ROBERTO ROCCHETTA

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OVERVIEW

Roberto Rocchetta, is a Research Scholar involved in a collaborative research effort with the National Institute of Aerospace (NIA) and the Dynamic Systems & Control Branch at NASA Langley. Roberto holds a Master of Science in Energy Engineering from the University of Bologna, Italy, a Master of Research in Decision-Making Under Risk and Uncertainty from the University of Liverpool, United Kingdom, and Ph.D. in Resilience Engineering and Data Science from the same university. Prior joining NIA and during his Ph.D., Roberto was a visiting student at ETH Zurich, Switzerland, at Polytechnic of Milano, Italy, and at Ecole Central de Paris, France. He participated in the development of Machine Learning methods the ARAMIS s.r.l, Milan, in 6 moth internships. His research interests primarily focus on developing advanced methods for uncertainty quantification, automatic learning and data analysis for safety-critical systems. He contributed to the development of mathematical frameworks for reliability-based design optimization, generalized uncertainty quantification, maintenance optimization and analysis of complex systems and interconnected energy infrastructures. Roberto's Ph.D. project contributed to a variety of topics related to networks reliability. Please refer to the listed publications for more details.

WORK EXPERIENCE, VISITING AND INTERNSHIPS

Research Scholar, **NIA/NASA Langley, Hampton**, VA, USA	1/1/2019-Present
Internship, **ARAMIS s.r.l.**, Milan, IT	6 months 2017
Visiting student, **Energy Science Center ETH**, Zurich, SW	2 months 2017
Visiting student, **Lasar group at Milano Polytechnic**, Milan, IT	2 months 2016
Master thesis, **Ecole Centrale de Paris**, Paris, FR	5 months 2013

EDUCATION

Ph.D. at Institute for Risk and Uncertainty, Liverpool University	(2015-2018)
Master of Research in Decision Making Under Risk and Uncertainty	(2014-2015)
Liverpool University, UK	
M. Eng. in Energy Engineering	(2011-2014)
Alma Mater Studiorum University of Bologna, IT	
B.Eng. in Energy Engineering	(2007-2011)
Alma Mater Studiorum University of Bologna, IT	

WEB PAGES

https://www.scopus.com/authid/detail.uri?authorId=56991166000
https://www.researchgate.net/profile/Roberto_Rocchetta

PEER-REVIEWED JOURNAL PUBLICATIONS

R. Rocchetta, M. Compare, L. Bellani, E. Patelli, E. Zio, "*A Reinforcement Learning Framework for Optimal Operation and Maintenance of Power Grids", Applied Energy, 5 March,* 2019

R. Rocchetta, E. Patelli, E. Zio, "*A Power-Flow Emulator Approach for Resilience Assessment of Repairable Power Grids subject to Weather-Induced Failures and Data Deficiency", Applied Energy,* Volume 210, 15, pp 339-350, 2018, https://doi.org/10.1016/j.apenergy.2017.10.126

R. Rocchetta, E. Patelli, "*Assessment of Power Grid Vulnerabilities Accounting for Stochastic Loads and Model Imprecision*", International Journal for Electrical Power & Energy Systems, Volume 98, pp 219-232, 2018, https://doi.org/10.1016/j.ijepes.2017.11.047

R. Rocchetta, E. Patelli, M. Broggi, Q. Huchet, *"On-Line Bayesian Model Updating for Structural Health Monitoring",* Mechanical Systems and Signal Processing, Volume 103, 174 - 195, 2018, https://doi.org/10.1016/j.ymssp.2017.10.015.

R. Rocchetta, E. Patelli, M. Broggi*, "Do we have enough data? Robust reliability via uncertainty quantification*", Applied Mathematical Modelling, Vol-54, pp 710-721, 2018, https://doi.org/10.1016/j.apm.2017.10.020.

R. Rocchetta and Y.F. Li and E. Zio, "*Risk Assessment and Risk-Cost Optimization of Distributed Generation Systems Considering Extreme Weather Conditions",* Reliability Engineering and System Safety, Volume 136, pp 47 - 61, 2015, https://doi.org/10.1016/j.ress.2014.11.013.

R. Rocchetta, E. Patelli, "*A Post-Contingency Power Flow Emulator for Generalized Probabilistic Risks Assessment of Power Grids", (submitted 2019)*

R. Rocchetta, Luis G.Crespo, Sean P.Kenny, "*A Scenario Optimization Approach to Reliability Based Desing", (submitted 2019)*

Thesis available on-line at: http://livrepository.liverpool.ac.uk/id/eprint/3034529

PEER-REVIEWED CONFERENCE PUBLICATIONS (SELECTED)

R. Rocchetta, L. G. Crespo, S. Kenny, "*Reliability-Based Control Design by Scenario Optimization",* ASME Dynamic Systems and Control Conference, Utah, Park City, October, 2019.

R. Rocchetta, L. Bing, E. Patelli, G. Sansavini, *"Effect of Load-Generation Variability on Power Grid Cascading Failures",* ESREL 2018 conference, Trondheim, Norway, June 2018.

R. Rocchetta, M. Compare, E. Patelli, L. Bellani, E. Zio, *"A Reinforcement Learning Framework for Optimisation of Power Grid Operations and Maintenance",* 8th international workshop on reliable engineering computing, REC 2018, Liverpool, UK, Jully, 2018.

R. Rocchetta, E. Patelli, *"Stochastic Analysis and Reliability-Cost Optimization of Distributed Generators and Air Source Heat Pumps", to be presented at the* 2nd International Conference on System Reliability and Safety, ICSRS, 2017. doi: 10.1109/ICSRS.2017.8272792

R. Rocchetta, E. Patelli, *"An Efficient Framework for Reliability Assessment of Power Networks Installing Renewable Generators and Subject to Parametric P-box Uncertainty",* Proceedings of the 27th European Safety and Reliability Conference (ESREL 2017), Portoroz, Slovenia, pp. 3253 – 3260.

R. Rocchetta, E. Patelli, "*Power Grid Robustness to Severe Failures: Topological and Flow Based Metrics Comparison",* European Congress on Computational Methods in Applied Sciences and Engineering, ECCOMAS, Crete 2016, pp. 6121-6135.

R. Rocchetta, E. Patelli, M. Broggi, Q. Huchet, *"On Bayesian Approaches for Real-Time Crack Detection",* Safety and Reliability of Complex Engineered Systems, ESREL, Zurich 2015, pp 1929-1936.

R. Rocchetta, E. Patelli, "*Imprecise Probabilistic Framework for Power Grids Risk Assessment and Sensitivity Analysis",* European Safety and Reliability Conference, ESREL, Glasgow 2016

R. Rocchetta, E. Patelli, M. Broggi, *"Efficient Epistemic-Aleatory Uncertainty Quantification: Application to the NAFEMS Challenge Problem",* NAFEMS World Congress, San Diego, California, USA 21-24 June 2015.

R. Rocchetta, E. Patelli*, "A Simulation-Based Probabilistic Risk Assessment of Electric Vehicles Control Strategies Accounting Renewable Energy Sources",* International Probabilistic Workshop, IPW Liverpool, UK, 4-6 November 2015, pp. 183-198.

HONOURS AND AWARDS

Top 3 Finalist for the Image of Risk Competition
European Safety and Reliability Conference ESREL 2017, Portorz, Slovenia
First Prize (group), Mathematical Competitive Game (2016-2017)
'From the Earth to the Moon' Fédération Française des Jeux Mathématiques, French Federation of Mathematical Games & Mathematical Modelling Company, Corp.
Master of research and PhD scholarships offered by EPSRC and ESRC. (2015-2016)
Second Prize (group), Mathematical Competitive Game (2015-2016)
'*Uncertainties in GPS Positioning'* Fédération Française des Jeux Mathématiques, French Federation of Mathematical Games & Mathematical Modelling Company, Corp.
Winner of Leonardo da Vinci Scholarship for Research Abroad (2013)
Final Master Thesis project provided by Bologna University.

SOFTWARE KNOWLEDGE

Matlab, Python, LaTeX, Office, R-studio (basic), Inkscape

LANGUAGE QUALIFICATIONS

Italian	Mother tongue
English (IELTS & Cambridge Certificates)	Working Proficiency
Dutch	Just Started
French	Basic colloquial knowledge (B1)

KEY WORDS AND RESEARCH INTERESTS

Uncertainty Quantification; Machine Learning, Energy Systems; Power Grid; Networks; Resilience, Reliability, Vulnerability and Risk; Complex system and critical infrastructures; Renewable Energy; Bayesian Updating; Reliability-based Design Optimization; Imprecise Probability;