DORIS SÁEZ HUEICHAPAN

Full Professor, Department of Electrical Engineering, University of Chile
Date and Place of Birth: July 26th, 1971, Chile
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EDUCATION

- Doctor in Engineering Sciences, Pontificia Universidad Católica de Chile, December 2000.
- Master in Engineering Sciences, Pontificia Universidad Católica de Chile, August 1995.
- Civil Engineering, Mayor in Electrical Engineering, Pontificia Universidad Católica de Chile, August 1995.
- Bachelor in Engineering Sciences, Pontificia Universidad Católica de Chile, March 1993.

POSITIONS

2018 - Date	Full Professor, Department of Electrical Engineering, University of Chile.
2019 - Date	Founding Member, Sub-directorate of Indigenous People, Faculty of Mathematical and Physical Sciences, University of Chile.
2010 - 2018	Associate Professor, Department of Electrical Engineering, University of Chile.
2003 - 2010	Assistant Professor, Department of Electrical Engineering, University of Chile.
1997 - Date	Faculty Member, Department of Electrical Engineering, University of Chile.

JOURNAL ASSOCIATE EDITOR

2022- Date	Associate Editor *IEEE Electrification Magazine*
2020- 2022	Associate Editor *IEEE Transactions on Smart Grid*
2017 - 2020	Associate Editor *IEEE Control Systems Magazine*
2011 - 2019	Associate Editor *IEEE Transactions on Fuzzy Systems*
2012-2013	Associate Editor *Soft Computing*

AWARDS

2025	Top 10 in World's Best Electronics and Electrical Engineering Scientists: H-Index Electronics and Electrical Engineering Science Ranking in Chile 2025 | Research.com and Top 20 in the topic ranking EMS Top Scholars by Expertise | ScholarGPS
2022	In the ranking stanford's list world top 2% scientists, November 2022.
2018	Outstanding Woman in Energy, Ministry of Energy, March 2018.
2018	Recognition of 10 outstanding UC female engineers, Pontificia Universidad Católica de Chile, November 2018.
2009	MGA-IEEE Achievement Award. For increasing member engagement by implementing and developing an IEEE National Distinguished Lecturer Program in Chile, November 2009.

PARTICIPATION IN SCIENTIFIC SOCIETIES

2011 - 2013	Chair of Chilean Chapter IEEE Computational Intelligence Society.
2009 - 2010	Vice-Chair of IEEE Chile Section.
2007 - 2008	Chair of IEEE Chile Section.
2008	Member of Ad Hoc Committee on IEEE as a Model Global Association.
2005 - Date	Senior Member IEEE.

PUBLICATIONS

- **BOOKS & BOOKS CHAPTERS**

[1] Universidad de Chile, “Cien propuestas para el país que queremos,” co-author of chapter “Medioambiente, cambio climático y biodiversidad”, 2021, doi: 10.34720/5H56-4676.

[2] Núñez, A., **Sáez, D.**, Cortés, C. “Hybrid Predictive Control for Dynamic Transport Problems”, Springer-Verlag London, Series Advances in Industrial Control, England, 2013, 172 Pages, ISBN-10: 1447143507 | ISBN-13: 978-1447143505.

[3] **Sáez, D.**, Cipriano, A. “Supervisory Predictive Control of a Combined Cycle Thermal Power Plant”, Book Chapter “Thermal power plant simulation, monitor and control”, Edited by D. Flynn; IEE, The Institution of Electrical Engineering, 2003, United Kingdom, pp. 161-178, ISBN: 0 85296 419 6.

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- **ISI JOURNAL ARTICLES**

[1] R. Canessa, R. Santibañez, C. Ahumada, P. Mendoza-Araya, O. Cartagena and **D. Sáez**, "Renewable Energies Integration in Electrification for Chilean Smartports—Challenges and Case Study," in IEEE Access, vol. 13, pp. 94437-94452, 2025, doi: 10.1109/ACCESS.2025.3574632.

[2] C. Ahumada, L. Tarisciotti, D. Sepúlveda and **D. Sáez**, "Torsional Vibrations Reduction in More Electric Ships Propellers Using Model Predictive Control," in IEEE Transactions on Industry Applications, 2024, doi: 10.1109/TIA.2024.3471974.

[3] O. Cartagena, F. Trovò, and **D. Sáez**, "A multivariate approach for fuzzy prediction interval design and its application for a climatization system forecasting," Expert Systems with Applications, vol. 255. Elsevier BV, p. 124715, Dec. 2024. doi: 10.1016/j.eswa.2024.124715.

[4] J. Ocaranza, **D. Sáez**, L. Daniele, and C. Ahumada, "Energy-water management system based on robust predictive control for open-field cultivation," Science of The Total Environment, vol. 946. Elsevier BV, p. 174241, Oct. 2024. doi: 10.1016/j.scitotenv.2024.174241.

[5] Morales, R., Marín. L., Roje, T., Caquilpan, V., **Sáez, D.**, Nuñez, A., Microgrid planning based on computational intelligence methods for rural communities: A case study in the José Painecura Mapuche community, Chile, Expert Systems with Applications, Volume 235, 2024, 121179, ISSN 0957-4174, https://doi.org/10.1016/j.eswa.2023.121179.

[6] O. Cartagena, F. Trovò, M. Roveri and **D. Sáez**, "Evolving Fuzzy Prediction Intervals in Nonstationary Environments," in IEEE Transactions on Emerging Topics in Computational Intelligence, vol. 8, no. 1, pp. 903-916, Feb. 2024, doi: 10.1109/TETCI.2023.3296486.

[7] S. Parra and **D. Sáez**, "Deep learning prediction intervals based on selective joint supervision," Applied Intelligence, vol. 53, no. 19. Springer Science and Business Media LLC, pp. 21706–21722, Jun. 09, 2023. doi: 10.1007/s10489-023-04610-8.

[8] R. A. Labra Mocarquer, C. Basáez Villagrán, **D. Sáez** Hueichapan, and C. Rodríguez-Seeger, "Piwkeyewün Project: Guidelines for the Co-design of Indigenous Technological Vegetable Cultivation Systems," Estudios Avanzados, no. 39. University of Santiago of Chile, pp. 145–169, Dec. 20, 2023. doi: 10.35588/estudav.v0i39.5731.

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[10] R. Bustos, L. G. Marín, A. Navas-Fonseca, L. Reyes-Chamorro, and **D. Sáez**, "Hierarchical energy management system for multi-microgrid coordination with demand-side management," Applied Energy, vol. 342. Elsevier BV, p. 121145, Jul. 2023. doi: 10.1016/j.apenergy.2023.121145.

[11] A. Navas-Fonseca, C. Burgos-Mellado, J. S. Gómez, E. Espina, J. Llanos, **D. Sáez**, M. Sumner, D. E. Olivares "Distributed predictive secondary control with soft constraints for optimal dispatch in hybrid AC/DC microgrids," in IEEE Transactions on Smart Grid, doi: 10.1109/TSG.2023.3261569.

[12] E. Espina, R. J. Cárdenas-Dobson, J. W. Simpson-Porco, M. Kazerani and **D. Sáez**, "A Consensus-Based Distributed Secondary Control Optimization Strategy for Hybrid Microgrids," in IEEE Transactions on Smart Grid, vol. 14, no. 6, pp. 4242-4255, Nov. 2023, doi: 10.1109/TSG.2023.3263107.

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[14] E. Rute-Luengo, A. Navas-Fonseca, J. Gómez, E. Espina, C. Burgos-Mellado, **D. Sáez**, M. Sumner, D. Muñoz-Carpintero "Distributed Model-based Predictive Secondary Control for Hybrid AC/DC Microgrids," in IEEE Journal of Emerging and Selected Topics in Power Electronics, vol. 11, no. 1, pp. 627-642, Feb. 2023, doi: 10.1109/JESTPE.2022.3157979.

[15] D. Köbrich, L. G. Marín, D. Muñoz-Carpintero, C. Ahumada, **D. Sáez**, M. Sumner, G. Jiménez-Estévez "A robust distributed energy management system for the coordinated operation of rural multi‐microgrids," International Journal of Energy Research, August 2022. https://doi.org/10.1002/er.8502.

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Vehicular Technology, vol. 69, no. 7, pp. 7187-7200, July 2020, doi: 10.1109/TVT.2020.2993949.

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PROJECTS

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FONDEF: Scientific and Technological Development Support Fund
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FONDART: National Fund for Cultural Development and the Arts.

1. Principal Investigator **IDEA** project ID24I10010 “Design and Implementation of an IoT/Renewable Technology Prototype with an Intercultural Approach for Indigenous Rural Schools”, 2024-2026.
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4. Principal Investigator **FONDECYT** project 1220507 “Distributed Predictive Control Strategies based on Evolving Prediction Intervals for Energy-Water Microgrids”, 2022-2025.
5. Co-Investigator **FONDECYT** project 1221392 “Enhanced Control Flexibility of Modular Multilevel Converters through Continuous Set Model Predictive Control”, 2022-2025.
6. Co-Investigator **FONDECYT** project 1210031 “A Hidden-Markov-Model-based Failure Prognostic Framework for Real-time Prognostic Decision Making”, 2021-2024.
7. Co-Investigator, **FONDART** project 576104, “Participatory Design for the Creation of a University Cultivation System” *Warriache*, 2021.
8. Co-Investigator, **FONDEF** ID19I10363, “Open expert system for supporting the water resources management through low-cost real-time monitoring of surface and groundwater”, 2020-2021.
9. Principal Investigator, **FONDECYT** Project 1170683 “Robust Distributed Predictive Control Strategies for the Coordination of Hybrid AC and DC Microgrids”, 2017-2020.
10. Co-Investigator, **FONDECYT** Project 1170044: “Prognostics Performance Metrics based on Bayesian Cràmer-Rao Lower Bounds”, 2017-2020.
11. Co-Investigator, **FONDEQUIP** Project EQM160122 “Equipment for the Emulation and Testing of Energy Storage Systems”, 2016-2017.
12. Co-Investigator, **International Cooperation** Project REDES150083 “Control Strategies and Hardware Topologies for the Operation of Energy Storage System in Microgrids”, Academic link AC3E UTFSM-U. of Waterloo, 2016-2017.
13. Principal Investigator, **FONDEF** Project 14I10063 “Design and Implementation of an Experimental Prototype of Microgrid for Mapuche Communities”, 2015-2018.
14. Director, Project from **Ministry of Energy**, Chile “Solar-Wind Energy Supply ‘Nehuen Kurruf Ka Antu’ for Community meeting place José Painecura”, 2015-2016.
15. Sub-director, **FONDEF** Project VIU14E075 “Development of a Real-time Estimator for the Energy Available of Battery Banks in Volcanic Monitoring Stations”, 2015-2016.
16. Principal Investigator, **FONDECYT** Project 1140775 “Design of Robust Predictive Control Strategies for the Operation of Microgrids with High Penetration of Renewable Energy”, 2014-2016.
17. Principal Investigator, **FONDECYT** Project 1110047 “Hybrid Fuzzy Predictive Control for Renewable Energy Plants”, 2011-2013.

18. Co-investigator, **FONDECYT** Project 1100239 “Advanced Modelling and Optimization of Dynamic Transport Systems”, 2010-2013.
19. Principal Investigator, **FONDEQUIP** Project EQM130058 “Microgrid Emulator for Design and Validation of Novel Control Strategies”, 2013-2014.
20. Co-Investigator, **FONDEQUIP** Project EQM120111 “Equipment for Research in Hybrid Generation Systems”, 2013.
21. Principal Investigator, **International Cooperation** Project REDES130053 “Control Strategies for Micro-grids with High Penetration of Renewable Energy”, U. Nottingham- Centre of Energy, U. Chile, 2013-2014.
22. Co-Investigator, **International Cooperation** Project REDES130029 “Control and Management of Energy Storage Systems for Traction and Distributed Generation”, U. Waterloo – Centre of Energy, U. Chile, 2013-2014.
23. Principal Investigator, **International Cooperation** Project REDENERG-0003 “Sustainability for Intelligent Micro-grids”, U. Waterloo – Centre of Energy, U. Chile, 2012-2013.
24. Co-Investigator, **International Cooperation** Project REDENERG-0002 “Efficient applications of Lithium batteries to traction, renewable energies and energy storage”, U. Nottingham– Centre of Energy, U. Chile, 2012-2013.
25. Associate Investigator, **FONDAP** Solar Energy Research Center, 2013-2023.
26. Young Researcher, Complex Engineering Systems Institute, **Millennium Science Initiative** ICM: P-05-004-F, **CONICYT**: FBO16, 2011-date.
27. Associate Investigator, Anillo-Bicentenario Project ACT32. **CONICYT** “Intelligent Real-Time Control for Integrated Transit Systems”. 2006-2010.
28. Principal Investigator, **FONDECYT** Project 1061156 “Design of Predictive Control Strategies Based on Fuzzy Hybrid Modeling”, 2006-2008.
29. Principal Investigator, **International Cooperation FONDECYT** Project 7070293 “Design of Predictive Control Strategies Based on Fuzzy Hybrid Modeling”, 2006.
30. Principal Investigator, **FONDECYT** Project 1040698 “Hybrid Predictive Control Systems with Continuous and Discrete Variables”, 2004 -2006.
31. Principal Investigator, **International Cooperation FONDECYT** Project 7040146 “Hybrid Predictive Control Systems with Continuous and Discrete Variables”. 2005.
32. Investigator. **EPSRC Engineering and Physical Sciences Research Council** Project “Towards Multiple-model Based Learning Control Paradigms for Complex Systems”, 2003 – 2004.
33. Principal Investigator, DI NºI2-03/14-2 Project, **University of Chile**, “Design of Supervisory Control Strategies for Non-linear Multivariate Systems and their Application to Thermal Power Plants”. 2004 – 2006.
34. Principal Investigator, FCFM Project, **University of Chile** “Design of Optimal Supervisory Control Strategies for Multivariate Nonlinear Systems”, 2003.
35. Principal Investigator, **FONDECYT** Project 4000026 “Stability of Optimized Supervisory Control Systems considering a Fixed Regulatory Level”. 2000-2002.
36. Principal Investigator, **FONDECYT** Project 2980029 “Design of Predictive Control Strategies based on Nonlinear Models and their Application to the Control of Thermal Power Plants”, 1998 – 2000.

STUDENTS

- **PhD. THESIS ADVISOR**
  - 13 graduate students

1. Luis Jiménez, "Energy Management System with Demand Side Management based on Robust Model Predictive Control Strategies for Seaport Microgrids". Double degree Ph. D in Electrical Engineering, U. Chile – U. Manchester. (2025 - Date)
2. Karina Montaluisa, *Research title under development*. Ph. D in Electrical Engineering, U. Chile (2025 - Date)
3. Álvaro Endo, "User Information Capture for Control Design/Decision-Making: Preliminary Proposal". Double degree Ph. D in Electrical Engineering, U. Chile – U. Nottingham (2024 - Date)
4. Javier Ocaranza, "Improving sustainability by studying water availability, quality, and pumping coordination in energy-water management systems". Double degree Ph.D Programme in Electrical Engineering, U. Chile – U. Nottingham (2023 - Date)
5. Oscar Cartagena, "Design of Evolving Fuzzy Prediction Intervals". Ph. D in Electrical Engineering, U. Chile. Graduated 2024.
6. Alex Navas, "Predictive Control Strategies for EMS & DSM of Microgrids" Double degree Ph. D in Electrical Engineering, U. Chile – U. Nottingham. Graduated 2022.
7. Jacqueline Llanos, "Design of Control Strategies for Microgrids including Congestion", Ph. D in Electrical Engineering, U. Chile. Graduated 2020.
8. Juan Sebastián Gómez, "Distributed Predictive Secondary Control Strategies for Microgrids", Ph. D in Electrical Engineering, U. Chile. Graduated 2020.
9. Claudio Burgos, "Control Strategies for Improving Power Quality and Stability Evaluation in Microgrids" Double degree Ph. D in Electrical Engineering, U. Chile – U. Nottingham. Graduated 2019.
10. Luis Marín, "Hierarchical Energy Management System Based on Fuzzy Prediction Intervals for Operation and Coordination of Microgrids", Ph. D in Electrical Engineering, U. Chile. Graduated 2018.
11. Carolina Ponce, "Design of Fuzzy Predictive Control Strategies for Combined Cycle Power Plants with Integrated Solar Collectors", Ph. D in Electrical Engineering, U. Chile. Graduated 2014.
12. Freddy Milla, "Design of Non-linear Predictive Control Strategies for the Operation of Dynamic Public Transport Systems", Ph. D in Electrical Engineering, U. Chile. Graduated 2012.
13. Alfredo Núñez, "Design of Hybrid Predictive Control Strategies for Optimization of Operational Processes in Dynamic Transport Systems", Ph. D in Electrical Engineering, U. Chile. Graduated 2009.

- **MASTER THESIS ADVISOR**
  - 33 graduate students (2024: 4, 2023: 2, 2022: 3, 2021: 2, 2020: 1, 2019: 1, 2017: 2, 2016: 4, 2013: 3, 2012: 2, 2011: 2, 2010: 2, 2009: 1, 2007: 3, 2005: 1).

- **UNDERGRADUATE FINAL PROJECT ADVISOR**
  - 37 undergraduate (2023: 2, 2022: 1, 2019: 1, 2018: 1, 2017: 2, 2016: 5, 2015: 2, 2013: 5, 2012: 1, 2011: 2, 2010: 2, 2009: 1, 2007: 4, 2006: 2, 2005: 2, 2004: 3, 2003: 1).

TEACHING

Below is the list of courses that I have taught since 2001:

- EL4004 Principles of System Control (undergraduate course).
- EL4105 Advanced Control of Systems (undergraduate course).
- EL5205 Advanced Control Laboratory (undergraduate course).
- EL7012 Intelligent Control (graduate course).
- EL7025 Intelligent Control for Transport Dynamic Systems (graduate course).
- EL7027 Seminar on Automatic Control (graduate course).