

Emanuele Borgonovo

Decision Analysis

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Curriculum Vitae

Full Professor of the Department of Decision Sciences at Bocconi University.

PhD in Probabilistic Risk Assessment at the Massachusetts Institute of Technology, Cambridge (MA), USA, 2001
MSc in Nuclear Engineering with specialization in Mathematics and Physics from the Politecnico of Milano, Italy, 1998
He has also attained advanced specialization courses at Harvard University and at MIT Sloan School of Management

Academic position and/or Professional activities

Full Professor of Decision Sciences & Business Analytics and Director of the Management Science Laboratory of SDA Bocconi Business School

He has been director of the ELEUSI Research Centre of Bocconi University from 2008 to 2012

Chairman of the Technical Committee on Uncertainty Analysis of the European Safety and Reliability Association

He has won several national and international awards, among which the McCormack Fellowship of the Westinghouse Corporation in 2000. He has been nominated honorary member of "Sigma XI, the Scientific Research Society of North America" and of "Alpha Nu Sigma, the Honorary Society of the American Nuclear Society," of which he was the president of its

MIT Section. He has been awarded the 2010 Best Referee Award of the European Journal of Operational Research and the 2012 Best Reviewer Award of Environmental Modelling and Software. He has won the Research Excellency Award of Bocconi University for seven consecutive years since 2006

He is author of several new sensitivity analysis methods, among which the Differential Importance Measure (DIM). DIM has been presented at the United States Nuclear Regulatory Commission in 2000 and, since 2002, is included in the "Probabilistic Risk Assessment Procedures Guide of NASA Managers and Practitioners"

He has been Guest Lecturer and invited speaker at the Massachusetts Institute of Technology (USA), the City University of Hong Kong, the Fudan University (Shanghai China), the Karlsruhe Institute of Technology, Ecole Central Paris, Ecole Supérieure de Cachan (Paris), the Université de Technologie de Troyes, Swiss University of Lugano, etc.. He has participated in and conducted several national and international research projects in cooperation with the Idaho Engineering National Laboratories, the Joint Research Center of the European Commission, Electricité de France, Fitch Ratings S.p.A., SAS Institute, FIDIA Farmaceutici S.p.A.. He is member of the Editorial Board of European Journal of Operational Research, Reliability Engineering and System Safety, International Journal of Mathematics in Operational Research, International Journal of Risk Management, International Journal of Business Logistics and International Journal of Service and Computing Oriented Manufacturing. He cooperates as referee with several international journals

He is the author of more than 100 publications. His works have appeared in international journals such as Management Science, Operations Research, European Journal of Operational Research, Risk Analysis, etc.

Research Interests

- Risk Analysis
- Decision Analysis
- Uncertainty and Global Sensitivity Analysis
- Agent-Based Simulation

Publications

Selection

- Baucells M. and Borgonovo E., 2013: "Invariant Probabilistic Sensitivity Analysis," Management Science, to appear
- Plischke E., Borgonovo E. and Smith C.L., 2013: "Global Sensitivity Measures from Given Data," European Journal of Operational Research, 226:536-550
- Borgonovo E. and Smith C.L., 2012; "Epistemic Uncertainty, Multilinearity and Risk Achievement Worth," European Journal of Operational Research, 222(2), pp. 301-311
- Castaings W., Borgonovo E., Morris M.D. and Tarantola S., 2012: "Sampling Strategies in Density-Based Sensitivity Analysis," Environmental Modelling & Software, 38, pp. 13-26
- Borgonovo E. and Tarantola S., 2012: "Advances in Sensitivity Analysis," Editorial for the Special Issue "Advances in Sensitivity Analysis", Reliability Engineering and System Safety, 107, pp. 1-2
- Borgonovo E., Zenter I., Pellegrini, A., Tarantola, S., and de Rocquigny E., 2013: "On the importance of uncertain factors in seismic fragility assessment," Reliability Engineering and System Safety, 109, pp. 66-76
- Borgonovo E. and Smith C.L., 2011: "A Study of Interactions in the Risk Assessment of Complex Engineering Systems: An Application to Space PSA," Operations Research, 59(6), 1461-1476
- Borgonovo E. Castaings W. and Tarantola S., 2012: "Emulators in Moment Independent Sensitivity Analysis: An Application to Environmental Modelling," Environmental Modelling & Software, 34, pp. 105-115
- M. Percoco and E. Borgonovo, 2011: "A note on the sensitivity analysis of the internal rate of return," International Journal of Production Economics
- Borgonovo E., 2010: "The Reliability Importance of Components and Prime Implicants in Coherent and Non-Coherent Systems Including Total-Order Interactions," European Journal of Operational Research, 204, pp. 485-495
- Borgonovo E., 2010: "Sensitivity Analysis with Finite Changes: an Application to Modified EOQ Models", European Journal of Operational Research, 200, pp. 127-138
- Borgonovo E. and Peccati L., 2011: "Finite Change Comparative Statics for Risk Coherent Inventories," International Journal of Production Economics, forthcoming, 131(1), 52-62
- Biava P.M., Basevi M., Biggiero L., Borgonovo E. and Burigana F.: Cancer cell reprogramming, 2011: stem cell differentiation stage factors and an agent based model to optimize cancer treatment, Current Pharmaceutical Biotechnology, 12(2), pp. 231-242
- Beccacece F. and Borgonovo E., 2011: "Function decomposition, monotonicity and ultramodularity: applications to multi-attribute utility theory", European Journal of Operational Research, 210, 326-335
- Borgonovo E., W. Castaings and S. Tarantola, 2011: "Moment Independent Importance Measures: New Results and Analytical

Test Cases,” *Risk Analysis*, 31 (3), pp. 404-428

- Borgonovo E., 2010: “A Methodology for Determining Interactions in PSA models by Varying One Parameter At-a-Time,” *Risk Analysis*, 30 (3), pp. 385-399
- Borgonovo E. and Percoco M., 2010: “Sensitivity Analysis of Portfolio Properties with Budget Constraints,” *International Journal of Mathematics in Operational Research*
- Borgonovo E., Gatti S. and Peccati L., 2010: “What Drives Value Creation? An Application of Sensitivity Analysis to Project Finance Transactions,” *European Journal of Operational Research*, 205 (1), pp. 227-236
- Borgonovo E. and L. Peccati, 2010: “Moment Calculation for Piecewise-Defined Functions: An Application to Stochastic Optimization with Coherent Measures of Risk,” *Annals of Operations Research*, 176 (1), pp. 235-258
- Borgonovo E. and L. Peccati, 2011: “Managerial Insights from Service Industry Models: a new scenario decomposition method,” *Annals of Operations Research*, 185(1), pp. 161-179
- Borgonovo E., 2008: “Sensitivity Analysis of Model Output with Input Constraints: A Generalized Rationale for Local Methods,” *Risk Analysis*, 28 (3) (June 2008), pp. 667-680
- Borgonovo E., 2008: “Epistemic Uncertainty in the Ranking and Categorization of Probabilistic Safety Assessment Model Elements: Issues and Findings,” *Risk Analysis*, 28 (4), pp. 983 - 1001
- Borgonovo E. and L. Peccati, 2009: “Financial Management in Inventory Problems: Risk Averse vs Risk Neutral Policies,” *International Journal of Production Economics*, 118 (1), pp. 233-242
- Borgonovo E., 2008: “Influence Diagrams,” *Encyclopedia of Medical Decision Making*, SAGE Editor
- Borgonovo E., 2008: “Differential Importance and Comparative Statics: An Application to Inventory Management,” *International Journal of Production Economics*, 111 (1) (January 2008), pp. 170-179
- Smith C.L. and Borgonovo E., 2007: “Decision Making During Nuclear Power Plant Incidents – A New Approach to the Evaluation of Precursor Events,” *Risk Analysis*, 27 (4), pp.1027-1042
- Borgonovo E., 2007: “A New Uncertainty Importance Measure,” *Reliability Engineering and System Safety*, 92, pp. 771-784. doi:10.1016/j.ress.2006.04.015
- Borgonovo E., 2007: “Differential, Criticality and Birnbaum Importance Measures: an Application to Basic Event, Groups and SSCs in Event Trees and Binary Decision Diagrams,” *Reliability Engineering and System Safety*, 92 (10), pp. 1458-1467
- Borgonovo E. and Peccati L., 2007: “Global Sensitivity Analysis in Inventory Management,” *International Journal of Production Economics*, 108 (1-2), pp. 302-313
- Borgonovo E., 2006: “Measuring Uncertainty Importance: Investigation and Comparison of Alternative Approaches,” *Risk Analysis*, 26 (5), pp. 1349-1362
- Borgonovo E. and L. Peccati, 2006: “Uncertainty and Global Sensitivity Analysis in the Evaluation of Investment Projects,” *International Journal of Production Economics*, 104 (1), pp. 62-73
- Borgonovo E. and L. Peccati, 2006: “The Importance of Assumptions in Investment Evaluation,” *International Journal of Production Economics*, 101 (2), pp. 298-311
- Borgonovo E. and G.E. Apostolakis, 2001: “A new importance measure for risk-informed decision making,” *Reliability Engineering & System Safety*, 72 (2), pp. 193-212