

MIRCEA DAN GRIGORIU

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EDUCATION

Dipl. Ing., Bucharest Institute of Civil Engineering, 1967
Dipl. Math., University of Bucharest, 1972
Ph.D., Massachusetts Institute of Technology, 1976

ACADEMIC EXPERIENCE

- Professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, NY (1987-date)
- Visiting Professor, Technical University of Norway, Trondheim, Norway (August 2007)
- Visiting Scientist, National Institute of Standard and Technology, Gaithersburg, Maryland, (Sept. 2007-Dec. 2007)
- Visiting Professor, Statistical and Applied Mathematical Institute (SAMSI), Raleigh, North Carolina (January 2008-December 2007)
- Visiting Professor, Technical University of Denmark, Lyngby, Denmark (Aug. 2000-Oct. 2000)
- Schmidt Distinguished Visiting Professor, Florida Atlantic University, Center for Applied Stochastic Research, Boca Raton, Florida (April 1998)
- Schmidt Distinguished Visiting Professor, Florida Atlantic University, Center for Applied Stochastic Research, Boca Raton, Florida (April 1999)
- Visiting Professor, University of Innsbruck, Austria (Aug. 1993-Jan. 1994)
- Visiting Professor, Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico (January 1987-March 1987)
- Visiting Professor, Princeton University, U.S.A. (April 1987-May 1987)
- Visiting Professor, Technical University of Munich, Germany (June 1987-Aug. 1987)
- Associate Professor, School of Civil and Environmental Engineering, Cornell University, Ithaca, NY (1980-1986)

- Visiting Associate Professor, Department of Civil Engineering, Johns Hopkins University, Baltimore, Maryland (July 1983-Aug. 1983)
- Visiting Associate Professor, Department of Civil Engineering, University of Waterloo, Ontario, Canada (October 1979-June 1980)
- Research Associate, Department of Civil Engineering, McGill University, Montreal, Canada (July 1977-May 1978)
- Associate Professor, Department of Civil Engineering, Simon Bolivar University, Caracas, Venezuela (Feb. 1976-Feb. 1977)

HONORS AND DISTINCTIONS

- **Newmark Medal** for original theoretical contributions to uncertainty quantification and their applications to earthquake/wind engineering and materials science, 2016
- **EMI Fellow ASCE**, since 2014
- **Doctor Honoris Causa**, Technical University of Civil Engineering, Bucharest, Romania, for novel probabilistic models of loads and methods for estimating structural responses to wind, earthquake, and other random loads, 2004
- **Norman Medal** (2005) for the paper entitled “Multiple Resistance Factor Design for Shallow Transmission Line Structure Foundations,” *Journal of Geotechnical and Geoenvironmental Engineering*, September, 2003
- **Daniel M. Lazar’29 Excellence in Teaching Award**, Cornell University, 2003
- **Alfred M. Freudenthal medal** for original developments and theoretical basis of probabilistic methods applications to civil engineering, 2002
- **Editor in Chief** Journal of Engineering Mechanics, ASCE, 2002-2004.
- **Romanian Academy of Technical Sciences**, Honorary member, 2000
- **Fellow ASCE**, since 1999
- **Distinguished Probabilistic Methods Educator**, The SAE International, Reliability, Maintainability, Supportability, and Logistics (RMSL) Division, 1998
- **IASSAR Research Prize** for novel and essential contributions to modelling non-Gaussian processes, 1993

PROFESSIONAL LEADERSHIP

- **Committee Chair:** (Duration: 2-4 years)
 - Dynamics, *Engineering Mechanics Division*
 - Probabilistic Methods, *Engineering Mechanics Division*
 - Lifeline Earthquake Engineering, *American Society of Civil Engineering*
 - Fatigue and Fracture Reliability, *American Society of Civil Engineering*
 - Reliability of Offshore Structures, *American Society of Civil Engineering*
 - Bridge Safety, *American Society of Civil Engineering*
 - Live Loads for the American National Standard A58 *American Society of Civil Engineering*
- **Editor:**
 - Editor in Chief, Journal of Engineering Mechanics, ASCE (two years)
 - Associate Editor, SIAM/ASA Journal on Uncertainty Quantification (four years)
 - Advisory Board, Structure and Infrastructure Engineering (since 2005)
- **Editorial Board:**
 - Structural Safety
 - International Journal of Reliability and Safety
 - Structure and Infrastructure Engineering Journal
 - Probabilistic Engineering Mechanics
- **Other:**
 - **Reviewer:** NSF, NSERC, NIST, National Research Council of Canada, Journal of Engineering Mechanics (ASCE), Journal of Structural Engineering (ASCE), Journal of Applied Mechanics, Probabilistic Engineering Mechanics, Structural Safety, Meccanica, Acta Mechanica, Journal of Wind Engineering & Industrial Aerodynamics, Journal of Computational Physics, Computer Methods in Applied Mechanics and Engineering, Nonlinear Dynamics, Earthquake Spectra, Journal of Sound and Vibration, Journal of Vibration and Control, International Journal of Non-Linear Mechanics, Nonlinear Dynamics, Reliability Engineering and System Safety, Engineering Fracture Mechanics, Mathematical Problems in Engineering, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Journal of Applied Physics, Soil Dynamics and Earthquake Engineering, Structures and Buildings, Structure and Infrastructure Engineering Journal, Applied Mathematical Modelling, Computational Materials Science, Earthquake Spectra, Journal of Mathematical Analysis and Applications, Monte Carlo Methods and Applications, and other technical journals, Prentice Hall, Elsevier, John & Wiley, and other publishers

- ***School/Colledge/University service:***
 - School Search Committees, Co-Chair or Member
 - School/Colledge Promotion Review, Chair or Member
 - University Faculty Senate
 - Mentor of Young Faculty
 - Graduate Representative for CEE Structures
- ***EERI Student Chapter Advisor:*** The Cornell University EERI Seismic Design team won the 2017 EERI competition

PRACTICAL EXPERIENCE

- **Consultant for Jet Propulsion Laboratory, Texas Tech University, NASA, AON, NIST, Sandia National Laboratories:** (1987-present)
 - *Probabilistic models* for wind, seismic, blast and other structural loads
 - *Probability-based specifications* for transmission lines, earthquake engineering, fracture mechanics, fatigue, and wind engineering
 - *Monte Carlo simulation* for solving large scale stochastic problems, e.g., response of complex linear/nonlinear dynamic systems to Gaussian/non-Gaussian excitations
 - *Probabilistic models* for concrete, laser welds, porosity in laser welds of stainless steel, polycrystals, and other physical quantities
 - *Sensitivity factors* for complex systems in random environment
- **Lead Engineer, ACRES Consulting Services Limited, Toronto, Canada:** (June 1978-Apr. 1979)
 - *Seismic qualification of nuclear power plant equipments:* Cordoba, Pt. Lepreau, Wolsung-1, and Gentilly-2 nuclear power plants for the **Atomic Energy of Canada Limited**
 - *Stress analysis:* Construction of computational models for equipments of nuclear power plants, calculation of stress/strain time histories in these equipments, and dynamic analysis of nuclear power plants subjected to specified seismic ground accelerations
 - *Modal Combination rules:* Development of novel combination rules for modal responses which account, in addition to the spacing between modal frequencies, for the modal damping ratios
- **Consultant, Western Geophysical Research Company, Boston:** (June 1974-May 1978)
 - *Computational framework:* Probabilistic seismic risk analysis

- *Seismic hazard assessment*: Sites in Massachusetts
- **Research Engineer, Bucharest Institute of Applied Mechanics, Romania:**
(Feb. 1967-Aug. 1972, part time)
 - *Stress analysis and design*: Nonstructural components, foundations, and tall buildings subjected to seismic events
 - *Experimental and theoretical studies*: Seismic performance of coupled shear walls
 - *Development of design specification*: Coupled shear walls
- **Engineer, Design Institute of Bucharest, Romania:**
(Sept. 1966-Feb. 1967, full time)
 - *Design*: Civil and industrial structures
 - *Seismic assessment*: Existing structural systems
 - *Dynamic analysis*: Intercontinental Hotel, Bucharest

GRIGORIU - BOOKS

Grigoriu, M., *Linear Dynamical Systems*, Springer Nature, Switzerland, 2021.

Grigoriu, M., *Stochastic Systems. Uncertainty Quantification and Propagation*, Springer-Verlag, London, 2012.

Grigoriu, M., *Stochastic Calculus. Applications in Science and Engineering*, Birkhäuser, Boston, 2002.

Grigoriu, M., *Applied Non-Gaussian Processes. Examples, Theory, Simulation, Linear Random Vibration, and MATLAB Solutions*, Prentice Hall, Englewood Cliffs, New Jersey, 1995.

Soong, T. T. and Grigoriu, M., *Random Vibration of Mechanical and Structural Systems*, Prentice Hall, Englewood Cliffs, New Jersey, 1992.

GRIGORIU - CHAPTERS IN BOOKS

Emery, J. and Grigoriu, M., “Efficient uncertainty propagation across continuum length scales for reliability estimates,” *Uncertainty in Materials Modeling*, Editor: D. L. McDowell, Elsevier, 2019.

Radu, A. and Grigoriu, M., “Bayesian statistics. Applications to earthquake engineering.” *Springer’s Encyclopedia of Earthquake Engineering*, 2015.

Grigoriu, M., “On Capacity of Pile Foundations,” *Foundation Engineering in the Face of Uncertainty: Honoring Fred H. Kulhawy*, 497-504, 2013.

Field, Jr., R. V. and Grigoriu, M., “Model selection for random functions with bounded range: Applications in science and engineering,” *Birkhäuser*, Editor: N. Bellomo, Politecnico di Torino, Italy, 2013.

Grigoriu, M. ”Research Perspective in Stochastic Mechanics” Chapter 6, Part I: Status and Future of Nondeterministic Approaches (NDA), *Engineering Design Reliability Handbook*, Editors, E. Nikolaidis, D.M. Ghiocel, and S. Singhal, CRC Press, New York, 2004.

Grigoriu, M., “Stochastic Mechanics,” Review paper, *Research Trends in Solid Mechanics*, Editor: G. J. Dvorak, Report from the United States National Committee on Theoretical and Applied Mechanics, Pergamon, Kidlington, Oxford, UK, 1999, pp. 197-214.

Grigoriu, M., “Fundamentals of Stochastic Mechanics,” Chapter 1, *Computational Stochastic Mechanics*, Editors: A. H.-D. Cheng and C. Y. Yang, Computational Mechanics, Boston, co-published with Elsevier Applied Science, New York, 1993, pp. 3-28.

Grigoriu, M., “Solution of random eigenvalue problem by crossing theory and perturbation,” *Computational stochastic mechanics*, pp. 81-88, Springer, Netherlands, 1991.

Grigoriu, M., *Applications of Random Vibration to Structural Engineering*, Course Book, National Chiao-Tung University, Hsin-Chu, Taiwan, 1989.

Grigoriu, M., “Response of Linear Systems to Random Series and Filtered Poisson Processes,” contribution to *Stochastic Structural Dynamics, Progress in Theory and Applications*, Editors S. T. Ariaratnam, G. I. Schuëller, and I. Elishakoff, Elsevier Applied Science Publishers Ltd., 1988, pp.89-101.

Trautman, C. H., Khater, M. M., O’Rourke, T. D., and Grigoriu, M., “Modeling Water Supply Systems for Earthquake Response,” *Structures and Stochastic Methods*, Editor A. S. Cakmak, Computational Mechanics Publications, Boston, 1987.

Grigoriu, M., “Crossing of Vector Processes,” Contributions to *Risk, Structural Engineering and Human Error*, Editor M. Grigoriu, University of Waterloo Press, Waterloo, Ontario, Canada, 1984, pp. 89-111.

GRIGORIU - TECHNICAL JOURNALS

Sepulveda, I., Haase, J.S., Liu, P., Grigoriu, M., Winckler, P., “Non-stationary probabilistic tsunami hazard assessments incorporating climate-change-driven sea level rise,” *Earth’s Future*, 9(6), e2021EF002007, 2021.

Grigoriu, M., “Statistics of Voltage Processes in Random Environment,” *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part B: Mechanical Engineering*, Vol. 7, 010910-1, 2021.

Albertini, G., Karrer, S., Grigoriu, M., Kammer, D.S., “Stochastic properties of static friction,” *Journal of the Mechanics and Physics of Solids*, 147, 104242, 2021.

Grigoriu, M. and Radu, A., “Are seismic fragility curves fragile?” *Probabilistic Engineering Mechanics*, 63, 103115, 2021.

Albertini, G., Schär, S., S. Karrer, S., Grigoriu, M., Kammer, D., “Nucleation of frictional sliding,” *17èmes Journées de la matière condensée, JMC*, JMC 12, 2021.

Paisley, B., Riasi, M. S., Yeghiazarian, L., and Grigoriu, M., “Fast numerical design of porous materials with target permeability, porosity, and pore size distribution,” *Journal of Porous Media*, 24 (1), 2021.

Sepulveda, I., Haase, J. S., Liu, P., Grigoriu, M., Tozer, B., Sandwell, D. “Uncertainty of bathymetry models and effect on tsunami models,” *Coastal Engineering Proceedings*, 22-22, 2020.

Albertini, G., Karrer, S., Grigoriu, M., Kammer, D. S., “Stochastic properties of static friction,” *Journal of the Mechanics and Physics of Solids*, 104242, 1, 2020.

Ciano, M., Giofrè, M., V Gusella, Grigoriu, M., “Non-stationary dynamic structural response to thunderstorm outflows,” *Probabilistic Engineering Mechanics*, 62, 103103, 2020.

Uy, W. I. T. and Grigoriu, M., “Neural network representation of the probability density function of diffusion processes,” *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 30 (9), 093118, 2020.

Sepulveda, I., Tozer, B., Haase, J. S., Liu, P., Grigoriu, M., “Modeling uncertainties of bathymetry predicted with satellite altimetry data and application to tsunami hazard assessments,” *Journal of Geophysical Research: Solid Earth*, 125 (9), e2020JB019735, 1, 2020.

Grigoriu, M., “First passage times for Gaussian processes by Slepian models,” *Probabilistic Engineering Mechanics*, 61, 103086, 2020.

Grigoriu, M., “Data-based importance sampling estimates for extreme events,” *Journal of Computational Physics*, 412, 109429, 2020.

- Uy, W. I. T. and Grigoriu, M., “Identification of input random field samples causing extreme responses,” *Applied Mathematical Modelling*, 82, 916-937, 2020.
- Pepi, C., Giofrè, M., Grigoriu, M., “Bayesian inference for parameters estimation using experimental data,” *Probabilistic Engineering Mechanics*, 60, 103025 (1) 2020.
- Ciano, M., Giofrè, M., Grigoriu, M. “The role of intensity measures on the accuracy of seismic fragilities,” *Probabilistic Engineering Mechanics*, 60, 103041 (4) 2020.
- Uy, W. I. T. and Grigoriu, M., “Specification of additional information for solving stochastic inverse problems,” *SIAM Journal on Scientific Computing*, 41 (5), A2880-A2910.
- Grigoriu, M. and Uy, W. I. T., “Extreme Events: Mechanisms and Prediction,” *Applied Mechanics Reviews*, 71 (5), 2019.
- Pepi, C., M. Gioffre, M., and Grigoriu, M., “Parameters identification of cable stayed footbridges using Bayesian inference,” *Meccanica* 54, 1403- 1419, 2019.
- Grigoriu, M., “Statistics of voltage processes in random environment,” *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems: Part B. Mechanical Engineering*, in press.
- Ciano, M., M. Gioffre, M., and Grigoriu, M., “ The role of intensity measures on the accuracy of seismic fragilities,” *Probabilistic Engineering Mechanics*, 2020, in press.
- Pepi, C., M. Gioffre, M., and Grigoriu, M., “Bayesian inference for parameters estimation using experimental data,” *Probabilistic Engineering Mechanics*, 2020, in press.
- Grigoriu, M., “PC translation models for random vectors and multivariate extremes,” *SIAM, Computational Methods in Science and Engineering*, ***, 2019.
- Zhao, H., Grigoriu, M., and Gurley, K. R., “Translation processes for wind pressures on low-rise buildings,” *Journal of Wind Engineering & Industrial Aerodynamics*, 184, 405-416, 2019.
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- Zhao, H., Grigoriu, M., and Gurley, K. R., “Translation processes for wind pressures on low-rise buildings,” *Journal of Wind Engineering & Industrial Aerodynamics*, 184, 405-416, 2019.
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- Radu, A. and Grigoriu, M., “An earthquake-source-based metric for seismic fragility analysis,” *Bulletin of the Seismological Society of America*, March, 2018.

- Radu, A. and Grigoriu, M., “A site-specific ground-motion simulation model: Applications for Vrancea earthquakes,” *Soil Dynamics and Earthquake Engineering*, 111, 77-86, 2018.
- Uy, W. I. T. and Grigoriu, M., “An adaptive method for solving stochastic equations based on interpolants over Voronoi cells,” *Probabilistic Engineering Mechanics*, 51, 23-41, 2018.
- Grigoriu, M., “Estimates of system response maxima by extreme value theory and surrogate models,” *SIAM, Journal of Uncertainty Quantification*, 5(1), 190-217, 2017.
- Grigoriu, M., “Monte Carlo algorithm for vector-valued Gaussian functions with preset component accuracies,” *Monte Carlo Methods & Applications*, 23(3), 165-188, 2017.
- Grigoriu, M., “Translation models revisited,” *Probabilistic Engineering Mechanics*, 48, 68-75, 2017.
- Sepúlveda, I., Liu, P. L. F., Grigoriu, M., and Pritchard, M., “Tsunami hazard assessment with consideration of uncertain earthquake slip distribution and location,” *Journal of Geophysical Research: Solid Earth*, 122, 2017.
- Tagle, F., Berner, J., Grigoriu, M., Mahowald, N.M., and Samorodnitsky, G., “Temperature Extremes in the Community Atmosphere Model with Stochastic Parameterizations,” *Journal of Climate, American Meteorological Society*, 241-258, 2016.
- Pakawat, P., Sun, W., Grigoriu, M., Hess, P., and Samorodnitsky, G., “Extreme ozone events: Tail behavior of the surface ozone distribution over the U.S.,” *Atmospheric Environment*, 128, 134-146, 2016.
- Grigoriu, M., “Microstructure models and material response by extreme value theory,” *SIAM/ASA Journal on Uncertainty Quantification*, 4, 190-217, 2016.
- Grigoriu, M., “Models for space-time random functions,” *Probabilistic Engineering Mechanics*, 43, 5-19, 2016.
- Grigoriu, M., “Do seismic intensity measures (IMs) measure up?,” *Probabilistic Engineering Mechanics*, 46, 80-93, 2016.
- Emery, J. M., Grigoriu, M., and Field Jr, R. V., “Bayesian methods for characterizing unknown parameters of material models,” *Applied Mathematical Modelling*, 40(13-14), 6395-6411, 2016.
- Grigoriu, M., “Material response at micro-, multi-, and macro-scale,” *International Journal for Multiscale Computational Engineering*, 14(3), 237-254, 2016.
- Grigoriu, M., “Parametric models for samples of random functions,” *Journal of Computational Physics*, 297, 47-71, 2015.

- Emery, J. M., Field, Jr., R. V., Foulk III, J. W., Karlson, K. N., and Grigoriu, M., "Predicting laser weld reliability with stochastic reduced-order models," *International Journal for Numerical Methods in Engineering*, 103, 914-936, 2015.
- Zhao, H. and Grigoriu, M., "A new perspective on independent component analysis," *Probabilistic Engineering Mechanics*, 42, 64-70, 2015.
- Grigoriu, M., "Material responses at micro- and macro-scales," *Computational Materials Science*, 107, 190-203, 2015.
- Field, Jr., R. V., Grigoriu, M., and Emery, J. M., "On the efficacy of stochastic collocation, stochastic Galerkin, and stochastic reduced order models for solving stochastic problems," *Probabilistic Engineering Mechanics*, 41, 60-72, 2015.
- Warner, J. E., Aquino, A., and Grigoriu, M., "Stochastic reduced order models for inverse problems under uncertainty," *Computer methods in applied mechanics and engineering*, 285, 488-514, 2015.
- Grigoriu, M., "A Novel Method for Solving Random Eigenvalue Problems," *Computational Methods, Seismic Protection, Hybrid Testing and Resilience in Earthquake Engineering*, (A Tribute to the Research Contributions of Prof. Andrei Reinhorn), 43-54, 2015.
- Grigoriu, M. and Samorodnitsky, G., "Reliability of dynamic systems in random environment by extreme value theory," *Probabilistic Engineering Mechanics*, 38, 54-69, 2014.
- Grigoriu, M., "An efficient Monte Carlo solution for problems with random matrices," *Monte Carlo Methods & Applications*, 20(2), 121136, 2014.
- Radu, A. and Grigoriu, M., "A site-specific seismological model for seismic hazard," *Bulletin of the Seismological Society of America*, 104(6), 3054-3071, 2014.
- Emery, J. M., Field, Jr., R. V., Foulk, III, J. W., Karlson, K. N., and Grigoriu, M., "Predicting laser weld reliability with stochastic reduced-order models," *International Journal of Solids and Structures*, 103(12), 914-936, 2015.
- Grigoriu, M., "Noise-induced transitions for random versions of Verhulst model," *Probabilistic Engineering Mechanics*, 38, 136-142, 2014.
- Grigoriu, M. and Field, Jr., R. V., "A method for analysis of linear dynamic systems driven by stationary non-Gaussian noise with applications to turbulence-induced random vibration," *Applied Mathematical Modelling*, 38(1), 336-354, 2014.
- Sarkara, S., Warner, J. E., Aquino, W., and Grigoriu, M., "Stochastic reduced order models for uncertainty quantification of intergranular corrosion rates," *Corrosion Science*, 80, 257-268, 2014.

- Grigoriu, M., "Response Statistics for Random Heterogeneous Microstructures," *SIAM/ASA Journal on Uncertainty Quantification*, 2(1), 252-275, 2014.
- Grigoriu, M., "An efficient Monte Carlo solution for problems with random matrices," *Monte Carlo Methods and Applications*, 20(2), 121-136, 2014.
- Grigoriu, M. and Field, Jr., R. V., "A two-step method for analysis of linear systems with uncertain properties driven by Gaussian noise," *Probabilistic Engineering Mechanics*, 34(1), 200-210, 2013.
- Grigoriu, M., "Solution of linear dynamic systems with uncertain properties by stochastic reduced order models," *Probabilistic Engineering Mechanics*, 34, 168-176, 2013.
- Field, Jr., R. V., Grigoriu, M. and Dohrmann, C. R., "An algorithm for on-the-fly generation of samples of non-stationary Gaussian processes based on a sampling theorem," *Monte Carlo Methods & Applications*, 19(2), 143-169, 2013.
- Warner, J. E., Grigoriu, M., and Aquino, W., "Stochastic reduced order models for random vectors. Application to random eigenvalue problems," *Probabilistic Engineering Mechanics*, 31, 1-11, 2013.
- Grigoriu, M., "Solution of linear dynamic systems with uncertain properties by stochastic reduced order models," *Probabilistic Engineering Mechanics*, 34, 168-176, 2013.
- Grigoriu, M., "A method for solving stochastic equations by reduced order models and local approximations," *Journal of Computational Physics*, 231, 6495-6513, 2012.
- Grigoriu, M., "Conditional Monte Carlo method for dynamic systems with uncertain properties," *Applied Mathematical Modelling*, 36(3), 1209-1218, 2012.
- Grigoriu, M., "Solution stability and phase transition for two SDEs by a fixed time step integration method," *Probabilistic Engineering Mechanics*, 26, 110-117, 2012.
- Field, Jr., R. V. and Grigoriu, M., "Level cut Gaussian random field models for transitions from laminar to turbulent flow," *Probabilistic Engineering Mechanics*, 26, 91-102, 2012.
- Field, Jr., R. V. and Grigoriu, M., "A method for the efficient construction and sampling of vector-valued translation random fields", *Probabilistic Engineering Mechanics*, 29, 79-91, 2012.
- Grigoriu, M., "Linear models for non-Gaussian processes and applications to linear random vibration", *Probabilistic Engineering Mechanics*, 20, 461-470, 2011.
- Keskin, R. S. O., Hover, K. C., and Grigoriu, M., "Size effect in modeling diffusivity of hardened mortar," *Computers and Structures*, 89, 713-723, 2011.
- Arwade, S. R., Lackner, M. A., and Grigoriu, M., "Probabilistic models for wind turbine and wind farm performance," *Journal of Solar Energy Engineering*, 133, 041006(1-9), 2011.

- Field, Jr., R. V. and Grigoriu, M., "A Poisson random field model for intermittent phenomena with application to laminar-turbulent transition and material microstructure", *Applied Mathematical Modelling*, 35(3), 1142-1156, 2011.
- Grigoriu, M., "To scale or not to scale seismic ground acceleration records," *Journal of Engineering Mechanics*, ASCE, 137, 284-293, 2010.
- Grigoriu, M., "Probabilistic models for stochastic elliptic partial differential equations," *Journal of Computational Physics*, 229, 8406-8429, 2010.
- Liu, X. Garboczi, E. J. Grigoriu, M., Lu. Y., Erdogan, S. T., "Spherical harmonic-based random fields based on real particle 3D data: improved numerical algorithm and quantitative comparison to real particles," *Powder Technology*, 203, 78-86, 2011.
- Grigoriu, M., "A spectral-based Monte Carlo algorithm for generating samples of non-stationary Gaussian processes," *Monte Carlo Methods and Applications*, 16, 143-165, 2010.
- Roth, C. P. and Grigoriu, M., "Applications of response sensitivity analysis in earthquake engineering," *Journal of the South African Institution of Civil Engineering*, 52(2), 12-18, 2010.
- Grigoriu, M., "Effective conductivity by stochastic reduced order models (SROMs)," *Computational Materials Science*, 50, 138-146, 2010.
- Grigoriu, M., "Discussion on "Public hurricane loss evaluation models: Predicting losses of residential structures in the state of Florida," *Statistical Methodology*, 7, 577-579, 2010.
- Grigoriu, M., "Nearest neighbor probabilistic model for aluminum polycrystals," *Journal of Engineering Mechanics*, ASCE, 136(7), 821-829, 2010.
- Grigoriu, M., "Linear random vibration by stochastic reduced-order models," *International Journal for Numerical Methods in Engineering*, 82(12), 1537-1559, 2010.
- Keskin, R. S. O. and Grigoriu, M., "A probability-based method for calculating effective diffusivity coefficients of composite media," *Probabilistic Engineering Mechanics*, 25(2), 249-254, 2010.
- Field, Jr., R. V. and Grigoriu, M., "Model selection for a class of stochastic processes or random fields with bounded range", *Probabilistic Engineering Mechanics*, 24(3), 331-342, 2009.
- Field, Jr., R. V. and Grigoriu, M., "Reliability of dynamic systems under limited information", *Probabilistic Engineering Mechanics*, 24(1), 1626, 2009.
- Grigoriu, M., "Reliability of linear systems under Poisson white noise," *Probabilistic Engineering Mechanics*, 24(3), 397-406, 2009.

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- Field, Jr., R. V. and Grigoriu, M., “Model selection for a class of stochastic processes or random fields with bounded range,” *Probabilistic Engineering Mechanics*, 24(3), 331-342, 2009.
- Field, Jr., R. V. and Grigoriu, M., “Reliability of dynamic systems under limited information,” *Probabilistic Engineering Mechanics*, 24(1), 16-26, 2009.
- Grigoriu, M., “Reliability of linear systems under Poisson white noise,” *Probabilistic Engineering Mechanics*, 24(3), 397-406, 2009.
- Grigoriu, M., “Existence and construction of translation models for stationary non-Gaussian processes,” *Probabilistic Engineering Mechanics*, 24(4), 545-551, 2009.
- Field, Jr., R. V. and Grigoriu, M., Closure on “ Model selection in applied science and engineering: a decision-theoretical approach,” *Journal of Engineering Mechanics*, 135(4), 360-360, 2009.
- Grigoriu, M., “Level-cut inhomogeneous filtered Poisson field for two-phase microstructures,” *International Journal for Numerical Methods in Engineering*, 78, 215-228, 2009.
- Grigoriu, M., “Reduced order models for random functions,” *Applied Mathematical Modelling*, 33, 161-175, 2009.
- Grigoriu, M. and Field, Jr., R. V., “A solution to the static frame validation challenge problem using Bayesian model selection,” *Computer Methods in Applied Mechanics and Engineering*, Special Issue on Sandia’s Validation Challenge Workshop, 197(29-32), 2540-2549, 2008.
- Grigoriu, M., “A critical evaluation of closure methods via two simple dynamic systems,” *Journal of Sound and Vibration*, 317, 190-198, 2008.
- Grigoriu, M., “A class of weakly stationary non-Gaussian processes,” *Probabilistic Engineering Mechanics*, 23(4), 378-384, 2008.
- Spence, S., Gioffré, M., and Grigoriu, M., “Probabilistic models and simulation of irregular masonry walls,” *Journal of Engineering Mechanics*, ASCE, 134(9), 750-762, 2008.
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- Field, Jr., R. V. and Grigoriu, M., "Model selection in applied science and engineering: a decision-theoretic approach," *Journal of Engineering Mechanics*, ASCE, 133(7), 780-791, 2007.
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Grigoriu, M., Ruiz, S. E., and Rosenblueth, E., "Nonstationary Models of Seismic Ground Acceleration," *Report NCEER-88-0043*, State University of New York at Buffalo, Buffalo, New York, 1988.

Grigoriu, M., Saif, M. T. A., El Borgi, S., and Ingraffea, A. R., "Mixed Mode Fracture Initiation and Trajectory Prediction under Random Stresses," *Report 88-5*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1988.

Grigoriu, M., "Response of Duffing Oscillators to Narrow Band Stationary Gaussian Excitations," *Report 88-4*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1988.

Fujita, M., Grigoriu, M., and Rackwitz, R., "Reliability of Redundant Dynamic Systems with Brittle Components," *Report 84*, Technical University of Munich, Munich, Germany, 1988.

Grigoriu, M., "Damage Models for Seismic Analysis," *Report 87-4*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1988.

Grigoriu, M., "Failure Time of Fiber Bundles Under Random Loads," *Report 87-3*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1987.

Grigoriu, M., "Maxima of Diffusion Processes," *Report 86-1*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1986.

Grigoriu, M. and Alibe, B., "Response of Compliant Offshore Platforms to Waves," *Report NBS GCR-85-501*, National Bureau of Standards, Washington, D. C., 1985.

Grigoriu, M. and Khater, M., "Finite Difference Analysis of Stochastic Beams on Elastic Foundation," *Report 85-7*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1985.

Grigoriu, M., "Estimation of Design Wind Speeds from Short-Term Records," *Report EPRI EL-3972*, Electric Power Research Institute, Palo Alto, California, 1985.

Buss, A. and Grigoriu, M., "Crossings of Non-Gaussian Processes," *Report 85-5*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1985.

Grigoriu, M., "Response of Linear Systems to Quadratic Gaussian Excitations," *Report 85-4*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1985.

Grigoriu, M. and Alibe, B., "Practical Approximations of Peak Wave Forces," *Report NBS-GCR-84-481*, National Bureau of Standards, Washington, D. C., 1984.

Grigoriu, M., "Quasi-Static Response of Offshore Platforms," *Report 84-5*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1984.

Morreale, T., Gergely, P. and Grigoriu, M., "Wind-Tunnel Study of Wind Loading on a Compliant Offshore Platforms," *Report NBS-GCR-84-465*, National Bureau of Standards, Washington, D. C., 1983.

Grigoriu, M., "Practical Methods for System Reliability Analysis," *Report 83-2*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1983.

Grigoriu, M., "Approximate Analysis of Complex Reliability Problems," *Report 82-8*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1982.

Grigoriu, M., "Contributions to Approximate Reliability Analysis," *Report 81-15*, Structural Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca, New York, 1981.

Grigoriu, M. and Lind, N. C., "Probabilistic Models for Prototype Testing," *Report 164*, Solid Mechanics Division, University of Waterloo, Waterloo, Ontario, Canada, 1981.

Grigoriu, M., et al., "Prototype Load Testing - Phase II," *Report for Contract No. 079048*, Division of Building Research, National Council of Canada, University of Waterloo, Waterloo, Ontario, Canada, 1980.

Grigoriu, M., "Load Analysis for Serviceability States," *Report 79-3*, Department of Civil Engineering and Applied Mechanics, McGill University, Montreal, Canada, 1979.

Grigoriu, M., "Risk Dependent Earthquake for Nuclear Plants," *Report 78-3*, Department of Civil Engineering and Applied Mechanics, McGill University, Montreal, Quebec, Canada, 1978.

Grigoriu, M., "On the Prediction of Extreme Flows," *Report 78-2*, Urban and Environmental Systems Engineering, McGill University, Montreal, Quebec, Canada, 1978.

Grigoriu, M. and Turkstra, C., "Structural Safety Indices for Repeated Loads," *Report 77-11*, Department of Civil Engineering and Applied Mechanics, McGill University, Montreal, Quebec, Canada, 1977.

Grigoriu, M., "A Decision Theoretical Approach to Model Selections for Structural Reliability," *Thesis for the degree of Doctor of Philosophy*, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1976.

Grigoriu, M., "On the Maximum of the Sum of Random Process Load Models," *Internal Document No. 1*, Structural Loads Analysis and Specification Project, Department of Civil Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1975.

Grigoriu, M., et al., "Analysis of Shells of Revolution by the Finite Element Method," *Technical Report*, Bucharest Institute of Civil Engineering, Bucharest, Romania, 1973.

Grigoriu, M., "Analysis of the Wiener Process and the Itô Integral," *Thesis* presented to the University of Bucharest, in 1972, in partial fulfillment of the requirements for the degree of Mathematician.

Grigoriu, M., (Co-author), "On the Seismic Design of Coupled Shear Walls," *Series of Technical Reports*, Bucharest Institute of Civil Engineering, Romania, 1967-1970

Grigoriu, M., "Analysis and Design of Thin Concrete Shells by the Finite Differences Method," *Thesis* presented to the Bucharest Institute of Civil Engineering, in 1966, in partial fulfillment of the requirements for the degree of Civil Engineer.

Seminars, Lectures, and Short Courses

Grigoriu, M., seminar on “Probabilistic models and methods for solving stochastic equations,” *Clarkson University*, Potsdam, NY, April, 2017.

Grigoriu, M., course on “Methods for solving stochastic partial differential equations,” *Duke University*, Durham, NC, March, 2016.

Grigoriu, M., course on “Applications of random vibration theory,” *Institute for Risk and Uncertainty, University of Liverpool*, United Kingdom, April, 2015.

Grigoriu, M., seminar on “Probabilistic models for microstructures and estimates of extreme material response,” *Duke University*, May, 2015.

Grigoriu, M., seminar on “Practical methods for characterizing solutions of stochastic equations,” *Workshop on Risk Management Approaches in Engineering Applications*, Gainesville, Florida-USA, November, 2015.

Grigoriu, M., seminar on “Probabilistic models for microstructures and solutions of stochastic equations,” *Johns Hopkins University*, Baltimore, MD, October, 2014.

Grigoriu, M., seminar on “Solution of stochastic mechanics problems by reduced order models,” *Sandia National Laboratory*, Albuquerque, October, 2012.

Grigoriu, M., seminar on “Fragility analysis by Bayesian analysis,” *University of Nevada*, Reno, Nevada, October, 2012.

Grigoriu, M., course on “Uncertainty quantification and propagation in engineering applications,” *UTSA Engineering*, Dean’s Distinguished Speaker Series, March, 2012.

Grigoriu, M., seminar on “Formulation and solution of stochastic problems,” *University of Illinois at Urbana-Champaign*, November, 2011.

Grigoriu, M., seminar on “Unintended effects of scaling seismic ground accelerations,” *University of Perugia*, Perugia, Italy, June, 2010.

Grigoriu, M., seminar on “Random field models for polycrystals and two-phase microstructures,” *University of Southern California*, Los Angeles, October, 2009.

Grigoriu, M., seminar on “Uncertainty quantification in engineering applications,” *Clarkson University*, Potsdam, NY, April 2009.

Grigoriu, M., seminar on “Formulation and solution of stochastic problems,” *Center for Applied Mathematics*, Cornell University, February, 2009.

Grigoriu, M., seminar on “Uncertainty quantification and propagation in engineering systems,” *University of Connecticut, Department of Statistics*, April, 2008.

Grigoriu, M., seminar on “Reduced order models for random variables and functions,” *SAMSI*, September, 2008

Grigoriu, M., seminar on “Stochastic problems in science and engineering,” *SAMSI*, Durham, NC, October, 2008

Grigoriu, M., seminar on “Reduced order models for random elements and solutions of stochastic equations,” *SAMSI*, Durham, NC, October, 2008

Grigoriu, M., seminar on “A unified approach for solving stochastic problems in engineering,” *Sandia National Laboratory*, Albuquerque, May, 2007.

Grigoriu, M., seminar on “Probabilistic models for material properties,” *Sandia National Laboratory*, Albuquerque, May, 2006.

Grigoriu, M., seminar on “Classification and solutions of stochastic problems in science and engineering,” seminar *University of Perugia*, Perugia, Italy, July 2005.

Grigoriu, M., seminar on “Transition of Reliability Methods from Research to Engineering Design,” *SAE 2005 World Congress*, Detroit, Michigan, April 2005.

Grigoriu, M., seminar on “Solutions of class stochastic differential and algebraic equations,” *University of Texas*, Austin, April 2005.

Grigoriu, M., seminar on “Probabilistic models for two-phase materials and effective conductivity,” *NSF Workshop*, Johns Hopkins, Baltimore, January 2005.

Grigoriu, M., seminar on “Rehabilitation decision analysis for hospitals,” *California Office of Statewide Health Planning and Development*, Sacramento, California, February 2005.

Grigoriu, M., seminar on “Fragility based and rehabilitation decision analysis,” *University of Buffalo*, Buffalo, NY, December 2004.

Grigoriu, M., seminar on “Some recent research results in stochastic mechanics,” *Technical University of Civil Engineering*, Bucharest, Romania, October 2004.

Grigoriu, M., seminar on “Digital microstructures: probabilistic models for polycrystals and two-phase microstructures,” *16th Annual Rio Grande Symposium on Advanced Materials*, Albuquerque, NM, October 2004.

Grigoriu, M., seminar on “Reliability of Systems of Sensors,” *Complex Systems and JCSS Fatigue Workshop at DTU*, Lungby, DTU, Denmark, August 23-25, 2004.

Grigoriu, M., seminar on “Formulation and solution of engineering problems involving uncertainty,” *SAE G-11 Fall 2003 Meeting*, Sterling Heights, Michigan, October 6-8, 2003.

Grigoriu, M., seminar on “Stochastic modeling and simulation of random microstructures,” *NSF-FHWA Workshop on Imaging and Simulation of Concrete Structure (nano to mesoscale)*, Northwestern university, Evanston, Illinois, July 30-31, 2003.

Grigoriu, M., seminar on “Probabilistic models for input and system properties,” *Sandia National Laboratory*, Albuquerque, July, 2003.

Grigoriu, M., seminar on “Model selection and solutions for deterministic/stochastic problems,” *Notre Dame University*, South Bend, Indiana, April 11, 2003.

Grigoriu, M., seminar on “Seismic Hazard and Fragility Surfaces”, *MCEER meeting*, University of Buffalo, NY, January 2003.

Grigoriu, M., seminar on “Solution of stochastic problems with deterministic and/or random input and operator,” *Sandia National Laboratory*, Albuquerque, April, 2002.

Grigoriu, M., seminar on “Selection of probabilistic models for a class of time series,” *Sandia National Laboratory*, Albuquerque, April, 2002.

Grigoriu, M., course on “Reliability and stochastic methods,” *University of Perugia*, Perugia, Italy, June, 2002.

Grigoriu, M., seminar on “Applications of Itô’s calculus to the local solution of solid mechanics problems,” *The Johns Hopkins University*, Baltimore, MD, May, 2001.

Grigoriu, M., seminar on “Stochastic problems in applied science and engineering,” *Duke University*, Durham, NC, October, 2000.

Grigoriu, M., course on “Risk Assessment, Management, and Design of Infrastructure Projects,” *National University of Singapore*, Singapore, June 28-30, 2000.

Grigoriu, M., course on “Stochastic Mechanics,” *Technical University of Denmark*, Lyngby, August-September, 2000.

Grigoriu, M., seminar on “Non-Deterministic Approaches,” *National Strategic Planning Workshop*, First AIAA WTG-NDA, Atlanta, April, 2000.

Grigoriu, M., seminar on “Stochastic Problems in Engineering and Applied Sciences,” *North Carolina State University*, Raleigh, April, 2000.

Grigoriu, M., International Ph.D. Course on “Stochastic Mechanics Methods,” *Technical University of Denmark*, Lyngby, Denmark, August 7-18, 2000.

Grigoriu, M., seminar on “Applications of Itô’s Formula to Deterministic and Stochastic Mechanics Problems”, *Florida Atlantic University, Center for Applied Stochastic Research*, Boca Raton, April 1998.

Grigoriu, M., seminar on “Applications of Itô’s Formula and Monte Carlo Simulation,” *Cornell University*, Department of Theoretical and Applied Mechanics, Ithaca, New York, January 1998.

Grigoriu, M., seminar on “Applications of Itô Formula to Random Vibration,” *State University of New York at Buffalo*, Buffalo, New York, May 1996.

Grigoriu, M., seminar on “Some Applications of Non-Gaussian Processes,” *Notre Dame University*, South Bend, Indiana, March 1996.

Grigoriu, M., seminar on “Parametric Models and Stochastic Integrals,” *IUTAM Symposium on Nonlinear Stochastic Mechanics, Specially Invited Lecture*, Norwegian Institute of Technology, Trondheim, Norway, June 1995.

Grigoriu, M., seminar on “Non-Gaussian Models in Applied Sciences, Engineering, Dynamics, and Reliability,” *State University of New York at Buffalo*, Buffalo, New York, March 1995.

Grigoriu, M., course on “Random Vibration”, *Innsbruck Technical University*, Innsbruck, Austria, Fall 1993.

Grigoriu, M., seminar on “Dynamic Systems Characterized by Switching Stochastic Differential Equations,” *University of Lund*, Lund, Sweden, March 1992.

Grigoriu, M., seminar on “Solution of Random Eigenvalue Problem by Crossing Theory,” *Rensselaer Polytechnic Institute*, Troy, New York, March 1991.

Grigoriu, M., seminar on “Stochastic Finite Element Method,” *Dresser-Rand*, Wellsville, New York, November 1990.

Grigoriu, M., seminar on “Effects of Uncertainty on Material Models in Seismic Design,” *NCEER Investigators Meeting*, State University of New York at Buffalo, Buffalo, New York, October 1990.

Grigoriu, M., seminar on “Application of Reliability Analysis to the Design of Complex Systems,” *Dresser-Rand*, Wellsville, New York, September 1990.

Grigoriu, M., course on “Random Vibration,” *National Chiao-Tung University*, Hsin-Chu, Taiwan, August 1989.

Grigoriu, M., seminar on “Reliability of Degrading Systems,” *Purdue University*, School of Aeronautics and Astronautics, West Lafayette, Indiana, November 1989.

Grigoriu, M., seminar on “Probabilistic Analysis of Complex Dynamic Systems,” *Jet Propulsion Laboratory*, California Institute of Technology Pasadena, California, November 1989.

Grigoriu, M., seminar on “Probabilistic Fracture Mechanics,” *University of Florence*, Florence, Italy, June 1989.

Grigoriu, M., seminar on “Applications of Probability Theory to Geotechnical Engineering and Structural Mechanics,” *University of Michigan*, Ann Arbor, Michigan, April 1989.

Grigoriu, M., seminar on “Introduction to Stochastic Mechanics and Application,” *State University of New York at Buffalo*, Buffalo, New York, January 1989.

Grigoriu, M., seminar on “Applications of Random Vibration to Earthquake Engineering,” *Lecture Series in China*, Futzo, Shanghai, Xien, and Beijing, August 1988.

Grigoriu, M., seminar on “Response and Reliability Analysis of a Duffing Oscillator Subjected to Narrow Band Excitations,” *Massan Distinguished Lectures*, Notre Dame University, South Bend, Indiana, April 1988.

Grigoriu, M., seminar on “Applications of Diffusion Processes in Engineering,” *Cornell University*, Operations Research and Industrial Engineering, March 1988.

Grigoriu, M., seminar on “Probabilistic Analysis of Buried Pipelines Subject to Earthquake Loads,” *Rensselaer Polytechnic Institute*, Troy, New York, March 1988.

Grigoriu, M., seminar on “Dynamic Response of Structure to Wind Loads,” *Technical University of Munich*, Munich, Germany, June 1987.

Grigoriu, M., course on “Extremes of Random Processes”; “Response of Linear Systems to Non-Gaussian Excitations”; “Response of Nonlinear Systems to Random Excitations”; “Approximate Methods in Nonlinear Random Vibrations”, and “Dynamic Response of Fiber Bundle Systems to Random Loads,” *Lecture Series*, Princeton University, Princeton, New Jersey, March-April 1987.

Grigoriu, M., course on “Simulation Methods in Random Vibration” and “Reliability Analysis of Structural Systems to Wave Forces,” *Lecture Series*, UNAM, Mexico City, Mexico, February 1987.

Grigoriu, M., seminar on “Structural Response to Non-Gaussian Excitations. An Application to Gust Response Factor Evaluation,” *Tokyo University*, Tokyo, Japan, June 1985.

Grigoriu, M., seminar on “Effects of Statistical Uncertainty in Seismic Analysis,” *University of Colorado at Boulder*, Boulder, Colorado, May 1985.

Grigoriu, M., seminar on “Statistical Uncertainty in Structural Response to Seismic Excitation,” *Cornell University*, Theoretical and Applied Mechanics, Ithaca, New York, October 1984.

Grigoriu, M., course on, “Probabilistic Methods for Structural Analysis,” *ASCE Structural Congress*, San Francisco, October 1984.

Grigoriu, M., seminar on “Response of Linear Systems to Random Excitation with Uncertain Parameters,” *State University of New York at Buffalo*, Earthquake Engineering Lecture Series, Buffalo, New York, October 1984.

Grigoriu, M., seminar on “Extremes of Non-Gaussian Load Processes,” *University of Trondheim*, Trondheim, Norway, June 1984.

Grigoriu, M., course on “Probabilistic Methods for Structural Analysis,” San Francisco, October 1984.

Grigoriu, M., seminar on “Methods for Building Safety Assessment,” *Cornell University*, School of Civil and Environmental Engineering, Ithaca, New York, October 1983.

Grigoriu, M., course on “Probabilistic Methods for Building Safety Assessment,” *ASCE Structural Congress*, Houston, October 1983.

Grigoriu, M., seminar on “Applications of Crossing Theory in Structural Reliability,” *Innsbruck Technical University*, Innsbruck, Austria, August 1983.

Grigoriu, M., seminar on “Analysis of Structures with Random Stiffness or Strength,” *Northwestern University*, Evanston, Illinois, May 1983.

Grigoriu, M., seminar on “Probabilistic Methods for Structural Reliability Analysis,” *Syracuse University*, Syracuse, New York, April 1983.

Grigoriu, M., course on “Probabilistic Methods for Building Safety Assessment,” *ASCE Structural Congress*, Houston, October 1983

Grigoriu, M., seminar on “Approximate Methods for Reliability Analysis,” *Technical University of Munich*, Munich, Germany, May 1982.

Grigoriu, M., seminar on “Probabilistic Analysis of Load Combinations,” *University of Waterloo*, Waterloo, Ontario, Canada, June 1979.

Grigoriu, M., seminar on “Extremes of Correlated Series,” *McGill University*, Montreal, Quebec, Canada, May 1978.

Grigoriu, M., seminar on “Bayesian Estimation of Extreme Flows,” *Simon Bolivar University*, Caracas, Venezuela, April 1977.

GRIGORIU - SPONSORED RESEARCH

National Science Foundation, PI, CMMI-1639669, A new perspective on seismic intensity measures and fragility analysis, 9/1/2016-8/31/2018, \$288,491

National Science Foundation, co-PI, AGS-1608775, The dynamical and chemical basis for the future of pollution extremes, 9/1/2016-8/31/2019, \$587,563

National Science Foundation, PI, CMMI-126551, Performance-based multi-hazard engineering for seismic and wind loads, 6/1/2013-5/31/2018, \$300,000

Environmental Protection Agency, co-PI, ID-83520501, Estimates of extreme air quality events using a hierarchy of models: present and future, 6/1/2012-5/31/2016, \$749,899

National Science Foundation, co-PI, CCF-1048915, Collaborative research: Type 1: Decadal predictability of extreme events: Impact of a model error representation and numerical resolution, 7/1/2011-6/30/2015, \$509,866

National Science Foundation, PI, CMMI-0969150, Effective properties of multi-phase materials by stochastic reduced order models, 5/1/2010-4/30/2016, \$300,000

National Science Foundation, PI, CMMI-0925714, Life-cycle and downtime cost estimates for structural systems subjected to seismic loads, 8/1/2009-7/31/2014, \$2776,000

National Institute of Standard and Technology, PI, 57055/A001, Algorithms for generating large sets of synthetic directional wind speed data for hurricane, thunderstorm, and synoptic winds, 9/1/2008-12/15/2008, \$56,995

Consortium of Universities for Research in Earthquake Engineering, Simulation of the seismic performance and fire effectiveness of nonstructural systems, 9/15/2007-8/31/2012, \$226,319

National Science Foundation, PI, Sunny Buffalo State 52398-52395/A001, Fragility-based rehabilitation decision analysis for acute care facilities, 7/1/2006-12/31/2007, \$62,500

National Science Foundation, PI, Sunny Buffalo State 52394-52393/A001, System risk and reliability for water supply systems, 7/1/2006-12/31/2007, \$38,607

National Science Foundation, PI, Sunny Buffalo State 50797, 50796, 50787, 50785, /A001, Fragility-based rehabilitation decision analysis for acute care facilities, 7/1/2005-12/31/2006, \$68,300

National Science Foundation, PI, Sunny Buffalo State 50790, 50788/A001, System risk and reliability for water supply systems, 7/1/2005-12/31/2006, \$48,800

National Science Foundation, PI, Sunny Buffalo State 48732, 48731, 48728, 48727/A001, Fragility-based rehabilitation decision analysis, 7/1/2004-12/31/2005, \$72,000

National Science Foundation, PI, Sunny Buffalo State 48734, 48733/A001, System risk and reliability for water supply systems, 7/1/2004-12/31/2005, \$56,000

National Science Foundation, PI, Sunny Buffalo State 46689, 46688, 46687, 46685, 46684/A001, Fragility-based rehabilitation decision analysis, 7/1/2003-12/31/2004, \$73,000

Sandia National Laboratory, PI, 114109, Probabilistic model selection, 2/6/2003-8/30/2004, \$138,171

National Science Foundation, co-PI, CMS-0220327, A probabilistic model for microstructure evolution with application to smart concrete materials, 8/15/2002-7/31/2006, \$271,717

National Science Foundation, PI, Sunny Buffalo State 46687, 46686/A001, System risk and reliability for water supply systems, 7/1/2003-12/31/2004, \$70,000

National Science Foundation, PI, Sunny Buffalo State 45849/A001, Fragility-based methodology, 7/1/2002-12/31/2003, \$47,450

National Science Foundation, PI, Sunny Buffalo State 45848, 45841/A001, System risk and reliability for water supply systems, 7/1/2002-12/31/2003, \$69,480

National Science Foundation, PI, CMS-9912524, Local numerical solutions in solid mechanics, 6/15/2000-5/31/2004, \$270,000

Department of Defence, co-PI, F49620-98-1-0401, Probabilistic simulation of fatigue crack initiation, 4/1/1998-9/30/2001, \$615,000

National Science Foundation, PI, CMS-9610022, Local numerical solutions in solid mechanics by the random walk method, 8/1/1997-6/30/2001, \$135,000

Department of Transportation, PI, 93-G-044, Reliability of airplane components subjected to cyclic stresses, 9/23/1993-4/30/1995, \$75,000

Department of Defence, co-PI, F49620-87-C-0054, Probabilistic fracture mechanics, 4/1/1987-3/31/1990, \$269,624

National Science Foundation, PI, MSM-8305956-A01, Analysis of general combinations of structural loads by translation models, 12/1/1983-11/30/1986, \$157,672

National Science Foundation, co-PI, Earthquake Hazards of Pipeline Systems by Lateral Spreading, and Protective Measures for Post-Earthquake Fire, 9/1/1983-8/31/1986, \$172,000

National Science Foundation, co-PI, Buried Pipeline Response to Earthquake-Induced Ground Failure, 9/1/1981-8/31/1983, \$175,000

GRIGORIU - SUPERVISION OF PH.D. THESES (Major advisor)

Kim, Sangwoo (projected completion, 2020) Methods and algorithms for generating seismic ground accelerations as solution of wave equations which account for soil heterogeneity and uncertainty.

Wayne, Isaac Uy (projected completion, 2019) Estimation of extreme material responses in random heterogeneous microstructures and solution of inverse problems in stochastic setting.

Cheng, Yuan (projected completion, 2018) Development of novel methods for calculating seismic fragilities based on actual and synthetic accelerograms and reduced order models.

Zhao, Haoran (2017) Space-time probabilistic models for wind pressure fields on buildings, calibration of these models to wind tunnel records, and algorithms for generating synthetic pressure fields.

Radu, Alin Constantin (2016) Fragility surfaces based on site-specific probabilistic models for seismic ground acceleration. Unlike fragility curves, which are functions of scalar intensity measures, fragility surfaces are characterized by two earthquake-hazard parameters, site-to-source distance and earthquake magnitude.

Keskin, Riza Secer Orkun (2008) Estimation of effective diffusion coefficient in concrete by the random walk and other local methods.

Kafali, Cagdas (2008) Performance of structural systems subjected to multi-hazard environmental actions and development of optimal strategies for designing these systems.

Field, Richard Van Deventer (2004) Selection of probabilistic/deterministic models based on laboratory experiments and physics with applications to random heterogeneous microstructures.

Mostafa, Ehab Mohamed (2003) Optimization of retrofitting techniques for water supply systems which account for the inherent random fluctuations of soil and pipeline mechanical properties.

Arwade, Sanjay Raja (2002) Stochastic models for characterization material microstructures and calibration to these models to measurements of atomic lattice orientation in aluminum.

Roth, Christopher (2001) Dynamic sensitivity analysis for structures subjected to earthquakes and sensitivity-based rational design strategies.

Waisman-Abarno, Federico Manuel (1998) Non-Gaussian models for wind, earthquake, and other random loads and estimation of dynamical responses of structural systems to these actions.

Markov, Ivan Jovan (1995) Evaluation of seismic serviceability of water supply networks with application to the San Francisco auxiliary water supply system.

Balopoulou, Stavroula Dimitrios (1994) Seismic response of nominally symmetric nonlinear structures with components of uncertain mechanical properties.

Sharif Rahman (1991) Markov models for the seismic reliability analysis of degrading structures and applications to probability-based design codes.

Mahmoud Khater (1989) Response analysis of system with random properties by stochastic finite differences and stochastic Green function and applications to the serviceability of the San Francisco Water Supply System.

Bunu Alibe (1986) Random vibration estimates of peak response of offshore structures subjected to wave and current forces and validation of these estimates by wind tunnel measurements.

Behrooz Riaz (1985) Response analysis of linear/nonlinear structures subjected to nonstationary random actions and applications to Earthquake Engineering.

Wen-Chen Jau (1984) Probabilistic models for the reliability analysis of concrete members and model validation by laboratory measurements.

GRIGORIU - COURSES TAUGHT/DEVELOPED

Natural Hazards, Reliability, and Insurance, CEE 4770/6770: 3 credit hours, Fall 2017 (new course)

Topics: Review of essential concepts of statistics and probability, Monte Carlo simulation methods, calibration of probabilistic models for natural hazards to measurements, Monte Carlo estimates of structural performance, and probabilistic models for repair costs for damages caused by natural hazards with applications to insurance rates.

Earthquake Engineering Design, CEE 4070: 3 credit hours, Academic Year 2017-2018, taught with G. McLaskey

Topics: Preliminary seismic designs of small scale building models are optimized to satisfy specified limit states under imposed ground motion records. Shake table tests are used to validate results of dynamic analyses. Students work in teams under faculty supervision.

Fundamentals of Structural Mechanics, CEE 4710/6710: 3 credit hours (Fall)

Topics: Beam bending, beams on elastic foundations, stability analysis for columns and beam-columns, elements of linear elasticity, numerical solutions for linear elasticity problems, and applications which include stress concentration, torsion, and plates.

Structural Dynamics and Earthquake Engineering, CEE 4780/6780: 3 credit hours (Spring)

Topics: Time and frequency domain analysis for single degree of freedom systems subjected to impact, harmonic, and arbitrary loads, modal analysis for discrete and continuous systems, numerical methods for calculating the response of multi-degree of freedom structures to seismic loads, modal combination rules, torsional vibration, methods for reducing the number of degrees of freedom and seismic forces, and introduction to seismic hazards and codes.

Engineering Analysis, CEE 6770: 3 credit hours (at demand)

Topics: Vector spaces, linear transformations, and eigenvalue problems with applications to matrix structural analysis, linear dynamics, stability, and principal stresses, strains, and moments of inertia. Fourier analysis for periodic and non-periodic functions with applications to the solution of ordinary differential equations, beams, plates, and other structural mechanics problems. Partial differential equations with applications to the analysis of static and dynamic response of continuous systems and transport problems.

Stochastic Mechanics in Science and Engineering, CEE 7710: 3 credit hours (at demand)

Topics: Probability theory, stochastic processes, and Itô's formula with illustrations by Monte Carlo Simulation. Analytical and numerical methods for solving stochastic problems defined by algebraic, differential, and integral equations with random/deterministic coefficients and random/deterministic input. Applications include Laplace, transport, Schrodinger, and other deterministic partial differential equations, dynamic systems subjected to Gaussian and non-Gaussian noise, random eigenvalue problems, homogenization of random microstructures, and pattern formation for random heterogeneous materials.

Random Vibration, CEE 7720: 3 credit hours (at demand)

Topics: Random-process theory, simulation, and estimates of response maxima by the first-passage theory. Linear random vibration: second-moment response descriptors and applications from fatigue, seismic analysis, and response to wind, wave, and other non-Gaussian load processes. Nonlinear random vibration: equivalent linearization, perturbation techniques, Fokker-Planck and Kolmogorov equations, Itô's calculus, and applications from chaotic vibration, fatigue, seismic analysis, and perimetrically excited systems.

Structural Reliability, CEE 7730, 3 credit hours (at demand)

Topics: Practical measures for structural reliability, second moment and generalized second moment reliability indices, probability models for strength and loads, probability-based design codes, reliability of structural systems, imperfection-sensitive structures, fatigue, stochastic finite-element methods, and elementary concepts of probabilistic fracture mechanics.