RESUME

Patricio Andrés Mendoza Araya

Contact Information

Current position:	Assistant Professor, full-time Departamento de Ingeniería Eléctrica Universidad de Chile
Address:	Avenida Tupper 2007, Of. 410 Santiago, Chile
Office phone:	+56 (2) 2978-4768
Mobile phone:	+56 (9) 7822-7574
Email:	pmendoza@ing.uchile.cl

Education

2008-2014	Ph.D. Electrical Engineering, University of Wisconsin-Madison.
2001-2007	Electrical Engineer (P.E.), University of Chile, Santiago, Chile.
2001-2004	Bachelor of Science, University of Chile, Santiago, Chile.

Research Experience

2015-	Researcher at the *Solar Energy Research Center* (SERC-Chile). Participation in research line 5: "Power electronics and Energy Conversion".
2014-	Researcher at *Centro de Energía* at the University of Chile. Participation in several projects and academic coordinator. Current research topics include microgrid stability, microgrid protection, isolated and grid-connected microgrids, among others.
2008-2014	Research assistant at *WEMPEC*, working on renewable energy topics. Main work focused on small hydro generation technologies, substation equipment (capacitor switching, load tap changer), and microgrid technologies (static switch, wireless communications, stability).
2007	Team member of the *Eolian* project, for the competition on the solar car race Panasonic World Solar Challenge - Australia 2007. Joint project of the University of Chile, ENAER and Conecta.

Teaching Experience

- Lecturer, EL4001, "Energy Conversion and systems", University of Chile, since 2018
- Lecturer, EL7045, "Microgrids and distributed generation", University of Chile, since 2014
- Lecturer, EL5203, "Energy Systems Laboratory", University of Chile, since 2014.
- Lecturer, EL3003, "Electrical Engineering Laboratory", University of Chile, 2014-2019.
- Lecturer, EL4001, "Electromechanical energy conversion", University of Chile, 2016.
- Teaching assistant, ECE712, "Solid State Power Conversion", UW-Madison, 2010.

Publications

Journals

- Fernando J. Lanas, Francisco J. Martínez-Conde, Diego Alvarado, Rodrigo Moreno, Patricio Mendoza-Araya, and Guillermo Jiménez-Estévez. Non-strategic capacity withholding from distributed energy storage within microgrids providing energy and reserve services. Energies, 13(19):5235, Oct 2020.
- M. Farrokhabadi et al., "Microgrid Stability Definitions, Analysis, and Examples," in IEEE Transactions on Power Systems, vol. 35, no. 1, pp. 13-29, Jan. 2020.
- Oscar Núñez-Mata, Rodrigo Palma-Behnke, Felipe Valencia, Alexander Urrutia-Molina, Patricio Mendoza-Araya, and Guillermo Jiménez-Estévez. Coupling an adaptive protection system with an energy management system for microgrids. The Electricity Journal, 32(10):106675, 2019.
- Rodrigo Palma-Behnke; Guillermo A. Jiménez-Estévez; Doris Sáez; Marcia Montedonico; Patricio Mendoza-Araya; Roberto Hernández; Carlos Muñoz Poblete, "Lowering Electricity Access Barriers by Means of Participative Processes Applied to Microgrid Solutions: The Chilean Case," in Proceedings of the IEEE, vol. 107, no. 9, pp. 1857-1871, Sept. 2019.
- Núñez-Mata, O.; Palma-Behnke, R.; Valencia, F.; Mendoza-Araya, P.; Jiménez-Estévez, G.; “Adaptive Protection System for Microgrids Based on a Robust Optimization Strategy,” Energies, vol. 11, no. 2, p. 308, 2018.
- P. Mendoza-Araya, G. Venkataramanan, “Stability analysis of AC Microgrids using incremental phasor impedance matching,” Electric Power Components and Systems, vol. 43, iss. 4, pp.473-484, 2015.
- J. Merino, P. Mendoza-Araya, G. Venkataramanan and M. Baysal, "Islanding Detection in Microgrids Using Harmonic Signatures," *IEEE Transactions on Power Delivery*, vol. 30, no. 5, pp. 2102-2109, Oct. 2015.
- Merino J., Mendoza-Araya P., Veganzones C., "State of the Art and Future Trends in Grid Codes Applicable to Isolated Electrical Systems," Energies, vol. 7 no. 12, pp.7936-7954, 2014.
- P. Mendoza-Araya, J. Munoz Castro, J. Cotos Nolasco, R.E. Palma-Behnke, “Lab-Scale TCR-Based SVC System for Educational and DG Applications”, IEEE Transactions on Power Systems, vol. 26 no. 1, Feb 2011.

Conferences

- Danny Alexander Espın Sarzosa, Cristian Retamal Vallejos, and Patricio Mendoza-Araya. Impact of battery aging model in an energy management system for an isolated solar microgrid. In Proceedings of the ISES Solar World Congress 2019. International Solar Energy Society, 2019.
- B. Blanco-Contreras, J. Meneses-Silva, P. Mendoza-Araya, and G. Jiménez-Estévez. Effect of constant power load models on the stability of isolated microgrids. In 2019 IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), pages 1–6, Nov 2019.
- M. Montes-Parra, J. García-Hernández, J. Gordillo-Sierra, G. Jiménez-Estévez, and P. Mendoza-Araya. Microgrid energy management system optimization using game theory. In 2019 IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), pages 1–7, Nov 2019.
- D. Rivera, J. Ponce, C. Carvallo, P. Mendoza-Araya, and G. Jiménez-Estévez. Communication-based fault location, isolation, and service restoration for microgrids. In 2019 IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), pages 1–6, Nov 2019.

- C. D. B. Rodríguez, J. A. J. Segura, M. C. C. Ruiz, G. A. J. Estevez, and P. A. M. Araya. Evaluating the impact of a v2g scheme on the demand curve. In 2019 IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), pages 1–6, Nov 2019.
- T. Roje, A. Navas, M. Urrutia, P. Mendoza-Araya, and G. Jiménez-Estévez. Advanced lead-acid battery models for the state-of-charge estimation in an isolated microgrid. In 2019 IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), pages 1–6, Nov 2019.
- N. Mira-Gebauer and P. Mendoza-Araya. Microgrid small-signal impedance characterization considering droop controlled inverters. In 2019 IEEE Power Energy Society General Meeting (PESGM), pages 1–5, Aug 2019.
- O. Nuñez-Mata, R. Palma-Behnke, and P. Mendoza-Araya. Robust coordination of overcurrent and undervoltage protection devices for microgrids. In 2018 IEEE 38th Central America and Panama Convention (CONCAPAN XXXVIII), pages 1–6, Nov 2018.
- P. Ramirez-Del-Barrio, P. Mendoza-Araya, F. Valencia, G. León, L. Cornejo-Ponce, M. Montedonico, G. Jiménez-Estévez, "Sustainable development through the use of solar energy for productive processes: The Ayllu Solar Project," 2017 IEEE Global Humanitarian Technology Conference (GHTC), San Jose, CA, USA, 2017, pp. 1-8.
- J. Diego Jiménez, S. M. Vives, E. G. Jiménez and A. P. Mendoza, "Development of a methodology for planning and design of microgrids for rural electrification," 2017 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), Pucon, Chile, 2017, pp. 1-6.
- O. Nuñez-Mata, P. González-Inostroza, P. Mendoza-Araya and G. Jiménez-Estévez, "Development of a microgrid protection laboratory experiment for the study of overcurrent and undervoltage functions," 2017 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), Pucon, Chile, 2017, pp. 1-6.
- N. F. Mira-Gebauer, E. F. Rojo-Olea and P. A. Mendoza-Araya, "Induction machine small-signal impedance for stability studies using dynamic phasor modeling," 2017 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), Pucon, Chile, 2017, pp. 1-6.
- C. Sepulveda, R. Moreno and P. Mendoza-Araya, "Combined economic and stability analysis of a microgrid: A co-optimisation approach," 2017 IEEE Manchester PowerTech, Manchester, 2017, pp. 1-5.
- P. Ramírez-Del-Barrio, F. Valencia, A. Marconi-Vargas, I. Polanco-Lobos and P. Mendoza-Araya, "An alpaca fiber processing solution based on Solar energy for an isolated location in Chile following a co-construction approach," 2017 IEEE Mexican Humanitarian Technology Conference (MHTC), Puebla, Mexico, 2017, pp. 130-136.
- R. Sandoval and P. A. Mendoza-Araya, "Impacts of using microwave oven transformers on micropower distribution grids," 2016 IEEE Global Humanitarian Technology Conference (GHTC), Seattle, WA, USA, 2016, pp. 495-501.
- O. Núñez, F. Valencia, P. Mendoza-Araya, R. Palma-Behnke, G. Jiménez and J. Cotos, "Microgrids protection schemes," 2015 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), Santiago, 2015, pp. 597-602.
- Mendoza-Araya, P.A.; Venkataramanan, G., "Dynamic phasor models for AC microgrids stability studies," 2014 IEEE Energy Conversion Congress and Exposition (ECCE), pp.3363-3370, 14-18 Sept. 2014.
- Mendoza-Araya, P.A.; Venkataramanan, G., "Impedance matching based stability criteria for AC

microgrids," 2014 IEEE Energy Conversion Congress and Exposition (ECCE), pp.1558-1565, 14-18 Sept. 2014.

- John, M.; Mendoza-Araya, P.A.; Venkataramanan, G., "Small signal impedance measurement in droop controlled AC microgrids," 2014 IEEE Energy Conversion Congress and Exposition (ECCE), pp.702-709, 14-18 Sept. 2014.
- P.A. Mendoza-Araya, P.J. Kollmeyer, D.C. Ludois, "V2G integration and experimental demonstration on a lab-scale microgrid," 2013 IEEE Energy Conversion Congress and Exposition (ECCE), pp.5165,5172, 15-19 Sept. 2013
- D. Ludois, J. Lee, P. Mendoza, G. Venkataramanan, “Reuse of Post-Consumer E-Waste for Low Cost Micropower Distribution”, 2011 IEEE Global Humanitarian Technology Conference (GHTC), pp.137-142, Oct. 30 2011-Nov. 1 2011.

Reviewer experience

- Guest Editor of IEEE Transactions on Smart Grid.
- IEEE Journals such as IEEE Trans. on Transportation Electrification, IEEE Trans. on Sustainable Energy, Journal of Emerging and Selected Topics in Power Electronics, IEEE Trans. on Energy Conversion, and IEEE Power and Energy Technology Systems Journal.
- IEEE Conferences such as IEEE PES GM, IEEE ISGT, IEEE ICIT, among others.
- Other journals such as IET Generation, Transmission & Distribution, European Transactions on Electrical Power (Wiley), Sustainable Energy, Grids and Networks (Elsevier), among others.
- Other conferences such as ISES Solar World Congress, INGELECTRA (Chile), among others.

Research projects/Grants

- Fondecyt 1181928, “Resilient Network Operation and Planning against Multiple Natural Hazards”, 2018-2022 (Co-PI)
- Programa de Cooperación Internacional, CONICYT, REDI170224, “Red de investigación de sistemas de energía de pequeña escala (RISEPE)”, 2017. (PI)
- U-Inicia Project UI0010/15, “Evaluación de la estabilidad de micro-redes mediante análisis de impedancia de pequeña señal”, 2015. (PI)
- EPRI Project 1017756, “Matrix Switch Solid State Load Tap Changers , A Design Study”, P.I.: Giri Venkataramanan, 2009. (Project Engineer)
- EPRI Project 1015948, “Advanced Power Electronics Controllers for Substations, Challenges and Solutions”, P.I.: Giri Venkataramanan, 2008. (Project Engineer)

Research stays

2019 Institute for Drive Systems and Power Electronics (IAL), Leibniz Universität Hannover, Germany. As part of the project REDI170224, a research stay was carried out with the purpose of developing appropriate demand models applicable to microgrids. The incorporation of demand side management strategies, along with their models, contribute to the understanding of flexibility in small scale energy systems.

2018 Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC), University of Wisconsin-Madison. As part of the project REDI170224, a research stay was carried out with the purpose of validating small scale energy system design methodologies through experiments in a laboratory environment with power electronics and hardware in the loop technologies.

2015 Institute for Drive Systems and Power Electronics (IAL), Leibniz Universität Hannover, Germany. The research stay comprised the development of suitable simulation and hardware-in-the-loop models for power systems, which are further used for microgrids and renewable energy evaluation, including stability analysis. Also, an evaluation of several cooperation opportunities between IAL and the Electrical Engineering department of the University of Chile was carried out. This research stay was part of the Green Talents program.

Awards

2014 Awardee of “Green Talents 2014”. A high-ranking jury of experts selected 25 ‘green’ visionaries out of over 800 applicants from more than 100 countries. The awardees participated in the two-week “Green Talents – International Forum for High Potentials in Sustainable Development”, during which they visited top locations for sustainability research in Germany.

2011 Winner of the IEEE Distinguished Student Humanitarian Prize, of the 2011 IEEE Presidents’ Change the World competition, which recognizes the development of a unique solution to a real world problem using engineering, science, computing and leadership skills to benefit humanity.

2010 “100 Jóvenes Líderes”, Sábado magazine (El Mercurio) and Centro de Liderazgo estratégico, University Adolfo Ibañez, which is awarded to young entrepreneurs who demonstrate leadership skills.

2010 Winner of Grand Prize of the Climate Leadership Challenge run by the Nelson Institute’s Center for Sustainability and the Global Environment (SAGE) at the University of Wisconsin-Madison.

2008 “Roberto Ovalle Aguirre” Award, Instituto de Ingenieros de Chile, which recognizes the best thesis project related to the development of a national industry.

2007 Student with rank 1/540 on the School of Engineering, Univ. of Chile.

2001-2006 Outstanding student of the School of Engineering, Univ. of Chile.

2005 Winner of Grand Prize of Chilean Students Car Race “Fórmula-i”, with electrical vehicle “Cuetazo RC”.