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Research interests

Power Electronic Conversion & Control
Modular Multi-level Power Converters
Application of Wide Bang-gap Semiconductor Devices
Solid State Transformer
Distributed and Sustainable Power Generation and Storage

Employment

Investigador

Universidad San Sebastián
Concepción , Chile
2023 → present

Investigador

Facultad de Ingeniería
Universidad San Sebastián
Chile
2023 → present

Investigador

Centro de Transición Energetica
Universidad San Sebastián
Chile
2023 → present

Investigador

Sede Santiago
Universidad San Sebastián
Chile
2023 → present

Investigador

Doctorado en Ingeniería
Universidad San Sebastián
Chile
2023 → present

Universidad Tecnologica de Chile INACAP

2020 → 2023

Universidad Tecnologica de Chile INACAP

2015 → 2020

Research outputs

An Optimized Model-Free FCSMPC Method Based on Affine Projection Algorithm for Three-Phase Inverter Systems
Aly, M., Vazquez, A. A., Olivares, M., Allende, F. R., Avalos, J. G. & Sanchez, G., 2026, In: IEEE Transactions on Industrial Electronics.

Deep Q-Learning Control for Voltage Source Inverters: A Practical Guideline

Ruiz, F., Sanchez, D., Menéndez-Granizo, O., García, C., Rodríguez, J. & Norambuena, M., 2026, (Accepted/In press) In: IEEE Journal of Emerging and Selected Topics in Industrial Electronics.

Modeling and Analysis of Operating Limits of the Differential Boost Inverter

Lopez-Caiza, D., Perez, M. A., Ruiz, F., Kouro, S. & Blaabjerg, F., 2026, (Accepted/In press) In: IEEE Journal of Emerging and Selected Topics in Power Electronics.

Multi-Objective Energy Management System in Smart Homes with Inverter-Based Air Conditioner Considering Costs, Peak-Average Ratio, and Battery Discharging Cycles of ESS and EV

Dehghani, M., Bornapour, S. M., Ruiz, F. & Rodriguez, J., 2025, In: Energies. 18, 19, p. 5298 5298.

A High-Performance Fractional Order Controller Based on Chaotic Manta-Ray Foraging and Artificial Ecosystem-Based Optimization Algorithms Applied to Dual Active Bridge Converter

Ruiz, F., Pichardo, E., Aly, M., Vazquez, E., Avalos, J. G. & Sánchez, G., 2024, In: Fractal and Fractional. 8, 6, 332.

Model-free Neural Network-based Current Control for Voltage Source Inverter

Menendez, O., Ruiz, F., Pesantez, D., Vasconez, J. & Rodriguez, J., 2024, *2024 IEEE International Conference on Automation/26th Congress of the Chilean Association of Automatic Control, ICA-ACCA 2024*. Institute of Electrical and Electronics Engineers Inc., (2024 IEEE International Conference on Automation/26th Congress of the Chilean Association of Automatic Control, ICA-ACCA 2024).

Model Predictive Control of a Dual Active Bridge: Real-Time HIL Validation with FPGA Modulator

Obando, D., Young, H., Matus, C., Rojas, C., Ruiz, F., Cifuentes, C. & Rodriguez, J., 2024, *2024 IEEE International Conference on Automation/26th Congress of the Chilean Association of Automatic Control, ICA-ACCA 2024*. Institute of Electrical and Electronics Engineers Inc., (2024 IEEE International Conference on Automation/26th Congress of the Chilean Association of Automatic Control, ICA-ACCA 2024).

Predictive Control of the Boost Inverter with Bypass Mode Connection for PV Microinverter Applications

Lopez-Caiza, D., Ruiz, F., Quijada, M. & Rodriguez, J., 2024, In: IECON Proceedings (Industrial Electronics Conference).

Simulation of Maximum Power Point Tracking Applied to a Wave Energy Converter

Zapata-Fonseca, H., Perez, M. A., Ruiz, F. & Rodriguez, J., 2024, *IECON 2024 - 50th Annual Conference of the IEEE Industrial Electronics Society, Proceedings*. IEEE Computer Society, (IECON Proceedings (Industrial Electronics Conference)).

Assessment of Deep Reinforcement Learning Algorithms for Three-Phase Inverter Control

Menéndez, O., López-Caiza, D., Tarisciotti, L., Ruiz, F., Auat-Cheein, F. & Rodríguez, J., 2023, *COBEP 2023 - 17th Brazilian Power Electronics Conference and SPEC 2023 - 8th IEEE Southern Power Electronics Conference, Proceedings*. Institute of Electrical and Electronics Engineers Inc., (COBEP 2023 - 17th Brazilian Power Electronics Conference and SPEC 2023 - 8th IEEE Southern Power Electronics Conference, Proceedings).

Control of cross-circulating currents in a MMC with parallel connected arms in Solid State Transformers

Ruiz, F. L., Perez, M. A., Flores-Bahamonde, F. & Malinowski, M., 2021, *IECON 2021 - 47th Annual Conference of the IEEE Industrial Electronics Society*. IEEE Computer Society, (IECON Proceedings (Industrial Electronics Conference); vol. 2021-October).

Modeling of cross-circulating currents in a MMC with parallel connected submodules in Solid State Transformers

Allende, F. R., Perez, M. A., Flores-Bahamonde, F. & Malinowski, M., 2021, *Proceedings of 2021 IEEE 30th International Symposium on Industrial Electronics, ISIE 2021*. Institute of Electrical and Electronics Engineers Inc., (IEEE International Symposium on Industrial Electronics; vol. 2021-June).

Surveying Solid-State Transformer Structures and Controls: Providing Highly Efficient and Controllable Power Flow in Distribution Grids

Ruiz Allende, F., Perez, M. A., Espinosa, J. R., Gajowik, T., Stynski, S. & Malinowski, M., 2020, In: IEEE Industrial Electronics Magazine. 14, 1, p. 56-70 15 p., 9046048.

Control of Solid State Transformer based on Modular Multilevel Converters with Interconnecting Dual Active Bridges

Perez, M. A., Ruiz, F., Espinoza, J. R. & Malinowski, M., 2019, *Proceedings - 2019 IEEE 28th International Symposium on Industrial Electronics, ISIE 2019*. Institute of Electrical and Electronics Engineers Inc., p. 2343-2348 6 p. 8781544. (IEEE International Symposium on Industrial Electronics; vol. 2019-June).