# CURRICULUM VITAE

## PROF. EMANUELE BORGONOVO, PH.D.

Department of Decision Sciences Bocconi University, Via Roentgen 1, 20136 Milan, Italy. E-mail: emanuele.borgonovo@unibocconi.it.

### EDUCATION

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| 2001 | Ph.D. in Probabilistic Risk Assessment, Massachusetts Institute of Technology, Cambridge (MA), USA. Supervisor: prof. George E. Apostolakis. |
| 1999 | Harvard Business School e Sloan School of Management, MIT, post-graduate courses. |
| 1998 | Master in Nuclear Science and Engineering, with Specialization in Mathematics and Physics for the New Technologies, Polytechnic of Milan, 100/100. |

### ACADEMIC POSITIONS

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| 2022-2025 | Director, Department of Decision Sciences, Bocconi University |
| 2016-2022 | Director, Bachelor in Economics Management and Computer Science, Bocconi University |
| 2012-today | Full Professor, Department of Decision Sciences, Bocconi University |
| 2013-2017 | Director, Management Science Laboratory, SDA Bocconi Business School |
| 2008-2012 | Associate Professor, Department of Decision Sciences, Bocconi University |
| 2008-2012 | Director, ELEUSI Research Center, Bocconi University |
| 2004-2008 | Assistant Professor, Institute for Quantitative Methods, Bocconi University |
| 2002-2004 | Researcher Institute of Quantitative Methods, Bocconi University. |
| 2002-Today | Adjunct Professor, Department of Industrial Engineering, Carlo Cattaneo University, Italy. |
| 2001-2002 | Adjunct Professor, Mathematics and Modeling, Bocconi University |
| 1999-2000 | Research Assistant in Probabilistic Risk Assessment, MIT. |
| 1998-1999 | Teaching Assistant in Probability and its Applications to Quality Control and Risk Assessment, Massachusetts Institute of Technology. |

### ACADEMIC AWARDS

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| 2022 | Outstanding Service Award, Decision Analysis Society, INFORMS |
| 2020 | Teaching Innovation Award, Bocconi University |
| 2020 | Excellence in Research Award, Bocconi University |
| 2020 | Research Profile Award, 2020-2022, Bocconi University |
| 2018 | President-Elect of the Decision Analysis Society of INFORMS |
| 2018 | Research Profile Award, 2018-2020, Bocconi University |
| 2018 | Officer, Subcommittee on Innovative Funding, INFORMS |
| 2017 | Chinese Academy of Sciences President's International Fellowship for Visiting Scientists |
| 2016 | Research Profile Award, 2016-2018, Bocconi University |
| 2015 | Teaching Excellence Award, Bocconi University |
| 2015 | IBM Faculty Award |
| 2014 | 2014 Best Risk Analysis Paper Award*, from Risk Analysis, an International Journal for the paper: Uncertainty in Climate Change: Can Global Sensitivity Analysis be of Help?* with B. Anderson, M. Galeotti, and R. Roson |
| 2014 | 2013 Best Reviewer Award *Reliability Engineering and System Safety* |
| 2014 | 2013 Best Reviewer Award *European Journal of Operational Research* |
| 2014 | 2013 Best Reviewer Award *Risk Analysis* |
| 2013 | 2012 Best Reviewer Award *Environmental Modelling and Software* |
| 2012 | Research Excellence Award, Bocconi University |

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| 2012 | Profilo Research Award, 2012-2014 Bocconi University |
| 2012 | 2011 Best Research Paper Award of the journal “Economia&Management”, SDA Business School, Bocconi University |
| 2011 | 2010 Best Reviewer Award, *European Journal of Operational Research* |
| 2011 | Research Excellence Award, Bocconi University |
| 2010 | Research Excellence Award, Bocconi University |
| 2010 | Profilo Research Award, 2010-2011, Bocconi University |
| 2009 | Research Excellence Award, Bocconi University |
| 2008 | 2008-2009 Profilo Research Award, Bocconi University |
| 2008 | Research Excellence Award, Bocconi University |
| 2007 | Research Excellence Award, Bocconi University |
| 2006 | Research Excellence Award, Bocconi University |
| 2000 | Elected Honorary member of “ΣΧ, the Scientific Research Society of North America” |
| 2000 | President of the MIT Chapter of “Alpha Nu Sigma (ΑΝΣ),” the Honorary Society of the American Nuclear Society. |
| 2000 | McCormack Fellowship of Westinghouse Corporation (USA), attributed to the best Ph.D. candidate of the Nuclear Science and Engineering Department, MIT. |
| 1999 | Elected fellow of “ΑΝΣ, the Honorary Society of the American Nuclear Society (ANS)”. |

## OTHER AWARDS

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| 2011 | Paul Harris Fellow of Rotary International. |

## SCIENTIFIC COMMITTEES AND INSTITUTIONAL ROLES

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| 2020-today | President, Decision Analysis Society, INFORMS |
| 2019-today | Member of the Scientific Committee of the “Fondazione Silvio Tronchetti Provera” |
| 2022 | Swiss National Science Foundation: Referee |
| 2021 | Swiss National Science Foundation: Referee |
| 2017-2019 | Chair, Organizing Committee, Advances in Decision Analysis 2019 |
| 2017 | Decision Analysis Journal, 2016 Best Paper Award, Committee Chair |
| 2017-today | Scientific Advisor, Springer International Series in Management Science and Operations Research |
| 2017 | EURO Best Paper Award, Committee Member |
| 2016 | Decision Analysis Journal, 2016 Best Paper Award, Committee Member |
| 2016-2017 | Committee Co-Chair, Decision Analysis Society Best Student Paper Award |
| 2015-2018 | Elected Member of the Council of the Decision Analysis Society of INFORMS |
| 2015-2016 and 2010-2012 | Member of Bocconi University Faculty Research Committee |
| 2014-Today | Co-Chair, European Safety and Reliability Association, Technical Committee on Uncertainty Analysis |
| 2014 | NORDFORSK: panel member for the evaluation of international research projects |
| 2013 | The European Research Council: Scientific Expert for the Evaluation of Advanced Grant Research Projects |
| 2012 | The Research Council of Norway: scientific expert for the evaluation of the PETROMACKs research projects. |
| 2012 | The Research Council of Portugal: scientific expert for the evaluation of Portuguese research projects |

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| 2013 | Italian Ministry of University and Research: expert for the evaluation of FIRB projects |
| 2013 | Member of the Management Committee of the European Research Council COST Action “Expert Judgment Network: Bridging the Gap Between Scientific Uncertainty and Evidence-Based Decision Making.” |
| 2011-2015 | Member of the Scientific Committee of the EnergyLab Foundation |

**INVITED SEMINARS AND PRESENTATIONS**

- Princeton University, Department of Chemistry, External Member, Ph.D. Thesis Committee, November 4, 2022.
- Keynote Speaker, ESREL 2022: “Reliability Importance Measure: A Conditional Viewpoint,” Panel in memory of Nozer Singpurwalla, September 1st, 2022.
- Invited Speaker, MIT, Stata Building, Computer Science Department: “Algorithms for Global Sensitivity Analysis with Optimal Transport,” July 18th, 2022.
- Invited Speaker Princeton University, Department of Chemistry: “Global Sensitivity Analysis with Optimal Transport and Information Density,” July 15th, 2022.
- Invited Speaker Princeton University, Department of Chemistry: “Do Neural Networks Have a Mean Dimension?” July 15th, 2022.
- Invited Speaker: “AI for Business and Society: Opportunities and Challenges,” Paris, Skema Business School, June 17th, 2022.
- Moderator, Panel in Memory of David Schmeidler, Advances in Decision Analysis Conference, Washington D.C. June 23rd, 2022
- Invited Speaker: “SAMO Summer School on Sensitivity Analysis 2022”, Joint Research Center of the European Commission, June 8th, 2022
- Committee Thesis Member, University of Sheffield, May 30th, 2022
- Invited Speaker, UCL London, Invited Speaker for the Panel: “Responsible Modelling in Uncertain Times: Ethics of Quantification in Action,” November 17, 2021
- Invited Lecturer, “Moxoff Academy,” “Interpretability, Explainability, and Sensitivity Analysis,” November 12, 2021.
- Opening Speech: “DAS-SRA Emerging Risk Conference,” June 22, 2021, online
- Invited Speaker: “Big Data and Machine Learning Finance Conference,” Politecnico di Milano, June 11, 2021
- Il Sole24 Ore, Tvitch TV, “La giornata del data Scientist”, June 9th 2021
- Politecnico di Milano, “Moxoff Academy,” “Interpretability, Explainability, and Sensitivity Analysis,” May 21, 2021.
- University of Edinburgh: “New Insights on Interpretability, Explainability and Sensitivity Analysis”, May 18, 2021
- Moxoff-Academy – Zucchetti: “Big Data for Business Analytics”, inhouse presentation, March 8, 2021
- The University of Liverpool, “Interpretability, Explainability and Sensitivity Analysis”, December 10, 2020
- Siemens Digital Week: “Modelli per la Business Analytics”, November 27, 2020
- Allianz Business Forum, “Quando ai manager danno i numeri”, November 23, 2020
- Moxoff Academy, Politecnico di Milano, “Interpretability, Explainability and Sensitivity Analysis”, October 23, 2020
- NIER Engineering, Bologna: “Interpretability, Explainability, and Sensitivity Analysis”, July 2020.
- Milan Digital Week, Fondazione Trochetti Provera: “Trends in the Digital Era”, May 25th, 2020.
- Durham University Business School: Invited Speaker, “Interpretability, Explainability and Sensitivity Analysis”, 18 June 2020.

- The University of Reggio Calabria, “Interpretability, Explainability, and Sensitivity Analysis”, 8 June 2020, Invited Webinar
- Cass Business School, London, Invited Speaker at the Workshop: “Advancing Machine Learning in Finance, Insurance, and Economics,” 17th January 2020
- Politecnico di Milano, “Interpretability, Explainability, and Sensitivity Analysis”, Invited Seminar, December 6, 2019
- Society for Risk Analysis Webinar, “Sensitivity Analysis for Risk Assessment”, November 6, 2019.
- Keynote Speaker, “Sensitivity Analysis of Model Output”, Barcelona, October 28, 2019, Spain
- Keynote Speaker, Quantitative Finance and Risk Analysis Conference, June 23, 2019, Kos, Greece.
- Invited Speaker, European Geophysical Union, Vienna, April 2019.
- Keynote Speaker, “MateItaly”, Venezia, April 2018, Università Ca’ Foscari.
- Invited Speaker, The University of Bergamo - Georgia Tech Workshop on Stochastic Optimization for Data Analytics and Computational Management, Bergamo, February 8-9, 2018.
- Keynote Speaker, “Giornata di Fondazione della Federazione Italiana di Matematica Applicata”, Roma, November 2017, Consiglio Nazionale delle Ricerche.
- Keynote Speaker, ICRSR Conference, December 21, 2017, “Reliability Importance Measures: A Critical Overview”, Politecnico di Milano.
- Invited Speaker, Chinese University of Academy of Sciences, Beijing, June 12, 2017.
- Keynote Speaker: IQR, 2017, Annual Meeting of Tsinghua Institute for Quality and Reliability, Beijing, June 10, 2017
- Keynote Speaker: 10$^{th}$ International Conference on Mathematical Methods in Reliability, July 3-6, 2017, Grenoble.
- Invited Speaker: “International Conference on Games and Decisions in Reliability and Risk,” Madrid, June 6-7, 2017.
- Invited Speaker “Sensitivity Analysis for the Management Sciences,” ESSEC Business School, Paris, May 22, 2017.
- Invited Speaker: “A tutorial on Global Sensitivity Analysis,” NAFEM event on “Uncertainty in Engineering,” April 2017, Politecnico di Milano.
- Keynote Speaker: “Big Data and Business Analytics”, La Storia in Piazza, Palazzo Ducale, Genova, April 2017.
- Invited Speaker, ETH, Zurich, Set-Nav Workshop on Modelling of Risk & Uncertainty in Energy Systems: “Links between risk assessment and decision-making in energy systems,” March 30$^{th,}$ 2017
- Keynote Speaker: “Research Day,” Università Ca’ Foscari, Venice, October 26, 2016.
- Speaker, “The Future of Science”, Fondazione Silvio Tronchetti Provera and Umberto Veronesi, Venice, September 23, 2016.
- Keynote Tutorial: “Introduction to Uncertainty Quantification,” International Conference ESREL 2016, Glasgow.
- Invited Speaker: “Scoring Rules, Value of Information and Global Sensitivity Analysis,” ETH Zurich, Department of Economics, May 2016.
- Keynote Speaker: “Scoring Rules, Value of Information and Global Sensitivity Analysis,” MASCOT-NUM Conference, University of Toulouse, March 2016.
- Invited Speaker, ISOR Colloquium, University of Vienna: “Integral Sensitivity in Linear Programming,” January 2016.
- Invited Speaker “Integral Sensitivity in Linear Programming,” Katz Business School, Pittsburgh University, USA, July 2015.
- Invited Speaker “Risk, Importance, and Value of Information,” Georgetown University, Washington DC, USA, July 2015.

- Invited Speaker: “Scoring Rules, Value of Information and Sensitivity Analysis,” George Washington University, July 2015
- Invited Speaker “Sensitivity Methods for the Management Sciences,” Southern University of Denmark, June 2015.
- Invited Speaker “Sensitivity Methods for the Management Sciences,” Manchester Business School, March 2015.
- Keynote Speaker IBIT XV: “Uncertainty and Risk Analysis in Investment Evaluation,” Sevilla, October 23-24, 2014.
- Keynote Speaker, “Future Vision for Safety: Reliability and Risk Assessment,” ESREL 2013, Amsterdam, September 30- October 2, 2013.
- Invited Speaker “Risk Analysis with Contractual Default: Does Covenant Breach Matter?” September 2012, Universidade Pablo de Olivade, Sevilla, Spain.
- Invited speaker for the “Workshop on the Future of Research in Risk and Reliability,” among “*eight international leading figures*” in the field, organized by PSAM and ESREL-ESREDA societies, Helsinki, June 2012.
- Invited Lecturer by the Joint Research Centre European Commission for the School on Sensitivity Analysis of Model Output, July 2012, Ispra (Italy).
- Invited Speaker “Risk, Uncertainty, and Systems Analysis Methods: Energy, Environmental and Climatic Change Applications,” Masdar Institute of Science and Technology, Abu Dhabi, 2012.
- Invited Speaker: “Advances in Risk and Reliability Analysis of Complex Systems,” City University of Hong Kong, 2012.
- Invited Speaker: “Seismic Risk Achievement Worth,” Electricité de France, R&D Division, September 2011.
- Invited Speaker: “Moment Independent Sensitivity Analysis,” Ecole Centrale Paris, Department of Mathematics, 2010.
- Invited Speaker “Moment Independent Sensitivity Analysis for Seismic Risk Assessment,” Electricitè de France, R&D Division, 2010.
- Invited Speaker: “Total Order Reliability Importance,” Massachusetts Institute of Technology, Boston, USA, 2009.
- Invited Speaker: “Total Order Reliability Importance,” Idaho National Laboratories, USA 2009.
- Invited Speaker: “What sensitivity analysis methods for Physics models?” Karlsruhe Institute of Technology, Germany, 2009.
- Invited Speaker “Joint and Differential Reliability Importance,” Universitè de Technologie, Troyes, France, 2008.
- Invited Speaker “Valuing Energy Auto-production from Solar Energy Sources,” Department of Management Engineering, Carlo Cattaneo University, Italy, 2005.
- Invited Speaker “Sensitivity Analysis of Large Spreadsheet models for Industrial Investment Evaluation,” Department of Economics, The University of Insubria, Varese, 2007.
- Invited Speaker: “Probabilistic Sensitivity Analysis,” Pavia University, Department of Mathematics and Statistics, 2006.
- Invited Speaker: “Sensitivity Analysis in Probabilistic Risk Assessment,” ENEA, Rome, Italy, 2001.
- Invited Speaker “A New Importance Measure for Risk-Informed Decision Making,” United States Nuclear Regulatory Commission, permanent commission of the United States Parliament, Washington D.C., USA, 2000.

**EDITORIAL ACTIVITIES**

2015-today: Co-Editor-In-Chief *European Journal of Operational Research*

2017- today: Scientific Advisor, Springer International Series in Operations Research and Management Science
2016- Today Associate Editor: Journal of Risk and Reliability
Member of the Editorial Board of:
- *Risk Analysis (2012-Today)*
- *Reliability Engineering and System Safety (2010-Today)*
- *International Journal of Mathematics in Operational Research (2010-Today)*
- *International Journal of Risk Management (2013-Today)*
- *International Journal of Service and Computing-Oriented Manufacturing (2013-Today)*
- *Journal of Business Logistics (2012-Today)*
- *Economia & Management, SDA Bocconi Business Review (2014-2018)*
- *Operations Research Perspectives (2016-Today)*
- *Socio-Environmental Systems Modeling (2017- Today)*

Refereeing activity for: *European Journal of Operational Research, Risk Analysis*, *Operations Research, Management Science, Philosophical Transactions of the Royal Society A, Journal of the Royal Statistical Society Series A, Omega, Decision Analysis, Theory and Decision, SIAM/ASA Journal on Uncertainty Quantification, Statistical Papers, Journal of Computational Physics, TEST, Journal of Statistical Computation and Simulation, Entropy, International Journal of Production Economics, Journal of Global Economic Analysis, Journal of Banking and Finance, Journal of Business Logistics, Applied Stochastic Models in Business and Industry, Computer Physics Communications, Physica A, Mechanical Systems and Signal Processing, Biomechanics and Modeling in Mechanobiology, Physics Letters A, Science of the Total Environment, PlusONE, Computational Statistics and Data Analysis*, *Journal of Risk and Reliability, Safety Science, Reliability Engineering and System Safety, IEEE Transactions on Reliability*, *Water Resources Research, Water, Structural and Multidisciplinary Optimization*, *Journal of the Mechanical Behavior of Biomedical Materials, IEEE Transactions on Automation Science and Engineering, Fuel*, *Journal of Complex Systems*, *IIE Transactions, Environmental Modelling and Software, Remote Sensing of Environment, Climatic Change, Ecological Modelling, AIAA Journal*, *Quarterly Journal of Economics and Finance, International Journal of Numerical Methods in Engineering*, *Journal of Engineering Manufacture, Journal of Computational and Applied Mathematics, Engineering Structures, Computers in Industrial Engineering*, *Computers & Mathematics with Applications, Mathematical and Computer Modelling*, *Computers in Applied Mathematical Modelling*, *Computers in Biology and Medicine, Finanza Marketing e Produzione, Chemie Ingenieur Technik*.

## MEDIA AND PUBLIC NEWS

*RAI, Isoradio, "Ben Detto at 18:00", conducted by Benedetto Marcucci, October 31, 2022*
*Corriere Della Sera, Snack News, Il Sole 24 Ore, INFORMS e-News, BEMACS Lectures.*

## CONFERENCES ORGANIZATION AND TECHNICAL COMMITTEES

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| Advances in Decision Analysis 2019 | Chair of the Organizing Committee |
| INFORMS 2017, Houston, USA | Session Co-Organizer and Co-Chair within the Decision Analysis Stream |

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| INFORMS 2016, Nashville USA | Session Organizer and Chair within the Decision Analysis Stream |
| INFORMS 2015, Philadelphia, USA | Session Organizer and Chair within the Decision Analysis Stream |
| INFORMS 2014, San Francisco, USA | Session Organizer and Chair within the Decision Analysis Stream |
| INFORMS 2013, Minneapolis, USA | Session Organizer and Chair within the Decision Analysis Stream |
| INFORMS 2012, Phoenix, USA | Session Organizer and Chair within the Decision Analysis Stream |
| INFORMS 2011, Charlotte, NC, USA | Invited organizer and chair of 3-back-to-back clusters: "Decision Support Models and Sensitivity Analysis I, II, and III." |
| PSAM11-ESREL2012, Helsinki, Finland | Member of the Conference Scientific Committee and Special Session Organizer. |
| SAMO Conference Series | Member of the Technical Committee of the Conference Series. |
| SAMO 2010 | Chair of the Scientific and Local Organizing committee. |
| PSAM10, Seattle, USA, June 7-11, 2010 | Invited organizer and chair of the special session: Reliability Importance Measures. |
| ESREL 2011, Troyes, France | Member of the technical committee |

## SCIENTIFIC INTERESTS

Sensitivity Analysis, Business Analytics, Machine Learning, Computer Simulations, and Decision Analysis.

## FUNDED PROJECTS/INITIATIVES

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| March 2022-March 2023 | *NextChem, MaireTechnimont:* "Archy, Developing a Platform for Green Hydrogen Projects Economic Evaluation". |
| Nov. 2019-Today | *Gruppo Campari* S.p.A.: "Machine Learning for PNL Forecasting", EUR 22,000. |
| Nov. 2017-Dec. 2019 | US Defense Advanced Research Projects Agency (*DARPA),* World Modelers Program, SAUCE: Sensitivity and Uncertainty Analysis, in cooperation with Charles River Analytics, Boston, MA, USA. A four-year frontier research project at the interface between artificial intelligence and decision support to use artificial intelligence for supporting decision-making in food crises (South Sudan). Funding: EUR 200,000. |
| 2018-2021 | *Siemens for Education*: "Big Data for Business Analytics", Sponsored Undergraduate Course on Industry 4.0. |
| 2016-2017 | *Grandi Stazioni*, "Big Data Infrastructure and Machine Learning"; Project Leader. Funding: EUR 70,000. |
| 2015-Today | "Neural Networks and Global Sensitivity Analysis", IBM faculty award, EUR 15,000, |
| 2013-today | IS1304, European COST Action, Coordinated by Strathclyde University, Prof. Tim Bedford. Country representative for Italy. |
| 2011-today | ELEUSI-CESVR: "Sensitivity Analysis in the Evaluation of Oil and Gas Investment Projects." EUR: 25,000 |
| 2011-2012 | SDA Bocconi: "Risk Profiles for Private Equity Investments." EUR: 27,000 |

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| 2011 | US INL- ELEUSI Research Center: "Analysis of Interactions in Complex Risk Assessment Models: An Application to NASA Space PSA," Faculty Exchange Program, sponsored by Idaho Engineering National Laboratories, USA. EUR: 20,000 |
| 2011 | CAREFIN Research Centre: "Pricing Covenants.": EUR 5,000 |
| 2010-today | LaMSID (EDF)- ELEUSI: "Moment Independent Uncertainty Importance in Seismic Risk Assessment," sponsored by LaMSID, Laboratoire de mécanique des structures industrielles durables, Paris, France. EUR: 25,000 |
| 2010 | CAREFIN Research Centre: Risk Measures for Large Investment Projects: EUR 5,000. |
| 2010 | INL- ELEUSI Research Center: "Analysis of Interactions in Complex Risk Assessment Models: An Application to NASA Space PSA," Faculty Exchange Program, sponsored by Idaho Engineering National Laboratories, USA. EUR: 20,000 |
| 2005-2010 | CONAI – University Carlo Cattaneo: "Development of a Simulation Model for Assessing the Costs of Waste storage, collection, transport, and transfer in Urban Regions," EUR: 200,000 |
| 2009 | INL- ELEUSI Research Center: "Nuclear Power Plant Safety and Reliability Sensitivity Metrics", Faculty Exchange Program, sponsored by the US Idaho Engineering National Laboratory. EUR: 20,000 |
| 2009 | SAS Institute-ELEUSI Research Center: "Probabilistic Risk Assessment in Health-Care". Sponsored by the SAS Institute. EUR: 18,000 |
| 2009 | ELEUSI-IEFE: "Abuses in the Energy Market Derivative Products". Sponsored at the IEFE research center by the Italian Energy Regulatory Authority. EUR: 20,000 |
| 2008 – today | FIDIA Farmaceutici - ELEUSI Research Center: "Quantitative methods for the Selection of Energy Contracts"; Sponsored by FIDIA Farmaceutici, Italy. EUR: 75,000 |
| 2008-today | ELEUSI-IEFE: "Project Financing and the financing of new nuclear builds", a joint research project with the IEFE research center, sponsored by EnergyLab. EUR 15,000 |
| 2008 | ELEUSI-IEFE: "Risk Analysis and Risk Perception in the Nuclear Arena", a joint research project with the IEFE research center sponsored by EnergyLab. EUR 15,000 |
| 2008 | Fitch Rating New York, USA – ELEUSI: "New Sensitivity Analysis Methods for Model Validation, Performance Driver Identification, and Investment Monitoring". EUR 50,000 |
| 2006-2008 | PRIN 2006: National Interest Research project sponsored by the Italian Ministry of Research and University, the year 2006 – "Credit spreads stochastic models for a heterogeneous set of financial instruments. A theoretical and empirical analysis." EUR 32,000 for the Bocconi unit. |
| 2006 – 2008 | "Distance-Based Sensitivity Analysis with Correlations," with S. Tarantola and A. Saltelli, Joint Research Center of the European Community, Ispra, VA, Italy. EUR: N/A |
| 2006 – 2008 | "Generalized Comparative Statics: Differential Geometry and Finite Changes," sponsored by Bocconi University, Research Funds, 2006. EUR: 4,000 |
| 2004- 2007 | "Sensitivity Analysis of Portfolio Volatility: A New Approach and its Application to Risk Management," sponsored by Bocconi University, Research Funds, 2004. EUR 4,000. |
| 2004-2005 | ELEUSI Research Center: "Application of the Differential Importance Measure to Financial Models," in collaboration with BANCA INTESA and Italian Association of Cost Engineers. EUR: N/A |
| 1998-2000 | MIT, "The use of Probabilistic Risk Assessment and Decision Analysis in Accident Management," sponsored by Electricitè de France (EdF), Parigi. USD: 155,000 |
| 1999-2000 | MIT, "Uncertainty and Risk Contributors," in cooperation with the Joint Research Centre (JRC) of the European Community, Ispra. EUR: N/A |

1998-1999: MIT: "Regulatory Excellence: developing a performance-based regulatory framework for the US Department of Energy (DOE) Regulation". Sponsor: US DOE, Washington D.C. USD: 100,000.

### NOTE ON RESEARCH ACTIVITY

The technique "Differential Importance Measure" introduced by Borgonovo and Apostolakis (2001) is included since 2002 in the "NASA Probabilistic Risk Assessment Procedures Guide for NASA Managers and Practitioners."

### GRADUATE AND UNDERGRADUATE TEACHING

**COURSE RESPONSIBILITIES**

- 2016- Today: Responsible for the course "Mathematics" for the Bachelor in Economics, Management and Computer Science.
- 2014-2016: responsible for the course "Mathematics I", at the undergraduate level, with coordination of 20 classes, 2500 students, and 20 university professors.
- 2010-today: responsible for the course "Fundamentals of Business Analytics", at the graduate level, with coordination of 7 classes, 850 students, and 15 University professors.
- 2018-Today: Responsible for the course "Big Data for Business Analytics", sponsored by Siemens.

**PH.D. COURSES**

- 2014-Today: "Quantitative Methods for Management Science Research", Ph.D. in Management, Bocconi University.
- 2013-Today: Methods for Risk Analysis, Ph.D. in Statistics, Bocconi University.
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**GRADUATE AND UNDERGRADUATE COURSES AT INTERNATIONAL UNIVERSITIES**

- Massachusetts Institute of Technology, Cambridge (MA), USA: Guest Lecturer of "Probability and its Application to Reliability, Quality Control, and Risk Assessment," 2009.
- MIT: "Probabilistic Risk Assessment," in "Nuclear Engineering for the 21st century," Invited Lecture, Massachusetts Institute of Technology, 2000.
- Georgetown University, Washington D.C.: International Project Finance, as part of Bocconi Campus abroad (July 2013 and July 2014).
- Fudan University, Shanghai, China: "Quantitative Methods for Management," 2008.
- Ecole Superiore d'Arts e Metiers (Paris, France), "Mastère Spécialisé - Management Global des Risques," Groupe de recherche sur le Risque, l'Information et la Décision, Cachan, Paris, 2006–2008.
- Swiss University, Lugano, Switzerland: "Project Financing," 2002.

**GRADUATE AND UNDERGRADUATE COURSES AT NATIONAL UNIVERSITIES**

- SDA Bocconi Business School, Doctorate in Business Administration, "Machine Learning for Business Analytics", 2020 – Today
- SDA Bocconi Business School, MBA, "Decision Analysis", 2015-2019
- SDA Bocconi Business School, Global Executive MBA, "Fundamentals of Business Analytics," 2018
- Bocconi University, Italy, "Fundamentals of Business Analytics," 2006-today
- Bocconi University, Italy, "Mathematics," Bocconi University 2006-today.
- Bocconi University, Italy, "Financial Mathematics," 2004-today.
- Bocconi University, Italy, "International Project Financing," 2003-today.
- Bocconi University, Italy, "Mathematics and Modeling," 2001-2006.
- Bocconi University, Italy, "Mathematical Methods for Management," 2004.
- Carlo Cattaneo University, Italy, "Operations Research II," 2002-2007
- Carlo Cattaneo University, Italy, "Stochastic Processes and Statistical Methods," 2003- today
- Carlo Cattaneo University, Italy, "Mathematical Methods for Industrial Engineering," 2008-2010

- Carlo Cattaneo University, Italy, “Statistics and Data Analysis,” 2008-2010
- MAFINRISK, Bocconi University, Italy, 2005-2007, IMQ, Bocconi University.
- Bocconi Business School, “Project Financing,” Master of Corporate Finance, 2005-2008.
- Bocconi Business School, “Project Financing,” Course of Tesoreria and Risk Hedging for Pirelli, 2006.
- “Project Finance”, Milan and Rome, post-graduate “Course in Cost Engineering”, 2004–2009.
- Bocconi University, “Discover Your Talent,” week, “Discover Your Talent in Math”, 2005-today.
- Italian Banking Association (ABI), “Project Finance: Models and Operational Tools,**”** 2005.
- IlSole24Ore, Italy: “Impact of International Taxation on Investment Valuation,” in Master in Finance, Control and Administration, 2002.
- IlSole24Ore, Italy: “Project Finance, Financial and Strategic Aspects”, 2005.
- Il Sole24Ore, Italy: “The Appraisal of Enterprises Value”, 2006.
- Turin University, Italy: School of Business and Administration: “Influence Diagrams and Decision Trees,” in the Master in Business and Administration, 2001.

## PROFESSIONAL EXPERIENCE

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| December 2002 – September 2004 | Financial Manager, ENELPOWER S.p.A., Milano, Control and Administration – Finance. Responsibility: edging contracts and financial transactions of the Latin American subsidiaries. Management of loan agreements with the Banco National de Desenvolvimento Economico e Social (BNDES – Brazil). |
| January 2001 – December 2002 | Structured Finance Analyst, ENELPOWER S.P.A, Milano. Responsibility: financial modeling, valuation e financial structuring for Project Finance transactions in the Energy Sector. He has worked on different projects in Europe, Asia, Africa, and Latin America. In particular, he has collaborated with the financial close of the projects: TSN, 1100km transmission line (Brazil), with a project finance facility of around 250MEUR by BNDES; and Novatrans, 1300km transmission line (Brazil), with project finance, closed with BNDES and Inter-American Development Bank. |
| 2010 | Consultant for the Lombardy Region Working Group on the planning and actuation of the UN Convention “Enable,” defending the Rights and Dignity of Persons with Disabilities. |
| 2018 | Assicurazioni Generali, Consultant for the project “Train the Trainer in Data Science.” |

## SCIENTIFIC PUBLICATIONS

### 1. Articles in refereed journals / Articoli in riviste con referaggio

1. A. Puy, E. Borgonovo, S. Levin, A. Saltelli, S. Lo Piano: “Irrigated areas drive irrigation water withdrawals”, *Nature Communications*, 2021, to appear.
2. E. Plischke, G. Rabitti, and E. Borgonovo, 2021: “Estimating Shapley Values from Given Data,” S*IAM/ASA Journal on Uncertainty Quantification*, to appear.
3. E. Borgonovo, E. Plischke, G. Li, J. Barr, and H. Rabitz: “Global Sensitivity Analysis with Multiple Distributions: A Generalized ANOVA Approach”, *Risk Analysis*, forthcoming.
4. Borgonovo, E., Hazen, G.B., Jose, V.R.R., Plischke, E., 2021: Probabilistic sensitivity measures as information value, *European Journal of Operational Research*, 289 (2), pp. 595-610.
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## 6. Working papers/non-published papers

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## 7. Books / Libri

E. Borgonovo, 2017: “Sensitivity Analysis, An Introduction for the Management Scientist,” Springer Series in Operations Research and Management Science. The book has registered 17,690 downloads in the period from April 2017- May 7, 2018.

E. Borgonovo and L. Molteni, 2021: “Quando ai Manager danno i numeri”, EGEA.