Petros Aristidou

Contact Information

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Positions

Sept. 2016–present **University of Leeds**, *Leeds, UK*.
Lecturer (Assistant Professor) in Smart Energy Systems

Sept. 2015–Aug. 2016 **Swiss Federal Institute of Technology (ETH Zürich)**, *Zürich, Switzerland*.
Postdoctoral Researcher

April 2014–July 2015 **University of Liège**, *Liège, Belgium*.
Research Engineer

Oct. 2010–March 2014 **University of Liège**, *Liège, Belgium*.
Graduate Researcher

Education

June 2015 **PhD in Engineering Sciences (DEng)**,
University of Liège, Liège, Belgium.
- **Thesis title:** Time-domain simulation of large electric power systems using domain-decomposition and parallel processing methods
- **Advisor:** Prof. Thierry Van Cutsem

July 2010 **Diploma in Electrical and Computer Engineering (5 year curriculum)**,
National Technical University of Athens, Athens, Greece.
- **Thesis title:** Microgrid Modeling and Analysis using Game Theory Methods
- **Advisor:** Prof. Nikolaos Hatziargyriou
- **GPA:** 9.74/10.00 (top 1% of the class and 1^{st} in the Energy speciality)

Selected Honors and Awards

2019 **High Quality Paper awards (two)** for papers 'Interval-Based Adaptive Inertia and Damping Control of a Virtual Synchronous Machine' and 'Data-driven Control Design Schemes in Active Distribution Grids: Capabilities and Challenges', IEEE PES 2019 PowerTech, Milan (honorary diploma)

2018 **Outstanding Technical Report Award** for the IEEE report on 'Contribution to Bulk System Control and Stability by Distributed Energy Resources Connected at Distribution Network', IEEE PES 2018 GM (honorary diploma)

2017 **High Quality Paper award** for paper 'Stability Performance of Power Electronic Devices with Time Delays', IEEE PES 2017 PowerTech, Manchester (honorary diploma)

2014 **Best Paper student award** for paper 'Parallel Computing and Localization Techniques for Faster Power System Dynamic Simulations', CIGRE 2014 Conference, Brussels (honorary diploma)

2013 **High Quality Paper award** for paper 'Dynamic Simulations of Combined Transmission and Distribution Systems using Decomposition and Localization', IEEE PES 2013 PowerTech, Grenoble (honorary diploma)

2012 **Technical Chamber of Greece award**, granted to the top students graduated from all Engineering schools in Greece (honorary diploma)

2010-2014 **Bourse de Doctorat**, research grant by the University of Liège

2010-2014 **Bodossaki Scholarship**, selected based on academic performance, granted to graduate students from Greek universities to pursue a PhD

2010 **Thomaideion award**, granted to the top 3 students graduating from the School of Electrical and Computer Engineering at the National Technical University of Athens (honorary diploma)

2010 **Grigoris Farakos award**, granted to the top 3 students in Energy, graduating from the School of Electrical and Computer Engineering and the School of Mechanical Engineering at the National Technical University of Athens (honorary diploma)

2005-2010 **Greek State Scholarships Foundation** (IKYE) for ranking in the top 3 among the students of the School of Electrical and Computer Engineering at the National Technical University of Athens

2005-2010 **Cyprus State Scholarships Foundation** (IKYK) for excellent performance of Cypriot students abroad

2009, 2006 **Karydogianni award** for excellent performance, awarded to students of the School of Electrical and Computer Engineering and the School of Mechanical Engineering at the National Technical University of Athens (also nominated for the award in 2007 and 2008) (honorary diploma)

2006 **Christos Papakyriakopoulos Maths award** for ranking in the top 3 in Mathematics among the students of the School of Electrical and Computer Engineering at the National Technical University of Athens (honorary diploma)

Invited Talks / Tutorials / Seminars

Feb. 2019 **Data-driven decentralised control design in Active Distribution Networks**, *Invited speaker*, Future Electric Power Systems and the Energy Transition, Champery, Switzerland.

April 2018 **Decentralised control of active distribution grids using optimisation and machine learning techniques**, *Keynote speaker*, Symposium on Stability Assessment and Intelligent Control for Sustainable Electrical Power Systems, TU-Delft, Netherlands.

April 2018 **Increasing real-time awareness in Smart Grids**, *Invited talk*, Symposium on Power System modelling and simulation, IEEE PES Student Branch, University of Strathclyde, UK.

Sept. 2017 **Mitigating operational risk through increased real-time system awareness**, *Invited talk*, HubNet: Future of Energy Networks 2017, Bath, UK.

June 2017 **Modelling and Dynamic Performance of Inverter-Based Generation in Power System Studies**, *Tutorial (1-day)*, CIRED 2017, Glasgow, UK.

Co-organising a special session on "Modelling and Dynamic Performance of Inverter-Based Generation in Power System Studies", *Tutorial*, IEEE PowerTech 2017, Manchester, UK.

May 2016 **Towards Active Distribution Networks: Promises & Challenges**, *Seminar presentation*, University of Leeds, UK.

May 2015 **Future of Smart Energy Systems**, *School of Electronic and Electrical Engineering*, University of Leeds, Leeds, UK.

July 2014 **Algorithmic and Computational Advances for Fast Power System Dynamic Simulations**, *Panel Session on Future Trends and Directions in Dynamic Security Assessment*, IEEE PES 2014 General Meeting, Washington DC, USA.

Algorithmic and Computational Advances for Fast Power System Dynamic Simulations, *IREQ research center*, Hydro-Québec, Montreal, Canada.

Teaching

Current **Smart Grid analysis**, *University of Leeds*, Module leader.

Electric power systems, *University of Leeds*, Module leader.

Power Electronics, *University of Leeds*, Laboratory.

Past **Grid-connected microgeneration systems**, *University of Leeds*, Module leader.

Introduction to Electric Power Transmission: System & Technology, *ETH Zürich*, Teaching assistant and substitute lectures.

Power System Dynamics, Control and Operation, *ETH Zürich*, Teaching assistant and substitute lectures.

Electric power systems analysis and operation, *University of Liège*, Teaching assistant.

Power system dynamics, control and stability, *University of Liège*, Teaching assistant and substitute lectures.

Supervision **Currently 4 PhD candidates as main supervisor and 2 as second supervisor**.

Grants

Summary	Secured £2.1M in Leeds / Own budget (based on academic share) £470k
2019–2023	Electrification and system integration of High Speed Railway, Industrial Funding, Co-I (funding not included in the summary)
2019	Towards resilience and sustainability in islanded energy systems, EPSRC IAA, PI
2018–2021	Creating Resilient Sustainable Microgrids through Hybrid Renewable Energy Systems, EPSRC GCRF, Co-I
2018–2020	E4R-Education for Renewables, Royal Society of Engineering, Higher Education Partnerships Sub-Saharan Africa, Co-I
2018–2021	Data-driven anomaly detection techniques in electric power systems, University of Leeds Global Challenges scholarship, PI
2018–2019	Optimal Dispatch of Virtual Power Plant using Cyber-Physical Controller for Real-Time EMS, Royal Society Institutional Links, Co-I
2016	Acquired funding from the University of Leeds through a competitive procedure to set up a Smart Grid laboratory, University of Leeds, Co-I

Consultations

2018-2019	Investigation of anti-islanding techniques in a low-inertia system, EAC Cyprus
2016-2018	Development of real-time Dynamic Security Assessment platform, Hydro-Québec

Computer Skills

Programming	Fortran, OpenMP, Python, C, MEX (matlab), BASH, Java, html, php, latex, SQL
Software	RAMSES (core developer), Matlab/Simulink, Intel Parallel Studio, Netbeans, PSpice
Platforms	Linux, Microsoft Windows

Languages

English	Fluent (C2)
Greek	Fluent (Native speaker)
French	Advanced (B2)

Professional Associations

2011–present	Cyprus Scientific and Technical Chamber (ETEK)
2010–present	IEEE Power and Energy Society
	Society for Industrial and Applied Mathematics (SIAM)

Service

Work-groups **Impact of Low Inertia Network on Protection and Control**, *CIGRÉ JWG B5/C4.61*, Member, 2018–present.

Modelling and dynamic performance of inverter-based generation in power system transmission and distribution studies, *CIGRÉ C4-C6.35/CIRED Joint Work-Group*, Chapter leader, 2014–2018.

Contribution to Bulk System Control and Stability by Distributed Energy Resources connected at Distribution Networks, *IEEE PES Power System Dynamic Performance Committee*, Member, 2014–2016.

Reviewer Regular reviewer at many major journals and conferences. For instance, IEEE Trans. on Power Systems, IEEE Trans. on Smart Grids, IEEE Systems Journal, IEEE Trans. on Parallel and Distributed Systems.

International Assessment Board member for Government of Ireland (GOI) Postdoctoral Fellowship Scheme, Irish Research Council

Publications

Book Chapters

2018 G. Valverde, **P. Aristidou**, and T. Van Cutsem. Enhancement of transmission system voltage stability through local control of distribution networks. In *Dynamic Vulnerability Assessment and Intelligent Control for Sustainable Power Systems*. John Wiley & Sons, 2018.

H. Soleimani, G. Valverde, **P. Aristidou**, M. Glavic, and T. Van Cutsem. Operation of distribution systems within secure limits using real-time model predictive control. In *Dynamic Vulnerability Assessment and Intelligent Control for Sustainable Power Systems*. John Wiley & Sons, 2018.

2012 **P. Aristidou**, D. Fabozzi, and T. Van Cutsem. A Schur complement method for DAE systems in power system dynamic simulations. In *Domain Decomposition Methods in Science and Engineering XXI*, volume 98 of *Lecture Notes in Computational Science and Engineering*. Springer International Publishing, 2012.

2011 G. Asimakopoulou, Y. Papagrigorakis, A. L. Dimeas, **P. Aristidou**, and N. Hatziargyriou. A review of customer management tools: The energy industry. In *Energy-Efficient Computing and Networking*, volume 54 of *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering*, pages 64–72. Springer Berlin Heidelberg, 2011.

P. Aristidou, A. Dimeas, and N. Hatziargyriou. Microgrid modelling and analysis using game theory methods. In *Energy-Efficient Computing and Networking*, volume 54 of *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering*, pages 12–19. Springer Berlin Heidelberg, 2011.

Refereed Journal Articles

2019 J. Schiffer, **P. Aristidou**, and R. Ortega. Online estimation of power system inertia using dynamic regressor extension and mixing. *IEEE Transactions on Power Systems*, pages 1–1, 2019.

N. Pilatte, **P. Aristidou**, and G. Hug. Tdnetgen: An open-source, parametrizable, large-scale, transmission, and distribution test system. *IEEE Systems Journal*, 13(1):729–737, March 2019.

U. Markovic, Z. Chu, **P. Aristidou**, and G. Hug. Lqr-based adaptive virtual synchronous machine for power systems with high inverter penetration. *IEEE Transactions on Sustainable Energy*, 10(3):1501–1512, July 2019.

S. Karagiannopoulos, J. Gallmann, M. G. Vaya, **P. Aristidou**, and G. Hug. Active distribution grids offering ancillary services in islanded and grid-connected mode. *IEEE Transactions on Smart Grid*, pages 1–1, 2019.

S. Karagiannopoulos, **P. Aristidou**, and G. Hug. Data-driven local control design for active distribution grids using off-line optimal power flow and machine learning techniques. *IEEE Transactions on Smart Grid*, pages 1–1, 2019.

E. Ekomwenrenren, H. Alharbi, T. Elgorashi, J. Elmirghani, and **P. Aristidou**. Stabilising control strategy for cyber-physical power systems. *IET Cyber-Physical Systems: Theory & Applications*, February 2019.

2018 K. Yamashita, H. Renner, S. Martinez Villanueva, G. Lammert, **P. Aristidou**, J. Carvalho Martins, L. Zhu, L. David Pabon Ospina, and T. Van Cutsem. Industrial recommendation of modeling of inverter-based generators for power system dynamic studies with focus on photovoltaic. *IEEE Power and Energy Technology Systems Journal*, 5(1):1–10, March 2018.

2017 S. Karagiannopoulos, **P. Aristidou**, and G. Hug. Hybrid approach for planning and operating active distribution grids. *IET Generation, Transmission Distribution*, 11(3):685–695, 2017.

P. Aristidou, G. Valverde, and T. Van Cutsem. Contribution of distribution network control to voltage stability: A case study. *IEEE Transactions on Smart Grid*, 8(1):106–116, Jan 2017.

2016 F. Plumier, **P. Aristidou**, C. Geuzaine, and T. Van Cutsem. Co-simulation of electromagnetic transients and phasor models: A relaxation approach. *IEEE Transactions on Power Delivery*, 31(5):2360–2369, Oct 2016.

F. Olivier, **P. Aristidou**, D. Ernst, and T. Van Cutsem. Active management of low-voltage networks for mitigating overvoltages due to photovoltaic units. *IEEE Transactions on Smart Grid*, 7(2):926–936, March 2016.

P. Aristidou, S. Lebeau, L. Loud, and T. Van Cutsem. Prospects of a new dynamic simulation software for real-time applications on the hydro-quebec system. *CIGRE Science & Engineering*, 4(1):88–95, February 2016.

P. Aristidou, S. Lebeau, and T. Van Cutsem. Power system dynamic simulations using a parallel two-level schur-complement decomposition. *IEEE Transactions on Power Systems*, 31(5):3984–3995, Sept 2016.

2015 **P. Aristidou** and T. Van Cutsem. A parallel processing approach to dynamic simulations of combined transmission and distribution systems. *International Journal of Electrical Power & Energy Systems*, 72:58–65, Nov 2015.

2014 **P. Aristidou**, D. Fabozzi, and T. Van Cutsem. Dynamic simulation of large-scale power systems using a parallel schur-complement-based decomposition method. *IEEE Transactions on Parallel and Distributed Systems*, 25(10):2561–2570, Oct 2014.

Refereed Conference Papers

2019 U. Markovic, N. Fruh, **P. Aristidou**, and G. Hug. Interval-based adaptive inertia and damping control of a virtual synchronous machine. In *Proc. of the IEEE PES PowerTech Conf., Milano*, June 2019. **(High Quality Paper award)**.

S. Karagiannopoulos, R. Dobbe, **P. Aristidou**, G. Hug, and D. Callaway. Data-driven decentralized control schemes in active distribution grids. In *Proc. of the IEEE PES PowerTech Conf., Milano*, June 2019. **(High Quality Paper award)**.

D.R. Flores, U. Markovic, N. Fruh, **P. Aristidou**, and G. Hug. Robust converter control design under time-delay uncertainty. In *Proc. of the IEEE PES PowerTech Conf., Milano*, June 2019.

S. Alghamdi, N. Smith, J. Schiffer, and **P. Aristidou**. Delay-robust distributed secondary frequency control: A case study. In *Proc. of the IEEE PES PowerTech Conf., Milano*, June 2019.

2018 C. Spanias, **P. Aristidou**, M. Michaelides, and I. Lestas. Power system stability enhancement through the optimal, passivity-based, placement of svcs. In *Proc. of the 2018 PSCC*, June 2018.

R. Ofir, U. Markovic, **P. Aristidou**, and G. Hug. Droop vs. virtual inertia: Comparison from the perspective of converter operation mode. In *Proc. of the 2018 Energycon conf.*, June 2018.

U. Markovic, J. Vorwerk, **P. Aristidou**, and G. Hug. Stability analysis of converter control modes in low-inertia power systems. In *Proc. of the 2018 ISGT Europe conf.*, October 2018.

U. Markovic, O. Stanojev, **P. Aristidou**, and G. Hug. Partial grid forming concept for 100% inverter-based transmission systems. In *Proc. of the 2018 IEEE PES General Meeting*, August 2018. **(Best Conference Papers on Power System Stability, Control, and Protection)**.

U. Markovic, Z. Chu, **P. Aristidou**, and G. Hug. Fast frequency control scheme through adaptive virtual inertia emulation. In *Proc. of the 2018 ISGT Asia conf.*, 2018.

S. Karagiannopoulos, **P. Aristidou**, and G. Hug. A centralised control method for tackling unbalances in active distribution grids. In *Proc. of the 2018 PSCC*, June 2018.

F. Bellizio, S. Karagiannopoulos, **P. Aristidou**, and G. Hug. Optimized local control schemes for active distribution grids using machine learning techniques. In *Proc. of the 2018 IEEE PES General Meeting*, August 2018.

2017 S. Martinez Villanueva, K Yamashita, H. Renner, J. Carvalho Martins, **P. Aristidou**, T. Van Cutsem, G Lammert, and L. D. Pabon Ospina. Current status of joint working group cigre c4/c6.35/cired: Modeling and dynamic performance of inverter based generation in power system transmission and distribution studies. In *XVII Encuentro Regional Iberoamericano del CIGRE (ERIAC)*, May 2017.

U. Markovic, **P. Aristidou**, and G. Hug. Virtual induction machine strategy for converters in power systems with low rotational inertia. In *Proc. of 2017 IREP Conf., Espinho*, Aug 2017.

U. Markovic, **P. Aristidou**, and G. Hug. Stability performance of power electronic devices with time delays. In *Proc. of IEEE PES Powertech Conf., Manchester*, June 2017. **(High Quality Paper award)**.

G Lammert, K Yamashita, H. Renner, S. Martínez Villanueva, J. Carvalho Martins, **P. Aristidou**, T. Van Cutsem, L. D. Pabón Ospina, M. Braun, and J Boemer. Activities of the joint working group cigre c4/c6.35/cired: Modelling and dynamic performance of inverter based generation in power system transmission and distribution studies. In *1st International Conference on Large-Scale Grid Integration of Renewable Energy in India*, September 2017.

S. Karagiannopoulos, L. Roald, **P. Aristidou**, and G. Hug. Operational planning of active distribution grids under uncertainty. In *Proc. of 2017 IREP Conf., Espinho*, Aug 2017.

S. Karagiannopoulos, **P. Aristidou**, and G. Hug. Co-optimisation of planning and operation for active distribution grids. In *Proc. of IEEE PES Powertech Conf., Manchester*, June 2017.

2016 S. Karagiannopoulos, **P. Aristidou**, A. Ulbig, S. Koch, and G. Hug. Optimal planning of distribution grids considering active power curtailment and reactive power control. In *Proc. of 2016 General Meeting*, July 2016.

P. Aristidou and G. Hug-Glanzmann. Accelerating the computation of critical eigenvalues with parallel computing techniques. In *Proc. of 2016 PSCC*, June 2016.

2015 **P. Aristidou**, L. Papangelis, X. Guillaud, and T. Van Cutsem. Modular modelling of combined AC and DC systems in dynamic simulations. In *Proc. of IEEE PES 2015 PowerTech Conf.*, July 2015.

P. Aristidou, S. Lebeau, L. Loud, and T. Van Cutsem. Prospects of a new dynamic simulation software for real-time applications on the Hydro-Québec system. In *CIGRÉ 2015 Canada Conf.*, 2015.

2014 F. Plumier, **P. Aristidou**, C. Geuzaine, and T. Van Cutsem. A relaxation scheme to combine phasor-mode and electromagnetic transients simulations. In *Proc. of the 18th PSCC, Wroclaw*, August 2014.

P. Aristidou and T. Van Cutsem. Parallel computing and localization techniques for faster power system dynamic simulations. In *Proc. of Cigre Belgium Conf., Brussels*, March 2014. **(Best Paper student award)**.

P. Aristidou and T. Van Cutsem. Dynamic simulations of combined transmission and distribution systems using parallel processing techniques. In *Proc. of the 18th PSCC, Wroclaw*, August 2014.

P. Aristidou and T. Van Cutsem. Algorithmic and computational advances for fast power system dynamic simulations. In *Proc. of the IEEE PES General Meeting, Washington DC*, July 2014.

P. Aristidou, F. Olivier, D. Ernst, and T. Van Cutsem. Distributed model-free control of photovoltaic units for mitigating overvoltages in low-voltage networks. In *Proc. of CIRED Workshop, Rome*, June 2014.

2013 **P. Aristidou** and T. Van Cutsem. Dynamic simulations of combined transmission and distribution systems using decomposition and localization. In *Proc. of IEEE PES PowerTech Conf., Grenoble*, June 2013. **(High Quality Paper award)**.

P. Aristidou, D. Fabozzi, and T. Van Cutsem. Exploiting localization for faster power system dynamic simulations. In *Proc. of IEEE PES PowerTech Conf., Grenoble*, June 2013.

Technical Reports

2018 Modelling of inverter-based generation for power system dynamic studies. Technical Report 727, JWG C4/C6.35/CIRED, 5 2018.

2017 N. Hatziargyriou, T. Van Cutsem, J. Milanovic, P. Pourbeik, C. Vournas, O. Vlachokyriakou, P. Kotsampopoulos, M. Hong, R. Ramos, J. Boemer, **P. Aristidou**, V. Singhvi, J. dos Santos, and L. Colombari. Contribution to bulk system control and stability by distributed energy resources connected at distribution network. Technical Report TR22, IEEE Power & Energy Society, 1 2017. **(IEEE PES Outstanding Technical Report award)**.