Francisco Jaramillo Montoya

fr.jaramillo.m@gmail.com francisco.jaramillo@uchile.cl ResearchGate ORCID LinkedIn

Estudios

2018 › **Doctor en Ingeniería Eléctrica, Universidad de Chile**, Santiago, Chile.

2009 › **Ingeniero Civil Electrónico, Universidad de La Frontera**, Temuco, Chile.

Experiencia Laboral Académica

2023 – 2025 › **Centro de Aceleración Sostenible de Electromovilidad (CASE)**, Santiago, Chile.
Subdirector Proyecto Tecnológico 08 (PT-08), *Electric Vehicle Battery State-of-Health and Second-life Assessment*.

Postdoctorado

2025 – · · · › **Centro de Aceleración Sostenible de Electromovilidad (CASE)**, Santiago, Chile.
Proyecto **Codelco ODS-16-24**, *Electromovilidad en minería subterránea*.

2024 – · · · › **Universidad de Los Andes**, Santiago, Chile.
Proyecto **Tecnologías Avanzadas TA23i10055**, *Sistema Integrado de Monitoreo Estructural Predictivo para Aerogeneradores*.

2022 – 2023 › **Universidad de Los Andes**, Santiago, Chile.
Proyecto **FONDEF ID17I20140**, *Sistema de monitoreo para diagnóstico y pronóstico de daño estructural en turbinas eólicas*.

2021 › **Universidad de Chile**, Santiago, Chile.
Proyecto **FONDEF ID19I10363**, *Sistema abierto experto para apoyar la gestión de recursos hídricos mediante monitoreo de bajo costo en tiempo real de aguas superficiales y subterráneas*.

2020 – 2021 › **Universidad de Chile**, Santiago, Chile.
Proyecto **FONDEF ID18I10379**, *Desarrollo de un modelo de inteligencia artificial para la optimización del rendimiento de baterías ion-litio en vehículos eléctricos*.

2018 – 2020 › **Universidad de Los Andes**, Santiago, Chile.
Proyecto **FONDEF ID17I10140**, *Sistema de monitoreo para diagnóstico y pronóstico de daño estructural en turbinas eólicas*.

Miembro de comisión evaluadora

2023 › **Universidad de Chile**, Santiago, Chile.
Miembro Comisión y Profesor Co-Guía Tesis de Magister en Ciencias de la Ingeniería y Trabajo de Título Ingeniero Civil Eléctrico. Tema: *Plataforma abierta de detección de anomalías y aprendizaje automático para apoyo a la toma de decisiones en la gestión de aguas subterráneas*.

› **Universidad de Chile**, Santiago, Chile.
Miembro Comisión y Profesor Co-Guía Tesis de Magister en Ciencias de la Ingeniería y Trabajo de Título Ingeniero Civil Eléctrico. Tema: *Modelamiento del sistema electromecánico de un Aerogenerador*.

2013 › **Universidad de Chile**, Santiago, Chile.
Miembro Comisión Trabajo de Título Ingeniero Civil Electricista. Tema: *Análisis de fallas en maquinaria minera*.

2012 › **Universidad de Chile**, Santiago, Chile.
Miembro Comisión Trabajo de Título Ingeniera Civil Electricista. Tema: *Análisis de falla en sistemas de detonación electrónicos y eléctricos*.

Experiencia Laboral Académica (continued)

Cursos dictados

2010 – 2011 › **Universidad Católica de Temuco**, Temuco, Chile.
Física I.
Laboratorio de Electricidad y Electrónica.

2007 › **Universidad Católica de Temuco**, Temuco, Chile.
Laboratorio de Física General II.

Ayudantías

2014 – 2017 › **Universidad de Chile**, Santiago, Chile.
Diagnóstico y Pronóstico de Fallas.
Taller de Diseño.

Experiencia Laboral Empresas

2017 › **DIIT Chile S.A.** Santiago, Chile.
Certificación OTDR y PMD red Fibra Óptica EFE.
Encargado del curso *Entrenamiento en trabajos de fusión y medición de fibra óptica* para personal de planta externa Entel.

2016 › **DIIT Chile S.A.** Santiago, Chile.
Certificación CD/PMD red Fibra Óptica Minera Escondida.

2013 › **DIIT Chile S.A.** Santiago, Chile.
Encargado de capacitación para personal de Telefónica Chile en equipos para fibra óptica EXFO: OTDR y analizadores de CD/PMD.

2012 › **DIIT Chile S.A.** Santiago, Chile.
Supervisor en terreno certificación Red GPON Entel en Temuco y Puerto Montt.

2008–2010 › **DIIT Chile S.A.** Santiago, Chile.
Ingeniero de Soporte.
Soporte para pre y post venta de equipos de telecomunicaciones.
Supervisor para instalación de sistemas contra incendio en termoeléctrica Guacolda.
Supervisor en terreno para certificación de fibra óptica.

2007 › **Celulosa Arauco y Constitución S.A. Planta Nueva Aldea**, Nueva Aldea, Chile.
Trabajo en parada de planta como Técnico Electrónico.
Limpieza y mantenimiento de equipos electrónicos.

Publicaciones Científicas

Journal Articles

01. K. Espinoza, J. E. G. Bustos, L. Baldo, **F. Jaramillo-Montoya**, D. E. Acuña-Ureta, and M. E. Orchard, "A two-step sub-sampling approach for a computationally efficient particle filter-based prognosis," *IEEE Transactions on Reliability*, pp. 1–14, 2026. DOI: https://doi.org/10.1109/TR.2026.3655549.

02. J. E. García, B. B. Schiele, B. Masserano, R. Salas-Espiñeira, D. Troncoso-Kurtovic, D. E. Acuña-Ureta, **F. Jaramillo-Montoya**, M. E. Orchard, J. F. Silva, and A. Perez, "Enabling online maximum driving range prognostics in electric vehicles via uncertain event likelihood functions," *Engineering Applications of Artificial Intelligence*, vol. 173, p. 114 449, 2026, ISSN: 0952-1976. DOI: https://doi.org/10.1016/j.engappai.2026.114449.

03. J. E. García, B. B. Schiele, L. Baldo, B. Masserano, **F. Jaramillo-Montoya**, D. Troncoso-Kurtovic, M. E. Orchard, A. Perez, and J. F. Silva, "In Situ Estimation of Li-Ion Battery State of Health Using On-Board Electrical Measurements for Electromobility Applications," *Batteries*, vol. 11, no. 12, 2025, ISSN: 2313-0105. DOI: https://doi.org/10.3390/batteries11120451.

04. J. M. Gutiérrez, R. Astroza, **F. Jaramillo**, M. Orchard, and M. Guarini, "Evolution of modal parameters of composite wind turbine blades under short- and long-term forced vibration tests," *Journal of Civil Structural Health Monitoring*, 2024, ISSN: 2190-5479. DOI: https://doi.org/10.1007/s13349-024-00773-1.

05. D. Muxica, S. Rivera, M. E. Orchard, C. Ahumada, **F. Jaramillo**, F. Bravo, J. M. Gutiérrez, and R. Astroza, "Autonomous sensor system for low-capacity wind turbine blade vibration measurement," *Sensors*, vol. 24, no. 6, 2024. DOI: https://doi.org/10.3390/s24061733.

06. E. Paccha-Herrera, **F. Jaramillo-Montoya**, W. R. Calderón-Muñoz, D. Tapia-Peralta, B. Solórzano-Castillo, J. Gómez-Peña, and J. Paccha-Herrera, "A particle filter-based approach for real-time temperature estimation in a lithium-ion battery module during the cooling-down process," *Journal of Energy Storage*, vol. 94, p. 112 413, 2024, ISSN: 2352-152X. DOI: https://doi.org/10.1016/j.est.2024.112413.

07. C. Muñoz, J. Huircan, **F. Jaramillo**, and Á. Boso, "Calibration of Sensor Network for Outdoor Measurement of PM2.5 on High Wood-Heating Smoke in Temuco City," *Processes*, vol. 11, no. 8, 2023, ISSN: 2227-9717. DOI: https://doi.org/10.3390/pr11082338.

08. C. Antileo, **F. Jaramillo**, O. Candia, A. Osorio, C. Muñoz, J. Farías, J. B. Proal-Nájera, Q. Zhang, and S.-U. Geissen, "Long-term nitrite-oxidizing bacteria suppression in a continuous activated sludge system exposed to frequent changes in pH and oxygen set-points," *Journal of Environmental Management*, vol. 318, p. 115 545, 2022, ISSN: 0301-4797. DOI: https://doi.org/10.1016/j.jenvman.2022.115545.

09. **F. Jaramillo**, J. M. Gutiérrez, M. Orchard, M. Guarini, and R. Astroza, "A Bayesian approach for fatigue damage diagnosis and prognosis of wind turbine blades," *Mechanical Systems and Signal Processing*, vol. 174, p. 109 067, 2022, ISSN: 0888-3270. DOI: https://doi.org/10.1016/j.ymssp.2022.109067.

10. C. Díaz, V. Quintero, A. Pérez, **F. Jaramillo**, C. Burgos-Mellado, H. Rozas, M. E. Orchard, D. Sáez, and R. Cárdenas, "Particle-Filtering-Based Prognostics for the State of Maximum Power Available in Lithium-Ion Batteries at Electromobility Applications," *IEEE Transactions on Vehicular Technology*, vol. 69, no. 7, pp. 7187–7200, 2020, ISSN: 1939-9359. DOI: https://doi.org/10.1109/TVT.2020.2993949.

11. F. Lindow, C. Muñoz, **F. Jaramillo**, R. H. Bishop, J. B. Proal-Nájera, and C. Antileo, "Active biomass estimation based on ASM1 and on-line OUR measurements for partial nitrification processes in sequencing batch reactors," *Journal of Environmental Management*, vol. 273, p. 111 150, 2020, ISSN: 0301-4797. DOI: https://doi.org/10.1016/j.jenvman.2020.111150.

12. M. Martínez-Ledesma and **F. Jaramillo Montoya**, "Performance evaluation of the particle swarm optimization algorithm to unambiguously estimate plasma parameters from incoherent scatter radar signals," *Earth, Planets and Space*, vol. 72, no. 1, p. 172, 2020, ISSN: 1880-5981. DOI: https://doi.org/10.1186/s40623-020-01297-w.

13. E. Paccha-Herrera, W. R. Calderón-Muñoz, M. Orchard, **F. Jaramillo**, and K. Medjaher, "Thermal Modeling Approaches for a LiCoO2 Lithium-ion Battery—A Comparative Study with Experimental Validation," *Batteries*, vol. 6, no. 3, p. 40, 2020, ISSN: 2313-0105. DOI: https://doi.org/10.3390/batteries6030040.

14. H. Rozas, **F. Jaramillo**, A. Perez, D. Jimenez, M. M. E. Orchard, and K. Medjaher, "A method for the reduction of the computational cost associated with the implementation of particle-filter-based failure

prognostic algorithms," *Mechanical Systems and Signal Processing*, vol. 135, p. 106 421, 2020, ISSN: 0888-3270. DOI: https://doi.org/10.1016/j.ymssp.2019.106421.

15. D. Leottau, K. Lobos-Tsunekawa, **F. Jaramillo**, and J. Ruiz-del-Solar, "Accelerating decentralized reinforcement learning of complex individual behaviors," *Engineering Applications of Artificial Intelligence*, vol. 85, pp. 243–253, 2019, ISSN: 09521976. DOI: https://doi.org/10.1016/j.engappai.2019.06.019.

16. **F. Jaramillo**, M. Orchard, C. Muñoz, C. Antileo, D. Sáez, and P. Espinoza, "On-line estimation of the aerobic phase length for partial nitrification processes in SBR based on features extraction and SVM classification," *Chemical Engineering Journal*, vol. 331, no. Supplement C, pp. 114–123, 2018, ISSN: 1385-8947. DOI: https://doi.org/10.1016/j.cej.2017.07.185.

17. **F. Jaramillo**, M. Orchard, C. Muñoz, M. Zamorano, and C. Antileo, "Advanced strategies to improve nitrification process in sequencing batch reactors - A review," *Journal of Environmental Management*, vol. 218, pp. 154–164, 2018, ISSN: 0301-4797. DOI: https://doi.org/10.1016/j.jenvman.2018.04.019.

18. A. Perez, V. Quintero, **F. Jaramillo**, H. Rozas, D. Jimenez, M. Orchard, and R. Moreno, "Characterization of the degradation process of lithium-ion batteries when discharged at different current rates," *Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering*, vol. 232, no. 8, pp. 1075–1089, 2018. DOI: https://doi.org/10.1177/0959651818774481.

19. M. A. Diaz, J. C. Zagal, C. Falcon, M. Stepanova, J. A. Valdivia, M. Martinez-Ledesma, J. Diaz-Peña, **F. Jaramillo**, N. Romanova, E. Pacheco, M. Milla, M. Orchard, J. Silva, and F. P. Mena, "New opportunities offered by Cubesats for space research in Latin America: The SUCHAI project case," *Advances in Space Research*, vol. 58, no. 10, pp. 2134–2147, 2016, ISSN: 0273-1177. DOI: https://doi.org/10.1016/j.asr.2016.06.012.

20. C. Antileo, H. Medina, C. Bornhardt, C. Muñoz, **F. Jaramillo**, and J. Proal, "Actuators monitoring system for real-time control of nitrification–denitrification via nitrite on long term operation," *Chemical Engineering Journal*, vol. 223, no. 0, pp. 467–478, 2013, ISSN: 1385-8947. DOI: https://doi.org/10.1016/j.cej.2013.02.079.

Conference Proceedings

01. J. E. Garcia, B. Brito, B. Masserano, C. E. Allendes, R. Salas-Espiñeira, F. Oropeza, C. Platz-Gamboa, L. Gleisner, D. Troncoso-Kurtovic, **F. Jaramillo-Montoya**, H. Rozas, and M. E. Orchard, "EV-sim: Urban Traffic and Battery Dynamics Simulator for Degradation-Prognostics and Range-Aware Decision-Making for Electric-Vehicle Operations," in *Proceedings of the Annual Conference of the PHM Society 2025*, 2025, p. 16. DOI: https://doi.org/10.36001/phmconf.2025.v17i1.4370.

02. B. Masserano, J. E. Garcia, C. Ramirez, B. Brito, C. E. Allendes, R. Salas-Espiñeira, S. Mancilla, J. L. Espinoza, A. Perez, **F. Jaramillo-Montoya**, and M. E. Orchard, "A Lithium-Ion Battery Degradation Model Agnostic to Cell Chemistry with Integrated State-of-Charge and Temperature Dependence," in *Proceedings of the Annual Conference of the PHM Society 2025*, 2025, p. 9. DOI: https://doi.org/10.36001/phmconf.2025.v17i1.4373.

03. C. E. Allendes, A. Beltran, J. E. García Bustos, D. Troncoso-Kurtovic, B. Masserano, B. Brito Schiele, V. Rivera, **F. Jaramillo**, M. E. Orchard, J. F. Silva, H. Rozas, and S. Rangarajan, "Modeling and Simulation of Thermal Effects on Electrical Behavior in Lithium-Ion Cells," in *Vol. 16 No. 1 (2024): Proceedings of the Annual Conference of the PHM Society 2024*, 2024, p. 11. DOI: https://doi.org/10.36001/phmconf.2024.v16i1.4080.

04. C. Muñoz, C. Antileo, P. Cachaña, and **F. Jaramillo**, "Optimal Operation Points for Long-Term Partial Nitrification in CSTR for Dairy Wastewater Treatment: A Simulation Study," in *2023 IEEE Conference on AgriFood Electronics (CAFE)*, 2023, pp. 177–181. DOI: https://doi.org/10.1109/CAFE58535.2023.10291524.

05. A. Valverde, V. Quintero, **F. Jaramillo**, A. Perez, and M. Orchard, "Understanding the Effect on the State of Health of a Lithium-ion Battery Caused by Charging at a High Current Rate," 2, vol. 56, 2023, pp. 11 930–11 935. DOI: https://doi.org/10.1016/j.ifacol.2023.10.608.

06. A. Perez, **F. Jaramillo**, C. Baeza, M. Valderrama, V. Quintero, and M. Orchard, "A Particle-Swarm-Optimization-Based Approach for the State-of-Charge Estimation of an Electric Vehicle When Driven Under Real Conditions," 1, vol. 13, 2021, pp. 1–11. DOI: https://doi.org/10.36001/phmconf.2021.v13i1.3013.

07. **F. Jaramillo**, M. Valderrama, V. Quintero, A. Pérez, and M. Orchard, "Time-of-Failure Probability Mass Function Computation Using the First-Passage-Time Method Applied to Particle Filter-based Prognostics," in *Annual Conference of the Prognostics and Health Management Society 2020*, 2020, p. 11. DOI: https://doi.org/10.36001/phmconf.2020.v12i1.1299.

08. H. Rozas, F. Tamssaouet, **F. Jaramillo**, K. T. P. Nguyen, K. Medjaher, and M. Orchard, "Comparison of different models of future operating condition in Particle-Filter-based Prognostic Algorithms," 2, vol. 53, 2020, pp. 10 336–10 341. DOI: https://doi.org/10.1016/j.ifacol.2020.12.2770.

09. J. M. Gutierrez, R. Astroza, J. Abell, C. Soto, **F. Jaramillo**, M. Guarini, and M. Orchard, "Experimental System and Damage Identification of Small-Scale Wind Turbine Blades," in *Experimental Vibration Analysis for Civil Engineering Structures*, 2019, p. 8. DOI: https://doi.org/10.1201/9781003090564-23.

10. A. Pérez, H. Rozas, **F. Jaramillo**, V. Quintero, and M. Orchard, "A Simulation Engine for the Characterization of Capacity Degradation Processes in Lithium-ion Batteries Undergoing Heterogeneous Operating Conditions," in *Annual Conference of the PHM Society*, 2019, p. 9. DOI: https://doi.org/10.36001/phmconf.2019.v11i1.855.

11. V. Quintero, A. Perez, **F. Jaramillo**, C. Estevez, and M. Orchard, "Procedure for selecting a transmission mode dependent on the state-of-charge and state-of-health of a lithium-ion battery in wireless sensor networks with energy harvesting devices," in *Proceedings of the Annual Conference of the Prognostics and Health Management Society, PHM*, 2018, ISBN: 9781936263295. DOI: https://doi.org/10.36001/phmconf.2018.v10i1.520.

12. C. Reyes, **F. Jaramillo**, B. Zhang, C. Kulkarni, and M. Orchard, "Just-in-time Point Prediction Using a Computationally-efficient Lebesgue-sampling-based Prognostic Method," in *Proceedings of the Annual Conference of the PHM Society*, 2018, p. 8. DOI: https://doi.org/10.36001/phmconf.2018.v10i1.484.

13. **F. Jaramillo**, V. Quintero, A. Pérez, and M. Orchard, "Spatio-temporal probabilistic modeling based on Gaussian mixture models and neural gas theory for prediction of criminal activity," in *Annual Conference of the Prognostics and Health Management Society 2017*, 2017, p. 8. DOI: https://doi.org/10.36001/phmconf.2017.v9i1.2391.

14. A. Pérez, V. Quintero, H. Rozas, **F. Jaramillo**, R. Moreno, and M. Orchard, "Modelling the degradation process of lithium-ion batteries when operating at erratic state-of-charge swing ranges," in *2017 4th International Conference on Control, Decision and Information Technologies (CoDIT)*, 2017, pp. 860–865. DOI: https://doi.org/10.1109/CoDIT.2017.8102703.

15. A. Pérez, V. Quintero, H. Rozas, D. Jimenez, **F. Jaramillo**, and M. Orchard, "Lithium-ion battery pack arrays for lifespan enhancement," in *2017 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON)*, Oct. 2017, pp. 1–5. DOI: https://doi.org/10.1109/CHILECON.2017.8229537.

16. S. Seria, V. Quintero, P. Espinoza, A. Pérez, **F. Jaramillo**, M. Benavides, and M. Orchard, "Energy management of electric bicycles given a traveling elevation profile," in *Proceedings of the Annual Conference of the Prognostics and Health Management Society, PHM*, 2017, ISBN: 9781936263059. DOI: https://doi.org/10.36001/phmconf.2017.v9i1.2390.

17. P. Flores, M. Vergara, P. Fuentes, **F. Jaramillo**, D. Acuna, A. Perez, and M. Orchard, "Modeling and Prediction of Criminal Activity Based on Spatio-Temporal Probabilistic Risk Functions," in *Annual Conference of the Prognostics and Health Management Society 2015*, 2015. DOI: https://doi.org/10.36001/phmconf.2015.v7i1.2676.

18. C. Tampier, A. Pérez, **F. Jaramillo**, V. Quintero, M. Orchard, and J. Silva, "Lithium-Ion Battery End-of-Discharge Time Estimation and Prognosis based on Bayesian Algorithms and Outer Feedback Correction Loops: A Comparative Analysis," in *Annual Conference of the Prognostics and Health Management Society 2015*, 2015, pp. 1–14. DOI: https://doi.org/10.36001/phmconf.2015.v7i1.2718.

Participación en Eventos

Congresos/Conferencias

2025 › GECAMIN - Congreso de Minería Digital. 8-10 de julio del 2025, Santiago, Chile.

2022 › 43trd International Summer School of Automatic Control. September, 5-9, 2022, Grenoble, France.

2019 › Wind Energy Science Conference (WESC) 2019, Cork, Ireland.

2015 › Annual Conference of the Prognostic and Health Management Society 2015, October 19th-24th, San Diego, CA, USA.

2014 › XXI Congreso de la Asociación Chilena de Control Automático (ACCA), realizado en la Universidad Central de Chile. Santiago, Chile.

2013 › IX Escuela de Verano Latinoamericana en Inteligencia Computacional (EVIC), realizado en la Universidad de La Frontera. Temuco, Chile.

2005 › Congreso INGELECTRA, realizado en la Facultad de Ingeniería de La Universidad de Chile. Santiago, Chile.

Pasantías

2019 › Proyecto REDES 170031, pasantía por 3 meses en L'École Nationale d'Ingénieurs de Tarbes (ENIT), Tarbes, Francia.

Becas y Premios

Becas

2014 › Beca Doctorado Nacional. Comisión Nacional de Investigación Científica y Tecnológica (CONICYT).

2012 › Beca de inglés. Corporación de Fomento de la Producción (CORFO).

2000 › Beca Juan Gómez Millas. Gobierno de Chile, Ministerio de Educación.

Premios

2013 › Tercer lugar concurso de posters en Inteligencia Computacional, IX Escuela de Verano Latinoamericana en Inteligencia Computacional (EVIC).

Habilidades Técnicas

Lenguajes › Inglés nivel Intermedio (Escrito y Hablado).
Español (Nativo).

Software › Windows, Microsoft Office (Word, Excel, PowerPoint), LaTeX , Matlab, Simulink.

Programación › Matlab, Python.