

MATHAIOS PANTELI

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Current Employment

Sept 2015 – Present **University of Cyprus, Cyprus**
Post-Doctoral Research Associate, Department of Electrical and Computer Engineering

- Research in the area of power systems
- Preparation of research articles and participation in international conferences
- Preparation of grant proposals
- Development of curriculum and delivery of courses in power systems

Please see below the projects undertaken and the course delivered within this role

Sept 2015 – Present **University of Nicosia, Cyprus**
Visiting Lecturer, Department of Electrical Engineering

Please see below the course delivered within this role

Work Experience

Oct 2012 – Aug 2015 **The University of Manchester, United Kingdom**
Post-Doctoral Research Associate, Electrical Energy and Power Systems Group

- Research in the area of power systems
- Preparation of research articles and participation in international conferences
- Supervision and mentoring of students at BSc, MSc and PhD level

Please see below the projects undertaken within this role

Oct 2010 – Sep 2013 **The University of Manchester, United Kingdom**
Project Mentor, Electrical Energy and Power Systems Group

- Development of power engineering projects, including key deliverables, milestones and timelines
- Mentor, supervise and lead individuals and groups of students and engineers engaged in power engineering projects
- Attend and contribute to weekly themed project meetings

Oct 2010 – Sept 2013 **The University of Manchester, United Kingdom**
Tutor, Electrical Energy and Power Systems Group

- Lead lectures and lab demonstrations in M.Sc. and B.Sc. power system programs including Power System Protection, Analysis, Operation and Economics
- Assistance in the development of the course structure and deliverables
- Preparation of lab and tutorials handouts/coursework
- Tutorial advice to power engineering students

Education

Oct 2009 – Apr 2013 **The University of Manchester, United Kingdom**
PhD Researcher, Electrical Energy and Power Systems Group

- Topic: Impact of ICT Reliability and Situation Awareness on Power System Blackouts
- Supervised by Prof Daniel S. Kirschen and Prof Peter A. Crossley
- Project partially supported by National Grid PLC, UK (UK transmission system operator)
- Key Contributions:
 - Review and analysis of historical power system blackouts: identification of non-electrical events (i.e. ICT failures and operator errors) affecting the reliability of electrical networks
 - Development of a comprehensive power system model, which represents not only the heavy electrical components (e.g. transmission lines and buses), but also the protection, monitoring,

- communication and control devices
- Proposal of a procedure based on Sequential Monte Carlo simulation for assessing the impact of failures in ICT systems on power system operation
- Development of a multi-state model using Markov modeling for assessing the impact of insufficient situation awareness on the probability of cascading outages
- Proposal of a method using Markov modeling to assess the reliability of System Integrity Protection Schemes (SIPS)
- Evaluation of the risk associated with the high penetration of SIPS in modern power systems: investigation of the complexity and challenges in the coordination of different SIPS

Sep 2004 –
Jul 2009

Aristotle University of Thessaloniki, Greece

MEng Degree, Department of Electrical and Computer Engineering

- GPA: 7.74/10
- Distinct Area: Electrical Energy and Power Systems
- Modules include: Power Systems Planning and Protection, Operation and Control, Renewable Energy Sources (RES), Management of High Penetration of RES in Power Systems, Transmission and Distribution of Electrical Power, High Voltage Technology and Applications, Power Electronics and Energy Conversion, Electrical Machines
- Final Project: “Design of a Maximum Power Point Tracking (MPPT) control system for wind power generation applications”

Research Projects

2015 – Present

University of Cyprus, Cyprus

- 1) **Reliability and Resilience Assessment of Power Systems to High-impact, Low-probability Events**
 - Funded by Research Grant, University of Cyprus
 - Key deliverables:
 - Asset and risk management
 - Impact assessment of environmental conditions
 - Development of new time-dependent resilience indices
- 2) **Analysis of the Present and Future Power Distribution System in Cyprus**
 - Funded by Joint Research Centre (JRC), European Commission
 - Supported by the Electricity Authority of Cyprus (EAC)
 - Key deliverables:
 - Categorization of the Low Voltage (LV) feeders of the Cypriot network based on characteristic features (e.g. PV penetration)
 - Identification of representative LV Feeders.
 - Extraction of characteristics of these representative LV feeders.

2012 – 2015

The University of Manchester, United Kingdom

1) **Resilient Electricity Networks for Great Britain (RESNET)**

- Funded by Engineering and Physical Sciences Research Council (EPSRC), UK
- Project Participants: The University of Manchester, Tyndall Centre (Climate Change Research Centre), The University of Newcastle and National Grid PLC
- Key deliverables:
 - Development of a time-series model using Sequential Monte Carlo simulation for assessing the impact of extreme weather events and climate change on the resilience of the National Grid transmission network
 - Evaluation of adaptation/reinforcement measures for building a resilient and sustainable National Grid transmission network
 - Cost/benefit analysis of these measures

- 2) **Integrated modelling of electricity and natural gas networks in UK.**
 - Multidisciplinary collaboration with several researchers.
 - Key deliverables:
 - Build a combined UK electricity and natural gas network model
 - Develop business cases for future load demand scenarios and the ability of the network to tackle future challenges

- 3) **Reliability Assessment of Existing System Integrity Protection Schemes (SIPS) & Development of Design Procedures for Future SIPS**
 - Project funded and supported by National Grid PLC, UK
 - Personally developed and submitted the research proposal to National Grid's Research & Development (R&D) Department
 - Key deliverables:
 - Review of National Grid's historical database for the identification of SIPS misoperations and their main causes
 - Reliability-based design refinement: evaluation of different techniques, e.g. voting schemes, for enhancing SIPS reliability
 - Development of procedures for determining the reliability of SIPS components and the logic design of SIPS in order to optimize their performance

Course development and teaching

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| 2015 – 2016 | University of Cyprus, Cyprus
ECE680: Power Systems Analysis (BSc and MSc) |
| 2015 – 2016 | University of Nicosia, Cyprus
ECE466/566: Electric Power Generation, Transmission and Distribution (BSc and MSc) |

Supervision

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| 2009 – 2015 | The University of Manchester, United Kingdom <ul style="list-style-type: none"> - Undergraduate students, BSc (20+, each year) - MSc students (10+, each year) - PhD students (co-supervision, 3 students) - Co-supervision of one MSc student from Universidad de Costa Rica, Costa Rica - Co-supervision of one MSc student from Pontifical Catholic University of Chile - Co-supervision of one PhD student from Oregon State University, USA |
| 2015 – 2016 | University of Cyprus, Cyprus <ul style="list-style-type: none"> - BSc and MSc students (50+) |
| 2015 – 2016 | University of Nicosia, Cyprus <ul style="list-style-type: none"> - MSc students (5) |

Skills Developed

- **Management:**
 - Attendance to management training courses (see below)
 - Project Management: identifying key roles, project methodology, tools and techniques, monitoring/reporting on progress
 - Time management: setting and prioritizing goals, meeting strict deadlines, working under pressure in a multitasking manner.
 - Data management: effective processing and management of large amount of data
- **Communication:**
 - Written: Several technical reports and academic papers presenting simulation results and discussion in the field of energy and power systems
 - Oral: Participation, oral (Microsoft PowerPoint) and poster presentations in numerous meetings and international conferences
 - Intercultural skills: living and working in a multicultural environment

- **Leadership:**
 - Encourage and inspire students and colleagues for achieving short- and long-term goals
 - Ability to lead and manage individuals and groups of people
- **Teaching and Supervision:**
 - Ability to develop innovative curriculum and use innovative and interactive teaching techniques
 - Ability to supervise individuals and different sizes of students groups
- **Team Working:**
 - Work effectively within a group
 - Contribute to regular group meetings
- **IT:**
 - Proficient in Microsoft Office package
 - Highly skilled in programming in C, C++, Fortran and Matlab
 - Large experience in software packages for power system analysis and modeling, such as PSCAD, PowerWorld Simulator, Matlab/Simulink and DigSILENT PowerFactory
- **Reviewing and Proofreading:**
 - Frequent reviewer of articles submitted for publication in high quality journals and conferences
- **Analytical and Problem Solving:**
 - Individually developed techniques for tackling key challenges in energy related matter

Workshops and Training Courses

- Optimizing Research Posters
- Academic Writing
- Building a Funding Portfolio/Grand Writing: Developing Targeted Proposals
- Creating Effective Collaboration/Networking
- Best Practices in Lecture Capture
- Teaching in Higher Education
- Project Management
- Tools for time management
- BESC Assessment – Substations (training provided by National Grid PLC)

Professional Services/Memberships

- 2010 – Present Member of the Institution of Engineering & Technology (IET)**
- Contributed and participated at international conferences organized by IET and events organised by the IET Manchester Network Power Technical Group.
 - IET Chartered Engineer, CEng (in process)
- 2010 – Present Member of Institute of Electrical and Electronics Engineers (IEEE)**
- Active member of:
 - IEEE Power and Energy Society
 - IEEE Cascading Failure Working Group (Understanding, Prediction, Mitigation and Restoration of Cascading Failures)
 - IEEE PES Reliability, Risk and Probability Applications Subcommittee
 - Frequent reviewer of papers for leading international conferences and journals.
- 2013 – 2015 Post-Doctoral Research Associate (PDRA) Liaison Committee, The University of Manchester, UK**
Representative of Electrical Energy and Power Systems Group.
- 2011 – 2013 The University of Manchester Student Branch of the IEEE Power and Energy Society**
Senior Member

Member of Organizing Committees

- 2011 The University of Manchester, United Kingdom**
Postgraduate Poster Conference, Manchester, UK
- Representative of Faculty of Engineering and Physical Sciences (EPS)

- 2013 The University of Manchester, United Kingdom**
 Manchester Electrical Energy and Power Systems Workshop (MEEPS), “Distribution Networks of the Future”
- Advisor
 - Event awarded the “Darrel Chong Student Activity Award” by IEEE.
- 2015-2016 18th IEEE Mediterranean Electrotechnical Conference, MELECON 2016**
- Member of Technical Programme Committee (TPC)

Research Interests

- Reliability, Risk and Resilience Assessment of Power Systems
- Power System Protection
- Smart Grids
- Renewable Energy Sources
- Blackout Prevention
- Application of Probabilistic Methods in Power Systems
- Wide Area Monitoring, Protection and Control (WAMPAC)
- Wide Area Situation Awareness
- Interdependencies between ICT and Electrical Infrastructures
- Impact of Climate Change and Extreme Weather on the Resilience of Power Systems
- Integrated Modelling of Gas and Electricity Networks

Research and Academic Collaborators

Prof Peter A. Crossley, The University of Manchester, UK
 Prof Vladimir Terzija, The University of Manchester, UK (IEEE Fellow)
 Prof Daniel S. Kirschen, University of Washington, USA (IEEE Fellow)
 Prof Hugh Rudnick, Pontifical Catholic University of Chile, Chile (IEEE Fellow)
 Prof Nikos D. Hatziargyriou, National Technical University of Athens (NTUA), Greece (IEEE Fellow)
 Prof Charalambos A. Charalambous, University of Cyprus, Cyprus
 Prof Elias Kyriakides, University of Cyprus, Cyprus
 Dr Pierluigi Mancarella, The University of Manchester, UK
 Dr Jairo Quirós-Tortós, University of Costa Rica, Costa Rica
 Dr Eduardo Cotilla-Sanchez, Oregon State University, OR, USA
 Dr John Fitch, National Grid, UK
 Dr Dejan Sobajic, Grid Engineering LLC, USA (IEEE Fellow)
 Dr Nisheeth Singh, Manager Grid Applications, Swissgrid, Switzerland

List of Publications

Peer-Reviewed Journal Papers

1. **M. Panteli**, P. A. Crossley, D. S. Kirschen and D. J. Sobajic, “Assessing the Impact of Insufficient Situation Awareness on Power System Operation”, *IEEE Transactions on Power Systems*, vol. 28, no. 3, pp. 2967-2977, August 2013
2. **M. Panteli**, P. A. Crossley and J. Fitch, “Quantifying the Reliability Level of System Integrity Protection Schemes”, *IET Generation, Transmission & Distribution*, vol. 8, no. 4, pp. 753 – 764, April 2014
3. **M. Panteli** and P. Mancarella, “Modelling and Evaluating the Resilience of Critical Electrical Power Infrastructure to Extreme Weather Events”, Early access article, *IEEE Systems Journal*, Feb. 2015
4. **M. Panteli** and D. S. Kirschen, "Situation Awareness in Power Systems: Theory, Concepts and Applications", *Electric Power Systems Research*, vol. 122, pp. 140-151, May 2015
5. **M. Panteli**, P. A. Crossley and J. Fitch, “Design of Dependable and Secure System Integrity Protection Schemes”, *International Journal of Electrical Power and Energy Systems*, vol. 68, pp. 15-25, June 2015
6. **M. Panteli** and P. Mancarella, “The Grid: Stronger, Bigger, Smarter? Presenting a Conceptual Framework of Power System Resilience”, *IEEE Power and Energy Magazine*, vol. 13, no. 3, pp. 58-66, 2015 May/June issue

7. J. Quirós-Tortós, **M. Panteli**, P. Wall and V. Terzija, "Sectionalizing Methodology for Parallel System Restoration Based on Graph Theory," *IET Generation, Transmission & Distribution*, vol. 9, no. 1, pp. 1216-1225, August 2015
8. **M. Panteli** and P. Mancarella, "Influence of Extreme Weather and Climate Change on the Resilience of Power Systems: Impacts and Possible Mitigation Strategies", *Electric Power Systems Research*, vol. 127, pp. 259-270, October 2015
9. IEEE Working Group on Understanding, Prediction, Mitigation and Restoration of Cascading Failures, "Benchmarking and Validation of Cascading Failure Analysis Tools", Key contributors (in alphabetical order): J. Bialek, E. Ciapessoni, D. Cirio, E. Cotilla-Sanchez, C. Dent, I. Dobson, P. Henneaux, P. Hines, J. Jardim, S. Miller, **M. Panteli**, M. Papic, A. Pitto, J. Quiros-Tortos, and D. Wu, *IEEE Transactions on Power Systems*, Early Access, pp.1-14, Feb. 2016
10. **M. Panteli**, D.N. Trakas, P. Mancarella, and N.D. Hatziargyriou, "Boosting the Power Grid Resilience to Extreme Weather Events Using Defensive Islanding", *IEEE Transactions on Smart Grid*, Special issue on "Power Grid Resilience", Early Access, Mar. 2016.
11. S. Espinoza, **M. Panteli**, P. Mancarella, and H. Rudnick, "Multi-phase assessment and adaptation of power systems resilience to natural hazards", *Electric Power Systems Research*, Accepted Mar. 2016
12. J. Quiros-Tortos, P. Demetriou, **M. Panteli**, E. Kyriakides, and V. Terzija, "Intentional Controlled Islanding and Risk Assessment: A Unified Framework", *IEEE Systems Journal*, Under Review

Peer-Reviewed International Conference Papers

1. **M. Panteli**, and D. S. Kirschen, "Assessing the Effect of Failures in the Information and Communication Infrastructure on Power System Reliability," in *Proceedings of the 2011 IEEE Power Systems Conference and Exposition (PSCE)*, pp.1-7, Phoenix, USA, 20-23 March, 2011
2. **M. Panteli**, and P. A. Crossley, "Impact of SIPS Performance on Power Systems Integrity," in *Proceedings of the International Conference on Advanced Power System Automation and Protection (APAP)*, pp.280-285, Beijing, China, 16-20 October, 2011
3. **M. Panteli**, P. A. Crossley, and D. S. Kirschen, "A Multi-state Model for Assessing the Impact of Insufficient Wide-area Situational Awareness," in *Proceedings of the 11th IET International Conference on Developments in Power Systems Protection (DPSP)*, pp.1-6, Birmingham, UK, 23-26 April, 2012
4. **M. Panteli**, and P. A. Crossley, "Reliability assessment of SIPS Based on a Safety Integrity Level and Spurious Trip Level", in *Proceedings of the International Conference on Sustainable Power Generation and Supply (SUPERGEN 2012)*, pp. 1-7, Hangzhou, China, 8-9 September, 2012
5. **M. Panteli**, and P. A. Crossley, "Assessing the Risk Associated with a High Penetration of System Integrity Protection Schemes", in *Proceedings of the 2012 3rd IEEE PES International Conference and Exhibition on Innovative Smart Grid Technologies (ISGT Europe)*, pp. 1-7, Berlin, Germany, 14-17 October, 2012
6. **M. Panteli**, D. S. Kirschen, P. A. Crossley and D. J. Sobajic, "Enhancing Situation Awareness in Power System Control Centers", in *Proceedings of the 2013 IEEE International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)*, pp. 1-8, San Diego, USA, 25-28 February, 2013
7. **M. Panteli**, P. A. Crossley and D. S. Kirschen, "Reliability Analysis of Defense Plans Against Slow and Fast Cascading Phenomena", in *Proceedings of the 2013 IEEE PowerTech*, pp. 1-6, Grenoble, France, 16-20 June, 2013
8. J. Quirós-Tortós, **M. Panteli**, V. Terzija, and P. A. Crossley, "On Evaluating the Performance of Intentional Controlled Islanding Schemes", in *Proceedings of the 2013 IEEE General Meeting*, pp.1-5, Vancouver, Canada, 21-25 July 2013
9. N. Liu, **M. Panteli**, and P. A. Crossley, "Reliability evaluation of substation automation system (SAS) communication network based on IEC 61850", in *Proceedings of the 12th IET International Conference on Developments in Power System Protection (DPSP)*, Copenhagen, Denmark, 31 March - 3 April 2014.
10. **M. Panteli**, P. A. Crossley, and J. Fitch, "Determining the Reliability Requirements of System Integrity Protection Schemes", in *Proceedings of 13th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*, Durham, UK, 7-10 July 2014

11. N. Liu, **M. Panteli** and P. A. Crossley, "Reliability Evaluation of an All-digital System Integrity Protection Scheme", Protection, Automation and Control World (PACW) Conference, Glasgow, UK, 29 June – 2 July, 2015
12. **M. Panteli** and P. Mancarella, "Operational Resilience Assessment of Power Systems Under Extreme Weather and Loading Conditions", *IEEE PES General Meeting 2015*, Denver, USA, 26-30 July, 2015
13. **M. Panteli**, P. Mancarella, S. Wilkinson, R. Dawson and C. Pickering, "Assessment of the Resilience of Transmission Networks to Extreme Wind Events", *IEEE PowerTech 2015*, Eindhoven, Netherlands, 29 June – 2 July 2015
14. P. Fernández-Porras, **M. Panteli** and J. Quirós-Tortós, "A Risk-Based Methodology for Defining the Time of Intentional Controlled Islanding", *2015 IEEE PES Conference on Innovative Smart Grid Technologies, Latin America (2015 ISGT LA)*, Montevideo, Uruguay, 5-7 October 2015
15. Nan Liu, **M. Panteli** and P.A. Crossley, "Reliability Evaluation of IEC 61850 based Substation Communication Network in System Integrity Protection Scheme", *IET International Conference on Resilience of Transmission and Distribution Networks (RTDN) 2015*, Birmingham, UK, 22-24 September, 2015
16. **M. Panteli**, P. Mancarella, X. Hu, I. Cotton, D. Calverley, R. Wood, C. Pickering, S. Wilkinson and R. Dawson, "Impact of Climate Change on the Resilience of UK Power System", Project Collaborative paper, *IET International Conference on Resilience of Transmission and Distribution Networks (RTDN) 2015*, Birmingham, UK, 22-24 September, 2015
17. **M. Panteli**, A.I. Nikolaidis, Y. Zhou, F.R. Wood, S. Glynn, C.A. Charalambous, and P. Mancarella, "Analyzing the Resilience and Flexibility of Power Systems to Future Demand and Supply Scenarios", Accepted, *IEEE Mediterranean Electrotechnical Conference (MELECON)*, Limassol, Cyprus, 18-20 April, 2016
18. D.N. Trakas, **M. Panteli**, P. Mancarella, and N.D. Hatziaegyriou, "A Severity Risk Index for High-impact Low-probability Weather Events in Transmission Systems", *2016 IEEE Innovative Smart Grid Technologies - Europe (ISGT Europe)*, Under Review

Other Contributions

1. **M. Panteli**, "Impact of ICT Reliability and Situation Awareness on Power System Blackouts", PhD Thesis, The University of Manchester, 2013, Available: <https://www.escholar.manchester.ac.uk/uk-ac-man-scw:191895>
2. **M. Panteli**, and P. A. Crossley, "Reliability Assessment of System Integrity Protection Schemes in National Grid PLC", Report submitted to National Grid PLC, September 2013
3. **M. Panteli**, and P. Mancarella, "Call for Evidence: Resilience of Electricity Infrastructure", Science and Technology Committee, House of Lords, UK Parliament, Oral Evidence given on 9th December 2014, UK Parliament, Available: <http://www.parliament.uk/documents/lords-committees/science-technology/Resilienceofelectricityinfrastucture/Resilienceofelectricityinfrastructureevidence.pdf>
4. A.I. Nikolaidis, **M. Panteli** and C.A. Charalambous, "Identification of Low Voltage Networks", Report submitted to Joint Research Centre (JRC), European Commission, January 2016.

Other Presentations/Seminars

1. **M. Panteli**, and D. S. Kirschen, "Impact of Information and Communication Technologies on Power System Security", poster presented in *EEE PGR Poster Conference*, Manchester, UK, November 2010
2. **M. Panteli** and D. S. Kirschen, "The Role of Human Operator and of Information and Communication Infrastructure Under Emergencies", in *11th Workshop on Electrical Power Control Centers: Experiences and Trends in Generation, Transmission and Distribution Control Centers*, Altea, Spain, May 2011
3. P. A. Crossley and **M. Panteli**, "Impact of Functional Integration on the Reliability of Substation Protection and Control Systems", tutorial presentation in *11th International Conference on Developments in Power Systems Protection (DPSP)*, Birmingham, UK, 23-26 April, 2012
4. **M. Panteli**, "Assessing the Contribution of non-electrical failures to the probability of power system blackouts", invited talk in the University of Cyprus, May 2012
5. **M. Panteli**, "Analysis and Prevention of Power System Blackouts", invited talk in *Seminar on Reliability Assessment of Power Systems*, The University of Manchester, UK, March 2013

6. P. Demetriou, J. Quiros-Tortos, **M. Panteli**, E. Kyriakides and V. Terzija, "Intentional Controlled Islanding Method based on Identification of Cutsets", presentation given by P. Demetriou, KIOS Research Center, University of Cyprus, April 2014.
7. **M. Panteli** and P. Mancarella, "Impact of Extreme Weather on the Resilience of Critical Power Infrastructure", 5th Annual Event on Risk and Reliability Modeling of Energy Systems, Durham, UK, November 2014
8. **M. Panteli** and P. Mancarella, "Assessing the Impact of Climate Change and Extreme Weather on the Resilience of Critical Power Infrastructure", invited talk given at National Technical University of Athens (NTUA), Greece, April 2015.
9. **M. Panteli**, "*Defining, Evaluating and Boosting Power Systems Resilience to High-impact Low-probability Events*", invited talk, University of Cyprus, September 2015