

Claudio Adrián Cañizares Curriculum Vitae

1. PERSONAL DATA

a. Address:

University of Waterloo
Department of Electrical and Computer Engineering
Office EIT-4168
200 University Avenue West
Waterloo, ON, Canada N2L 3G1

519-888-4567 Ext. 35355
Fax 519-746-3077
ccanizar@uwaterloo.ca
<http://www.power.uwaterloo.ca>

b. Education:

DEGREE	PLACE	DATES	COMMENTS
PhD Electrical Engineering	University of Wisconsin-Madison USA	Sept. 1991	Thesis: Voltage Collapse Analysis of AC/DC Systems. Advisors: Profs. Fernando L. Alvarado and Christopher DeMarco. Major: Power Systems. Minors: Control, Computer Science. GPA: 4.0/4.0
M.Sc. Electrical Engineering	University of Wisconsin-Madison USA	May 1988	Thesis: Graphic and Symbolic Simulation Techniques Applied to the Analysis of Power Systems. Advisors: Prof. Fernando L. Alvarado. GPA: 3.9/4.0
Ingeniero Eléctrico (Electrical Engineer Diploma)	Escuela Politécnica Nacional Quito-Ecuador	April 1984	Thesis: New Algorithms for the Computation of Short-circuits in Large Power Systems (Spanish). Advisor: Ing. Alfredo Mena GPA: 9.1/10.0 SUMMA CUM LAUDE

c. Employment:

POSITION	PLACE	DATES	COMMENTS
Professor Associate Professor Assistant Professor	University of Waterloo E&CE Department Canada	July 2003-present July 1998-June 2003 Sept. 1993-June 1998	Instructor of several Electrical Engineering undergraduate and graduate courses. Supervision of undergraduate, graduate and post-graduate research assistants, research associates and visitors, and teaching assistants. Lead and collaborate in research grants and contracts funded by government agencies and industry.
Hydro One Endowed Chair	University of Waterloo Canada	May 2010-present	Research chair position supported by a \$1.5 million endowment from Hydro One to sponsor the Chair's research program in support of Hydro One activities, particularly in the areas of Smart Networks and Emerging Industry Infrastructure.
Associate Chair for Research	University of Waterloo E&CE Department Canada	Sept. 2015-Aug. 2016	Support and promote research activities in the Department, such as grants, awards, recognitions, and highlight research accomplishments.
Associate Director	University of Waterloo Waterloo Institute for Sustainable Energy (WISE) Canada	Sept. 2008-Dec. 2015	Collaborate with the Executive Director of WISE in the set up of the Institute, including hiring new staff for the Institute, developing links with industry partners in the energy sector and raising the Institute's profile, playing a leadership role within the Institute.
Acting Executive Director	University of Waterloo Waterloo Institute for Sustainable Energy (WISE) Canada	Jan.-Aug. 2015	Replace the Executive Director of WISE during his sabbatical leave, leading all administrative and technical activities of the Institute.
Invited Professor	University of Castilla-La Mancha and University of Seville, Electrical Engineering, Spain	Nov. 2006-Feb. 2007	Continue collaborative research work on electricity market auctions and power system security.
Invited Professor	Swiss Federal Institute of Technology (ETH), Power Systems and High Voltage Lab., Zurich, Switzerland	Sept. 2006-Oct. 2006	Start collaborative research work on the study of multi-carrier energy systems.

Acting Chair	University of Waterloo E&CE Department Canada	July 2004- August 2004	Temporary Chair of the largest department at the University of Waterloo (2003-2004 figures: 60+ faculty members, 40+ office and technical staff, 1200+ undergraduate students, 300+ graduate students, \$12+ millions in research funding).
Deputy Chair	University of Waterloo E&CE Department Canada	January 2003- June 2004	In charge of most of the internal affairs of the E&CE Department, which included year-end evaluations of faculty members and secretarial and technical staff; chairing several standing committees for teaching, alumni and co-op affairs, and hiring; etc.
Associate Chair of Graduate Studies	University of Waterloo E&CE Department Canada	Sept. 2000- December 2002	In charge of the Graduate Program of the E&CE Department, with a 250+ enrollment at the time. The work included making decisions on funding for graduate students, student-supervisor ombudsman, maintaining academic and research program standards, etc.
Visiting Professor	Politecnico di Milano Dipartimento di Elettrotecnica Milan, Italy	Sept. 1999- July 2000	Collaborated in several research projects with Prof. A. Berizzi. Taught a short course on power systems stability to grad students and people from industry.
Consultant	ENEL-Ricerca and CESI Milan, Italy	Sept. 1999- January 2001	Work as a consultant for a research project entitled "Uses of FACTS and their Influence on Automatic Voltage Regulation in Networks with Secondary Voltage Controls," with M. Pozzi and S. Corsi.
Professor Assistant Professor	Escuela Politécnica Nacional Quito, Ecuador	April 1992- August 1993 July 1984- March 1992	In charge of sophomore level courses in machines and senior level courses in power systems analysis and simulation. Chairman of the Power Systems Area, helping on the restructuring the Electrical Engineering Faculty. Research: power systems computational techniques and stability.
Consultant	Self Waterloo, Canada	Sept. 1993- present	Consultant, instructor, and evaluator in power engineering academic and technical matters for several institutions and companies around the world, such as: Ziena Optimization Inc., US; ADEWA, Abu Dhabi; CELEC, Ecuador; McMaster University, Canada; Universidad de Chile, Santiago; Simon Fraser University, Canada; Escuela Politécnica Nacional, Ecuador; Universidad de Cuenca, Ecuador; and others.
Consultant	Self Quito, Ecuador	Sept. 1991- August 1993	Evaluate and inspect distribution network projects.

Consultant	University of Wisconsin-Madison ECE Department USA	Sept. 1991- Dec. 1992	Research and develop new software tools for ac dc power system analysis, and prepare technical papers in the subject.
Research Assistant	University of Wisconsin-Madison ECE Department USA	Jan. 1987- August 1991	Research several areas in power systems simulation, modeling and analysis; manage a small computer network; help in the development of the EMTP EPRI Workbooks II, III and IV; assist on computer setup and simulations for EMTP and Power Systems summer courses.
Teaching Assistant	University of Wisconsin-Madison ECE Department USA	Sept. 1988- May 1990	Taught two semesters of basic circuit analysis to non-electrical engineering students, and two semesters of the corresponding labs.
Lab Assistant	Escuela Politécnica Nacional Facultad de Ingeniería Eléctrica Quito, Ecuador	August 1983- June 1984	Help in the setup and delivery of several undergraduate labs in power systems and basic circuit analysis.
Engineering Assistant	INELIN Quito-Ecuador	August 1982- July 1983	Analysis and design of distribution networks.
Teacher	Colegio Americano Quito-Ecuador	Oct. 1979- Sept. 1982	Teach basic physics and related labs to senior, junior and sophomore high school students.
Engineering Assistant	Dirección de Aviación Civil Quito-Ecuador	Aug. 1982- Sept. 1982	Assist in the repair of electronic equipment at the Airport in Quito, Ecuador.

2. RESEARCH

a. Areas:

The following is a list of the various research topics in which my research group is involved:

i. Smart grids and microgrids:

- Energy storage dynamic and static modeling for impact and dispatch studies of grids and microgrids.
- Energy management systems for customers and distribution feeders, and study and optimal management of the impact of smart loads in transmission and distribution systems, as well as microgrids.
- Microgrids planning, dispatch, control, and stability analysis, particularly of unbalanced, remote (isolated) systems, considering technical, economic, and social issues.
- Modeling, simulation, and control of distributed generation (DG), for both large grids and microgrids.
- Integration of renewables, particular wind and solar power, and energy storage systems considering their impact in dispatch, stability, and control in large grids and microgrids.
- Electric vehicles' smart charging and their impact on transmission and distribution systems.

ii. Stability and security analysis and improvements of power systems in a deregulated environment and in the context of smart grids:

- Study and manage the impact of converter-based renewable energy generation, particularly wind- and solar-power plants, on the stability of power grids.
- Pricing of system security and controls.
- Stability analysis of power systems including HVDC and FACTS controllers, and development of new analysis methodologies and control strategies to monitor and avoid stability problems.
- Development of efficient computational tools for the analysis of stability, dispatch and planning problems in power systems.
- Application of optimization techniques to bifurcation and stability-constrained OPF problems.
- Nonlinear system theory application to power systems, particularly the study of bifurcations and chaotic behavior.

iii. Optimal management and forecasting:

- Development of dispatch tools including DG and generation and load uncertainties.
- Reactive power management and markets.
- Probabilistic and stochastic OPF problems in grid dispatch and planning considering variable load and generation.
- Load and price forecasting.

iv. Simulation and studies of energy systems with multiple energy carriers:

- Optimization and economic studies of multi-energy systems.
- Feasibility studies of hydrogen systems with emphasis on the use of hydrogen as a storage medium for solar- and wind-power integration.

v. Simulation, modeling and analysis of FACTS controllers in power systems:

- Development and validation of dynamic and power flow models.
- Design and development of control strategies.

b. Publications: 337

	Google Scholar Sept. 2019	SCOPUS Sept. 2019
Citations	18953	10271
h-index	64	48

(i) Journal Papers: 116

- [1] M. H. Ravanji (Visitor), **C. A. Cañizares**, and N. Parniani, "Modeling and Control of Variable Speed Wind Turbine Generators for Frequency Regulation," *IEEE Transactions on Sustainable Energy*, submitted October 2018, revised and resubmitted March 2019, accepted April 2019, 11 double-column pages.
- [2] E. Nasr-Azadani, P. Su, W. Zhenga, J. Rajda, **C. Cañizares**, M. Kazerani, E. Veneman, S. Cress, M. Wittemund, M. Manjunath, and N. Wrathall, "Canadian Renewable Energy Laboratory (CANREL) – A Testbed for Microgrids," *IEEE Electrification Magazine*, submitted July 2018, accepted February 2019, 8 double-column pages.
- [3] IEEE-PES Task Force on Microgrid Stability Analysis and Modeling: M. Farrokhhabadi (Student), **C. A. Cañizares (Co-chair)**, J. W. Simpson-Porco, E. Nasr, L. Fan, P. A. Mendoza-Araya, R. Tonkoski, U. Tamrakar, N. Hatziargyriou, D. Lagos, R. W. Wies, M. Paolone, M. Liserre, L. Meegahapola, M. Kabalan, A. H. Hajimiragha, D. Peralta (Student), M. Elizondo, K. P. Schneider, F. Tuffner, and J. Reilly (Co-chair), "Microgrid Stability Definitions, Analysis, and Examples," *IEEE Transactions on Power Systems*, vol. 35, no. 1, January 2020, pp. 13-29.
- [4] J.-M. Clairand (Visitor), M. Arriaga (PDF), **C. A. Cañizares**, and C. Alvarez, "Power Generation Planning of Galapagos' Microgrid Considering Electric Vehicles and Induction Stoves," *IEEE Transactions on Sustainable Energy*, vol. 10, no. 4, October 2019, pp. 1916-1926.
- [5] **C. A. Cañizares**, J. Nathwani, and D. Kammen, "Electricity for All: Issues, Challenges, and Solutions for Energy-Disadvantaged Communities," *IEEE Proceedings*, Special Issue "Electricity for All: Access to Electricity Issues and Solutions for Energy-disadvantaged Communities," **invited paper**, vol. 107, no. 9, September 2019, pp. 1775-1779.
- [6] I. Das (PDF) and **C. A. Cañizares**, "Renewable Energy Integration in Diesel-based Microgrids at the Canadian Arctic," *IEEE Proceedings*, Special Issue "Electricity for All: Access to Electricity Issues and Solutions for Energy-disadvantaged Communities," **invited paper**, vol. 107, no. 9, September 2019, pp. 1838-1856.
- [7] I. Calero (Student), **C. A. Cañizares**, and K. Bhattacharya, "Compressed Air Energy Storage System Modeling for Power System Studies," *IEEE Transactions on Power Systems*, vol. 35, no. 5, September 2019, pp. 1558-0679.
- [8] B. Solanki (Student), **C. A. Cañizares**, and K. Bhattacharya, "Practical Energy Management Systems for Isolated Microgrids," *IEEE Transactions on Smart Grid*, vol. 10, no. 5, September 2019, pp. 4762-4775.
- [9] N. Mehboob (Student), M. Restrepo (PDF), **C. A. Cañizares**, C. Rosenberg, and M. Kazerani, "Smart Operation of Electric Vehicles with Four-Quadrant Chargers Considering Uncertainties," *IEEE Transactions on Smart Grid*, vol. 10, no. 3, May 2019, pp. 2999-3009.
- [10] D. F. Romero (Visitor) and **C. A. Cañizares**, "An Affine Arithmetic-Based Energy Management System for Isolated Microgrids," *IEEE Transactions on Smart Grid*, vol. 10, no. 3, May 2019, pp. 2989-2998.
- [11] J. Lara (Student), D. Olivares (Student), and **C. A. Cañizares**, "Robust Energy Management System of Isolated Microgrids," *IEEE Systems Journal*, vol. 13, No.1, March 2019, pp. 680-691.

- [12] J. M. Gonzalez (PDF), E. Pouresmaeil (PDF), **C. A. Cañizares**, K. Bhattacharya, A. Mosaddegh (Student), and B. Solanki (Student), “Smart Residential Load Simulator for Energy Management in Smart Grids,” *IEEE Transactions on Industrial Electronics*, Special Section “Methods and Systems for a Smart Energy City,” vol. 66, no. 2, February 2019, pp. 1443-1452.
- [13] P. Sauter (Visitor), B. V. Solanki (Student), **C. A. Cañizares**, K. Bhattacharya, and S. Hohmann, “Electric Thermal Storage System Impact on Northern Communities’ Microgrids,” *IEEE Transactions on Smart Grid*, vol. 10, no.1, January 2019, pp. 852-863.
- [14] B. Tamimi (Student) and **C. A. Cañizares**, “Modeling and Application of Hybrid Power Flow Controller in Distribution Systems,” *IEEE Transactions on Power Delivery*, vol. 33, no. 6, December 2018, pp. 2673-2682.
- [15] A. Mosaddegh (Student), **C. A. Cañizares**, and K. Bhattacharya, “Optimal Demand Response for Distribution Feeders with Existing Smart Loads,” *IEEE Transactions on Smart Grid*, vol. 9, no. 5, September 2018, pp. 5291-5300.
- [16] M. Restrepo (Student), **C. A. Cañizares**, and M. Kazerani, “Three-Stage Distribution Feeder Control Considering Four-Quadrant EV Chargers,” *IEEE Transactions on Smart Grid*, vol. 9, no.4, July 2018, pp. 3736-3747.
- [17] M. Farrokhabadi (Student), **C. A. Cañizares**, and K. Bhattacharya, “Unit Commitment for Isolated Microgrids Considering Frequency Control,” *IEEE Transactions on Smart Grid*, vol. 9, no.4, July 2018, pp. 3270-3280.
- [18] M. Farrokhabadi (Student), S. König (Visitor), **C. A. Cañizares**, K. Bhattacharya, and T. Leibfried, “Energy Storage System Models for Microgrid Stability Analysis and Dynamic Simulation,” *IEEE Transactions on Power Systems*, vol. 33, no. 2, March 2018, pp. 2301-2312.
- [19] M. Restrepo (Student), J. Morris (Student), M. Kazerani, and **C. A. Cañizares**, “Modeling and Testing of a Bidirectional Smart Charger for Distribution System EV Integration,” *IEEE Transactions on Smart Grid*, vol. 9, no.1, January 2018, pp. 152-162.
- [20] A. Vaccaro (Student) and **C. A. Cañizares**, “A Knowledge-based Framework for Power Flow and Optimal Power Flow Analyses,” *IEEE Transactions on Smart Grid*, vol. 9, no. 1, January 2018, pp. 230-239.
- [21] D. Remon (Visitor), **C. A. Cañizares**, and P. Rodriguez, “Impact of 100-MW-scale PV Plants with Synchronous Power Controllers on Power System Stability in Northern Chile,” *IET Generation, Transmission & Distribution*, vol. 11, no. 11, November 2017, pp. 2958-2964.
- [22] B. V. Solanki (Student), K. Bhattacharya, and **C. A. Cañizares**, “A Sustainable Energy Management System for Isolated Microgrids,” *IEEE Transactions on Sustainable Energy*, vol. 8, no. 3, October 2017, pp. 1507-1517.
- [23] M. Farrokhabadi (Student), B. V. Solanki (Student), **C. A. Cañizares**, K. Bhattacharya, S. König (Visitor), P. Sauter (Visitor), T. Leibfried, and S. Hohmann, “Energy Storage in Microgrids: Compensating for Generation and Demand Fluctuations While Providing Ancillary Services,” *IEEE Power and Energy Magazine*, **invited paper**, vol. 15, no. 5, Sept./Oct. 2017, pp. 81-91.
- [24] B. V. Solanki (Student), A. Raghurajan (Student), K. Bhattacharya, and **C. A. Cañizares**, “Including Smart Loads for Optimal Demand Response in Integrated Energy Management Systems for Isolated Microgrids,” *IEEE Transactions on Smart Grid*, vol. 8, no. 4, July 2017, pp. 1739-1748.
- [25] A. Mosaddegh (Student), **C. A. Cañizares**, K. Bhattacharya, and H. Fan, “Distributed Computing Architecture for Optimal Control of Distribution Feeders with Smart Loads,” *IEEE Transactions on Smart Grid*, **invited paper**, special section “High Performance Computing Applications for a More Reliable and Efficient Power Grid,” vol. 8, no. 3, May 2017, pp. 1469-1478.

- [26] M. Farrokhbadi (Student), **C. A. Cañizares**, and K. Bhattacharya, "Frequency Control in Isolated/Islanded Microgrids Through Voltage Regulation," *IEEE Transactions on Smart Grid*, vol. 8, no. 3, May 2017, 1185-1194.
- [27] B. Tamimi (Student), **C. A. Cañizares**, and C. Battistelli (PDF), "Hybrid Power Flow Controller Steady-State Modelling, Control and Practical Application," *IEEE Transactions on Power Systems*, vol. 32, no. 2, March 2017, pp. 1483-1492.
- [28] IEEE-PES Task Force on Benchmark Systems for Stability Controls: **C. A. Cañizares**, T. Fernandes, E. Geraldi Jr., L. Gerin-Lajoie, M. Gibbard, I. Hiskens, J. Kersulis, R. Kuiava, L. Lima, F. De Marco, N. Martins, B. C. Pal, A. Piardi, R. Ramos (Chair), J. dos Santos, D. Silva, A. K. Singh, B. Tamimi (Student), and D. Vowles, "Benchmark Models for the Analysis and Control of Small-Signal Oscillatory Dynamics in Power Systems," *IEEE Transaction on Power Systems*, vol. 32, no. 1, January 2017, pp. 715-722.
- [29] A. Vaccaro (Student) and **C. A. Cañizares**, "An Affine Arithmetic-based Framework for Uncertain Power Flow and Optimal Power Flow Studies," *IEEE Transactions on Power Systems*, vol. 32, no. 1, January 2017, pp. 274-288.
- [30] M. Chávez-Lugo, C. R. Fuerte-Esquivel, **C. A. Cañizares**, and V. J. Gutierrez-Martinez, "Practical Security Boundary-Constrained DC Optimal Power Flow for Electricity Markets," *IEEE Transactions on Power Systems*, vol. 31, no. 5, September 2016, pp. 3358-3368.
- [31] M. Arriaga (Student), **C. A. Cañizares**, and M. Kazerani, "Long-Term Renewable Energy Planning Model for Remote Communities," *IEEE Transactions on Sustainable Energy*, vol. 7, no. 1, January 2016, pp. 221-231.
- [32] D. Olivares (Student), J. D. Lara (Student), **C. A. Cañizares**, and M. Kazerani, "Stochastic-Predictive Energy Management System for Isolated Microgrids," *IEEE Transactions on Smart Grid*, vol. 6, no. 6, November 2015, pp. 2681- 2693.
- [33] B. Le (Student), **C. A. Cañizares**, and K. Bhattacharya, "Incentive Design for Voltage Optimization Programs for Industrial Loads," *IEEE Transactions on Smart Grid*, vol. 6, no. 4, July 2015, pp. 1865-1873.
- [34] D. Saez (Visitor), F. Avila (Visitor), D. Olivares (Student), **C. A. Cañizares**, and L. Marin, "Fuzzy Prediction Interval Models for Forecasting Renewable Resources and Loads in Microgrids," *IEEE Transactions on Smart Grid*, vol. 6, no. 2, March 2015, pp. 548-556.
- [35] S. Paudyal (Student), **C. A. Cañizares**, and K. Bhattacharya, "Optimal Operation of Industrial Energy Hubs in Smart Grids," *IEEE Transactions on Smart Grid*, vol. 6, no. 2, March 2015, pp. 684-694.
- [36] I. Sharma (Student), K. Bhattacharya, and **C. A. Cañizares**, "Smart Distribution System Operations with Price-Responsive and Controllable Loads," *IEEE Transactions on Smart Grid*, vol. 6, no. 2, March 2015, pp. 795-807.
- [37] M. Chehrehgani (Student), **C. A. Cañizares**, and K. Bhattacharya, "Optimal Energy Management of Greenhouses in Smart Grids," *IEEE Transactions on Smart Grid*, vol. 6, no. 2, March 2015, pp. 827-835.
- [38] M. Chehrehgani (Student), **C. A. Cañizares**, and K. Bhattacharya, "Optimal Operation of Climate Control Systems of Produce Storage Facilities in Smart Grids," *IEEE Transactions on Smart Grid*, vol. 6, no. 1, January 2015, pp. 351-359.
- [39] M. Pirnia (Student), **C. A. Cañizares**, K. Bhattacharya, and A. Vaccaro (Visitor), "A Novel Affine Arithmetic Method to Solve Optimal Power Flow Problems with Uncertainties," *IEEE Transactions on Power Systems*, vol. 29, no. 6, November 2014, pp. 2775-2783.

- [40] I. Das (Student), K. Bhattacharya, and **C. A. Cañizares**, “Optimal Incentive Design for Targeted Penetration of Renewables and Electricity Conservation,” *IEEE Transactions on Sustainable Energy*, vol. 5, no. 4, October 2014, pp. 1213-1225
- [41] E. Nasr (Student), **C. A. Cañizares**, and K. Bhattacharya, “Stability Analysis of Unbalanced Distribution Systems With Synchronous Machine and DFIG Based Distributed Generators,” *IEEE Transactions on Smart Grid*, vol. 5, no. 5, September 2014, pp. 2326-2338.
- [42] IEEE PES TF in Microgrid Control: D. E. Olivares (Student), A. Mehrizi-Sani, A. H. Etemadi, **C. A. Cañizares** (Chair), R. Iravani, M. Kazerani, A. H. Hajimiragha, O. Gomis-Bellmunt, M. Saeedifard, R. Palma-Behnke (Secretary), G. A. Jiménez-Estévez, and N. D. Hatziargyriou, “Trends in Microgrid Control,” *IEEE Transactions on Smart Grid*, vol. 6, no. 4, July 2014, pp. 1905-1919. **IEEE-PES Technical Committee Working Group Recognition Award**, July 2015.
- [43] D. Olivares (Student), **C. A. Cañizares**, and M. Kazerani, “A Centralized Energy Management System for Isolated Microgrids,” *IEEE Transactions on Smart Grid*, vol. 6, no. 4, July 2014, pp. 1864-1875.
- [44] M. Arriaga (Student), **C. A. Cañizares**, and M. Kazerani, “Northern Lights,” *IEEE Power and Energy Magazine*, **invited paper**, vol. 12, no. 4, July-August 2014, pp. 50-59.
- [45] I. Sharma (Student), **C. A. Cañizares**, and K. Bhattacharya, “Smart Charging of PEVs Penetrating into Residential Distribution Systems,” *IEEE Transactions on Smart Grid*, vol. 5, no. 3, May 2014, pp. 1196-1209.
- [46] M. Pirnia (Student), **C. A. Cañizares**, and K. Bhattacharya, “Revisiting the Power Flow Problem Based on a Mixed Complementarity Formulation Approach,” *IET Generation, Transmission & Distribution*, vol. 7, no. 11, November 2013, pp. 1194-1201.
- [47] J. C. Muñoz (Student), **C. A. Cañizares**, K. Bhattacharya, and A. Vaccaro (Visitor), “An Affine Arithmetic Based Method for Voltage Stability Assessment of Power Systems with Intermittent Generation Resources,” *IEEE Transactions on Power Systems*, vol. 28, no. 4, November 2013, pp. 4475-4487.
- [48] A. Vaccaro (Visitor), **C. A. Cañizares**, and K. A. Bhattacharya, “A Range Arithmetic-Based Optimization Model for Power Flow Analysis Under Interval Uncertainty,” *IEEE Transactions on Power Systems*, vol. 28, no. 2, May 2013, pp. 1179-1186.
- [49] M. Arriaga (Student), **C. A. Cañizares**, and M. Kazerani, “Renewable Energy Alternatives for Remote Communities in Northern Ontario, Canada,” *IEEE Transactions on Sustainable Energy*, vol. 4, no. 3, July 2013, pp. 661-670.
- [50] B. Tamimi (PDF), **C. A. Cañizares**, and K. Bhattacharya, “System Stability Impact of Large-scale and Distributed Solar Photovoltaic Generation: The Case of Ontario, Canada,” *IEEE Transactions on Sustainable Energy*, vol. 4, no. 3, July 2013, pp. 680-688.
- [51] I. Das (Student), K. Bhattacharya, **C. A. Cañizares**, and W. Muneer (Student), “Sensitivity-Indices Based Risk Assessment of Large Scale Solar PV Investment Projects,” *IEEE Transactions on Sustainable Energy*, vol. 4, no. 2, April 2013, pp. 370-378.
- [52] M. Chehreghani (Student), S. A. Hashmi (Student), H. Hassen (Student), **C. A. Cañizares**, and K. Bhattacharya, “Optimal Operation of Residential Energy Hubs in Smart Grids,” *IEEE Transactions on Smart Grid*, vol. 3, no. 4, December 2012, pp. 1755-1766.
- [53] W. Muneer (Student), K. Bhattacharya, and **C. Cañizares**, “Large-scale Solar PV Investment Models, Tools and Analysis: The Ontario Case,” *IEEE Transactions on Power Systems*, vol. 26, no. 4, November 2011, pp. 2547-2555.
- [54] A. Hajimiragha (Student), **C. A. Cañizares**, M. W. Fowler, S. Moazeni, and A. Elkamel, “A Robust Optimization Approach for Planning the Transition to Plug-in Hybrid Electric Vehicles,” *IEEE Transactions on Power Systems*, vol. 26, no. 4, November 2011, pp. 2264-2274.

- [55] C. Buccella, **C. A. Cañizares**, C. Cecati, F. Muzi, and P. Siano, "Guest Editorial," *IEEE Transactions on Industrial Electronics*, vol. 58, no. 10, October 2011, pp. 4483-4486.
- [56] S. Paudyal (Student), **C. A. Cañizares**, and K. Bhattacharya, "Optimal Operation of Distribution Feeders in Smart Grids," *IEEE Transactions on Industrial Electronics*, special section on "Methods and Systems for Smart Grids Optimization," vol. 58, no. 10, October 2011, pp. 4495-4503.
- [57] A. Hajimiragha (Student), **C. A. Cañizares**, M. W. Fowler, S. Moazeni, A. Elkamel, and S. Wong, "Sustainable Convergence of Electricity and Transport Sectors in the Context of a Hydrogen Economy," *International Journal of Hydrogen Energy*, vol. 36, no. 11, June 2011, pp. 6357-6375.
- [58] A. A. Sousa, G. L. Torres (Visitor), and **C. A. Cañizares**, "Robust Optimal Power Flow Solution Using Trust Region and Interior-Point Methods," *IEEE Transactions on Power Systems*, vol. 26, no. 2, May 2011, pp. 487-499.
- [59] V. J. Gutierrez-Martinez (Student), **C. A. Cañizares**, C. R. Fuerte-Esquivel, A. Pizano-Martinez, and X. Gu, "Neural-Network Security-Boundary Constrained Optimal Power Flow," *IEEE Transactions on Power Systems*, vol. 26, no. 1, January 2011, pp. 63-72.
- [60] J. M. Gonzalez (Student), **C. A. Cañizares**, and J. M. Ramirez, "Stability Modeling and Comparative Study of Series Vectorial Compensators," *IEEE Transactions on Power Delivery*, vol. 25, no. 2, April 2010, pp. 1093-1103.
- [61] A. Vaccaro (Visitor), **C. A. Cañizares**, and D. Villacci, "An Affine Arithmetic Based Methodology for Reliable Power Flow Analysis in the Presence of Data Uncertainty," *IEEE Transactions on Power Systems*, vol. 25, no. 2, February 2010, pp. 624-632.
- [62] B. Tamimi (Student), **C. A. Cañizares**, and S. Vaez-Zadeh, "Effect of Reactive Power Limit Modeling on Maximum System Loading and Active and Reactive Power Markets," *IEEE Transactions on Power Systems*, vol. 25, no. 2, February 2010, pp. 1106-1116.
- [63] H. Zareipour (Student), K. Bhattacharya, and **C. A. Cañizares**, "Economic Benefits of Improving Electricity Market Price Forecasting Accuracy: A Demand-side Analysis," *IEEE Transactions on Power Systems*, vol. 25, no. 1, February 2010, pp. 254-262.
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- [323] **C. A. Cañizares**, discussion to “A Piecewise Global Small-disturbance Voltage-stability Analysis of Structure-preserving Power System Models” by B. Lee et al., *IEEE Transactions on Power Systems*, vol. 10, no. 4, November 1995, pp. 1971.
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b. Awards, Fellowships, Recognitions, and Scholarships: 27

No.	TITLE & INSTITUTION	AWARD	DATES
27	IEEE-PES Technical Committee Working Group Recognition Award (TF Chair), Power System Dynamic Performance Committee	Framed Diploma	August 2020
26	Distinguished Visiting Professorship, Tsinghua University, Beijing, China	Ceremony and Invited Lectures	January 2020
25	IEEE-PES Technical Committee Service Recognition Award (Committee Chair), Power System Dynamic Performance Committee	Framed Diploma	August 2019
24	IEEE-PES Technical Committee Working Group Recognition Award (TF Chair), Power System Dynamic Performance Committee	Framed Diploma	August 2019
23	IEEE-PES Outstanding Power Engineering Educator Award for fostering partnerships between industry and power engineering education and for developing innovative online power engineering programs	Plaque, \$1,000 USD, and \$1,000 USD travel allowance	July 2017
22	IEEE-PES Technical Committee Distinguished Service Award, Power System Dynamic Performance Committee	Plaque	July 2017
21	IEEE-PES Technical Committee Working Group Recognition Award (TF Member), Power System Dynamic Performance Committee	Diploma	July 2017
20	IEEE-PES Technical Committee Working Group Recognition Award (TF Member), Power System Dynamic Performance Committee	Diploma	July 2016
19	IEEE Canada Electric Power Medal for outstanding contributions to power engineering research and education	Silver medal, plaque, and travel allowance	May 2016
18	IEEE-PES Technical Committee Working Group Recognition Award (TF Chair), Power System Dynamic Performance Committee	Framed Diploma	July 2015
17	IEEE-PES PowerTech Conference A. Papadias Best Student Paper Award	Diploma, plaque, €1,000	August 2015
16	IEEE-PES Technical Committee Working Group Recognition Award (WG Member), Power System Dynamic Performance Committee	Diploma	July 2013
15	Fellow of the Canadian Academy of Engineering for outstanding contributions to power engineering research	Diploma and pin	June 2013
14	Fellow of the Royal Society of Canada for outstanding contributions to power engineering research	Diploma and pin	Nov. 2012
13	IEEE-PES Power System Dynamic Performance Committee Certificate of Appreciation for Outstanding Leadership	Certificate	July 2012

12	Outstanding Performance Award, Faculty of Engineering, University of Waterloo	\$3,434 CD salary increase	May 2012
11	IEEE-PES Technical Council Working Group Recognition Award for Outstanding Technical Report (WG Member)	Framed Diploma	July 2009
10	Outstanding Performance Award, Faculty of Engineering, University of Waterloo.	\$3,334 CD salary increase	May 2009
9	IEEE-PES Technical Committee Working Group Recognition Award (WG Member), Power System Dynamic Performance Committee	Diploma	July 2007
8	Fellow of the IEEE for outstanding contributions to voltage stability of power systems	Framed Diploma and pin	Jan. 2007
7	IEEE-PES Technical Council Working Group Recognition Award for Outstanding Technical Report (WG Chair)	Plaque	June 2005
6	IEEE-PES Technical Committee Working Group Recognition Award (WG Chair), Power System Dynamic Performance Committee	Framed Diploma	June 2005
5	Outstanding Performance Award, Faculty of Engineering, University of Waterloo	\$2,930 CD salary increase	May 2005
4	Distinguished Performance Award, Faculty of Engineering, University of Waterloo	\$2,500 CD	Feb. 2003
3	OAS Scholarship, Organization of American States, Washington, DC, USA	\$10,000 USD/year plus travel	Sept. 1989-Aug. 1991
2	EPN Scholarship, Escuela Politécnica Nacional (EPN), Quito, Ecuador	~\$6,000 USD/year	Aug. 1986-Nov. 1989
1	Fulbright-Laspau Scholarship, Institute of International Education, New York, NY, USA	\$8,500 USD/year plus travel	Aug. 1986-Aug. 1988

Grants and Contracts:

No.	HOLDERS	TITLE & INSTITUTION	CASH & IN-KIND (CD)	CASH SHARE		DATES	
				CD	%	START	END
59	C. Cañizares (PI) and K. Bhattacharya	“Computer server for power system and market studies using AI and big-data techniques,” NSERC, Research Tools and Instruments (RTI), Canada.	\$122,437	\$122,437	100	App. Oct. 2019 Apr. 2020	Mar. 2022

58	J. McArthur (PI) and 11 co-PIs from 4 universities	“Making Ontario Buildings Smarter: Closing the technology gap and developing business strategies to enable broad- scale smart building adoption,” Ryerson, Waterloo, Toronto, Carleton, and 17 industry partners, Ontario Research Fund (ORF) Research Excellence (RE), Canada.	\$14,137,362	\$574,000	14	App. Sept. 2019 Jan. 2020	Dec. 2024
57	B. Venkatesh (PI) and 3 co-PIs from 2 universities	“Transactive Electric Distribution System (TEDS) for Ontario,” Ryerson, Waterloo, York, and 7 industry partners, Ontario Research Fund (ORF) Research Excellence (RE), Canada.	\$8,447,180	\$490,000	18	App. Sept. 2019 Jan. 2020	Dec. 2024
56	C. Cañizares	“Hybrid Power Flow Controller with Integrated Energy Storage (EHPFC) as a Smart Device in Electric Power Systems,” Qingdao International Academician Park (QIAP), Academician-led Project, China.	\$4,202,250	\$4,202,250	100	App. Nov. 2018, Rev. Sept. 2019 Jan. 2020	Dec. 2024
55	C. Cañizares	Support for grad students from MEng Power Eng. Program (\$21,660/year), University of Waterloo, Canada.	\$238,260	\$238,260	100	Nov. 2008	
54	C. Canizares (PI) and 6 others	“Waterloo’s Energy Audit,” Sustainability Action Fund, University Waterloo, Canada	\$34,625	\$9,925	100	Aug. 2019	Dec. 2019
53	C. Cañizares	“A Grid of Microgrids,” NSERC, Discovery Grant, Canada.	\$185,000	\$185,000	100	Apr. 2017	Mar. 2022
52	Z. Lin (PI) and co-PIs from 9 institutions	“Research, Demonstration, and Commercialization of DC Microgrid Technologies” (RDC2MT), Aston Univ. and 8 other partners including Waterloo, Marie Skłodowska-Curie Research and Innovation Staff Exchange, European Commission.	\$638,654	0	0	Feb. 2017	Jan. 2021

51	B. Venkatesh (PI) and 4 other (co-PIs)	“NSERC Energy Storage Technology (NEST) Network”, NSERC-Ryerson-14 other partners, Strategic Network Grant, Canada.	\$11,587,213	\$421,500	5	June 2015	May 2020
50	Joel D. M. Trujillo (co-PI) and C. Cañizares (co-PI)	“Spatial Microgrid Planning with Renewable Energy and Electric Vehicles,” FAPESP, Brazil, and Waterloo, Canada, Sao Paulo Researchers in International Collaboration (SPRINT).	\$21,918	\$12,300	56	June 2019	May 2020
49	C. Cañizares	Research support for Hydro One Endowed Chair (~\$30,000/year, depending on endowment returns), University of Waterloo, Canada.	\$270,000	\$270,000	100	May 2010	Apr. 2020
48	C. Cañizares	“Predictive Maintenance of Wind Generators based on Artificial Intelligence Enabled Big Data Analysis,” NSERC-Bluewave-ai, Engage Grant, Canada.	\$46,500	\$22,500	100	Dec. 2018	May 2019
47	M. Dusseault (PI) and 8 others (co-PIs)	“Compressed Air Energy Storage in Salt Caverns”, NSERC-OCE-AITF-Waterloo-6 other partners, CRD Grant, Canada.	\$1,380,796	\$110,000	8	Sept. 2016	Apr. 2019
46	J. Simpson-Porco (PI) and C. Cañizares	“Interface and Testing Platform Design for Canadian Renewable Energy Laboratory,” NSERC, Engage Grant, Canada.	\$40,000	\$12,500	50	July 2018	Dec. 2018
45	C. Cañizares (PI) and K. Bhattacharya	“10th Seminar for Next Generation of Researchers in Power Systems,” Banff International Research Station (BIRS), workshop grant (estimate), Canada.	\$10,000	\$10,000	100	May 2018	May 2018
44	C. Cañizares	“Feasibility Study of Variable Speed Generators (VSG) for Canadian Arctic Communities,” Innovus Power, Research Contract, Canada.	\$16,500	\$16,500	100	Apr. 2017	May 2017

43	B. Oliphant (PI) and several others	“Integrated Energy Management and Monitoring System,” Canada-Israel Industrial Research and Development Fund, Guelph Municipal Holding Inc.-Rafael Advance Defense Systems Ltd- Magna International-Ellisdon Construction-Sheridan College-Univ. Waterloo-Univ. Guelph, Research Grant, Canada.	\$4,903,000	0	0	June 2015	May 2017
42	C. Cañizares	“Techniques and Tools for Power System Operation and Control in the New Smart Grid Environment,” NSERC, Discovery Grant, Canada.	\$165,000	\$165,000	100	Apr. 2012	Mar. 2017
41	C. Cañizares	“Feasibility Studies of Pilot Renewable Energy Deployment in Canadian Arctic,” World Wildlife Fund (WWF)-Canada, Contract, Canada.	\$61,800	\$52,800	100	Aug. 2016	Jan. 2017
40	B. Lu (PI) and several others	“CSI Renewable Energy (RE) Microgrid Test Centre,” Ontario Ministry of Energy-Canadian Solar-Univ. Waterloo-Guelph Hydro-Electrovaya-Kinetrics, Smart Grid Fund, Canada.	\$6,290,982	0	0	Jan. 2014	Sept. 2016
39	C. Rosenberg (PI) and 3 others (co-PIs).	“Impact of Electric Vehicles on the Grid,” NSERC-Hydro One-IBM-GITS, CRD Grant, Canada.	\$1,156,155	\$193,000	30	Sept. 2012	Aug. 2016
38	C. Cañizares	“Pre-feasibility Studies of Pilot Renewable Energy Deployment in Canadian Arctic,” World Wildlife Fund (WWF)-Canada, Contract, Canada.	\$48,380	\$39,380	100	Sept. 2015	July 2016
37	C. Cañizares (PI), I. Rowlands (co-PI), G. Ellis (co-PI), and 2 others.	“The Energy Hub Management System II: Empowering LDCs to Enable the Smart Grid,” OCE-Hydro One-Energent-Milton Hydro, Special Energy Fund, Canada.	\$1,354,476	\$500,000	80	May 2012	Apr. 2016

36	H. Farhangi (PI) and several others	“NSERC Smart Microgrid Network,” NSERC-28 partners, Strategic Network, Canada.	\$14,118,280	\$162,000	4	May 2011	April 2016
35	M. Sedighy (co-PI), C. Cañizares (co-PI), and several others	“Development of a Utility Grade Controller for Remote Microgrids with High Penetration of Renewable Generation,” NRCAN-Hatch-Hydro One-KLFN-UofT-Wenvor, ecoEnergyII, Research Grant, Canada.	\$3,096,733	\$600,000	30	Jan. 2013	Mar. 2016
34	A. Khajepour (PI) and 25 others	“Green Intelligent Transportation Systems (GITS),” ORF and various industry partners, Research Grant, Canada	\$24,000,000	\$90,000	1	Apr. 2010	Mar. 2015
33	C. Cañizares	“Using Smart Grid Technologies to Reduce Production Costs and Increase Access to Renewable Energy in Power Systems,” NSERC-Hydro One, CRD Grant, Canada	\$318,500	\$124,500	100	Oct. 2011	Dec. 2014
32	C. Foster (PI) and 4 others	“Industrial Voltage Optimization,” OPA-Flakeboard-PCS UtiliData, Conservation Fund, Research Contract, Canada.	\$739,448	\$210,470	40	Jan. 2012	Oct. 2014
31	K. Bhattacharya (PI) and 4 others	“Operation, Communications and Information Management of Smart Electricity Grids,” NSERC-Hydro One-IBM-ABB, Strategic Grant, Canada.	\$1,623,394	\$324,679	50	Jan. 2011	Sept. 2014
30	I. Rowlands (PI), C. Cañizares (co-PI), G. Ellis (co-PI), and 2 others.	“The Energy Hub Management System: Enabling and Empowering Energy Managers Through Increased Information and Control,” OCE-Energent-Hydro One-Milton Hydro, Special Energy Fund, Research Grant, Canada.	\$3,753,600	\$500,000	50	June 2008	Dec. 2012

29	R. Varma and M. Salama (PIs) and 14 others	“Large-Scale Photovoltaic Solar Power Integration in Transmission and Distribution Networks,” OCE- Hydro One- Opti Solar-London Hydro, Special Energy Fund, Research Grant, Canada.	\$6,278,560	\$147,264	5	Sept. 2009	Aug. 2012
28	A. Vannelli and M. Anjos (PIs), and 15 others	“High Performance Optimization: Theory, Algorithm Design and Engineering Applications,” MITACS, Research Grant, Canada.	\$300,000	\$60,000	20	Apr. 2010	Mar. 2012
27	C. Cañizares	“Operation of Power Systems with Sustainable Energy Resources in Competitive Electricity Markets,” NSERC, Discovery Grant, Canada. (One of the few grant “increases” in 2007; the majority were reduced about 12% due to budgetary constraints.)	\$165,400	\$165,400	100	Apr. 2007	Mar. 2012
26	C. Cañizares (PI) and K. Bhattacharya	“Operation of Power Systems with High DG Penetration,” ABB-MITACS, Contract, Canada.	\$130,600	\$65,300	50	Apr. 2009	Mar. 2011
25	C. Cañizares (PI), J. Nathwani (co-PI), and 6 others	“Development of Advanced Smart Grid Systems for integration of PHEVs,” OCE-OPG-Hydro One-OPA-NRCAN, Research Grant, Canada.	\$54,000	\$6,750	13	June 2009	Apr. 2010
24	T. Terlaky and A. Vannelli (PIs), and 12 others	“High Performance Optimization: Theory, Algorithm Design and Engineering Applications,” MITACS, Research Grant, Canada.	\$295,000	\$50,000	15	Apr. 2008	Mar. 2010
23	C. Cañizares (PI) and K. Bhattacharya	“Improving Technologies for Deployment of Energy Conservation and Demand Management Programs,” OCE-Energent, Research Grant, Canada.	\$82,978	\$41,489	50	Nov. 2007	Feb. 2009

22	C. Cañizares (PI) and K. Bhattacharya	“Reactive Power Ancillary Service Markets and Dispatch: Design and Analysis,” OCE-ABB-OPA, Research Grant, Canada.	\$99,468	\$49,734	50	Nov. 2006	Oct. 2008
21	C. A. Cañizares (PI) and K. Bhattacharya	“Reactive Power Ancillary Service Markets: Design and Analysis,” NSERC, CRD Grant, Canada.	\$26,520	\$13,260	50	Aug. 2005	July 2008
20	M. Fowler (PI) and 3 others	“Bruce Power Hydrogen Economy Research and Development Initiative,” OCE-Bruce Power, Research Grant, Canada.	\$150,000	\$29,000	20	Mar. 2006	Apr. 2008
19	T. Terlaky (PI) and 12 others	“High Performance Optimization and Applications,” MITACS, Canada.	\$290,000	\$22,500	7	Apr. 2006	Mar. 2008
18	C. A. Cañizares	“Power System Stability and Controls and their Costs in Competitive Electricity Markets,” NSERC, Discovery Grant, Canada.	\$164,900	\$164,900	100	Apr. 2002	Mar. 2007
17	C. A. Cañizares	“Representing and Pricing Power System Security in Electricity Markets,” Invited Professor Grant, Ministry of Education, Spain.	\$18,000	\$18,000	100	Nov. 2006	Feb. 2007
16	C. A. Cañizares (PI) and K. Bhattacharya	“Reactive Power Dispatch in Electricity Markets,” ABB Inc., Contract, US.	\$27,500	\$13,750	50	Jan. 2006	Dec. 2006
15	C. A. Cañizares	Invited Professor Grant, EE Dept., Swiss Federal Institute of Technology (ETH), Zurich, Switzerland.	\$10,000	\$10,000	100	Sept. 2006	Oct. 2006
14	C. A. Cañizares (PI) and K. Bhattacharya	“Reactive Power Ancillary Service Market Design and Analysis,” ABB Inc., Contract, US.	\$33,204	\$16,602	50	Jan. 2005	Dec. 2005

13	C. A. Cañizares (PI), K. Bhattacharya, and H. Zareipour (Student)	“Price Forecasting and Optimal Energy Scheduling,” NRGGen Inc., Contract, Canada.	\$24,624	\$12,312	50	Sept. 2004	Aug. 2005
12	C. A. Cañizares	“Electricity Markets Simulation Lab,” NSERC and E&CE-Waterloo, Equipment Grant, Canada.	\$21,160	\$21,160	100	Apr. 2003	Mar. 2004
11	C. A. Cañizares (PI) and H. Chen (Student)	“Research White Paper for Electrical Storage Systems,” NRGGen Inc., Contract, Canada.	\$10,400	\$10,400	100	June 2003	June 2003
10	C. A. Cañizares	“Modeling, Simulation and Stability Analysis of Power Networks with FACTS in an Open Electricity Market,” NSERC, Discovery Grant, Canada.	\$104,695	\$104,695	100	Apr. 1998	Mar. 2002
9	M. Salama (PI), M. Kazerani, and C. A. Cañizares	“Development of High-Voltage Power Supply (HVPS) for Aerospace Applications,” Allied Signals and Honeywell Inc., Contract, Canada	\$60,000	\$10,000	15	Jan. 1999	Dec. 2001
8	C. A. Cañizares	“Uses of FACTS and their Influence in Automatic Voltage Control in Networks with Secondary Voltage Control,” CESI and ENEL Ricerca, Contract, Italy.	\$30,000	\$30,000	100	Sept. 1999	Jan. 2001
7	C. A. Cañizares (PI), V. H. Quintana, J. Reeve, A. Singh, and M. Kazerani	“Multiprocessor Computer Network for Power Systems Modeling and Simulation,” NSERC and E&CE-Waterloo, Equipment Grant, Canada	\$54,564	\$54,564	100	April 1998	Mar. 1999
6	C. A. Cañizares	“Bifurcation Analysis of AC DC Power Systems,” NSERC, Operating Grant, Canada	\$72,000	\$72,000	100	Apr. 1994	Mar. 1998

5	C. A. Cañizares	“Comparative Study of MAPLE, MATLAB and EES as Teaching Aids for Electrical Engineering Courses,” TRACE Learning Technologies Research Grant, Univ. Waterloo.	\$7,000	\$7,000	100	Apr. 1994	Mar. 1995
4	C. A. Cañizares	President’s NSERC, Univ. Waterloo.	\$2,187	\$2,187	100	Apr. 1994	Mar. 1995
3	C. A. Cañizares	President’s NSERC, Univ. Waterloo.	\$8,958	\$8,958	100	Sept. 1993	April 1994
2	C. A. Cañizares	E&CE Dept. Start-up Grant, Univ. Waterloo.	\$5,000	\$5,000	100	Sept. 1993	Apr. 1994
1	C. A. Cañizares	ICR Equipment Grant, Univ. Waterloo.	\$8,000	\$8,000	100	Jan. 1994	Jan. 1994
TOTALS			\$111,543,161	\$10,879,226			

e. Invited Keynote Speeches, Presentations, and Seminars: 189

1. “Overview of Microgrids,” presentation, Centre of Power and Information (CPI) Seminar Series, University of Toronto, January 13, 2020.
2. “Canadian Remote Community Microgrids,” presentation, Small Scale Energy Systems Seminar, Universidad de Chile, Santiago, December 13, 2019.
3. “Frequency Stability and Control,” tutorial, Universidad de Chile, Santiago, December 11, 2019.
4. “Energy Storage Overview and Research at Waterloo,” tutorial, Universidad de Chile, Santiago, December 11, 2019.
5. “Microgrids,” tutorial, Universidad de Chile, Santiago, December 10, 2019.
6. “Microgrid and Energy Storage,” keynote speech, Taller Int. CEMIE-Océano, Universidad Autonoma de Zacatecas (UAZ), Zacatecas, Mexico, December 5, 2019.
7. “Overview of Microgrid Research,” presentation, EECS Dept. Seminar Series, York University, November 18, 2019.
8. “Examples of Electricity Access,” presentation, “Electricity for All: Access to Electricity Issues and Solutions for Energy-disadvantaged Communities” Webinar, IEEE Proceedings, US, October 18, 2019.
9. “Novel Controls for Microgrids with Renewable Energy Sources and Energy Storage,” lecture, DFG SPP 1984 – 2019 Autumn School, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, October 1, 2019.
10. “Stability and Electronic Compensation of Power Systems,” seminar, Universidad Politécnica Salesiana, Quito, Ecuador, August 19-31, 2019.
11. “A Practical Perspective of the Impact of Converter-based Renewable Generation on Grid Stability,” presentation, “Impact of High Penetration of Renewable Resources” Panel, IEEE PES General Meeting, Atlanta, GA, August 7, 2019.

12. “Stability Definitions and Classification,” presentation, “Microgrid Stability Definitions, Analysis, and Modeling” Panel, IEEE PES General Meeting, Atlanta, GA, August 7, 2019.
13. “Converter-driven Stability,” presentation, “Stability definitions and characterization of dynamic behavior in systems with high penetration of power electronic interfaced technologies” Panel, IEEE PES General Meeting, Atlanta, GA, August 6, 2019.
14. “Energy Storage Overview and Research at Waterloo,” keynote speech, National University of Colombia, Manizales, Colombia, July 10, 2019.
15. “Electricity Systems and Markets in Canada,” lecture, National University of Colombia, Manizales, Colombia, July 8, 2019.
16. “Frequency Stability and Renewable Generation Impact and Control,” lecture, “Assessment and Enhancement of Power System Stability of Contemporary and Future Power Networks” Course, University of Manchester, UK, April 12, 2019.
17. “Dynamic Modelling and Simulation of Power Systems,” lecture, Los Alamos National Laboratory 3rd Grid Science Winter School and Conference, Santa Fe, AZ, January 7, 2019.
18. “Overview of Remote Microgrid Research,” keynote speech, University of Cuenca, Ecuador, December 14, 2018.
19. “Dynamic and Secure Operation of Power Systems,” seminar, University of Cuenca, Ecuador, December 7-15, 2018.
20. “Microgrid Voltage Control and Stability,” presentation, “Addressing Voltage Control Challenges for High Penetration of DERs” Panel, IEEE PES General Meeting, Portland, OR, August 9, 2018.
21. “Secondary and Tertiary Voltage Regulation Controls Based on Regional Optimal Power Flows,” presentation, “Decentralized Computing in WAMPACs” Panel, IEEE PES General Meeting, Portland, OR, August 7, 2018.
22. “Dynamic Modelling and Control of CAES, Flywheel, and Battery Storage Systems,” presentation, “Modeling and Applications of Energy Storage Systems in Power Grids - Energy Storage Fundamentals and Modelling” Tutorial, Power System Computation Conference (PSCC), Dublin, Ireland, June 11, 2018.
23. “New VSG Technologies to Increase Renewable Energy Penetration in Remote Community Microgrids,” presentation, WISE Energy Day, University of Waterloo, Waterloo, March 27, 2018.
24. “Overview of Remote Microgrid Research,” ENSIEL webinar, Politecnico di Milano, Milan, Italy, December 15, 2017.
25. “Overview of Remote Microgrid Research,” seminar, University of Michigan, Ann Arbor, October 12, 2017.
26. “Overview of Remote Microgrid Research,” presentation, Delft University of Technology (TUD), Delft, Netherlands, September 6, 2017.
27. “Smart Grid Research: Smart Loads, Electric Vehicle Smart Charging, Microgrids, and Energy Storage,” presentation, Ingenieria Electrica, Universidad Autonoma de Mexico (UNAM), Mexico City, August 23, 2017.
28. “Overview of Remote Microgrid Research,” keynote speech, Facultad de Ingenieria, Universidad Autonoma de Mexico (UNAM), Mexico City, August 22, 2017.
29. “Overview of Remote Microgrid Research,” presentation, Escuela Superior de Ingeniería Mecánica y Eléctrica (ESIME), Instituto Politécnico Nacional (IPN), Mexico City, August 2, 2017.

30. "Overview of Remote Microgrid Research," keynote speech, IEEE Canada International Humanitarian Technology Conference (IHTC), Toronto, July 21, 2017.
31. "Overview of Remote Microgrid Research," keynote speech, Int. Conf. on Clean Electrical Power (ICCEP), Santa Margherita, Liguria, Italy, June 28, 2017.
32. "Replacing Diesel Generation with Renewable Sources in Arctic Communities," presentation, WISE Energy Day, University of Waterloo, March 30, 2017.
33. "Remote Microgrids," presentation, University of British Columbia, Vancouver, BC, December 16, 2016.
34. "Electrical Energy needs for Canadian Remote Communities," presentation, IAGT Workshop, Montreal, October 18, 2016.
35. "Remote Microgrids," keynote speech, IEEE ETCM, Guayaquil, Ecuador, October 12, 2016.
36. "Trends in Microgrid Control," lecture, IEEE PES Technical Webinar Series, September 27, 2016.
37. "Energy Management Systems for Microgrids," keynote speech, IEEE T&D Latin America, Morelia, Mexico, September 22, 2016.
38. "Renewable Energy opportunities in Nunavut," presentation, WWF Renewable Energy Summit: Fueling change in Nunavut, Iqaluit, NU, September 15, 2016.
39. "The Energy Hub Management System (EHMS)," keynote speech, PhD Program Inauguration, Universidad Autónoma de Occidente, Cali, Colombia, August 11, 2016.
40. "Remote Microgrids," keynote lecture, IEEE PES EPN Student Chapter, Escuela Politécnica Nacional, Quito, Ecuador, August 4, 2016.
41. "Stability Analysis," lecture, IEEE PES General Meeting, Tutorial "Microgrids: Overview, Design, Analysis, Operation, Control, and Applications," Boston, MA, July 19, 2016.
42. "Impact of Large-scale and Distributed Renewables on Power System Stability," presentation, "Power System Resilience to Major Disturbances" Panel, Power System Computation Conference (PSCC), Genova, Italy, June 24, 2016.
43. "The Energy Hub Management System (EHMS)," presentation, Göran Andersson's Farewell Event, ETH, Zurich, Switzerland, June 19, 2016.
44. "Power System Components and Modeling," PhD course, Escuela Politécnica Nacional, Quito, Ecuador, December 14-18, 2015.
45. "Microgrid Research at Waterloo," lecture, Karlsruhe Institute of Technology (KIT), Germany, November 12, 2015.
46. "Energy Management Systems for Microgrids," keynote speech, International Symposium on Energy System Optimization, Heidelberg, Germany, November 9, 2015.
47. "Overview of Remote Microgrid Research at Waterloo," keynote speech, IEEE International Autumn Meeting on Power, Electronics and Computing (ROPEC), Ixtapa, Mexico, November 5, 2015.
48. "Renewable Energy Integration Issues and Approach at Remote Microgrids," presentation, "Arctic Renewable Energy: Alternatives for peoples and the environment" Panel, Arctic Circle Assembly, Reykjavik, Iceland, October 17, 2015.
49. "Microgrid Stability and Control Issues," presentation, University of Chile, Santiago, October 8, 2015.
50. "Overview of Remote Microgrid Research at Waterloo," presentation, Catholic University of Chile, Santiago, October 7, 2015.

51. "Microgrid Stability and Control Issues," presentation, University of Waterloo, October 2, 2015.
52. "Overview of Remote Microgrid Research at Waterloo," keynote speech, IEEE International Conference on Smart Energy Grid Engineering (SEGE), UOIT, Oshawa, ON, August 17, 2015.
53. "2016-2025 Quebec's Energy Policy Electricity Expert Panel," keynote speech, Ministry of Energy and Natural Resources, Shawinigan, Quebec, March 30, 2015.
54. "Microgrids Overview and Research," keynote speech, IEET Conference, Cuenca, Ecuador, December 5, 2014.
55. "Overview of Microgrids," seminar, IEEE PES T&D Latin America, Medellin, Colombia, September 10, 2014.
56. "Analysis and Dispatch of Microgrids with Variable Generation," presentation, University of Chile, Santiago, Chile, June 18, 2014.
57. "Microgrid Overview and Research," presentation, Universidad de Sevilla, Spain, May 22, 2014.
58. "Smart PEV Charging Impact on Residential Distribution Systems," presentation, TRANSLOG, McMaster, May 14, 2014.
59. "Microgrids," online seminar, Universidad Pontificia Bolivariana, Medellin, Colombia, March 7, 2014.
60. "The Energy Hub Management System (EHMS)," online seminar, University of Seville, Spain, February 12, 2014.
61. "Operation, Control and Stability Issues Related to the Integration of Variable Renewable Resources in Power Grids," keynote speech, 2014 Energy Conference, Quito, Ecuador, January 30, 2014.
62. "The Energy Hub Management System (EHMS)," presentation, IEEE PES Chapter, Quito, Ecuador, December 20, 2013.
63. "Remote Microgrids in Canada," lecture, Design and Operation of Intelligent Microgrids Seminar, University of Chile, Santiago, Chile, December 18, 2013.
64. "Overview of Microgrids," lecture, Design and Operation of Intelligent Microgrids Seminar, University of Chile, Santiago, Chile, December 16, 2013.
65. "Training Smart Grid HQP," presentation, Smart Grids Seminar, CIEEPI, Quito, Ecuador, November 22, 2013.
66. "FACTS Overview and Applications," presentation, Smart Grids Seminar, CIEEPI, Quito, Ecuador, November 21, 2013.
67. "Smart Grid Research Projects Overview," presentation, Ingeniar 2013, Universidad Pontificia Bolivariana, Medellin, Colombia, October 2, 2013.
68. "Power System Stability," seminar, Universidad Pontificia Bolivariana, Medellin, Colombia, October 1, 2013.
69. "Remote Microgrids in Canada," presentation, Ingeniar, Universidad Pontificia Bolivariana, Medellin, Colombia, September 30, 2013.
70. "Operation, Control and Stability Issues Related to the Integration of Variable Renewable Resources in Power Grids," presentation, Universidad Nacional, Manizales, Colombia, September 27, 2013.
71. "Remote Microgrids in Canada," presentation, Universidad Nacional, Manizales, Colombia, September 27, 2013.

72. "Flexible AC Transmission Systems (FACTS) Overview and Applications," presentation, Congreso Internacional de Operación de Sistemas de Mercados de Energia (COSMER), Medellin, Colombia, September 25, 2013.
73. "Operation, Control and Stability Issues Related to the Integration of Variable Renewable Resources in Power Grids," presentation, Congreso Internacional de Operación de Sistemas de Mercados de Energia (COSMER), Medellin, Colombia, September 24, 2013.
74. "Remote Microgrids in Canada," Super Session "Electricity Supply to Rural and Remote Communities," IEEE PES General Meeting, Vancouver, July 24, 2013.
75. "Dealing with Uncertainties in OPFs," Panel Session "Intelligent OPF in an Uncertain and Variable Environment," IEEE PES General Meeting, Vancouver, July 23, 2013.
76. "Power System Stability and Wind and Solar Renewable Energy Integration," short course, Centro de Investigaciones y Pruebas Electromagneticas (CIPEL), Havana, Cuba, May 29, 2013.
77. "Remote Microgrids in Canada," keynote speech, Second Cuban Electrical Engineering Congress, La Habana, Cuba, November 26, 2012.
78. "Ontario's Remote Community Microgrids," presentation, workshop "Remote Community Microgrids," CanmetEnergy, NRCAN, Varennes, Quebec, September 27, 2012.
79. "Impact of Electric Vehicles on Electricity Grids," keynote speech, II Latin American and Caribbean Seminar of Electricity, Latin American Energy Organization (OLADE), San Jose, Costa Rica, September 5, 2012.
80. "The Energy Hub Management System (EHMS)," presentation, MOPTA symposium, Lehigh University, PA, USA, August 1, 2012.
81. "The Energy Hub Management System (EHMS)," presentation, symposium "Trends in Electrical Energy Grids," CINVESTAV, Guadalajara, Mexico, June 7-8, 2012.
82. "Optimal Electrical Energy Management of Water Plant Facilities," presentation, Energy Matter Summit, Toronto, May 28, 2012.
83. "Remote Microgrids in Canada," seminar, IEEE-PES Local Chapter, COPPE, Federal University of Rio de Janeiro, Brazil, May 24, 2012.
84. "Remote Microgrids in Canada," presentation, workshop "Challenges in the Development of Smart Micro-grids in Remote Areas," University of Chile, Santiago, Chile, April 13, 2012.
85. "Remote Microgrids in Canada," presentation, workshop "Potential of Renewable Energy Options in Africa: Importance of Mini-grid Energy Systems," ICS-UNIDO, Trieste, Italy, April 3-5, 2012.
86. "Optimization Applications in Competitive Smart Grids," seminar, University of Bari, Italy, March 29-April 2, 2012.
87. "Green Energy," presentation, Extended Learning Opportunities Group, Erin, ON, February 16, 2012.
88. "PEV Impact on Ontario's Grid," presentation, FISE-The International Electric Sector Trade Show, Medellin, Colombia, December 1, 2011.
89. "Energy Hub Management System (EHMS) Project," presentation, FISE-The International Electric Sector Trade Show, Medellin, Colombia, December 1, 2011.
90. "PEV Impact on Ontario's Grid," presentation, University of Toronto, November 22, 2011.
91. "Energy Hub Management System (EHMS) Project," presentation, PEO Future of Energy in Ontario Symposium, Oakville, November 12, 2011.

92. "Energy Hub Management System (EHMS) Project," presentation, University of Sannio, Benevento, Italy, June 1, 2011.
93. "Energy Hub Management System (EHMS) Project," presentation, ETH, Zurich, Switzerland, May 27, 2011.
94. "Energy Hub Management System (EHMS) Project," presentation, Politecnico Di Milano, Milan, Italy, May 25, 2011.
95. "Stability-constrained Optimal Power Flows and Their Applications to Electricity Markets," presentation, Smart Grids Seminar Series, Los Alamos National Laboratory, Los Alamos, New Mexico, December 14, 2010.
96. "Storing electricity as Hydrogen: Does it make sense?," presentation, CINVESTAV, Guadalajara, Mexico, June 11, 2010.
97. "Power System Analysis," seminar, ADEWA, Abu Dhabi, June 29-July 3, 2010.
98. "Power System Components and Modeling," seminar, ADEWA, Abu Dhabi, June 23-27, 2010.
99. "Storing electricity as Hydrogen: Does it make sense?," presentation, University of Ljubljana, Slovenia, December 17, 2009.
100. "Reactive Power Procurement and Dispatch in Competitive Electricity Markets," presentation, University of Chile, Santiago, Chile, December 9, 2009.
101. "Storing electricity as Hydrogen: Does it make sense?," keynote speech, Carnegie Mellon, Pittsburgh, US, September 4, 2009.
102. "Storing electricity as Hydrogen: Does it make sense?," presentation, Università degli Studi del Sannio, Benevento, Italy, July 10, 2009.
103. "Power Systems Stability Analysis," seminar, Politecnico di Milano, July 3-8, 2009.
104. "Storing electricity as Hydrogen: Does it make sense?," presentation, Politecnico di Milano, Italy, July 8, 2009.
105. "Storing electricity as Hydrogen: Does it make sense?," presentation, University of Cuenca, Ecuador, June 28, 2009.
106. "Storing electricity as Hydrogen: Does it make sense?," keynote speech, Energy and Environmental Systems Seminar Series, University of Calgary, April 20, 2009.
107. "On-line Oscillatory Instability Prediction and its Application to Power System Protection," presentation, School of Electric Power, South China University of Technology, Guangzhou, China, August 8, 2008.
108. "On-line Oscillatory Instability Prediction and its Application to Power System Protection," presentation, Department of Electric Power Engineering, North China Electric Power University, Baoding Campus, China, August 6, 2008.
109. "Voltage Stability Constrained OPFs and their Application to Market Clearing and Dispatch," presentation, School of Electrical and Electronic Engineering, North China Electric Power University, Beijing Campus, China, August 4, 2008.
110. "Power Systems' Research and the Future of Power Engineering," presentation, University of Cuenca, Ecuador, May 16, 2008.
111. "Power Systems' Modeling and Stability Analysis," seminar, University of Cuenca, Ecuador, May 12-19, 2008.

112. "Power Systems' Current and Future Research Issues," presentation, McGill University, Montreal, May 9, 2008.
113. "Power Systems' Modeling and Stability Analysis," seminar, University of Merida, Venezuela, April 28-May 1, 2008.
114. "Optimizing Integrated Energy Systems in a Hydrogen Economy," presentation, Sustainable Development in Communities Workshop and Exhibit, McMaster University, November 26, 2007.
115. "Hydrogen and Electrical Systems at Waterloo," presentation, Cleantech Research Lab Showcase, Toronto, October 24, 2007.
116. "Power System Analysis Techniques and Tools: Past, Present and Future," presentation, University of Calgary, October 19, 2007.
117. "Power Systems Research and the Future of Power Engineering," keynote speech, University-Industry Dinner, University of Calgary, October 18, 2007.
118. "Stability-Constrained OPFs and their Applications in Energy Auctions," presentation, University of Calgary, October 18, 2007.
119. "Power System Analysis Techniques and Tools: Past, Present and Future," keynote speech, Italian Power Engineering Research Group Meeting, Caserta, Italy, September 29, 2007.
120. "Stability-Constrained OPFs and their Applications in Energy Auctions," presentation, Politecnico di Milano, Milan, Italy, September 28, 2007.
121. "Power System Stability and Blackouts," seminar, Federal University, Itajubá, Brazil, August 27-29, 2007.
122. "The Causes Behind the Most Significant Blackouts in History," presentation, University of Waterloo, Summer Series Lectures, IEEE Waterloo Student Branch, May 16, 2007.
123. "Power System Stability and Blackouts," presentation, Tercer Congreso Internacional de Ingenierías Eléctrica y Electrónica (3CIIE E), Bogotá, Colombia, March 15-17, 2007.
124. "Simulation, Modeling and Analysis of FACTS Controllers," keynote speech, Tercer Congreso Internacional de Ingenierías Eléctrica y Electrónica (3CIIE E), Bogotá, Colombia, March 15, 2007.
125. "Power System Stability and Blackouts," presentation, University of Seville, Seville, Spain, February 27, 2007.
126. "FACTS," seminar, University of Seville, Seville, Spain, February 12 and 19, 2007.
127. "Power System Stability and Blackouts," presentation, University of Castilla la Mancha, Ciudad Real, Spain, January 11, 2007.
128. "Power System Stability and Blackouts," seminar, Jornadas Ing. Eléctrica y Electrónica (JIEE), Quito, Ecuador, November 22-24, 2006.
129. "Voltage Stability," seminar, University of Tehran, November 14, 2006.
130. "A Detailed Analysis of Blackouts," seminar, International Power System Conference, Tehran, Iran, November 14, 2006.
131. "The 2003 North American North-East and Italian Blackouts," keynote speech, International Power System Conference, Tehran, Iran, November 13, 2006.
132. "Pricing Power System Controllers in Competitive Electricity Markets," presentation, University of Ljubljana, Slovenia, October 4, 2006.

133. "Pricing Power System Controllers in Competitive Electricity Markets," presentation, ABB Corporate Research, Baden, Switzerland, September 29, 2006.
134. "Power System Stability II," seminar, Escuela Politécnica Nacional, Quito, Ecuador, July 17-22, 2006.
135. "Optimal Energy Management Considering Uncertain Energy Price Forecasts," presentation, Advancing Energy Sustainability in Ontario and Beyond, University of Waterloo, May 9, 2006.
136. "Power System Stability I," seminar, Escuela Politécnica Nacional, Quito, Ecuador, April 17-22, 2006.
137. "Reactive Power Dispatch in Electricity Markets," presentation, New England ISO, Holyoke, MA, USA, February 14, 2006.
138. "New NLP problems for Power System Analysis and Operation in Competitive Electricity Markets," presentation with K. Bhattacharya, Fields Industrial Optimization Seminars, The Fields Institute, University of Toronto, Ontario, Canada, February 7, 2006.
139. "Reactive Power Markets," presentation, IESO of Ontario, Mississauga, Ontario, November 7, 2005.
140. "System Stability and Security in Electricity Markets," presentation, University of Western Ontario, Electrical and Computer Engineering, London, Ontario, June 6, 2005.
141. "Pricing Security and Controls in Competitive Electricity Markets," presentation, University of Seville, Electrical Engineering, April 21, 2005.
142. "Frequency and Voltage Stability in Power Systems," seminar, University of Castilla-La Mancha, Electrical Engineering, April 18-20, 2005.
143. "Reactive Power Markets," presentation, IESO of Ontario, Mississauga, Ontario, April 7, 2005.
144. "Optimization Problems for Reactive Power Dispatch in Electricity Markets," presentation, McMaster University, Hamilton, ON, Canada, March 21, 2005.
145. "Power Engineering Research at Waterloo," presentation, ABB US Corporate Research, Raleigh, NC, USA, March 15, 2005.
146. "The August 2003 North-east Blackout," keynote speech, PEO Niagara Chapter Meeting, St. Catharines, Ontario, February 8, 2005.
147. "Understanding Demand Response," presentation, Demand Response Workshop, Power Save Series, Government of Ontario and Hamilton Hydro, McMaster University, November 29, 2004.
148. "Innovation, Knowledge Transfer and Entrepreneurship in Information & Communications Technology @ Waterloo," presentation, SMAU-2004, Milan, Italy, October 22, 2004.
149. "Demand Response and Energy Generation, Storage & Management in Electricity Markets," presentation, UW-NRGen Workshop: An Overview of Power Markets Research, University of Waterloo, October 14, 2004.
150. "Power Research at Waterloo," presentation, An Overview of Power Markets Research, UW-NRGen Workshop: An Overview of Power Markets Research, Waterloo, October 14, 2004.
151. "The August 2003 North-east Blackout," keynote speech, PEO Georgian Bay Chapter Meeting, Kincardine, Ontario, October 13, 2004.
152. "Pricing Power System Stability," presentation, UMIST, Manchester, UK, September 15, 2004.
153. "The August 2003 North-east Blackout," presentation, E&CE BRAG Seminar Series, University of Waterloo, July 8, 2004.
154. "Pricing Power System Stability," presentation, IEEE Sweden, Chalmers University, Gothenburg, Sweden, June 3, 2004.

155. "Pricing Power System Stability," presentation, Royal Institute of Technology, Stockholm, Sweden, June 1, 2004.
156. "Pricing Power System Stability," presentation, Asian Institute of Technology, Bangkok, Thailand, January 12, 2004.
157. "Nonlinear Systems Theory Applied to Power Systems," seminar, Politecnico di Milano, Dipartimento di Elettrotecnica, Milan, Italy, October 6-8, 2003.
158. "The Cost of Voltage Stability," presentation, Voltage Stability Focus Group, 2003 IEEE-PES General Meeting, Toronto, July 15, 2003.
159. "FACTS in Stability Control," presentation, CENACE (ISO), Quito, Ecuador, June 6, 2002.
160. "Cost of Security in Electricity Markets," seminar, IEEE-Ecuador, Quito, Ecuador, May 30-31, 2002.
161. "Applied Nonlinear Systems Theory," seminar, Politecnico di Milano, Dipartimento di Elettrotecnica, Milan, Italy, November 7-9, 2001.
162. "Pricing System Security in Electricity Markets," presentation, Instituto de Energía Eléctrica, Universidad de San Juan, Argentina, August 2, 2001.
163. "Electrical Engineering at Waterloo," presentation, Instituto de Energía Eléctrica, Universidad de San Juan, Argentina, August 2, 2001.
164. "FACTS in Stability Control," seminar, Instituto de Energía Eléctrica, Universidad de San Juan, Argentina, July 7-August 2, 2001.
165. "Electrical Engineering Education in Canada," keynote speech, Int. Symposium in Electric Power Engineering at the Beginning of the Third Millennium, Capri, Italy, May 15, 2000.
166. "Optimization Techniques to Determine Costs of Voltage Security," presentation, University of Castilla-La Mancha, Electrical Engineering, Ciudad Real, Spain, May 3, 2000.
167. "Optimization Techniques to Determine Costs of Voltage Security," presentation, University of Sevilla, Department of Electrical Engineering, Seville, Spain, April 27, 2000.
168. "The Electrical Energy Market," seminar with Prof. G. Gross, Politecnico di Milano, Dipartimento di Elettrotecnica, Milan, Italy, April 10-14, 2000.
169. "The University System in North America," presentation, Escuela Politécnica Nacional, Quito, Ecuador, June 9, 1999.
170. "Time Dependence of Corrective Measures to Avoid Voltage Collapse," presentation, ENEL, Milan, Italy, July 9, 1999.
171. "Voltage Security in an Open Access Power System," seminar, Universidad de Chile, Santiago, Chile, May 17-19, 1999.
172. "Practical Use of Symbolic Computation Tools," presentation, Task Force on Symbolic Computations, IEEE-PES Winter Meeting, New York, NY, February 1, 1999.
173. "Applications of Optimization to Voltage Collapse Analysis," presentation, Panel Session on Optimization Techniques in Voltage Collapse Analysis, IEEE-PES Summer Meeting, San Diego, CA, July 14, 1998.
174. "Voltage Stability Indices," seminar, Voltage Stability Special Tutorial, IEEE-PES Summer Meeting, San Diego, CA, July 13, 1998.
175. "Voltage Stability: Past, Present and Future," presentation, Power Systems Stability Subcommittee, IEEE-PES Summer Meeting, Berlin, Germany, July 23, 1997.

176. "Fast Voltage Collapse Computations Using Tangent Vectors," presentation, Power System Stability Subcommittee, IEEE-PES Winter Meeting, New York, NY, USA, February 5, 1997.
177. "Evaluating Computer-based Resources for Teaching," presentation, Learning Technologies Innovation Showcase, University of Waterloo, December 10, 1996.
178. "FACTS devices and Optimal Compensation to Increase Loadability Margins," presentation, Voltage Stability and Long-term Stability, Working Group IEEE-PES Winter Meeting, Baltimore, MA, USA, January 23, 1995.
179. "New Voltage Stability Indices," presentation, Voltage Stability and Long-term Stability Working Group, IEEE-PES Summer Meeting, Portland, OR, USA, July 25, 1995.
180. "Bifurcations and Voltage Stability," presentation, Voltage Stability and Long-term Stability Working Group, IEEE-PES Winter Meeting, New York, NY, USA, January 31, 1995.
181. "Modern Techniques for Power System Analysis II," seminar, CIEEPI, Quito, Ecuador, May 25-29, 1993.
182. "Novell Networks," seminar, Escuela Politécnica Nacional, Quito, Ecuador, March 11-17, 1993.
183. "Modern Techniques for Power System Analysis I," seminar, CIEEPI, Quito, Ecuador, February 15-19, 1993.
184. "Bifurcation and Energy Function Analysis of AC/DC Systems," presentation, University of Waterloo, Canada, December 2, 1992.
185. "HVDC Systems," seminar, Jornadas de Ingeniería Eléctrica y Electrónica (JIEE), Escuela Politécnica Nacional, Quito, Ecuador, July 2-3, 1992.
186. "UNIX," seminar, Escuela Politécnica Nacional, Quito, Ecuador, November 18-29, 1991.
187. "Voltage Collapse and Transient Energy Functions in AC/DC Systems," presentation, CEPTEL, Rio de Janeiro, Brazil, December 13, 1990.
188. "Transient Energy Functions," presentation, Escuela Politécnica Nacional, Quito, Ecuador, December 3, 1990.
189. "Voltage Collapse," presentation, Escuela Politécnica Nacional, Quito, Ecuador, December 2, 1990.

f. Others:

- Continuously upgrading the program UWPFLOW, a continuation power flow for voltage collapse studies in power systems including HVDC and FACTS controllers. This program is freely distributed for research purposes throughout the world through the web. Older versions of the program and/or some of its parts have been licensed to various companies.
- Co-leader on the design and set up of Waterloo Institute for Sustainable Energy (WISE) at the University of Waterloo; November 2004-today. Member of its advisory board since September 2008.
- Co-leader on the design and set up of successful the Ontario Research Chair (ORC) Program in Environmental Policy and Renewable Energy at the University of Waterloo, a program worth over \$450,000/year; July 2005-May 2006.
- Waterloo Approved Doctoral Dissertation Supervisor (or LIARS) since January 1996.

3. TEACHING

a. Courses Taught:

COURSE	TERM'	EVAL/100 Av. Qual.	LEVEL	COMMENTS
ECE 761: Applied Nonlinear Systems Theory	Winter'02 Fall'97 Fall'94 Fall'93	NA NA NA NA	Grad	Course for the Power and Control Groups. Formerly taught as ECE 788 and ECE 764. Covers various aspects of nonlinear systems such as equilibrium points, stability regions and boundaries, Lyapunov stability, bifurcations and chaos.
ECE 664: Power System Components and Modeling	Fall'17 Fall'15 Winter'11	73.3 67 NA NA	Grad	Covers the basic structure, functional characteristics, protection schemes as well as detailed and approximate (phasor) models of the main components that make up a powers system, in particular generators, transformers, transmission lines, cables, loads, HVDC and FACTS controllers.
ECE 664: Power System Computer Applications	Winter'10 Fall'07 Spring'06 Winter'05 Winter'04 Winter'03 Winter'02 Winter'01 Fall'98 Winter'96 Winter'95	74.4 75 NA 80.8 94 NA NA NA NA NA NA NA NA	Grad	Covers various issues associated with stability modeling, simulation and analysis of power systems. Various commercial-grade computational tools are introduced.
ECE 662: Power System Analysis and Control	Fall'18 Fall'16 Fall'14 Fall'12	60.0 68 82.4 82 76.8 79 78.5 86	Grad	Covers various advanced issues on powers system analysis and control: power flow, short circuits, and voltage, angle and frequency stability and control.
ECE 6613PD: Power System Analysis	Fall'18 Fall'16 Fall'14 Fall'13 Fall'12 Fall'11 Fall'09	80.3 67 85.7 75 62.1 63 78.0 81 75.9 79 NA NA	Grad	Course for on-line M.Eng. Power Engineering program (http://www.ece.uwaterloo.ca/Graduate/PowerMEng/). Advance course on all aspects of power system analysis, from power flows and short circuits to stability studies and control.

ECE 6601PD: Power System Components and Modeling	Fall'19 Winter'18 Winter'16 Winter'15 Winter'13 Fall'10	62.5 79.5	55 69 NA NA NA	Grad	Course for on-line M.Eng. Power Engineering program (http://www.ece.uwaterloo.ca/Graduate/PowerMEng/). Covers the basic structure, functional characteristics, protection schemes as well as detailed and approximate (phasor) models of the main components that make up a powers system, in particular generators, transformers, transmission lines, cables, loads, HVDC and FACTS controllers.
ECE 6601PD: Power System Modeling and Stability Analysis	Fall'08 Spring'07 Fall'03	NA NA NA		Grad	Course for on-line M.Eng. Power Engineering program (http://www.ece.uwaterloo.ca/Graduate/PowerMEng/). Covers diverse aspects of detailed and phasor modeling of power system elements, and the concepts, analysis techniques, tools, controls and protections associated with angle, voltage and frequency stability of power systems.
ECE 467: Power Systems Analysis, Operations and Markets	Winter'19 Winter'18 Winter'16 Winter'12	77.0 87.5 74.9 74.8	71 84 68 76	Undergrad	Basic course on analysis, operation and management of power systems considering main technical and economic issues.
ECE 465: Computer Simulation of Power Systems	Winter'03 Winter'02 Winter'01 Winter'99 Winter'98 Winter'97 Winter'94	88.9 93.4 71.7 86.7 75.4 61.8 63.4	91 96 75 88 69 50 29	Undergrad	Basic power system analysis course, where several computer tools for power system analysis are studied and applied. Formerly: "Power Systems"
ECE 463: Design and Applications of Power Electronic Converters	Spring'96	84.7	89	Undergrad	This is a basic power electronics course discussing the basics of various power electronic switches and converters. Helped in the development of new labs and curriculum. Formerly: "Power Electronics"
ECE 390: Engineering Design, Economics, and Impact on Society	Fall'19 Winter'15 Winter'13	68.6 72.6	55 70	Undergrad	The course discusses various concepts and tools in engineering economics, design, project management, and the impact of engineering projects on the environment and society.

ECE 362: Modeling and Control of Electric Drives.	Winter'99 Fall'98 Winter'98 Winter'97 Fall'95	81.3 69.1 76.7 61.6 76.6	79 58 71 51 72	Undergrad	A basic course in electric machines and associated controls. Introduced computer simulation of drives. New labs and curriculum were implemented. Formerly: "Energy Systems and Components 2"
ME 269: Electromechanical Devices and Power Processing	Fall'95 Fall'94	67.3 60.3	59 47	Undergrad	Service course for Mechanical Engineering on electric machine and associated controls. Students were introduced to several computer tools.
ECE 140: Linear Circuits	Fall'10 Fall'09	68.44 79.4	67 82	Undergrad	Introductory course in basic linear circuits for Electrical and Computer Engineering students. Helped to implement and develop the course for the first time.
GENE/ME 123: Electrical Engineering	Spring'01 Winter'99 Winter'97 Spring'96 Winter'96 Winter'95	80.7 74.7 48.7 66.7 47.9 70.2	79 68 34 62 38 64	Undergrad	Service course for Mechanical, Civil and Chemical Engineering in basic electrostatics, electromagnetism and linear circuits. Curricula and textbooks were changed several times.
ECE 100: Fundamentals of Electrical Engineering	Winter'09 Winter'08 Spring'07 Winter'06 Spring'05 Spring'04	72.7 74.1 71.9 76.6 85.1 76.0	71 73 70 76 90 68	Undergrad	Introductory course in electrostatics, electromagnetism, linear circuits and electronic devices for Electrical and Computer Engineering students.

Before joining the University of Waterloo: two years of teaching experience after PhD graduation at the Escuela Politécnica Nacional in Quito, Ecuador, where undergraduate Electric Machines and Power Systems courses, including labs, were completely restructured.

b. Graduate Student Supervision: In most cases, I have been the *main research supervisor*, considering the role of the Second supervisors and/or funding arrangements (see paper authorship).

NO.	NAME	DEGREE	DATES		COMMENTS
			START	END	
56	Daniel Rueda	MASc	May 2020		<ul style="list-style-type: none"> • Research: TBD. • Colombian scholar.
55	Samuel Cordova	PhD	May 2018	Today	<ul style="list-style-type: none"> • Research: Battery energy storage system (BESS) operation in frequency regulation markets. • Chilean scholar. • Co-supervisors: A. Lorca and D. Olivares, Catholic University, Santiago, Chile.
54	Carlos Ceja	PhD	Jan. 2018	Today	<ul style="list-style-type: none"> • Research: Grid of microgrids. • Mexican scholar.
53	Matheus Zambroni de Souza	PhD	Jan. 2018	Today	<ul style="list-style-type: none"> • Research: Compressed Air Energy Storage (CAES) integration on power system operation and electricity markets. • Co-supervisor: K. Bhattacharya
52	Dario Peralta	PhD	Sept. 2017	Today	<ul style="list-style-type: none"> • Research: Thermal energy storage electricity market applications. • Principal supervisor: K. Bhattacharya.
51	Baheej Alghamdi	PhD	May 2017	Today	<ul style="list-style-type: none"> • Research: Grid of microgrids frequency regulation. • South Arabian scholar.
50	Enrique Vera	PhD	May 2017	Today	<ul style="list-style-type: none"> • Research: Microgrid planning. • Second supervisor: M. Pirnia • Ecuadorian scholar.
49	Noela Sofia Guzmán	PhD	Sept. 2016	Today	<ul style="list-style-type: none"> • Research: Modeling and impact of Energy Storage Systems (ESS) for frequency regulation of actual power grids. • Second supervisor: K. Bhattacharya.
48	Fabian Calero	PhD	Jan. 2015	Today	<ul style="list-style-type: none"> • Research: Modeling, simulation, and impact of distributed battery energy storage in transmission systems. • Second supervisor: K. Bhattacharya. • Ecuadorian scholar.
47	Ivan Calero	PhD	Jan. 2015	Today	<ul style="list-style-type: none"> • Research: Modeling and control of Compressed Air Energy Storage (CAES) for power system performance studies. • Second supervisor: K. Bhattacharya. • Ecuadorian scholar.

46	Emin Mammadov	MASc	Sept. 2017	Dec. 2019	<ul style="list-style-type: none"> • Thesis: “Predictive Maintenance of Wind Generators based on AI Enabled Big Data Analysis.” • Industry scholar.
45	William Mendieta	MASc	May 2017	Aug. 2019	<ul style="list-style-type: none"> • Thesis: “Thermostatically Controllable Loads for Primary Frequency Control in Isolated Microgrids.” • Ecuadorian scholar. • Engineer at Empresa Electrica Centro Sur, Cuenca, Ecuador.
44	Chioma Anierobi	MASc	Sept. 2016	June 2019	<ul style="list-style-type: none"> • Thesis: “Behind-the-Meter Compressed Air Energy Storage Feasibility and Applications.” • Co-supervisor: K. Bhattacharya. • Power Consultant at Canadian Pacific Consulting Services, Ottawa.
43	Bharat Solanki	PhD	Jan. 2014	Apr. 2018	<ul style="list-style-type: none"> • Thesis: “Improved and Practical Energy Management Systems for Isolated Microgrids.” • Co-supervisor: K. Bhattacharya. • Engineer at SIEMENS Canada, Mississauga, ON.
42	Dario Peralta	MASc	Jan. 2015	Aug. 2017	<ul style="list-style-type: none"> • Thesis: “Primary Frequency Control with Flywheel Energy Storage Technologies.” • Second supervisor: K. Bhattacharya. • Ecuadorian scholar. • PhD student at Waterloo.
41	Alfredo Vaccaro	PhD	Jan. 2014	Apr. 2015	<ul style="list-style-type: none"> • Thesis: “Affine Arithmetic for Power and Optimal Power Flow Analyses in the Presence of Uncertainties.” • Professor at the University of Sannio, Benevento, Italy.
40	Jefferson Fabricio Ordoñez	MASc	Sept. 2013	Aug. 2015	<ul style="list-style-type: none"> • Thesis: “Optimal Load Management Application for Industrial Customers.” • Ecuadorian scholar. • Project Manager at CELEC, Ecuador.
39	Akash Raghurajan	MASc	May 2013	July 2014	<ul style="list-style-type: none"> • Thesis: “Optimal Demand Response of Controllable Loads in Isolated Microgrids.” • Principal supervisor: K. Bhattacharya. • Engineer at GE, Montreal.

38	Behnam Tamimi	PhD	Jan. 2013	Dec. 2017	<ul style="list-style-type: none"> • Thesis: “Modeling and Control of the Hybrid Power Flow Controller for Steady-state and Dynamic Studies and Applications.” • OGS scholar.
37	Mauricio Restrepo	PhD	Sept. 2012	May 2017	<ul style="list-style-type: none"> • Thesis: “Smart Operation of Four-Quadrant Electric Vehicle Chargers in Distribution Grids.” • Second supervisor: M. Kazerani. • Professor at Universidad del Norte, Colombia.
36	Jordan Morris	MASc	Sept. 2012	Jan. 2015	<ul style="list-style-type: none"> • Thesis: “Design and Testing of a Bidirectional Smart Charger Prototype”. • Principal supervisor: M. Kazerani. • Engineer at Tesla, California.
35	Jose Daniel Lara	MASc	Sept. 2012	Sept. 2014	<ul style="list-style-type: none"> • Thesis: “Robust Energy Management Systems for Isolated Microgrids Under Uncertainty.” • Costa Rican scholar. • Second supervisor: K. Bhattacharya. • PhD student at Berkeley.
34	Mostafa Farrokhhabadi	PhD	May 2012	Jan. 2017	<ul style="list-style-type: none"> • Thesis: “Primary and Secondary Frequency Control Techniques for Isolated Microgrids.” • Amit and Meena Chakma Award for Exceptional Teaching by a Student, 2015. • Second supervisor: K. Bhattacharya. • Director at BluWave-AI, Ottawa, ON.
33	Abolfazl (Amir) Mosaddegh	PhD	May 2012	Dec. 2016	<ul style="list-style-type: none"> • Thesis: “Optimal Operation of Power Distribution Feeders with Smart Loads.” • Second supervisor: K. Bhattacharya. • Engineer at Hatch, Mississauga, ON.
32	Mariano Arriaga	PhD	Jan. 2011	May 2015	<ul style="list-style-type: none"> • Thesis: “Long-Term Renewable Generation Planning for Off-grid Remote Communities.” • NSERC scholar. • Second supervisor: M. Kazerani. • General Manager at the Energy and Power Innovation Center Mohawk College, Hamilton, ON.

31	Nafeesa Mehboob	PhD	Sept. 2010	Apr. 2016	<ul style="list-style-type: none"> • Thesis: “Smart Charging of Plug-in Electric Vehicles in Distribution Systems Considering Uncertainties.” • OGS scholar. • IEEE-PES PowerTech A. Papadias Best Student Paper Award, 2015. • Co-supervisor: C. Rosenberg. • Engineer at Kinetrics, Toronto, ON.
30	Indrajit Das	PhD	May 2010	Aug. 2014	<ul style="list-style-type: none"> • Thesis: “Investment Planning Models and Optimal Incentive Design for System Planners and Investors to Integrate Renewables.” • Principal supervisor: K. Bhattacharya. • PDF at CANMET Energy, NRCAN, Varennes, QC.
29	Isha Sharma	PhD	Sept. 2009	Aug. 2014	<ul style="list-style-type: none"> • Thesis: “Operation of Distribution Systems with PEVs and Smart Loads.” • Co-supervisor: K. Bhattacharya. • Researcher at Oak Ridge National Laboratory, US.
28	Ehsan Nasr	PhD	Sept. 2009	May 2014	<ul style="list-style-type: none"> • Thesis: “Modeling, stability analysis and control of DG in the context of microgrids.” • Engineer at Microsoft, Seattle, WA.
27	Daniel Olivares	PhD	Sept. 2009	Jan. 2014	<ul style="list-style-type: none"> • Thesis: “An Energy Management System for Isolated Microgrids Considering Uncertainty.” • Chilean scholar. • Second supervisor: M. Kazerani. • Professor at the Catholic University, Santiago, Chile.
26	Juan Carlos Muñoz	PhD	Sept. 2009	Dec. 2013	<ul style="list-style-type: none"> • Thesis: “Arithmetic Based Methods for Power Systems Analysis Considering Intermittent Sources of Power.” • Venezuelan scholar. • Second supervisor: K. Bhattacharya. • Professor at the University of the Andes, Merida, Venezuela.

25	Felipe Ramos	MASc	Sept. 2011	Sept. 2013	<ul style="list-style-type: none"> • Thesis: “Modeling and Analysis of Demand Responsive Loads in the Operation of Smart Grids.” • Chilean scholar • Second supervisor: K. Bhattacharya. • Research Assistant, Catholic Univ., Santiago, Chile.
24	Rajib Kundu	MASc	Sept. 2011	Apr. 2013	<ul style="list-style-type: none"> • Thesis: “Smart Operation of Centralized Temperature Control System in Multi-Unit Residential Buildings.” • Principal supervisor: K. Bhattacharya. • Engineer at a company in ON.
23	Rupali Jain	MASc	Sept. 2011	Jan. 2013	<ul style="list-style-type: none"> • Thesis: “Optimal Operation of Climate Control Systems of Indoor Ice Rinks.” • Principal supervisor: K. Bhattacharya. • Engineer at METSCO Energy Solutions, Mississauga, ON.
22	Brian Le	MASc	May 2011	Sept. 2013	<ul style="list-style-type: none"> • Research: “Incentive Design of Conservation Voltage Reduction Planning for Industrial Loads in Ontario.” • Second supervisor: K. Bhattacharya. • Engineer at IESO, ON.
21	Adarsh Madhavan	MASc	May 2011	May 2013	<ul style="list-style-type: none"> • Thesis: “An Integrated Voltage Optimization Approach For Industrial Loads.” • Second supervisor: K. Bhattacharya • Engineer at PG&E, San Francisco, US.
20	Wajid Muneer	MASc	Sept. 2009	April 2011	<ul style="list-style-type: none"> • Thesis: “Large-scale Solar PV Investment Planning Studies.” • Co-supervisor: K. Bhattacharya. • Engineer at CANMET Energy, NRCAN, Varennes, QC.
19	Syed Ahsan Hashmi	MASc	May 2009	Sept. 2010	<ul style="list-style-type: none"> • Thesis: “Evaluation and Improvement of the Residential Energy Hub Management System.” • Second supervisor: K. Bhattacharya. • Engineer at GENIVAR, Elizabethtown, ON.
18	Hussin Hassen	MASc	Jan. 2009	Apr. 2010	<ul style="list-style-type: none"> • Thesis: “Implementation of Energy Hub Management System for Residential Sector.” • Second supervisor: K. Bhattacharya. • Engineer at ABB, Montreal, QC.

17	Sumit Paudyal	PhD	Sept. 2008	Aug. 2012	<ul style="list-style-type: none"> • Thesis: “Optimal Energy Management of Distribution Systems and Industrial Energy Hubs in Smart Grids.” • OGS scholar. • Co-supervisor: K. Bhattacharya. • Professor at Michigan Tech, Houghton, MI.
16	Mohammad Chehrehgani	PhD	Sept. 2007	Aug. 2011	<ul style="list-style-type: none"> • Thesis: “Optimal Operation of Energy Hubs in the Context of Smart Grids.” • MPRIME “Best Novel Use of Mathematics in Technology Transfer Award,” 2011. • The Sandford Fleming Foundation TA Excellence Award, 2009. • Second supervisor: K. Bhattacharya. • Engineer at NEC, Santa Clara, CA.
15	Amirhossein Hajimiragha	PhD	Jan. 2006	Apr. 2010	<ul style="list-style-type: none"> • Thesis: “Sustainable Convergence of Electricity and Transport Sectors in the Context of Integrated Energy Systems.” • Winning poster at Sharing Discovery, University of Waterloo graduate student research conference, April 30, 2010. • MITACS “Best Novel Use of Mathematics in Technology Transfer Award,” 2009. • E&CE TA Award, Winter and Spring 2007 terms, and U.W. Instructor Award, 2008. • Second supervisor: M. Fowler (Chem. Eng.). • Director BBS, Singapore.
14	Ismael El-Samahy	PhD	Sept. 2004	May 2008	<ul style="list-style-type: none"> • Thesis: “Secure Provision of Reactive Power Ancillary Services in Competitive Electricity Markets.” • OGST and OGS scholar. • MITACS “Best Novel Use of Mathematics in Technology Transfer Award,” 2008. • E&CE TA Award, Winter 2006 term. • Co-supervisor: K. Bhattacharya. • Engineer at IESO, ON.
13	José Rafael Avalos-Muñoz	PhD	Sept. 2004	May 2008	<ul style="list-style-type: none"> • Thesis: “Analysis and Application of Optimization Techniques to Power System Security and Electricity Markets.” • Mexican CONACYT scholar. • Second supervisor: M. Anjos (Manag. Sc.). • Engineer at California ISO, US.

12	Hamid Zareipour	PhD	Jan. 2003	Dec. 2006	<ul style="list-style-type: none"> • Thesis: “Price Forecasting and Optimal Operation of Wholesale Customers in a Competitive Electricity Market.” • Iranian scholar. • Co-supervisor: K. Bhattacharya. • Professor at University of Calgary, AB.
11	Warren King	MASc	Sep. 2002	Mar. 2004	<ul style="list-style-type: none"> • Thesis: “A Probabilistic Approach to Security Costs in Competitive Electricity Markets.” • Engineer at Alberta Electric System Operator (ASO), Calgary, AB.
10	Hassan Ghasemi	PhD	Jan. 2002	May 2006	<ul style="list-style-type: none"> • Thesis: “On-line Monitoring and Oscillatory Stability Margin Prediction in Power Systems Based on System Identification.” • OGST scholar. • Former professor at the Univ. Tehran, Iran, now senior Eng. at the IESO, Ontario.
9	Sameh Kodsi	PhD	Sept. 2001	Dec. 2005	<ul style="list-style-type: none"> • Thesis: “Accounting for the Effect of Power System Controllers and Stability on Power Dispatch and Electricity Market Prices.” • Engineer at Teshmont Consultants LP, Winnipeg, MB.
8	Hong Chen	PhD	Sept. 1998	Dec. 2002	<ul style="list-style-type: none"> • Thesis: “Security Cost Analysis in Electricity Markets Based on Voltage Security Criteria and Web-based Implementation.” • Second supervisor: A. Singh. • Best Student Poster Paper Award at the IEEE-PES Winter Meeting, Columbus, Ohio, January 2001. • Engineer at PJM, US.
7	Nadarajah Mithulananthan	PhD	Sept. 1998	May 2002	<ul style="list-style-type: none"> • Thesis: “Hopf Bifurcation Control and Indices for Power Systems with Interacting Generator and FACTS Controllers.” • OGS scholar. • Second Best Student Paper Award at NAPS, Waterloo, Ontario, October 2000. • E&CE TA Award, September 2000. • Second supervisor: J. Reeve (deceased). • Professor at University of Queensland, Australia..

6	William Rosehart	PhD	Sept. 1997	Dec. 2000	<ul style="list-style-type: none"> • Thesis: "Optimization of Power Systems with Voltage Security Constraints." • NSERC scholar. • Best Student Poster Paper Award at the IEEE-PES Summer Meeting, San Diego, California, July 1998. • U.W. Sandford Fleming TA Award, 1997, and U.W. Instructor Award, 1999. • Second supervisor: V. H. Quintana (retired). • IEEE-PES Technical Council GOLD Award, July 2007. • Professor and Dean of Eng. at the University of Calgary AB.
5	Li Kang	MASc	Sept. 1997	Aug. 1999	<ul style="list-style-type: none"> • Thesis: "Comparison of Simulation Programs for Modeling of FACTS Controllers in Power Systems." • Second supervisor: J. Vlach (deceased). • Project Manager at Pacific Technology Co., Ltd., Guangdong, China.
4	William Rosehart	MASc	May 1996	Sept. 1997	<ul style="list-style-type: none"> • Thesis: "Stability Analysis of Detailed Power System Models." • NSERC scholar. • Professor and Dean of Eng. at the University of Calgary AB.
3	Edvina Uzunovic	PhD	Sept. 1995	Aug. 2001	<ul style="list-style-type: none"> • Thesis: "EMTP, Transient Stability and Power Flow Models and Controls of VSC Based FACTS Controllers." • Part time student Oct.98-Aug.01. • Best Student Poster Paper Award at the IEEE-PES Summer Meeting, Edmonton, Alberta, July 1999. • Second supervisor: J. Reeve (deceased). • Instructor at Worcester Polytechnic Institute, MA, US.
2	Zeno Faur	MASc	Jan. 1994	Jan. 1996	<ul style="list-style-type: none"> • Thesis: "Effect of FACTS Devices on Static Voltage Collapse Phenomena." • Project Manager at SAF Drives, Kitchener.

1	Antonio Z. de Souza	PhD	Sept. 1993	July 1995	<ul style="list-style-type: none"> • Thesis: “New Techniques to Efficiently Determine Proximity to Static Voltage Collapse.” • Brazilian scholar. • Second supervisor: V. H. Quintana (retired). • Professor at the Federal Engineering School of Itajuba, Brazil.
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c. Research Fellow Supervision:

NO.	NAME	STATUS	DATES		COMMENTS
			START	END	
82	Katharina Wieninger	IVGS	Jan. 2020	Feb. 2020	<ul style="list-style-type: none"> • Research: DC microgrid dynamic modeling and simulation. • Karlsruhe Institute of Technology (KIT), Germany, scholar.
81	Behnam Tamimi	PDF	June 2018	May 2020	<ul style="list-style-type: none"> • Research: Hybrid Power Flow Controller (HPFC) with battery energy storage (BES). • NESTnet Theme 3 project management.
80	Mauricio Restrepo	PDF	June 2018	Sept. 2019	<ul style="list-style-type: none"> • Research: Interface and testing platform design for Canadian Renewable Energy Laboratory. • Co-supervisor: J. Simpson-Porco. • Professor at Universidad del Norte, Colombia.
79	Chioma Anierobi	Research Assistant	June 2019	Aug. 2019	<ul style="list-style-type: none"> • Research: Compressed Air Energy Storage (CAES) behind-the-meter applications. • Co-supervisor: K. Bhattacharya.
78	Nils van der Blij	IVGS	June 2019	July 2019	<ul style="list-style-type: none"> • Research: DC networks Energy Management Systems (EMS) under uncertainty. • Technical University of Delft (TUD), Netherlands, scholar
77	Fulong Li	IVGS	Apr. 2019	July 2019	<ul style="list-style-type: none"> • Research: Energy Management Systems (EMS) for dc microgrids. • Aston University, UK, scholar.
76	Jona Maurer	IVGS	Apr. 2019	May 2019	<ul style="list-style-type: none"> • Research: Market auction models with district heating. • Co-supervisor: K. Bhattacharya • Karlsruhe Institute of Technology (KIT), Germany, scholar.

75	Walter Violante	IVGS	Jan. 2019	June 2019	<ul style="list-style-type: none"> • Research: Operation of microgrids with thermal energy storage. • Politecnico di Bari, Italy, scholar.
74	Diego Ortiz	IVGS	Dec. 2018	Mar. 2019	<ul style="list-style-type: none"> • Research: Stability of power systems with high penetration of converter-based generation. • Univ. of Chile, Santiago, scholar.
73	Laura Ramirez-Elizondo	Visiting Prof.	Feb. 2018	Apr. 2018	<ul style="list-style-type: none"> • Research: DC microgrids. • Professor at TU Delft, Netherlands.
72	Mohammad Ravanji	IVGS	Nov. 2017	Apr. 2018	<ul style="list-style-type: none"> • Research: Wind power generation virtual inertia controller. • Sharif University, Tehran, Iran, scholar.
71	Mostafa Farrokhbabadi	PDF	Sept. 2017	Apr. 2018	<ul style="list-style-type: none"> • Research: Microgrid control and stability. • Co-supervisor: J. Simpson-Porco. • R&D Engineer at BluWave-AI, Ottawa, ON.
70	Jean Michel Clairand	IVGS	Oct. 2017	Mar. 2018	<ul style="list-style-type: none"> • Research: Isolated microgrid planning. • Universidad Politécnica de Valencia, Spain, scholar. • Professor at Universidad de Las Américas, Quito, Ecuador.
69	Fabian Meyer	IVGS	Aug. 2017	Sept. 2017	<ul style="list-style-type: none"> • Research: Thermal energy storage for cooling. • Karlsruhe Institute of Technology (KIT), Germany, scholar.
68	Mauricio Restrepo	PDF	June 2017	Aug. 2017	<ul style="list-style-type: none"> • Research: EV smart charging. • Co-supervisor: M. Kazerani. • Professor at Universidad del Norte, Colombia.
67	Mostafa Farrokhbabadi	PDF	May 2017	Aug. 2017	<ul style="list-style-type: none"> • Research: Microgrid stability definitions and modeling. • R&D Engineer at BluWave-AI, Ottawa, ON.
66	Indrajit Das	PDF	Apr. 2017	May 2017	<ul style="list-style-type: none"> • Research: Feasibility study of deployment of variable speed generators in remote communities in the Canadian Arctic. • PDF at CANMET Energy, NRCAN, Varennes, QC.
65	Mostafa Farrokhbabadi	Research Associate	Feb. 2017	Apr. 2017	<ul style="list-style-type: none"> • Research: Energy storage system modeling and control, and microgrid stability. • Second supervisor: K. Bhattacharya • Director at BluWave-AI, Ottawa, ON.

64	Abolfazl (Amir) Mosaddegh	Research Associate	Feb. 2017	Apr. 2017	<ul style="list-style-type: none"> • Research: Optimal operation of distribution feeders. • Second supervisor: K. Bhattacharya • Engineer at Hatch, Mississauga, ON.
63	Mariano Arriaga	PDF	June 2016	May 2018	<ul style="list-style-type: none"> • Research: Energy storage systems for power system frequency regulation. • NESTnet Theme 3 project management. • General Manager at the Energy and Power Innovation Center Mohawk College, Hamilton, ON.
62	David Romero	IVGS	May 2016	Apr. 2017	<ul style="list-style-type: none"> • Research: Affine Arithmetic Microgrid EMS • Universidad Nacional de Colombia, Bogota, scholar.
61	Edson Geraldi	IVGS	May 2016	Oct. 2016	<ul style="list-style-type: none"> • Research: “Development of a simplified model for the representation of distributed generation systems” • University of Sao Paulo (USP), Brazil, scholar.
60	Araz Ashouri	PDF	Mar. 2016	Apr. 2016	<ul style="list-style-type: none"> • Research: Energy storage systems.
59	Nico Meyer-Huebner	IVGS	Dec. 2015	Dec. 2015	<ul style="list-style-type: none"> • Research: Multi-period OPF with energy storage and ramping constraints for large power systems. • Second supervisor: K. Bhattacharya • Karlsruhe Institute of Technology (KIT), Germany, scholar.
58	Patrick Sauter	IVGS	Nov. 2015	Nov. 2015	<ul style="list-style-type: none"> • Research: Microgrid EMS including thermal loads and generation. • Second supervisor: K. Bhattacharya • Karlsruhe Institute of Technology (KIT), Germany, scholar.
57	Sebastian Köing	IVGS	Oct. 2015	Oct. 2015	<ul style="list-style-type: none"> • Research: Impact of Energy Storage Systems on microgrid stability and control. • Second supervisor: K. Bhattacharya • Karlsruhe Institute of Technology (KIT), Germany, scholar.
56	Indrajit Das	PDF	Sept. 2015	Jan. 2017	<ul style="list-style-type: none"> • Research: Feasibility study of deployment of renewable energy sources in remote communities in the Canadian Arctic. • PDF at CANMET Energy, NRCAN, Varennes, QC

55	Andrés Arias-Londoño	IVGS	Sept. 2015	Mar. 2016	<ul style="list-style-type: none"> • Research: EV optimal control in distribution feeders. • Technical University of Pereira, Colombia, scholar.
54	Daniel Remón	IVGS	Aug. 2015	June 2016	<ul style="list-style-type: none"> • Research: Solar PV generation synthetic inertia studies for bulk power systems. • Technical University of Catalonia, Spain, scholar.
53	Francisco García López	IVGS	July 2015	Sept. 2015	<ul style="list-style-type: none"> • Research: UPFC and HPFC applications to distribution feeders. • University of Seville, Spain, scholar.
52	Mariano Arriaga	PDF	May 2015	Aug. 2015	<ul style="list-style-type: none"> • Research: Database management and analysis for NRCAN-Hatch microgrid controller project. • General Manager at the Energy and Power Innovation Center Mohawk College, Hamilton, ON.
51	Felipe Valencia	Visiting Scholar (PDF)	Sept. 2014	Dec. 2014	<ul style="list-style-type: none"> • Research: Microgrid optimal load-frequency control. • PDF at University of Chile, Santiago.
50	Jose Daniel Lara	Research Associate	Sept. 2014	Dec. 2014	<ul style="list-style-type: none"> • Research: Microgrid EMS implementation. • Second supervisor: K. Bhattacharya. • PhD student at Berkeley.
49	Doris Saez	Visiting Prof.	Sept. 2014	Sept. 2014	<ul style="list-style-type: none"> • Research: Microgrid control. • Professor at University of Chile, Santiago.
48	Juan Carlos Muñoz	PDF	June 2014	June 2015	<ul style="list-style-type: none"> • Research: EHMS implementation and voltage control for industrial customers. • Professor at the University of the Andes, Merida, Venezuela.
47	Ehsan Nasr	Research Associate	May 2014	Aug. 2014	<ul style="list-style-type: none"> • Research: DG stability. • Second supervisor: K. Bhattacharya. • Engineer at Microsoft, Seattle, WA.
46	Andy Wu Xiaoyu	Research Associate	Oct. 2013	Dec. 2013	<ul style="list-style-type: none"> • Research: Survey of remote microgrids in Canada. • MEng student at the University of Waterloo.
45	Blanca Hernandez	Visiting Scholar (PhD)	July 2013	Sept. 2013	<ul style="list-style-type: none"> • Research: Optimal and distributed secondary voltage controls. • Mexican Scholar (CINVESTAV, Guadalajara, Mexico). • Professor at Tech. Univ. Manzanillo, Mexico.

44	Adarsh Madhavan	Research Associate	June 2013	Sept. 2013	<ul style="list-style-type: none"> • Research: Survey of remote microgrids in Canada. • Engineer at PG&E, San Francisco, US.
43	Fernanda Avila	Visiting Scholar (MSc)	May 2013	July 2013	<ul style="list-style-type: none"> • Research: Microgrid demand side management. • University of Chile, Santiago, scholar. • Research Assistant, Univ. Chile, Santiago, Chile.
42	Douglas Fyfe	Research Associate	Feb. 2013	Mar. 2016	<ul style="list-style-type: none"> • Project Manager for 2 research projects: OCE's EHMS and NRCAN's Microgrid Controller. • Private consultant.
41	Claudia Battistelli	PDF	Jan. 2013	Dec. 2013	<ul style="list-style-type: none"> • Research: Application of the HPFC FACTS technology to Ontario's grid. • PDF at Imperial College, London, UK.
40	Edris Pouresmaeil	PDF	June 2012	Sept. 2013	<ul style="list-style-type: none"> • Research: Residential energy hub simulator. • Second supervisor: K. Bhattacharya. • Researcher, Aalto University, Helsinki.
39	Doris Saez	Visiting Prof.	May 2012	July 2012	<ul style="list-style-type: none"> • Research: Microgrid control and forecast. • Professor at University of Chile, Santiago.
38	Victor Gutierrez	PDF	Jan. 2012	Sept. 2013	<ul style="list-style-type: none"> • Research: Energy hub management system • Second supervisor: K. Bhattacharya • Professor at Univ. Guanajuato, Mexico.
37	Behnam Tamimi	PDF	Dec. 2011	Dec. 2012	<ul style="list-style-type: none"> • Research: Application of the HPFC FACTS technology to Ontario's grid. • PhD student at Waterloo.
36	Blanca Hernandez	Visiting Scholar (PhD)	Sept. 2011	Aug. 2012	<ul style="list-style-type: none"> • Research: Wide area controls. • Mexican Scholar (CINVESTAV, Guadalajara, Mexico). • Professor at Tech. Univ. Manzanillo, Mexico.
35	Alfredo Vaccaro	Visiting Prof.	Sept. 2011	Oct. 2011	<ul style="list-style-type: none"> • Research: Power systems' security using probabilistic analysis techniques. • Professor at the University of Sannio, Benevento, Italy.
34	Juan Miguel Gonzalez	PDF	May 2011	April 2012	<ul style="list-style-type: none"> • Research: Residential house energy simulator. • Second supervisor: K. Bhattacharya. • Professor at Tech. Univ. Manzanillo, Mexico.

33	Wajid Muneer	Research Associate	May 2011	April 2012	<ul style="list-style-type: none"> • Research: Energy hub management system residential model implementation. • Second supervisor: K. Bhattacharya. • Project Manager at CANMET Energy, NRCAN, Varennes, QC.
32	Yulong Huang	Visiting Scholar (PhD)	Sept. 2010	Aug. 2011	<ul style="list-style-type: none"> • Chinese Scholar (China Scholarship Council grant). • Research: Stability constrained OPFs.
31	Syed Ahsan Hashmi	Research Associate	Sept. 2010	July 2011	<ul style="list-style-type: none"> • Research: Energy Hub Management System. • Second supervisor: K. Bhattacharya. • Engineer at GENIVAR, Elizabethtown, ON.
30	Amirhossein Hajimiragha	PDF	May 2010	Aug. 2010	<ul style="list-style-type: none"> • Research: Plug-in Electric Vehicle (PEV) grid impact studies. • Director BBS, Singapore.
29	Behnam Tamimi	PDF	Sept. 2009	Nov. 2011	<ul style="list-style-type: none"> • Research: Stability and operational aspects of power grids with large penetration of solar power. • Second supervisor: K. Bhattacharya. • PhD student at Waterloo.
28	Guilherme Lage	Visiting Scholar (PhD)	Sept. 2009	Aug. 2010	<ul style="list-style-type: none"> • Brazilian Scholar (CAPES). • Research: Voltage-stability-constrained optimal power flows.
27	Bo Hu	Visiting Scholar (PhD)	Sept. 2008	Sept. 2009	<ul style="list-style-type: none"> • Chinese Scholar (China Scholarship Council grant). • Research: Optimal reactive power and voltage management and control.
26	Geraldo Torres	Visiting Prof.	Sept. 2008	Aug. 2009	<ul style="list-style-type: none"> • Research: Optimal power flows. • Professor at the Federal University of Pernambuco, Recife, Brazil.
25	Gustavo Araujo	Visiting Scholar (PhD)	Sept. 2008	Apr. 2009	<ul style="list-style-type: none"> • Venezuelan Scholar (Universidad Nacional Experimental Politécnica Antonio José de Sucre, Barquisimeto, Venezuela). • Research: On-line detection of voltage instabilities.
24	Alfredo Vaccaro	Visiting Prof.	Sept. 2008	Feb. 2009	<ul style="list-style-type: none"> • Research: Power systems' security using probabilistic analysis techniques. • Professor at the University of Sannio, Benevento, Italy.

23	José Rafael Avalos-Muñoz	PDF	June 2008	Oct. 2008	<ul style="list-style-type: none"> • Research: Conservation and Demand Management (CDM). • Second supervisor: K. Bhattacharya. • Engineer at California ISO, US.
22	Claudia Battistelli	Visiting Scholar (PhD)	May 2008	Apr. 2009	<ul style="list-style-type: none"> • Italian Scholar (University of Naples Federico II Scholarship). • Research: Practical implementation of stability-constrained optimal power flows. • PDF at Waterloo.
21	Behnam Tamimi	Visiting Scholar (PhD)	Mar. 2008	Nov. 2008	<ul style="list-style-type: none"> • Iranian Scholar (University of Tehran Scholarship) • Research: OPF application in voltage stability and reactive power control.
20	Juan Miguel Gonzalez	Visiting Scholar (PhD)	Jan. 2008	Oct. 2008	<ul style="list-style-type: none"> • Mexican Scholar (CONACYT Scholarship) • Research: FACTS matrix converter modeling, simulation, analysis and control. • Professor at a Tech. Univ. Manzanillo, Mexico.
19	Tarek El-Fouly	PDF	Dec. 2007	Nov. 2008	<ul style="list-style-type: none"> • Research: Price forecasting and CDM. • Second supervisor: K. Bhattacharya. • Project Manager at CANMET Energy, NRCAN, Varennes, QC.
18	Hossein Haghghat	PDF	Oct. 2007	Jan. 2009	<ul style="list-style-type: none"> • Research: Reactive power markets. • Second supervisor: K. Bhattacharya. • Professor at a univ. in Iran.
17	Xianqi Li	Visiting Scholar (PhD)	Oct. 2007	Sept. 2008	<ul style="list-style-type: none"> • Chinese Scholar (China Scholarship Council grant). • Research: Stability analysis of power system with significant DG generation.
16	Victor Gutierrez	Visiting Scholar (PhD)	June 2007	May 2008	<ul style="list-style-type: none"> • Mexican Scholar (CONACYT Scholarship). • Research: Estimating power system stability regions using ANNs. • Professor at Tech. Inst. Morelia, Mexico.
15	Heresh Seyedi	Visiting Scholar (PhD)	May 2007	Oct. 2007	<ul style="list-style-type: none"> • Iranian Scholar (University of Tehran Scholarship). • Research: Protection and control schemes based on on-line stability indices. • Professor at University of Tabriz, Iran.

14	Gregor Taljan	Visiting Scholar (PhD)	Apr. 2007	Mar. 2008	<ul style="list-style-type: none"> • Slovenian Scholar (Ad-Futura and University of Ljubljana Scholarship). • Research: Wind power in multi-energy systems. • Second supervisor: M. Fowler. • Engineer at a company in Austria.
13	Mingbo Liu	Visiting Prof.	Mar. 2006	Feb. 2007	<ul style="list-style-type: none"> • Chinese Scholar (China Scholarship Council grant). • Research: Stability constrained optimization techniques. • Professor at the South China University of Technology.
12	Xueping Gu	Visiting Prof.	July 2005	June 2006	<ul style="list-style-type: none"> • Chinese Scholar (China Scholarship Council grant). • Research: AI methods applied to oscillation proximity indices. • Professor at North China Electric Power University.
11	Dengjun Yan	Visiting Prof.	July 2005	June 2006	<ul style="list-style-type: none"> • Chinese Scholar (China Scholarship Council grant). • Research: Effect of Hopf bifurcations in stability regions of power systems. • Engineer at ABB, Edmonton, AB.
10	Gregor Verbic	PDF	Feb. 2005	Jan. 2006	<ul style="list-style-type: none"> • NSERC-NATO Science Fellow. • Research: Pricing stability and security in electricity markets. • Professor at the University of Sydney, Australia.
9	Alejandro Marano-Marcolini	Visiting Scholar (PhD)	June 2004	Aug. 2004	<ul style="list-style-type: none"> • Spanish scholar from the Electrical Engineering Department, Engineering School, University of Seville, Spain. • Research: Management of ancillary services in deregulated power systems.
8	Hong Chen	PDF	Jan. 2003	June 2003	<ul style="list-style-type: none"> • Research: Energy storage, distributed generation and price forecasting in electricity markets. • Worked on contract with NRG. • Engineer at PJM, New England, USA.
7	Valery Knyazkin	Visiting Scholar (PhD)	Oct. 2002	Apr. 2003	<ul style="list-style-type: none"> • Swedish scholar from the Royal Institute of Technology, Stockholm. • Research: Distributed generation control and modeling. • Engineer at ABB, Sweden.

6	Ruben Salas-Cabrera	Visiting Prof.	Oct. 2001	Jan. 2002	<ul style="list-style-type: none"> • Visiting Professor from Instituto Tecnologico de Ciudad Madero, Mexico. • Research: Stability analysis of motor drives. • Formed part of the engineering staff of SAF Drives, Kitchener, Mar.00-Sept.01. • Professor at Tech, Inst. Ciudad Madero, Mexico.
5	Federico Milano	Visiting Scholar (PhD)	Sept. 2001	Dec.02	<ul style="list-style-type: none"> • Italian scholar from the University of Genoa. • Research: Pricing system security in electricity markets. • Professor at University College, Dublin, Ireland. • IEEE Fellow.
4	Claudio Cavallo	Visiting Scholar (MSc)	Apr. 2001	Dec. 2001	<ul style="list-style-type: none"> • Italian scholar from the Polytechnic of Milan.. • Research: Applications of FACTS controllers to the Italian power network. • Engineer in Italy.
3	Alberto Del Rosso	Visiting Scholar (PhD)	Jan. 2000	Oct. 2000	<ul style="list-style-type: none"> • Argentinean scholar on six month research visit. • Research: Using FACTS for on-line dynamic security enhancement in electric power systems. • Project Manager at EPRI, US.
2	Ruben Salas-Cabrera	Visiting Prof.	Mar. 1999	Feb. 2000	<ul style="list-style-type: none"> • Visiting Professor from Instituto Tecnologico de Ciudad Madero, Mexico. • Research: Stability analysis of motor drives. • Formed part of the engineering staff of SAF Drives, Kitchener, Mar.00-Sept.01. • Professor at Tech, Inst. Ciudad Madero, Mexico.
1	Andre Lerm	Visiting Scholar (PhD)	Sept. 1997	Sept. 1998	<ul style="list-style-type: none"> • Brazilian scholar on one year research visit. • Research: Direct methods for determination of Hopf bifurcation points. • Professor at the Catholic University of Pelotas, Brazil.

d. Undergraduate Student Supervision:

NO.	NAMES	DATES	COMMENTS
29	Jonathan Li	Winter 2012	<ul style="list-style-type: none"> Second year co-op Research Assistant hired to work on an upgrade of UWPflow, a voltage stability analysis program developed at our lab, and update the Power & Energy Systems group's website.
24-28	Paul Fugere Diana Compagnone Sean Mahood Yi Ke Darren Lee	Winter 2011 Spring 2010	<ul style="list-style-type: none"> ECE 492 design project: Develop a controlled electrical plug with Zigbee communication capabilities.
23	Mario Watson	Winter 2010	<ul style="list-style-type: none"> Second year co-op Research Assistant hired to work on an upgrade of UWPflow, a voltage stability analysis program developed at our lab, and update the Power & Energy Systems group's website.
22	James MacMahon	Fall 2009	<ul style="list-style-type: none"> Fourth year E&CE student hired to work as UG Research Assistant on an OCE project in Conservation and Demand Management (CDM). Co supervisor: Gord Ellis (Energent).
21	Shuting He	Spring 2009	<ul style="list-style-type: none"> Third year E&CE student hired to work as UG Research Assistant on a price forecasting project with industry. Co supervisor: Gord Ellis (Energent).
20	Philip McCarthy	Spring 2009	<ul style="list-style-type: none"> Third year E&CE student hired as UG Research Assistant to work on an OCE project in Conservation and Demand Management (CDM). Co supervisor: Gord Ellis (Energent).
19	Erik Louie	Spring 2009	<ul style="list-style-type: none"> Third year CS student hired to work as UG Research Assistant on an OCE project in CDM. Co supervisor: Gord Ellis (Energent).
18	Philip McCarthy	Winter 2009	<ul style="list-style-type: none"> Second year E&CE student co-op Research Assistant hired to work on an OCE project in Conservation and Demand Management (CDM). Co supervisor: Gord Ellis (Energent).
17	Erik Louie	Winter 2009	<ul style="list-style-type: none"> Second year CS student co-op Research Assistant hired to work on an OCE project in CDM. Co supervisor: Gord Ellis (Energent).
16	Jeff Wang	Fall 2008	<ul style="list-style-type: none"> Second year co-op Research Assistant hired to work on an upgrade of UWPflow, a voltage stability analysis program developed at our lab, and update the Power & Energy Systems group's website.
14	Shu Zhang	Winter 2006	<ul style="list-style-type: none"> Second year co-op Research Assistant hired to work on an upgrade of UWPflow, and update the Power & Energy Systems group's website.
13	Matt Soliguin	Winter 2004	<ul style="list-style-type: none"> First year co-op Research Assistant hired to work on the Nanotechnology Program web pages.

12	David Lee	Spring 2003	<ul style="list-style-type: none"> • First year co-op Research Assistant hired to work on the Power Group web pages and create a GUI for a web-based program developed in our lab.
11	Jonathan Ford	Winter 2001	<ul style="list-style-type: none"> • Second year Undergraduate Research Assistant (URA) hired to work on the Power Group web pages as well as read basic material on nonlinear systems and bifurcation analysis.
10	Fernando Cañas	Fall 1996 19and Winter 1997	<ul style="list-style-type: none"> • Systems Design Engineering 4th year Workshop Project: Reduced voltage starter for large electrical motors.
7-9	Raman Gupta Kean Reardon Brad Schleihauf	Winter 1997	<ul style="list-style-type: none"> • SYDE 362 project: Ballistic linear accelerator for space transport.
6	Mike Patullo	Fall 1996	<ul style="list-style-type: none"> • ECE-499 project: Battery discharger design for solar car.
4-5	Art Twareck Fed Zirdung	Spring 1996	<ul style="list-style-type: none"> • ECE-499 project: Battery charger design for solar car.
3	William Rosehart	Spring 1995	<ul style="list-style-type: none"> • ECE-499, part time Research Assistant in the Fall 1995 term, and Undergraduate Research Assistant (URA) in the Winter 1996 term. Project: Bifurcation analysis of induction motors.
2	Sandeep Minocha	Spring 1994	<ul style="list-style-type: none"> • ECE-499 project: Bifurcation analysis of induction motors using MAPLE-V.
1	Steve Hranilovic	Winter 1994	<ul style="list-style-type: none"> • URA: Transcritical bifurcations in ac/dc systems using MAPLE-V and EES.

e. Examining Committees:

1. External Examiner of PhD thesis “Novel Control of PV Solar Farms as STATCOM (PV-STATCOM) for Frequency Control and Power Oscillation Damping” by Mohammad Akbari Kelishadi, University of Western Ontario. London, ON, November 25, 2019.
2. Member of the Examining Committee of Fiodar Kazhamiaka’s PhD thesis “Modelling, Design, and Control of Energy Systems: A Data-Driven Approach,” University of Waterloo, September 9, 2019.
3. Member of Comprehensive Background Examination Committee of Etinosa Ekomwenrenren, E&CE, University of Waterloo, August 14, 2019.
4. Member of Comprehensive Background Re-examination Committee of Javad Zare, E&CE, University of Waterloo, July 31, 2019.
5. Member of the Examining Committee of Nitin Padmanabhan’s PhD thesis “Demand Response and Battery Energy Storage Systems in Electricity Markets: Frameworks & Models,” University of Waterloo, July 30, 2019.
6. External Examiner of MSc thesis “Characterization of a payment scheme for the demand participation in the provision of frequency control ancillary services in the Colombian electricity market” (in Spanish) by Dahiana López, National Univ. of Colombia, Manizales, July 11, 2019.
7. External Examiner of PhD thesis “Evaluation of Short-term Voltage Stability of Power Systems in Real Time” (in Spanish) by Jaime Pinzon, National Univ. of San Juan, Argentina, April 25, 2019.
8. Examiner of PhD proposal “Control of Voltage Source Converter Based Multi Terminal DC and Hybrid AC/DC Systems” by Aram Kirakosyan, University of Waterloo, April 22, 2019.

9. Member of Comprehensive Background Examination Committee of Javad Zare, E&CE, University of Waterloo, March 29, 2019.
10. Member of Comprehensive Background Examination Committee of Aram Kirakosyan, E&CE, University of Waterloo, May 2, 2018.
11. External Examiner of PhD thesis “Coordinated Energy Management in a Network of Microgrids” by Mohsen Rafieesandgani, McMaster University, Hamilton, January 25, 2018.
12. Member of the Examining Committee of Le Hong Lam’s PhD thesis “The Integration of Electricity Market in Europe,” Politecnico di Milano, Milan, Italy, December 18, 2017.
13. External Examiner of PhD thesis “Battery Energy Storage Systems: From Electrochemical Cells Modelling to Proper Design Criteria for Grid-Tied And Off-Grid Applications” by Claudio Brivio, Poltecnico di Milano, Milan, Italy, December 18, 2017.
14. Member of the Examining Committee of Khaled Saleh’s PhD thesis “Protection of Direct-current Systems,” University of Waterloo, October 20, 2017.
15. Member of the Examining Committee of Elham Karimi’s PhD thesis “A Generalized Optimal Planning Platform for Microgrids of Remote Communities Frequency and Voltage Regulation Constraints,” University of Waterloo, September 15, 2017.
16. Examiner of PhD proposal “Energy Storage and Demand Response as New Entrants in Electricity Markets: Frameworks and Models” by Nitin Padmanabhan, University of Waterloo, July 12, 2017.
17. Member of Comprehensive Background Examination Committee of Along Jin, E&CE, University of Waterloo, May 2, 2017.
18. External Examiner of PhD thesis “Planning and Operation of Active Smart Grids” by Mohammad Ghasemi Damavandi, University of British Columbia, Vancouver, December 16, 2016.
19. External Examiner of PhD thesis “Modeling of Multi-terminal VSC-HVDC Links for Power Flows and Dynamic Simulations of AC/DC Power Networks” by Luis Miguel Castro, Tampere University of Technology, Tampere, Finland, December 5, 2016.
20. Member of Comprehensive Background Examination Committee of Mehdi Parvizimosaed, E&CE, University of Waterloo, November 29, 2016.
21. Member of the Examining Committee of Zuher Alnasir’s PhD thesis “A Small-Scale Standalone Wind Energy Conversion System Featuring SCIG, CSI and a Novel Storage Integration Scheme,” University of Waterloo, July 29, 2016.
22. Member of the Examining Committee of Yousef Mahmoud’s PhD thesis “Enhancing the Modeling and Efficiency of Photovoltaic Systems,” University of Waterloo, July 22, 2016.
23. External Examiner of PhD thesis “Optimal Planning of Hybrid Microgrids” by Godfrey Moshi, Politecnico di Milano, Milan, Italy, January 5, 2016.
24. Examiner of PhD proposal “Optimal Planning of Renewable Energy-based Microgrids for Remote Communities Considering the Operation Constraints” by Elham Karimi, University of Waterloo, August 7, 2015.
25. Member of the Examining Committee of Omid Ardakanian’s PhD thesis “On the Control of Active End-nodes in the Smart Grid,” University of Waterloo, August 4, 2015.
26. Examiner of PhD proposal “Protection Strategies for Low-voltage Direct Current Grids” by Khaled Saleh, University of Waterloo, June 24, 2015.
27. Reader of MAsC thesis “Optimal Planning and Scheduling of Battery Storage Systems for Isolated Microgrids” by Hisham Alharbi, University of Waterloo, April 2015.
28. External Examiner of PhD thesis “Voltage Control Based on a Decentralized Strategy” by Blanca Hernandez, CINVESTAV, Guadalajara, Mexico, April 30, 2015.
29. External Examiner of PhD thesis “Modeling, Design and Control of Dish-Stirling Solar Thermal Power Generating System” by Yang Li, Nanyang Technological University (NTU), Singapore, March 8, 2015.
30. External Examiner of PhD thesis “Coordination of Generator Protection and Control in the Over and Under Excited Regions” by Eli Pajuelo, University of Saskatchewan, Saskatoon, January 30, 2015.
31. Member of the Examining Committee of Ali Hooshyar’s PhD thesis “Protection of Renewable Energy Systems,” University of Waterloo, November 5, 2014.

32. Member of the Examining Committee of Ahmed Awad's PhD thesis "Application of Energy Storage Systems in Smart Grids," University of Waterloo, September 12, 2014.
33. Re-examiner of PhD proposal "Mitigation of Power Losses in Partially Shaded PV Systems" by Yousef Mahmoud, University of Waterloo, August 8, 2014.
34. External Examiner of PhD thesis "Active Control of Power Flows in Distribution Grids" by Manuel Barragan, University of Seville, Spain, May 23, 2014.
35. Examiner of PhD proposal "Mitigation of Power Losses in Partially Shaded PV Systems" by Yousef Mahmoud, University of Waterloo, May 5, 2014.
36. Examiner of PhD proposal "Study of a Standalone Wind Energy Conversion System Based on Current-Source Inverter" by Zuher Alnasir, University of Waterloo, April 9, 2014.
37. External Examiner of PhD thesis "Control of Wind Energy Conversion Systems for Large-scale Integration with the Power System" by Omid Alizadeh, Western University, February 18, 2014.
38. Member of the Examining Committee of Mehrdad Pirnias's PhD thesis "Stochastic Modeling and Analysis of Power Systems with Intermittent Energy Sources," University of Waterloo, January 20, 2014.
39. External Examiner of PhD thesis "Techno-economic Models for Integration of Wind Energy" by Chandrabhanu O. G. Kankanamalage, Ryerson University, May 7, 2013.
40. Member of the Examining Committee of Prajna Dash's PhD thesis "Advances in Design and Control of Three-phase Grid-connected PV System based on Multilevel Current Source Inverter," University of Waterloo, February 6, 2013.
41. Reader of MASc thesis "Design of a Two-stage Level-two Bidirectional On-Board Charger for Plugin Vehicles" by Noreen Wong, University of Waterloo, December 2012.
42. Examiner of PhD proposal "Power Quality Measurement and Mitigation in the Context of Smart Grids" by Ali Hooshyar, University of Waterloo, December 13, 2012.
43. Member of the Examining Committee of Moahme Hassan Ahmed's PhD thesis "Novel Wind Models for Power System Operations," University of Waterloo, May 30, 2012.
44. Reader of MASc thesis "Operational Risk Assessment of Power Systems with Distributed Energy Sources Using Minimal Cut Set" by Badr Lami, University of Waterloo, January 2012.
45. Reader of MASc thesis "Optimally-sized Design of a Wind/Diesel/Fuel Cell Hybrid System for a Remote Community" by Mehdi Vafaei, University of Waterloo, September 2011.
46. Examiner of PhD proposal "Stochastic Modeling and Analysis of Power Systems with Intermittent Energy Sources" by Mehrdad Pirnia, University of Waterloo, December 2011.
47. External Examiner of PhD thesis "Voltage Security Boundary-Constrained Optimal Power Flow" by Victor Javier Gutierrez, University of Michoacan, Morelia, Mexico, October 7, 2011.
48. External Examiner of PhD thesis "Control Strategies for the Next Generation Microgrids" by Ali Mehrizi-Sani, University of Toronto, September 7, 2011.
49. External Examiner of PhD thesis "On Predictive Control for Coordination in Multi-Carrier Energy Systems" by Michele Arnold, Swiss Institute of Technology (ETH), Zurich, Switzerland, May 27, 2011.
50. Reader of MASc thesis "DFIG Based Wind Turbine Contribution to System Frequency Control" by Mansour J. Jalali, University of Waterloo, December 2010.
51. External Examiner of PhD thesis "Impact of Wind Energy on the Operation of Power Systems" by Jose F. Restrepo-Hernandez, McGill University, December 2010.
52. External Examiner of PhD thesis "Steady state and transient stability analysis of electrical grids with AC/AC based FACTS devices embedded" by Juan Miguel Gonzalez, CINVESTAV, Guadalajara, Mexico, June 11, 2010.
53. Examiner of PhD proposal "The Impact of Wind Generation Penetration on Electricity Markets" by Mohamed Hassan Ahmed, University of Waterloo, April 14, 2010.
54. External Examiner of PhD thesis "Improvement of Small-disturbance Stability by FACTS Devices" by Ilea Valentin, Politecnico di Milano, Italy, April 9, 2010.
55. External Examiner of PhD thesis "Application of Bifurcation Theory to Electric Power Systems" by Gustavo Revel (in Spanish), Universidad Nacional del Sur, Bahia Blanca, Argentina, March 25, 2010.

56. Member of the Examining Committee (Second supervisor) of Gregor Taljan's PhD thesis "The Use of Hydrogen in Electric Power Systems," University of Ljubljana, Ljubljana, Slovenia, December 17, 2009.
57. External Examiner of PhD thesis "Distribution System Planning by Means of Evolutionary Techniques" by Guillermo Jiménez (in Spanish), University of Chile, Santiago, Chile, December 7, 2009.
58. External Examiner of MEng thesis "Design and Implementation of Power System Stabilizers in Wind Farms" by Carlos Martinez, McGill University, Montreal, October 29, 2009.
59. Member of the Examining Committee of Hemantkumar Barot's PhD thesis "New Paradigms in Medium Term Operations and Planning of Power Systems Deregulation," University of Waterloo, September 17, 2009.
60. Member of the Examining Committee of Steven M. Wong's PhD thesis "Some Aspects of Distribution System Planning in the Context of Investments in Distributed Generation," University of Waterloo, August 20, 2009.
61. Examiner of PhD proposal "Multidisciplinary Optimization of Battery Electric and Hybrid Electric Vehicles" by Brian Su-Ming Fan, University of Waterloo, July 21, 2009.
62. Member of the Examining Committee of Seyed Masoud Barakati's PhD thesis "Modeling and Controller Design of a Wind Energy Conversion System Including a Matrix Converter," University of Waterloo, April 17, 2008.
63. Examiner of PhD proposal "On Some Aspects of Medium-term Operations and Planning of Power Systems in Deregulated Environment" by Hemantkumar Barot, University of Waterloo, August 2007.
64. Examiner of PhD proposal "Sustainable Distribution System Planning Amidst Deregulation" by Steven M. Wong, University of Waterloo, April 2007.
65. External Examiner of PhD thesis "Determination of Transient Stability Boundary in Functional Form with Application in Optimal Power Flow and Security Control" by Bathiya Jayasekara, University of Manitoba, Winnipeg, December 1, 2006.
66. External Examiner of PhD thesis "Use of FACTS Devices for Power Flow Control and Damping of Oscillations in Power Systems" by Rusejla Sadikovic, Swiss Institute of Technology (ETH), Zurich, Switzerland, July 7, 2006.
67. External Examiner of PhD thesis "On-line Evaluation of Dynamic Security of Power Systems" by Juan Manuel Giménez (in Spanish), Universidad de San Juan, Argentina, April 2006.
68. Examiner of PhD proposal "Control of Wind Turbine Generation System Based on Matrix Converter" by Seyed Masoud Barakati, University of Waterloo, May 18, 2005.
69. Reader of MAsC thesis "Market Design, Optimal Procurement and Pricing of Frequency Regulation 2003 and Spinning Reserve Services" by Haidan Zhao, University of Waterloo, July 2005.
70. External Examiner (Opponent) of PhD thesis by Adrian Andreoiu, Chalmers University of Technology, Gothenburg, Sweden, June 4, 2004.
71. Member of the Examining Committee of Jianwei Liu's PhD thesis "A Study of Distributed Energy Sources and RF Triggered HTS Current Switch," University of Waterloo, January 23, 2004.
72. Reader of MAsC thesis "An Economic Analysis of a Competitive Electricity Market" by Feng Ding, University of Waterloo, October 2003.
73. Member of the Examining Committee of Alberto Del Rosso's PhD thesis "Strategies for the Improvement of Power System Dynamic Security" (in Spanish), Universidad de San Juan, Argentina, August 3, 2001.
74. Reader of MAsC thesis "Development of a High-performance Photovoltaic Grid-connected Inverter" by Ghodrattollah Esmaeili Rineh, University of Waterloo, May 2001.
75. Member of the Examining Committee of Kannan Sreenivasachar's PhD thesis "Unified Power Flow Controller: Modeling, Stability Analysis, Control Strategy and Control System Design," University of Waterloo, April 27, 2001.
76. Member of the Examining Committee of Ahmed Gaouda's PhD thesis "Wavelet-automated Recognition System for Power Quality Monitoring," University of Waterloo, April 27, 2001.
77. Examiner of PhD proposal "Synchronous Real and Reactive Power Compensation with Superconducting Magnetic Energy Storage (SMES) for Voltage Sag Mitigation" by Jianwei Liu, University of Waterloo, April 18, 2001.

78. External reviewer of MEng thesis “Stochastic Pool-based Power Market Simulator” by Cheon Wei Chua, McGill, Montreal, December 2000.
79. Member of the Examining Committee of Marcelino Madrigal’s PhD thesis “Optimization Models and Techniques for Implementation and Pricing of Electricity Markets,” University of Waterloo, December 2000.
80. Member of the Examining Committee of Eduardo Enrique’s PhD thesis “Mathematical Models Based on Spline Functions for Industrial Applications,” University of Waterloo, December 2000.
81. External Reviewer of PhD thesis by Awad Ibraik Ibrahim, University of British Columbia, September 2000.
82. External Reviewer of PhD thesis “Advanced Methods for Small Signal Stability Analysis and Control in Modern Power Systems” by Zhao Yang Dong, University of Sydney, Australia, December 1998.
83. Examiner of PhD proposal “Resource Scheduling for Electricity Markets” by Marcelino Madrigal, University of Waterloo, December 1998.
84. Member of the Examining Committee of Geraldo Torres’ PhD thesis: “Nonlinear Optimal Power Flow by Interior and Non-interior Point Methods,” University of Waterloo, November 1998.
85. Examiner of PhD proposal “Approximation by Spline Functions for Industrial Processes: Modeling and Control” by Eduardo Enrique, University of Waterloo, April 1998.
86. Member of the Examining Committee of Wael Abdel-Fattah Farag’s PhD thesis: “Synthesis of Intelligent Hybrid Systems for Modeling and Control,” University of Waterloo, April 1998.
87. Examiner of PhD proposal “Approximation by Spline Functions for Industrial Processes: Modeling and Control” by Eduardo Enrique, University of Waterloo, April 1998.
88. Examiner of PhD proposal “Automated Recognition System for Power Quality Monitoring” by Ahmned Gaouda, University of Waterloo, April 1998.
89. Member of the Examining Committee of Xihui Yan’s PhD thesis: “Infeasible Primal-dual Interior Point Algorithms for Solving Optimal Power Flow Problems,” University of Waterloo, April 1997.
90. Reader of MASc thesis “EMTP Modeling of Static Compensators for Voltage Sag Studies” by Ian J. McIntyre, University of Waterloo, April 1997.
91. Member of the Examining Committee of Andre Plaisant’s PhD thesis: “Active Filtering of AC Harmonics for HVDC Converters,” University of Waterloo, December 1996.
92. Reader of MASc thesis “PSpice Model of and Electric Vehicle” by Radu Ionele, University of Waterloo, December 1996.
93. Reader of MASc thesis “Motor Optimization in a PV-array System Using PSpice Simulation” by Najeeb Bohio, University of Waterloo, August 1996.
94. Examiner of PhD proposal “Dynamic Performance of a Unified Power Flow Controller—A Fuzzy Logic Based Approach” by Kannan Sreenivasachar, University of Waterloo, August 1996.
95. Reader of MASc thesis “Digital Controller Representation in EMTP for FACTS Transient Studies” by Leon D. Voss, University of Waterloo, April 1996.
96. Examiner of PhD proposal “Direct Solution of the Optimal Power Flow in Rectangular Form via a Logarithmic Barrier Interior Point Method” by Geraldo L. Torres, University of Waterloo, April 1996.
97. Reader of MASc thesis “Aspects of Power Transfer Stability of DC Links Terminating at AC System Locations Having Low Short Circuit Capacities” by Edvina Uzunovic, University of Waterloo, June 1995.
98. Reader of MASc thesis “Sensitivity Analysis for Compensator Placement in Power Systems” by Eduardo H. Enrique, University of Waterloo, 1994.
99. Examiner of PhD proposal “Computer Simulation of Integrated AC Power Systems Including FACTS Devices” by Mansour R. Sultan, University of Waterloo, 1994.

f. Others:

- Leading the set up and implementation, with the financial support of Hydro One Inc. (\$500,000 for 7 years), of an on-line graduate program at the University of Waterloo for Power Engineering professionals and scholarships for undergraduate students considering power engineering courses and research; September 2003-August 2010.

- Collaboration on the restructuring of GENE-123 and ME-269 for the Mechanical Engineering Department.
- Introduction of several computational tools in all undergraduate and graduate courses taught.
- Introduction of computer delivered tutorials and simulations in ME-123, ME-269, E&CE-261 and E&CE-362.
- Worked in an overhaul of the Machines Lab. Applied and obtained funding from Faculty (Academic Development Funds), E&CE Department (Rockwell and Dept. funds) and students (WEEF) for an approximate total amount of \$58,000 CD to buy new equipment for this Lab.
- Class Prof. for the 2006-2011, 1994-1999 Electrical Engineering classes.

4. PROFESSIONAL ACTIVITIES AND SERVICES

a. Societies, Journals and Conferences:

- Editor in Chief, IEEE Transactions on Smart Grid, January 2020-December 2024.
- Member of the IEEE-PES Awards Committee, August 2019-today.
- Chair of the IEEE-PES Electrification Magazine Steering Committee, April 2019-today.
- Member of the IEEE-PES Lifetime Achievement Award Committee, March 2019-today.
- Past-Chair of the IEEE-PES Power System Dynamics Committee, January 2019-today.
- Editor and Lead of IEEE Smart Grid Technical Activities Committee's white paper "Microgrids: Utility Challenges and Opportunities," August 2018-today.
- Chair of IEEE-PES Task Force "Microgrid Dynamic Modeling," IEEE-PES Power System Stability Subcommittee, August 2018-today.
- Liaison between IEEE-PES Technical Council and New Product Development (NDP) Committee, August 2018-August 2019.
- Editor in Chief, IEEE Proceedings Special Issue "Electricity for All: Access to Electricity Issues and Solutions for Energy-disadvantaged Communities," June 2018-September 2019.
- Member of the IEEE-PES Outstanding Power Engineering Educator Award (OPEEA) Selection Committee, August 2017-today.
- Invited Member of the IEEE-PES Power System Dynamic Performance Committee Task Force on "Stability definitions and characterization of dynamic behavior in systems with high penetration of power electronic interfaced technologies," June 2017-today.
- Member of the IEEE Industrial Electronics Society Fellow Evaluation Committee, May 2017-today.
- Director of the Applied Science and Engineering Division of the RSC Academy of Science, January 2017-today.
- Chair of the IEEE-PES Power System Dynamics Committee, January 2017-December 2018.
- Member of the IEEE-PES NPD Committee, December 2016-today.
- Technical Program Chair of IEEE PES Innovative Smart Grid Technologies (ISGT) Latin America, September 2016-September 2017.
- Member of the International Program Committee for the 2017 IEEE PowerTech Conference in Manchester, UK, August 2016-June 2017.
- Member of the Editorial Board of the IEEE Proceedings, January 2016-today.
- Member of the New Fellow Selection Committee of the RSC Academy of Science, October 2015-December 2016.
- Member of the Research Steering Committee of the NSERC Energy Storage Technology (NEST) Network, September 2015-today.
- Vice-Chair of the IEEE-PES Power System Dynamics Committee, January 2015-December 2016.
- Co-Chair of IEEE-PES Task Force "Microgrid Stability Analysis and Modeling," IEEE-PES Power System Stability Subcommittee, July 2014-August 2018.

- Fellow of the Canadian Academy of Engineering (CAE) since June 2013.
- Secretary of the IEEE-PES Power System Dynamics Committee, January 2013-December 2014.
- Fellow of the Royal Society of Canada (RSC) since November 2012.
- Associate Editor, IEEE Transactions on Smart Grid, February 2012-December 2014.
- Member of the Technical Program Committee for the IEEE Innovative Smart Grid Technologies (ISGT) Conference, University of Manchester, Manchester, UK, March-December 2011.
- Associate Editor, IEEE Transactions on Industrial Electronics, January 2011-Novemeber 2012.
- Chair of IEEE-PES Task Force “Microgrid Control,” IEEE-PES Power System Stability Controls Subcommittee, June 2010-July 2014.
- Member of the Advisory Committee for the IEEE Innovative Smart Grid Technologies (ISGT) Conference, Chalmers University of Technology, Gothenburg, Sweden, April-October 2010.
- Member of Technical Committee of the 5th CIGRE Canada Conference, March-October 2010.
- Member of the International Program Committee for the 2011 IEEE PowerTech Conference in Trondheim, Norway, January 2010-June 2011.
- Guest Editor for the IEEE Transactions on Industrial Electronics Special Issue on “Methods and Systems for Smart Grids Optimization”, November 2009-January 2011.
- Member of Technical Committee of the 4th CIGRE Canada Conference, October 2008-October 2009.
- Associate Editor of the journal Optimization and Engineering (OPTE), May 2008-April 2009.
- Member of the Board of Directors of the International Institute for Research and Education in Power System Dynamics (IREP), October 2007-today.
- Member of the International Program Committee for the 2009 IEEE PowerTech Conference in Bucharest, Romania, November 2007-June 2009.
- Chair of the IEEE-PES Power Systems Stability Controls Subcommittee, July 2007-December 2011.
- Member of the Editorial Board of the European Transactions on Electrical Power (ETEP), March 2007-today.
- IEEE Fellow since January 2007.
- Member of the Technical Programme Committee for the IREP’s 2007 VII Bulk Power Systems Dynamics and Control Symposium, Nov. 2006-August 2007.
- Secretary of the IEEE-PES Power Systems Stability Controls Subcommittee, July 2006-July 2007.
- Member of the Editorial Advisory Board of the International Journal Electrical Engineering Education, August 2005-July 2017.
- Chair of IEEE-PES Task Force “Impact of Industry Restructuring on System Dynamic Performance,” Power System Stability Subcommittee, June 2005-July 2010.
- Member of the International Program Committee for the 2005 IASTED Power and Energy Systems (PES) conference, January-October 2005.
- Associate Editor of IEEE-PES Transactions Letters, August 2004-today.
- Member of Advisory Committee for 2004 conference “Electric Supply Industry in Transition: Issues and Prospects for Asia,” Asian Institute of Technology (AIT), Bangkok, January 2004.

- Member of the Editorial Board of the International Journal of Emerging Electric Power Systems, December 2003-September 2007.
- Member of the Technical Programme Committee for the IREP's 2004 VI Bulk Power Systems Dynamics and Control Symposium, Nov. 2003-August 2004.
- Member of the Technical Programme Committee for the 2005 Power System Computation Conference (PSCC), May 2003-July 2005.
- Member of the Editorial Advisory Panel of the Electric Power Systems Research journal, August 2001-today.
- Member of the Technical Programme Committee for the 2002 Power System Computation Conference (PSCC), December 2000-July 2002.
- Senior member of the IEEE November 2000-December 2006.
- Chair of the North American Power Symposium (NAPS) 2000, University of Waterloo, October 1999-October 2000.
- Member of the IEEE-PES Power System Dynamic Performance Committee, June 1998-today.
- Member of the IEEE/CIGRE Task Force on Power System Stability Terms, Definitions and Classifications, February 1998-December 2003.
- Chair of the Voltage Stability Focus Group of the IEEE-PES Power System Stability Subcommittee February 1997-January 2002. Organizer and Chair of several panel sessions at the IEEE-PES Summer and Winter Meetings.
- Member of the IEEE-PES Power System Stability Subcommittee, January 1997-today.
- Member of the IEEE-PES Power System Stability Controls Subcommittee, January 1997-today.
- Registered Professional Engineer in the Province of Ontario since September 1, 1995.
- Secretary of the IEEE-PES Voltage Stability and Long Term Stability Working Group, July 1994-January 1997.
- CIGRE Member since 1994. Contributor to Task Force 38.01.12 report on "Criteria and Countermeasures for Voltage Collapse," and to Task Force 38.02.23 report "Coordinated Voltage Control in Transmission Networks".
- IEEE Member since 1991.
- Sigma Xi Member 1991-2002.
- IEEE Student Member 1986-1991.

b. Refereeing:

- Member of the College of Reviewers for MITACS/MPRIME, December 2007-today.
- Member of the College of Reviewers for CFI's Leaders Opportunity Fund (LOF), October 2005-today.
- Reviewer of grant proposals for the Qatar National Research Fund since 2007.
- Reviewer of grant proposals for the Italian Ministry for University and Research since 1998.
- Member of Review Panel for Mechatronic Systems Engineering Program, Simon Fraser University, March 8 -9, 2017.
- Member of the Ontario Research Fund (ORF) ICT Panel, June 2016.

- Chair of International Scientific Review Committee of Department of Electrical Engineering, University of Chile, Santiago, October 5-7, 2015.
- Member of Review Panel for Graduate Program, Electrical and Computer Engineering, Ryerson University, February 23-24, 2015.
- Member of Review Panel for BTech Energy Engineering Technology Degree Completion Program, McMaster University, March 27 -28, 2014.
- Member of NSERC IRC Review Panel, Echole Politechnique, Montreal, February 5-6, 2014.
- Member of an NSF Review Panel, Washington, DC, US, October 22-23, 2007.
- Member of an NSF Review Panel, Washington, DC, US, May 22-23, 2006.
- Chair of the Ontario Graduate Scholarship (OGS) panel 17, 2005.
- Member of the Ontario Graduate Scholarship (OGS) panel 13, 2004.
- Member of the Ontario Graduate Scholarship (OGS) panel 8, 1998.
- Chair of the Ontario Graduate Scholarship (OGS) panel 6, 1997.
- Reviewer of grant proposals for NSERC since 1996.
- Referee of promotions and tenure cases from various universities around the world.
- Regular reviewer for various journals and conferences, notably: IEEE Transactions on Power Systems, Power Delivery and Circuits and Systems; IET Journal (formerly IEE Proceedings) Generation, Transmission & Distribution; International Journal of Electrical Power & Energy Systems; Electric Power Research; Power System Computation Conference (PSCC); IEEE Conference on Decision and Control (CDC); North American Power Symposium (NAPS); Intelligent System Application to Power Systems Conference (ISAP); Power Industry Computer Applications (PICA); International Symposium on Circuits and Systems (ISCAS); IEEE Power Tech conference.

c. Department Service:

- Member of the Annual Merit Committee, January-February 2019.
- Member of the Canada Research Chair (CRC) Advisory Committee, February 2018-June 2020.
- Member of the Graduate Studies Working Group, June 2018-today.
- Member of MTE-Power DACA, February-November 2017.
- E&CE Rep to EFC, January 2016-December 2017.
- EFC Nominations Committee, January 2016-December 2017.
- Member of Annual Merit Committee, January-February 2016.
- Associate Chair for Research, September 2015-August 2016.
- Member of Annual Merit Committee, January-February 2015.
- Member of the Department Tenure and Promotions Committee (DTPC), June 2012-April 2016.
- Member of Dept. Administrative Officer Hiring Committee, December 2011-May 2012.
- Member of Dept. Merit Addendum Review Task Force, September-November 2011.
- Member of the Vision 2015 Research Committee, December 2010-July 2011.

- Member of Annual Merit Committee, January-February 2009.
- Member of DACA II, October 2008-July 2015.
- Member of the Restructuring Task Force, October 2008-April 2009.
- Graduate Studies Committee: Member, October 2005-August 2006, September 1995-August 1999; Chair, September 2000-January 2003; Ex-officio February 2003-August 2004.
- Member of the ATC MEng Power Program Steering Committee, October 2004-August 2006.
- Acting Chair, July 2004-August 2004.
- Member of the Nanotech Program Committee, February 2003-August 2004. Organizer of a special Nanotech workshop in May 2003 with high profile invited speakers, as well as taking charge of the proposed program website.
- Member of Department hiring committee (DACA), February 2003-August 2004.
- Deputy Chair, February 2003-June 2004.
- Member of the Merit Committee, January 2001-August 2004.
- Member of the Department Program Committee (DPC), September 2000-August 2004.
- Associate Chair of Graduate Studies, September 2000-January 2003.
- Member of the Lecturer hiring committee (Lecturer DACA), September 2000-August 2002.
- Member of the Chair Selection Committee, October 2000-January 2001.
- Secretary of CSC hiring committee (DACA), February-August 1999.
- Co-organizer and co-chair of E&CE Retreat, February-April 1999.
- Member of the Tenure Committee, July 1998-August 1999.
- Member of the Resource Committee, June 1998-August 1999, September 2000-August 2004.
- Member of the Program Management Task Force, February-March 1998.
- Member of the Future Directions Task Committee (FDTC), July-August 1997.
- Secretary of the hiring committee (DACA D) for the Power Electronics area, February 1996-April 1997.
- Secretary of the Power Systems Research Group, September 1995-August 1999.

d. University and Faculty Service:

- Member of the Faculty of Engineering Dean Nomination Committee, June 2019-today.
- Climate and Energy Action Plan Advisor, May 2018-today.
- Senator, May 2017-April 2020.
- Member of the Senate Nominating Committee for Honorary Degrees, May 2018-April 2019.
- Associated Director of the Waterloo Institute for Sustainable Energy (WISE), September 2008-August 2015.
- Internal Member of Committee for the Review of the Department of Recreation and Leisure Studies Undergraduate and Graduate Programs, January-March 2012.

- Faculty of Engineering Nominations Committee, January 2009- December 2010.
- E&CE Representative to the Engineering Faculty Council, January 1996-December 1997, and January 2002-December 2003, January 2009- December 2010.
- FOE Graduate Studies Committee member, September 2000-January 2003.
- Member of the Faculty of Engineering Dean Nomination Committee, April 2002-September 2002.
- Member of FOE Graduate Task Force, November 2000-January 2001.
- Member of the Engineering PhD Admission Subcommittee A, September 1996-December 1997.
- Member of the Engineering First Year Council, September 1996-August 1999.
- Mentor for TA Workshop, September 1995.
- Member of the Advisory Committee for the students' CCSE conference at Waterloo, January 1996.
- Judge for Sandford Fleming Debates since January 1995.
- Power Systems Department Chair, Escuela Politécnica Nacional, Quito-Ecuador, January 1993-August 1993.

e. Other:

- Member of the Technical Advisory Board of Bluewave-ai, Ottawa, Canada, January 2019-today.
- Member of the Transitional Advisory Committee of Alectra's Green Energy and Technology (GRE&T) Centre, Guelph, Canada, May 2018-April 2019.
- Member of the Board of Advisors of NRGGen Inc., Toronto, Canada, June 2003-November 2005.
- Timer for the Region of Waterloo swimming meets September 1996-June 2002.
- Coach for the Waterloo Minor Soccer League: May 1994-August 1997.