure networks to natural hazards and deliberate attacks.” **Department of Civil and Environmental Engineering, Universidad de Los Andes**, Bogotá, Colombia, May 11, 2005.

“Simulation of regional interdependent response for fragility characterization and real-time decision making.” **Department of Structural Engineering, University of California, San Diego**, La Jolla, California, USA, May 5, 2003.

“Seismic retrofit strategies for historical buildings.” **Colombian Society of Engineers**, Bogotá, Colombia, August 8, 2001.

“The rehabilitation of Mitchell Hall for seismic upgrade.” **University of Cambridge**, Cambridge, United Kingdom, January 26, 2001.

Honors and Awards

2017 IASSAR Early Achievement Research Award, 08/2017. Presented by the International Association for Structural Safety and Reliability (IASSAR) at the 12th international conference on structural safety and reliability (ICOSSAR), Vienna, Austria.

Wilson Tang Best Paper Award, 05/2016. Presented at the 6th Asia-Pacific Symposium on Structural Reliability and its Applications (APSSRA), Shanghai, China.

Outstanding Earthquake Spectra Paper of 2013, 04/2015. Presented at the 2015 annual meeting of the Earthquake Engineering Research Institute (EERI), Boston, Massachusetts.

2013 ASCE Outstanding Reviewer, 03/2014. American Society of Civil Engineers (ASCE), *Journal of Infrastructure Systems*, Reston, Virginia.

2010 ASCE Outstanding Reviewer, 01/2011. American Society of Civil Engineers (ASCE), *Journal of Bridge Engineering*, Reston, Virginia.

Faculty Early Career Development (CAREER) Award for Young Investigators, 03/2008. National Science Foundation (NSF), Arlington, Virginia.

Best Ph.D. Thesis Award, 03/06. Georgia Institute of Technology, School of Civil and Environmental Engineering, Atlanta, Georgia.

Winner of the SAIC 2005 Ph.D. Student Paper Competition, 4/05. Science Applications International Corporation (SAIC) and the Georgia Institute of Technology, Atlanta, Georgia.

Excellence of poster presentation in the 2005 Georgia Tech graduate research symposium, 4/05. Georgia Institute of Technology, Atlanta, Georgia.

Bill Schultz fellowship for graduate students, 8/04. Georgia Institute of Technology, Atlanta, Georgia.

Field mission fellowship to Japan, 7/04. National Science Foundation (NSF) Centers for Earthquake Engineering Research, Urbana-Champaign, Illinois.

Outstanding graduate teaching assistant, 5/04. Georgia Institute of Technology, Atlanta, Georgia.

Best poster award in the 3rd MAE Center research assistant symposium, 11/02. Mid-America Earthquake Center, Memphis, Tennessee.

Doctoral assistantship, 8/01. Georgia Institute of Technology, Atlanta, Georgia.

Scholarship for graduate program at MIT, 6/00. Association for the future of Colombia, COLFUTURO, Bogotá, Colombia.

Second ranked among graduating senior students in civil engineering, 12/96. Universidad de la Salle, Bogotá, Colombia.

Funded Research

National Science Foundation (NSF), “Developing Quantitative Modeling Tools for Design and Performance Assessment of Integrated Water Management Systems: a U.S. - China Joint Research Project in Environmental Sustainability,” 07/01/2017-**06/30/2021**, \$500,000. Q. Li, Rice University (P.I.), L. Duenas-Osorio, Rice University (Co-P.I.)

National Science Foundation (NSF), “CRISP Type 2: Collaborative Research: Simulation-Based Hypothesis Testing of Socio-Technical Community Resilience Using Distributed Optimization and Natural Language Processing,” 10/01/2015-**09/30/2020**, \$2,015,017 (\$517,968 Rice funds). S. Miles, U. Washington, Seattle (P.I.), L. Duenas-Osorio, Rice University (P.I.)

Rice University’s Creative Venture Funds, Inter-Disciplinary Excellence Award (IDEA), “A Pilot Study of Integrated Resource Management on Rice University Campus Towards Sustainable Urban Food, Energy and Water,” 01/15/19-**01/14/20**, \$75,000. Q. Li (PI), L. Duenas-Osorio (Co-PI).

Kinder Institute for Urban Research and the City of Houston, Houston Solutions Lab Program, “Scalable and Robust Prototype of Sensor Network for Real-Time Street-Level Flood Measurement,” 08/10/18-**08/31/19**, \$73,000. G. Woods (PI), L. Duenas-Osorio (Co-PI).

Rice University’s Creative Venture Funds, Inter-Disciplinary Excellence Award (IDEA), “Quantum Computing for Engineering Reliability: Theory and Experiments,” 08/15/18-**08/14/19**, \$73,000. L. Duenas-Osorio (PI).

Department of Defense (DoD), Army Research Office (ARO), “MURI: Predicting and controlling systems of interdependent networks: Exploiting interdependence for control,” 07/01/2013-**07/31/2019**, \$5,850,000 (\$530,429 Rice funds). R. D’Souza, U. C. Davis (P.I.), L. Duenas-Osorio, Rice University (Co-P.I.)

National Science Foundation (NSF), Collaborative Research: Unraveling the Limits of Computation in Structural and Infrastructure Engineering, 08/15/2014-**08/14/2018**, \$450,000 (\$270,000 Rice funds). L. Duenas-Osorio, Rice University (P.I.), J. Rojo, University of Nevada, Reno, (P.I.)

National Science Foundation (NSF), Prioritizing and selecting bridge management actions for heightened truck loads and natural hazards in light of funding allocation patterns, 08/15/12-08/14/16, \$400,000. J.E. Padgett, Rice University (P.I.), L. Duenas-Osorio, Rice University (Co-P.I.)

National Science Foundation (NSF), CAREER: Reliability assessment and risk mitigation principles for smart interdependent infrastructure systems, 04/01/08-03/30/14, \$413,710. L. Duenas-Osorio, Rice University (P.I.)

City of Houston, Development and Validation of the Online Storm Risk Calculator Tool for Public Usage, 01/01/11-07/31/13, \$388,466. L. Duenas-Osorio, Rice University (PI), R. Stein and D. Subramanian, Rice University (Co-P.I.)

National Science Foundation (NSF), IT-enabled continuous risk assessment of road networks for customized and actionable multi-hazard interventions, 08/01/09-07/31/12, \$386,683. J.E. Padgett, Rice University (P.I.), L. Duenas-Osorio, Rice University (Co-P.I.)

Shell Center for Sustainability, Sustainable Water infrastructure for improving public health protection, 01/01/10-06/30/12, \$43,968. Q. Li, Rice University (P.I.), L. Duenas-Osorio, Rice University (Co-P.I.)

National Science Foundation (NSF), Interdependent response of complex urban infrastructures subjected to multiple hazards, 10/01/07-09/30/11, \$282,715. L. Duenas-Osorio, Rice University (P.I.), R. Stein, Rice University (Co-P.I.)

Rice Faculty Initiatives Fund, Informative household-level risk assessment to support the evacuation decisions of Houstonians, 07/01/08-06/30/10, \$59,436. L. Duenas-Osorio, Rice University (P.I.), R. Stein, D. Subramanian, and P. Bedient, Rice University (Co-P.I.)

Shell Center for Sustainability, Integrated Economic, Environmental and Reliability Modeling of Power System Growth, 01/01/08-12/31/08, \$33,000. D. Cohan, Rice University (P.I.), L. Duenas-Osorio, Rice University (Co-P.I.)

City of Houston, Tools for household-level risk assessment and evaluation of evacuation policies under hurricane hazards, 08/01/07-07/31/08, \$36,360. L. Duenas-Osorio, Rice University (P.I.), R. Stein and D. Subramanian, Rice University (Co-P.I.)

Rice International Collaboration Fund, Strategic Alliance with the Los Andes University in Bogotá, Colombia, 03/01/07-02/29-08, \$18,200. L. Duenas-Osorio, Rice University (P.I.)

Teaching Experience

2007 - Present: **Instructor**. Rice University, Department of Civil and Environmental Engineering, Houston, Texas.

2011- Present: **CEVE 424/524 - "Time-Dependent System Reliability Theory and Algorithms"**. Provides graduate and senior undergraduate students the foundations to assess the reliability and risk of complex engineering systems. Covers modern theoretical and computational methods to link component reliability to system-level reliability. Fall terms in alternating years.

2007- Present: **CEVE 492/592 - "Modeling and Analysis of Infrastructure and Networked Systems"**. Teaches graduate and senior undergraduate students concepts of graph theory, complex systems, and network science applicable to the modeling, analysis, and performance prediction of infrastructure systems. Fall terms in alternating years.

2007-Present: **CEVE/STAT 313 - “Uncertainty and Risk in Urban Infrastructure Systems”**. Undergraduate course to address the ASCE 2025 vision for new professionals to become fluent on applied probability and uncertainty evaluation. The course is also cross-listed with the Department of Statistics and covers decision analysis, statistics of extremes, and Bayesian statistics among other topics for quantifying uncertainty in practical decision making. Offered during Spring terms.

2007-2010: **CEVE/COMP 495, POLI 481 - “Hurricane risk assessment and evacuation policies for the City of Houston.”** This was a research-oriented course for undergraduate students, where multi-disciplinary teams designed and deployed behavioral surveys on evacuation behavior, developed fragility models for detached houses and utility systems, and wrote research papers with relevant hypotheses for emergency managers. This course was offered during the Spring and Fall terms.

Note: All classes by Dr. Dueñas-Osorio are digitally recorded, including instructor handwriting, slide shows, and support software. This approach allows students to review lectures, while revealing to the instructor lectures of interest and topics for expansion.

Spring 2006: **Instructor.** Georgia Institute of Technology, School of Civil and Environmental Engineering, Atlanta, Georgia.

Taught a College of Engineering undergraduate class in *Vector Mechanics*, and partially instructed a graduate class in *Earthquake Engineering* (Dr. R. DesRoches).

8/01 - 12/05: **Graduate Teaching Assistant.** Georgia Institute of Technology, School of Civil and Environmental Engineering, Atlanta, Georgia.

Provided undergraduate students with technical support to homework problems and lecture questions. Subjects included *Probability and statistics* (spring 2002 and spring 2005, Dr. B. Ellingwood), and *Statics and Dynamics* (spring 2003 and spring 2004, Dr. B. Goodno).

4/04 - 12/05: **Campus Tutor.** Georgia Institute of Technology, Division of Student Affairs, Success Programs, Atlanta, Georgia.

Participated in 1-to-1 mentoring and tutoring of undergraduates on *Statics and Dynamics*, *Probability*, *Physics*, *Calculus*, *French*, and *Spanish*.

10/04 - 1/05: **Peer Instructor.** Texas A&M University College Station, Texas.

Developed and coordinated the capstone project in seismic loss estimation for the 2005 MAE Center Consequence-Based Engineering Institute.

Professional Affiliations and Roles

Active Affiliations

American Society of Civil Engineers (ASCE)

- Member of Task Group 3 on Risk Assessment of Structural Infrastructure Facilities and Risk-Based Decision Making, ASCE/SEI Technical Council on Life-Cycle Performance, Safety, Reliability, and Risk of Structural Systems, 10/18 – 09/19.
- Chair of Task Group 3 on Risk Assessment of Structural Infrastructure Facilities and Risk-Based Decision Making, ASCE’s Structural Engineering Institute, Technical Council on Life-Cycle Performance, Safety, Reliability, and Risk of Structural Systems, 05/14 – 09/18.
- Chair of the Dependency Relations Subcommittee of the Civil Infrastructure and Lifeline Systems Committee, ASCE’s Infrastructure Resilience Division, 12/14 – Present.
- Chair of the Lifeline Systems Interdependencies Committee, ASCE’s Technical Council on Lifeline Earthquake Engineering (TCLEE), 12/09 – 12/14.

- Member of Task Group 3 on Risk Assessment of Structural Infrastructure Facilities and Risk-Based Decision Making, ASCE/SEI Technical Council on Life-Cycle Performance, Safety, Reliability, and Risk of Structural Systems, 05/09 – 05/14.
- Member of the SEI Seismic Effects Committee, 6/06 – 6/12.
- Member of the SEI Structural Control Committee, 6/06 – 6/09.
- Associate Member, ASCE, 8/06 – Present.
- Member, ASCE, 8/00 – 8/06.

Association for Computing Machinery (ACM)

Member, 1/12 – Present.

Joint Committee in Structure Safety (JCSS)

Invited Member, 11/08 – Present.

Network Science Society (NetSci)

Member, 6/12 – Present.

Institute for Operations Research and the Management Sciences (INFORMS)

Member, 10/17 – Present.

International Association on Structural Safety and Reliability (IASSAR)

Member, 6/09 – Present.

International Civil Engineering Risk and Reliability Association (CERRA)

- Member of the Board of Directors, 07/15 – Present.
- Member of the Scientific Committee, 06/10 – Present.
- Member, 6/03 – Present.

Society for Industrial and Applied Mathematics (SIAM)

Member, 7/11 – Present.

Former Affiliations

American Wind Energy Association (AWEA)

- Secretary of the AWEA/ASCE wind turbine structures group, 07/10 – 12/11.
- Member, 7/10 – 12/11.

Colombian Society of Engineers (SCI)

Member, 1/97 – 6/00.

Earthquake Engineering Research Institute (EERI)

- Member, 3/04 – 12/17.
- Student Chapter President, Georgia Institute of Technology, 8/02 – 2/04.

Institute of Electrical and Electronics Engineers (IEEE)

Member, 1/07 – 12/15.

Society of Hispanic Professional Engineers (SHPE)

Member, 8/11 – 12/16.

Editorial Positions

Active Roles

Structural Safety

Member of the Editorial Board, 10/17 – Present.

ASCE Natural Hazards Review

Associate Editor, 8/10 – Present.

Former Roles

ASCE Journal of Computing in Civil Engineering

Associate Editor, 3/10 – 12/16.

ASCE Journal of Structural Engineering

Guest Co-Editor for Special Issue on Resilience, 9/13 – 6/16.

Earthquake Spectra

Responsible *Editor*, 7/12 – 12/12.

Revista Ingeniería de Construcción, Chile

International Editorial Board, 10/09 – 12/12.

Peer Reviewer

Sample of Journals

Communications of the Association for Computing Machinery (CACM), Computer-Aided Civil and Infrastructure Engineering (CACAIIE); Earthquake Engineering and Structural Dynamics; Earthquake Spectra; IEEE Transactions on Power Systems; IEEE Transactions on Reliability; Journal of Computing in Civil Engineering; Journal of Infrastructure Systems; Journal of Risk and Uncertainty in Engineering Systems; Journal of Structural Engineering; Journal of Water Resources, Planning and Management; Natural Hazards Review; Operations Research; Probabilistic Engineering Mechanics; Reliability Engineering and System Safety; Risk Analysis; Structural Safety; Structure and Infrastructure Engineering.

Sample of Conferences

European Safety and Reliability Conference (ESREL); International Conference on Applications of Probability and Statistics (ICASP); International Conference on Bridge Maintenance, Safety and Management (IABMAS); International Conference on Structural Safety and Reliability (ICOSSAR); National Conference in Earthquake Engineering (NCEE); Structures Congress and Congress on Technical Advancement, American Society of Civil Engineers (ASCE); World Conference in Earthquake Engineering (WCEE).

Sample of Funding Agencies

U.S. National Science Foundation (NSF), Natural Sciences and Engineering Research Council of Canada (NSERC), Israel Science Foundation (ISF).

Sample of Outreach Activities

Summer Institute in Statistics, Oregon State University, Corvallis, OR, USA, 2017 - Present. Chair of the Advisory Board for the RUSIS@OSU summer program. Directed by J. Rojo, Department of Statistics.

Universidad de Los Andes, Bogotá, Colombia, Summer 2007 – Present. Strategic cooperation to encourage joint research proposals, faculty exchange, and graduate student recruitment.

University of Colorado, Denver, Fall 2019 – Fall 2021. Member of the Advisory Committee of the NSF-funded program “Enabling the Next Generation of Hazards and Disasters Researchers.”

Center for Civic Leadership, Rice University, 2016 – 2017. Mentor for Houston Action Research Teams (HART) on institutional decision making assessment during storms in Houston.

University of Colorado, Denver, Fall 2014 – Spring 2016. Mentor for the NSF-funded program “Enabling the Next Generation of Hazards and Disasters Researchers.”

Society for Hispanic Professional Engineers (SHPE), Fall 2011 – Fall 2015. Judge and subsequent Chair of the student research poster competition, and Judge of the graduate student paper competition.

Empowering Leadership Alliance (ELA), Fall 2010 – Fall 2012. Mentor of minority students.

Engineers without Borders (EWB), Fall 2006 – Spring 2012. Faculty advisor for the Rice University chapter.

National Science Foundation (NSF), September 7, 2012. Contributor to the NSF-funded hazards research showcase in recognition of the national preparedness month. In collaboration with J.E. Padgett. Hart Senate Office Building, Capitol Hill, USA.

Alliance for Graduate Education and the Professoriate (AGEP), Summer 2008 – Summer 2011. Speaker on academic careers for minorities and research on hurricane risk for Houston.

Society for Advancement of Chicanos and Native Americans in Science (SACNAS), Fall 2007 – Fall 2010. Mentor, judge of graduate technical presentations, and speaker on risk and reliability in engineering for the national conferences.

Rice University Summer Institute of Statistics (RUSIS), Summer 2007 – Summer 2009. Guest lecturer and faculty advisor to undergraduate students, especially from underrepresented minorities, with interests on applied statistical problems posed by aging urban systems.

Research Advising and Mentoring

Current Graduate Research Assistants

Kyle Shepherd, Ph.D. student, Department of Civil and Environmental Engineering, April 2019 – Present. Quantum tensor network algorithms for engineering combinatorics.

Xiangnan Zhou, Ph.D. student, Department of Civil and Environmental Engineering, August 2018 – Present. Probabilistic density evolution in network systems.

Jayant Patil, Ph.D. student, Department of Civil and Environmental Engineering, August 2017 – Present. Logic-based algorithms for system reliability computation.

Hesam Talebiyan, Ph.D. student, Department of Civil and Environmental Engineering, August 2016 – Present. Decentralized optimization methods.

Bowen Fu, Ph.D. student, Department of Civil and Environmental Engineering, August 2015 – Present. Graph theoretic system reliability and ranking methods.

Roger Paredes, Ph.D. candidate, Department of Civil and Environmental Engineering, August 2014 – Present. Theory of interdependence and approximate computation for infrastructure networks.

Former Graduate Research Assistants

Gonzalez, A., Ph.D., Department of Civil and Environmental Engineering. “Resilience Optimization of Systems of Interdependent Networks.” Advisor: L. Dueñas-Osorio. Summer 2017. Assistant Professor at the University of Oklahoma.

Mensah, A., Ph.D., Department of Civil and Environmental Engineering. “Resilience Assessment of Electric Grids and Distributed Wind Generation under Hurricane Hazards.” Advisor: L. Dueñas-Osorio. Spring 2015. Lead Risk Modeler at Risk Management Solutions (RMS).

Wang, Z., Ph.D., Department of Civil and Environmental Engineering. “Risk-based design of bridges and associated transportation networks under natural hazards. Co-advisors: L. Dueñas-Osorio and J.E. Padgett. Spring 2014. Senior Data Management and Analytics Engineer at the American Bureau of Shipping (ABS).

Rokneddin, K., Ph.D., Department of Civil and Environmental Engineering. “Reliability and risk assessment of urban networked infrastructure systems under natural hazards.” Advisor: L. Dueñas-Osorio. Spring 2013. Manager of Earthquake Modeling at the American International Group (AIG).

Hernández-Fajardo, I., Ph.D., Department of Civil and Environmental Engineering. “Probabilistic fragility of interdependent urban systems subjected to seismic hazards.” Advisor: L. Dueñas-Osorio. Spring 2012. Engineering Specialist at INGETEC S.A., Colombia.

Aygun, B., M.S., Department of Civil and Environmental Engineering. “Efficient seismic fragility assessment of highway bridges on liquefiable soils.” Advisor: L. Dueñas-Osorio. Spring 2009. Seismic Retrofit Engineer, Artyol Mühendislik, Turkey.

Post-Doctoral Fellows

Lu Liu, Post-Doctoral Fellow, Department of Civil and Environmental Engineering, Rice University, February 2018 – Present. Modeling and analysis water networks with distributed wastewater reuse. Mentors: Q. Li (lead), L. Stadler, L. Dueñas-Osorio.

Bhuvanesh Sundar, Post-Doctoral Fellow, Department of Physics and Astronomy, Rice University, August 2018 – October 2019. Quantum algorithms for optimization and engineering problems. Mentors: K. Hazzard (lead), L. Dueñas-Osorio.

Alireza Yazdani, Post-Doctoral Fellow, Department of Civil and Environmental Engineering, Rice University, August 2011 – December 2012. Optimization of potable water network topologies for enhanced reliability, energy consumption, water quality, and sustainability. Mentors: L. Dueñas-Osorio (lead), Q. Li.

Min Ouyang, Post-Doctoral Fellow, Department of Civil and Environmental Engineering, Rice University, December 2009 – February 2012. Modeling of smart infrastructure system interdependencies, reliability and resilience. Mentor: L. Dueñas-Osorio.

Other Graduate Students and Visiting Scholars

Alberto Azzolin, Ph.D., Politecnico di Milano, Italy, May 2015 – December 2015. Cascading failure modeling for power systems.

Jian Li, Ph.D., Central South University, China, October 2013 – October 2015. Controllability and reliability of engineered networked systems. Now at the China Academy of Safety Science and Technology.

David Kahle, Ph.D., Department of Statistics, Rice University, August 2010 – May 2012. Comparison of statistical models of spatially distributed power outages with engineering models.

Kanoknart Leelardcharoen, Ph.D., Department of Civil and Environmental Engineering, Georgia Institute of Technology, August 2006 – May 2012. Interdependence modeling of power and telecommunication systems under seismic hazards.

Xing Min, M.S., Department of Civil and Environmental Engineering, Rice University, August 2008 – May 2012. Design of interdependent infrastructure interfaces by inverse system reliability methods.

Camilo Gomez, Ph.D. Candidate, Department of Civil and Environmental Engineering, Universidad de Los Andes, January 2011 – January 2012. Systems engineering approach for infrastructure operation, management and decision making.

Undergraduate Research Assistants

Akshay Kalyan, Department of Civil and Environmental Engineering, August 2018 – Present. Algebraic tensor networks for reliability computation.

Drew Keefer, Department of Civil and Environmental Engineering, January 2018 – Present. Resilience modeling of water distribution networks.

Jordan Wheeler, Department of Civil and Environmental Engineering, January 2016 – May 2019. Physics-based modeling of street-level flooding in Houston.

Evan Lopez, Department of Civil and Environmental Engineering, March 2017 – December 2018. Modeling of water distribution networks for Houston.

Bob Zhang, Department of Civil and Environmental Engineering, August 2017 – May 2018. Sensitivity analysis of mixed-integer programming formulation for optimal infrastructure restoration.

Rafael Butiong, Department of Economics, August 2016 – August 2017. Analysis of 5-year power distribution system restoration data in Christchurch, New Zealand.

Claire Casey, Department of Civil and Environmental Engineering, January – December 2017. Power outage data capture and spatial-temporal analyses.

Kyle A. Shepherd, Department of Civil and Environmental Engineering, May 2014 – May 2016. Assessment of multi-utility restoration times and street-level flooding models for Houston.

Chris K. Chan, Department of Civil and Environmental Engineering, August 2012 – May 2013. Modeling of spatial-temporal interdependencies across lifeline systems.

Jason Wu, Department of Civil and Environmental Engineering, May 2010 – September 2012. Validation of lifeline interdependence failure propagation models using the 2010 Chile earthquake and quantification of coupling strength using spatial interpolation models.

Josh Rutenberg, Department of Civil and Environmental Engineering, March 2009 – May 2012. Time series analysis of coupled utility system performance.

Anjie Dong, Department of Mechanical Engineering and Materials Science, May 2011 – August 2011. Modeling of wind turbines using tools from the National Renewable Energy Laboratory (NREL).

Benjamin Berryhill, Department of Civil and Environmental Engineering, May 2010 – May 2011. Topological characterization of power transmission systems across the United States.

Carter Wang, Department of Computational and Applied Mathematics, January 2011 – May 2011. Evaluation of percolation theory with heterogeneous percolation probability for network applications.

Gesara Satumtira, Department of Civil and Environmental Engineering, May 2009 – May 2010. Synthesis of interdependent infrastructure systems research across disciplines.

James Winkler, Department of Chemical Engineering, January 2009 – December 2009. Evaluation of storm-tracks and outage prediction models.

Grant Warnecke, Department of Civil and Environmental Engineering, January 2008 – July 2009. Coupled modeling of rainfall and river models for flat watershed flood predictions.

William McGuinness, Department of Civil and Environmental Engineering, August 2007 – May 2009. Calculation of storm surge for Houston flood analyses.

Olufemi Oke, Department of Civil and Environmental Engineering, August 2008 – May 2009. Modeling of the Texas power grid for electricity growth.

Jay Datesh, Department of Statistics, August 2008 – December 2008. Development of synthetic models of infrastructure systems.

Eileen Ong, Department of Civil and Environmental Engineering, May 2008 – September 2008. Construction of Origin-Destination traffic databases for road network analyses.

David G. Murad, Department of Statistics, May 2007 – May 2008. Exploration of probability laws for the reliability of power distribution systems.

Alison Slowey, Department of Civil and Environmental Engineering, May 2007 – May 2008. Study of topological properties of power systems.

Academic and University Service Activities

Thesis Committees, Rice University (excludes Duenas-Osorio's students and thesis proposals for which thesis defenses have already taken place)

Misra, S., Ph.D. Candidacy, Department of Civil and Environmental Engineering. "Seismic Resilience of Rail-Truck Intermodal Freight Transportation Networks." Advisor: J.E. Padgett. Fall 2019.

Hundi, P., Ph.D. Candidacy, Department of Civil and Environmental Engineering. "Deep Learning to Accelerate Materials Property Predictions and Hierarchical Materials Design." Advisor: S. Nagarajaiah. Summer 2019.

Mikesell, D., Ph.D., Department of Computational and Applied Mathematics. "Monitoring on Graphs: An Exploration into k -Cores, Zero Forcing, and Power Domination." Advisor: I.V. Hicks. Summer 2019.

Vishnu, N., Ph.D., Department of Civil and Environmental Engineering. "Multi-threat Sustainability Assessment of Bridges and Bridge Networks." Advisor: J.E. Padgett. Spring 2019.

Meel, K., Ph.D., Department of Computer Science. "Constrained Counting and Sampling: Bridging the Gap between Theory and Practice." Advisor: M. Vardi. Fall 2017.

Grimmer, M., M.S., Department of Mechanical Engineering. "Analysis and Applications of Hysteretic Systems Comparing Preisach Formalism and Bouc-Wen Modeling." Advisor: P. Spanos. Spring 2017.

- Kameshwar, S., Ph.D., Department of Civil and Environmental Engineering. "Multi-hazard Fragility, Risk, and Resilience Assessment of Select Coastal Infrastructure." Advisor: J.E. Padgett. Spring 2017.
- Takhtaganov, T., Ph.D., Department of Computational and Applied Mathematics. "Efficient estimation of coherent risk measures for risk-averse optimization problems governed by partial differential equations with random inputs." Advisor: M. Heinkenschloss. Spring 2017.
- Sebastian, A., Ph.D., Department of Civil and Environmental Engineering. "Quantifying Flood Hazard and Risk in Highly Urbanized Coastal Watersheds." Advisor: P. Bedient. Fall 2016.
- Bajo Buenestado, R., Ph.D., Department of Economics. "Four Essays on Applied Energy Economics and Policy." Advisor: P.R. Hartley. Spring 2016.
- Irza, N., M.S., Department of Civil and Environmental Engineering. "Addressing Uncertainty in Residential Damage Estimates from Tropical Cyclone Storm Surge, with a Focus on Variability in Structure Elevations." Advisor: P. Bedient. Spring 2016.
- Torres, J., Ph.D., Department of Civil and Environmental Engineering. "Novel Computational and Probabilistic Methods for Characterizing Joint Flood Hazards under Extreme Cyclone Events." Advisor: P. Bedient. Spring 2016.
- Salazar, J., M.S., Department of Computer Science. "Predicting Wind Induced Damage to Residential Structures: A Machine Learning Approach." Advisor: D. Subramanian. Spring 2015.
- Kettler, J.J., Ph.D., Department of Political Science. "The Right to Party (Resources): Political Party Networks and Candidate Success." Advisor: K.E. Hamm. Fall 2014.
- Tapia, C., M.S., Department of Civil and Environmental Engineering. "Pursuing Life-Cycle Sustainability for Bridges Subjected to Multiple Threats." Advisor: J.E. Padgett. Summer 2014.
- Chen, L., M.S., Department of Civil and Environmental Engineering. "Screw and Edge Dislocations in Cement Phases: Atomic Modeling." Advisor: R. Shahsavari. Fall 2013.
- Fuselier, B.J., M.S., Department of Civil and Environmental Engineering. "Improved Seismic Risk Assessment of Non-ductile Reinforced Concrete Buildings." Advisor: J.E. Padgett. Fall 2013.
- Mand, K., M.S., Department of Mechanical Engineering. "Rendezvous and Proximity Operations at the Earth-Moon L2 Lagrange Point: Navigation Analysis for Preliminary Trajectory Design." Advisor: P. Spanos. Fall 2013.
- Ghosh, J., Ph.D., Department of Civil and Environmental Engineering. "Parameterized Seismic Fragility Assessment and Life-Cycle Analysis of Aging Highway Bridges." Advisor: J.E. Padgett. Spring 2013.
- Resendez de Lozano, L.E., Ph.D., Department of Anthropology. "The Construction of Sustainability in the Cement Industry: Audit Culture, Materiality and Affective Processes." Advisor: J. Faubion. Spring 2013.
- Deitz, R., M.S., Department of Civil and Environmental Engineering. "Distributed hydrologic modeling of large storm events in the Houston-Galveston region." Advisor: P. Bedient. Fall 2012.
- Pasala, D.T.R., Ph.D., Department of Civil and Environmental Engineering. "Control of structural systems using novel adaptive and adaptive-passive devices." Advisor: S. Nagarajaiah. Fall 2012.
- Robledo Ricardo, L.A., Ph.D., Department of Mechanical Engineering. "Nonlinear stochastic analysis of motorcycle dynamics." Advisor: P. Spanos. Fall 2012.
- Christian, J.K., Ph.D., Department of Civil and Environmental Engineering. "Assessing coastal vulnerability: Advanced modeling methods and dynamic hydraulic characteristics of Gulf Coastal systems." Advisor: P. Bedient. Spring 2012.
- Teague, A., Ph.D. Thesis Defense, Department of Civil and Environmental Engineering. "Development of a distributed water quality model using advanced hydrologic simulation." Advisor: P. Bedient. Summer 2011.
- Inal, O., Ph.D. Thesis Defense, Department of Economics. "Essays in power system economics." Advisor: P.R. Hartley. Spring 2011.
- Stepinski, E., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "1D and 2D methods for modeling floodplains under storm surge conditions." Advisor: P. Bedient. Spring 2011.
- Dennemann, K., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "Life-cycle cost benefit (LCC-B) analysis for bridge seismic retrofits." Advisor: J. Padgett. Fall 2009.

- Pasala, D., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "Repetitive control of hysteretic systems using robust H^∞ controller." Advisor: S. Nagarajaiah. Fall 2009.
- Ray, T., M.S. Thesis Defense, Department of Civil and Environmental Engineering. Flood modeling of Gulf Coast watersheds. Advisor: P. Bedient. Fall 2009.
- Vemuru, S., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "Dynamic response of multi-degree of freedom structure with sliding isolation system and uplift." Advisor: S. Nagarajaiah. Fall 2009.
- Crouse, B., M.S. Thesis Defense, Department of Mechanical Engineering and Materials Science. "Autonomous optical navigation for lunar missions." Advisor: P. Spanos. Spring 2009.
- Esteva, M., Ph.D. Thesis Defense, Department of Mechanical Engineering and Materials Science. "Hybrid finite elements nanocomposite characterization by stochastic microstructuring." Advisor: P. Spanos. Fall 2008.
- van Tassel, C., M.S. Thesis Defense, Department of Mechanical Engineering and Materials Science. "Stability analysis for the Ares-I launch vehicle." Advisor: P. Spanos. Spring 2008.
- Stegemeier, R., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "Mitigating seismic risk in developing countries: A case study on the 2005 Kashmir earthquake." Advisor: A. Durrani. Spring 2008.
- Clark, S., Ph.D. Thesis Defense, Department of Earth and Atmospheric Sciences. "Characterizing the southeast Caribbean – South American plate boundary at 64°W." Advisor: A. Levander. Spring 2008.
- Fang, N., Ph.D. Thesis Defense, Department of Civil Engineering. "A dynamic hydraulic floodplain map prediction tool for flood alert in a coastal urban watershed considering storm surge issues." Advisor: P. Bedient. Fall 2007.
- Ciarcia, M., Ph.D. Thesis Defense, Department of Mechanical Engineering and Materials Science. "Optimal starting conditions for the rendezvous maneuver: Analytical and computational approach." Advisor: A. Miele. Spring 2007.
- Akinwande, I., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "Nanocomposite strain sensors: Study of electrical and thermal properties". Advisor: S. Nagarajaiah. Spring 2007.
- Osenar, M., M.S. Thesis Defense, Department of Mechanical Engineering and Materials Science. "Analysis of CEV optical camera performance during lunar navigation." Advisor: P. Spanos. Spring 2007.
- Gordon, R., M.S. Thesis Defense, Department of Civil and Environmental Engineering. "Next generation hydraulic modeling for inundation mapping and flood warning in complex urban systems." Advisor: P. Bedient. Spring 2007.

Thesis Committees, Other Universities (excludes thesis proposals)

- Hackl, J., Ph.D., Department of Civil, Environmental and Geomatic Engineering, Swiss Federal Institute of Technology in Zurich (ETHZ). "Risk Assessments of Complex Infrastructure Systems Considering Spatial and Temporal Aspects." Advisor: B. Adey. Spring 2019.
- Applegate, C. J., Ph.D., School of Civil and Environmental Engineering, Georgia Institute of Technology. "New for probabilistic interdependency modeling and critical component identification to increase infrastructure system resilience." Advisor: I. Tien. Fall 2018.
- Wu, J., Ph.D., Department of Civil and Environmental Engineering, Stanford University. "End-to-end seismic risk analysis framework for the identification of infrastructure network retrofits." Advisor: J. Baker. Summer 2017.
- Karamlou, A., Ph.D., Department of Civil and Environmental Engineering, Lehigh University. "Multi-Scale Methodologies for Probabilistic Resilience Assessment and Enhancement of Bridges and Transportation Systems." Advisor: P. Bocchini. Summer 2016.
- Gómez, C., Ph.D., Department of Civil and Environmental Engineering, Universidad de Los Andes. "Risk-informed decision support for infrastructure network operation: the Complex Distributed Agent Network (CoDAN) framework." Co-Advisors: M. Sánchez-Silva and L. Dueñas-Osorio. Summer 2014.
- Paredes, R., M.S., Department of Civil, Building, and Geotechnical Engineering, Politecnico di Torino. "Resilience of Lifelines Considering Network Interdependencies." Co-advisors: G.P. Cimellaro and L. Dueñas-Osorio. Summer 2014.

Arcidiacono, V., Ph.D., Department of Civil, Building, and Geotechnical Engineering, Politecnico di Torino. "Fast Assessment of Disaster Community Resilience by Multilevel Distributed Expertise and Smartphone Communication." Co-advisors: A. De Stefano and G.P. Cimellaro. Spring 2014.

Leelardcharoen, K., Ph.D., Department of Civil and Environmental Engineering, Georgia Institute of Technology. "Interdependent response of telecommunication and electric power systems to seismic hazard." Co-advisors: B. Goodno, J. Craig, and L. Dueñas-Osorio. Fall 2011.

Cabrales Camacho, M., M.S., Department of Civil and Environmental Engineering, Universidad de Los Andes. In Spanish: "Extrapolación de las propiedades mecánicas de materiales novedosos para uso como elementos estructurales." Advisor: F. Ramírez Rodríguez. Spring 2007.

Department of Civil and Environmental Engineering Leadership and Committees

- Co-Chair of the ABET committee, Fall 2014 – Present.
- Faculty Advisor for the departmental curriculum of focus area IV on urban infrastructure, reliability and management, Spring 2009 – Present.
- Member of the curriculum committee, Spring 2009 – Present.
- Member of departmental Promotion and Tenure committee, Fall 2013 – Present.
- Faculty advisor, Chi Epsilon Civil Engineering Honor Society, Rice University Chapter, Fall 2012 – Summer 2017.
- Member of faculty search committees, Fall 2006 – Present.
- Member of the seminar series committee, Fall 2006 – Spring 2012.

School of Engineering Tasks and Committees

- Member of the Strategic Planning Committee, Fall 2017 – Spring 2018.
- Deputy Director for the Rice Center for Operations Research (RCOR), Fall 2016 – Fall 2018.
- Member of the curriculum committee, Fall 2007 – Spring 2016.
- Co-reviewer of ADVANCE program applications on "Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers." August 2011 and September 2012.
- Collaborator of the energy and environment task force, August 2010 – May 2011.
- Member of the international task force (global urban futures), August 2010 – May 2011.
- Member of the information science and technology committee, August 2006 – May 2008.
- Member of the urban systems and sustainability committee, August 2006 – May 2008.

University Level Engagements and Committees

- Faculty Advisor for the Kinder Institute for Urban Research, Fall 2016 – Present.
- Member of the University's Fellowships and Awards Committee, Fall 2013 – Present.
- Judge for the annual Rice Undergraduate Research Symposium, 2014 – Present.
- Judge for Rice University's centennial undergraduate poster competition, October 2012.
- Co-organizer of a demonstration of the Storm Risk Calculator (SRC) for Rice University's UnConvention, April 2012. In collaboration with B. Guven, R. Stein, and D. Subramanian.
- Facilitator for one of the tables of the "Rice 2032: Building the vision in disruptive times" workshop on international and global engagements, March 2012.
- Program planning committee member for the VII De Lange conference on "Transforming the metropolis," Houston, Texas, Spring 2008 – Spring 2009.

Professional Activities

Conference and Session Organizer

- Technical session on “Machine Learning Methods for Structural and Infrastructure Systems.” Co-organized with H. Burton (Lead), University of California, Los Angeles. ASCE/SEI Structures Congress, Fort Worth, Texas, April 19-21, 2018.
- Workshop on “Decentralized Optimization and Decision Making Methods for Urban Systems.” Organizer. Rice University, Houston, Texas, July 27, 2017.
- Mini-symposium on “Life-cycle reliability and risk of structural and infrastructure systems”. Co-organized with M. Ghosn, CUNY, D. Frangopol, Lehigh University, F. Biondini, Politecnico di Milano, and M. Akiyama, Waseda University. 12th International Conference on Structure Safety and Reliability (ICOSSAR), Vienna, Austria, August 6-10, 2017.
- Technical session on “Closing the gap: Probabilistic methods for decision support across complex structural and infrastructure systems.” Co-organized with B.R. Ellingwood, Colorado State University. ASCE/SEI Structures Congress, Phoenix, Arizona, USA, February 14-17, 2016.
- Mini-symposium on “Taming the Computational Complexity of Structure and Infrastructure Performance Assessment Metrics.” Co-organized with J. Song, Seoul National University, South Korea. International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP12), Vancouver, Canada, July 12-15, 2015.
- Technical session on “Challenges and Solutions towards Risk-Based Structural and Infrastructure Performance Assessment and Decision Support.” Co-organized with B.R. Ellingwood, Colorado State University. ASCE/SEI Structures Congress, Portland, Oregon, USA, April 23-25, 2015.
- Technical session on “Operationalizing risk-informed decisions for sustainable and resilient civil infrastructure.” Co-organized with B.R. Ellingwood, Colorado State University. ASCE/SEI Structures Congress, Boston, Massachusetts, USA, April 3-5, 2014.
- Mini-symposium on “Analytical, statistical, and simulation methods for the reliability and risk assessment of lifeline systems and associated structures”. Co-organized with Wei Liu, Tongji University. 11th International Conference on Structure Safety and Reliability (ICOSSAR), New York, USA, June 16-20, 2013.
- Technical session on “Risk-based and disaster resilience of bridge systems and networked infrastructures under multiple hazards.” Co-organized with Gian P. Cimellaro, Politecnico di Torino. Sixth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2012), Stresa, Italy, July 8-12, 2012.
- Mini-symposium on “Risk and reliability analysis for interdependent infrastructure systems.” Co-organized with Seth Guikema, Johns Hopkins University. International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP11), Zurich, Switzerland, August 1-4, 2011.
- Mini-symposium on “Probabilistic models and methods for risk assessment of lifeline networks and decision support.” Co-organized with Junho Song, University of Illinois at Urbana-Champaign. International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP11), Zurich, Switzerland, August 1-4, 2011.
- Mini-symposium on “Resilience assessment of communities and infrastructures.” Co-organized with Gian P. Cimellaro, Politecnico di Torino. Third international conference on computational

methods in structural dynamics and earthquake engineering (COMPdyn 2011), Corfu, Greece, May 26-28, 2011.

Technical session on “Seismic reliability and performance assessment of bridges.” Co-organized with J.E. Padgett, Rice University. ASCE/SEI Structures Congress 2011, Las Vegas, Nevada, USA, April 14-16, 2011.

Technical session on “Resilience of structures, infrastructures, and communities under seismic hazard.” Co-organized with Gian Paolo Cimellaro, Politecnico di Torino. ASCE/SEI Structures Congress 2011, Las Vegas, Nevada, USA, April 14-16, 2011.

Workshop on “Cascading disasters and resilience to hurricanes.” Co-organized with Robert Stein and Devika Subramanian, Rice University. Hurricane risk and evacuation behavior research groups at Rice University and Texas A&M University, Houston, Texas, March 25, 2011.

Workshop on “Challenges and opportunities for lifeline systems engineering.” Co-organized with Curtis Edwards, PSOMAS. 2011 EERI Annual Meeting, San Diego, California, February 9-12, 2011.

Panel session on “Emerging risks for infrastructure systems.” Co-organized with Bruce Ellingwood, Georgia Institute of Technology. ASCE/SEI Structures Congress 2010, Orlando, Florida, USA, May 12-14, 2010.

Technical session on “Innovative bridge system reliability.” Co-organized with Jamie Padgett, Rice University. ASCE/SEI Structures Congress 2010, Orlando, Florida, USA, May 12-14, 2010.

Technical session on “System reliability, risk and decision making.” Co-organized with Junho Song, University of Illinois at Urbana-Champaign. 10th International Conference on Structural Safety and Reliability (ICOSSAR), Osaka, Japan, September 13-17, 2009.

Technical session on “Interdependent lifeline systems.” Technical Council on Lifeline Earthquake Engineering (TCLEE) conference, Oakland, California, June 28 - July 1, 2009.

Professional and Scientific Advisory Activities

National Renewable Energy Laboratory (NREL): Member of the Resilience Science Working Group, October 2018 – Present.

National Institute of Standards and Technology (NIST) and Institute for Defense Analysis (IDA): Invited participant to a workshop on “Research Needed to Develop a New Immediate Occupancy Performance Objective”, Alexandria, VA, January 16-17, 2018.

Natural Hazards Engineering Research Infrastructure (NEHRI) Rapid Facility at the University of Washington: Representative of the lifeline systems discipline to the community workshop on natural hazards reconnaissance protocols, Seattle, Washington, January 26-27, 2017.

Technical Council on Life-Cycle Performance, Safety, Reliability and Risk of Structural Systems of ASCE/SEI: Invited participant to workshop on “Implementation of Risk-Based Methods for the Design of Structure and Infrastructure Systems”, Reston, Virginia, USA, Sept. 17th, 2014.

University of Liverpool and the American Society of Civil Engineers (ASCE): Member of the scientific committee of the 2nd international conference on vulnerability and risk analysis and management (ICVRAM 2014) and 6th international symposium on uncertainty modeling and analysis (ISUMA 2014), Liverpool, United Kingdom, July 13-16, 2014.

American Society of Civil Engineers (ASCE): Invited participant to risk and resilience workshop on “Charting the Course for the Future – for the Society and for the Profession”, Reston, Virginia, USA, July 25-26, 2013.

Earthquake Engineering Research Institute (EERI): Member of the seismic resilience panel to support a seismic resilience observatory for the *learning from earthquakes (LFE)* program, Oakland, California, USA, October 2012 – April 2013.

Engineering Mechanics Institute (EMI) of the American Society of Civil Engineers (ASCE): Member of the scientific committee. 2012 Joint Conference of the Engineering Mechanics Institute and the 11th ASCE Specialty Conference on Probabilistic Mechanics and Structural Reliability (EMI/PMC 2012), Notre Dame, Indiana, USA, June 17-20, 2012.

American Wind Energy Association (AWEA) and the American Society of Civil Engineers (ASCE): Member and secretary of the wind turbine tower structures subgroup. Development of the Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures, June 2010 – December 2011.

National Research Council (NRC): Member of the post-event response and recovery and lifelines discipline groups. Grand challenges in earthquake engineering research: A community workshop, Irvine, California, USA, March 14-16, 2011.

Earthquake Engineering Research Institute (EERI) and the National Science Foundation (NSF): Representative of the lifeline systems community for the Chile research needs workshop to identify opportunities and priorities following the February 27, 2010 earthquake, Alexandria, VA, August 19, 2010.

Technical Council on Lifelines Earthquake Engineering (TCLEE) of the American Society of Civil Engineers (ASCE): Member of the earthquake investigation team after the 27 February 2010 Mw 8.8 Offshore Maule, Chile seismic event. Led the interdependent lifeline system recovery data collection and analysis tasks. Concepción, Talcahuano, Talca, and Santiago, Chile, April 9-18, 2010.

National Research Council (NRC): Member of the lifeline systems committee for the workshop on national earthquake resilience—research, implementation, and outreach. Irvine, California, August 17-18, 2009.

Select Research and Education Impact

Benchmark Data Sets: Dr. Duenas-Osorio maintains in his website two data sets for algorithmic performance comparisons by peers, one on optimal restoration of networks and the other on rare-event network reliability. The data sets are already being downloaded and used. Fall 2016 - Present.

European Union (E.U.): The E.U.’s Institute for the Protection and Security of the Citizen published a 2010 Joint Research Centre report, which builds upon the interdependency models from Dr. Dueñas-Osorio’s research group. The report (LB-NA-24275-EN-N) is available from the Office of Publications of the European Union.

Office of Public Safety and Homeland Security of the City of Houston: Contributed to the development and operation of a practical online tool called the Storm Risk Calculator (SRC) for the City of Houston to aid with hurricane preparedness (June 2012 – December 2016). The tool was built in collaboration with B. Guven at the Houston Advanced Research Center, R. Stein, Rice Political Science, D. Subramanian, Rice Computer Science, and the SSPEED Center at Rice University, as well as with Houston-based LJA Engineering.

Disciplines Outside Civil and Environmental Engineering: The aggregate research output from Dr. Duenas-Osorio's group continues to be noted in different fields, including Statistical Physics, Network Science, Complexity Theory, Computer Science, Social Science, and Electrical and Electronic Engineering, among others. Sample journals or periodicals outside civil engineering citing his research include *Complexity*, *Lecture Notes in Computer Science*, *Nonlinear Dynamics*, *Physica A*, *Transportation Research Part F*.

General Public: Dr. Duenas-Osorio continues to write about his research findings or is featured by publications for general audiences. Recent outlets disseminating his findings include *Scientific American* (Oct. 2018) on computational models for street level flooding in his article "This Way Out", or *Science News* (Sept. 7, 2012) on better [networked] systems as interdependencies increase in an article titled "When Networks Network".

Other Skills and Professional Development

- User and adapter of modern educational tools to promote students' active learning, creativity, collaboration, and adaptability, while building trust for formative feedback. Supported by Rice's Center for Teaching Excellence (CTE).
- Participant of multi-day writing retreats organized by the Office of Faculty Development at Rice University in 2014, 2015, 2017, and 2019.
- Participant of online course on "Quantum Mechanics and Quantum Computation" to enable exploration of quantum algorithms and linkages to engineering reliability. EdX, Fall 2012.
- Proficiency in written and spoken languages: Spanish, English.
- Adequacy in written and spoken languages: Italian, French.
- Routine user and programmer of platforms such as Matlab, Gurobi, LaTeX.