HERALDO ROZAS

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Education

Georgia Institute of Technology — **Atlanta, USA**
Ph.D. Industrial Engineering — *August 2020 - 2024 (Expected)*

University of Chile — **Santiago, Chile**
M.Sc in Electrical Engineering — *April 2019*

University of Chile — **Santiago, Chile**
B.Sc in Electrical Engineering — *September 2017*

Research Experience

Graduate Research Assistant — *August 2020 - Present*
NASA's Habitat Optimized for Missions of Exploration-
Space Technology Research Institute (HOME STRI)
Predictive Analytics & Intelligent Systems (PAIS) Research Group
H. Milton Stewart School of Industrial and Systems Engineering
Georgia Institute of Technology

Research Assistant — *August 2016 - June 2020*
Fault Diagnosis and Failure Prognosis Laboratory
Department of Electrical Engineering
University of Chile.

Research Interests

- Condition-based maintenance using inaccurate prognostic results
- Data-driven joint optimization of maintenance and spare provisioning
- Applied works using Stochastic Programming and Distributionally Robust Optimization
- Fault diagnostic and failure prognostics algorithms
- Applications: industrial systems, deep space habitats, wind turbines, Li-Ion batteries, routing of electric vehicles

Publications

Journal Publications

1. Futalef, J. P., Muñoz-Carpintero, D., R **Rozas, H.**, and Orchard, M. E. (2023). An online decision-making strategy for routing of electric vehicle fleets. Information Sciences, 625, 715-737. doi.org/10.1016/j.ins.2022.12.108
2. Shi, J., **Rozas, H.**, Yildirim, M., and Gebraeel, N. (2023). A stochastic programming model for jointly optimizing maintenance and spare parts inventory for IoT applications. IISE Transactions, 55(4), 419-431. doi.org/10.1080/24725854.2022.2127164
3. **Rozas, H.**, Muñoz-Carpintero, D., Saéz, D., and Orchard, M. E. (2021). Solving in real-time the dynamic and stochastic shortest path problem for electric vehicles by a prognostic decision making strategy. Expert Systems with Applications, 184, 115489. doi.org/10.1016/j.eswa.2021.115489
4. **Rozas, H.**, Troncoso-Kurtovic, D., Ley, C. P., and Orchard, M. E. (2021). Lithium-ion battery State-of-Latent-Energy (SoLE): A fresh new look to the problem of energy autonomy prognostics in storage systems. Journal of Energy Storage, 40, 102735. doi.org/10.1016/j.est.2021.102735

5. Díaz, C., Quintero, V., Pérez, A., Jaramillo, F., Burgos-Mellado, C., **Rozas, H.**, and Cárdenas, R. (2020). Particle-filtering-based prognostics for the state of maximum power available in lithium-ion batteries at electromobility applications. IEEE Transactions on Vehicular Technology, 69(7), 7187-7200. doi.org/10.1109/TVT.2020.2993949
6. **Rozas, H.**, Jaramillo, F., Perez, A., Jimenez, D., Orchard, M., and Medjaher, K. (2019). "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. doi.org/10.1016/j.ymssp.2019.106421
7. Orchard, M.E., Muñoz-Poblete, C., Huircan, J.I., Galeas, P. and **Rozas, H.**. (2019). "Harvest Stage Recognition and Potential Fruit Damage Indicator for Berries Based on Hidden Markov Models and the Viterbi Algorithm". Sensors . doi.org/10.3390/s19204421
8. Perez, A., Quintero, V., Jaramillo, F., **Rozas, H.**, Jimenez, D., Orchard, M., and Moreno, R. (2018). "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. doi.org/10.1177%2F0959651818774481
9. Perez, A., Benavides, M., **Rozas, H.**, Seria, S., and Orchard, M., (2017). "Guidelines for the Characterization of Lithium-Ion Battery Internal Impedances in PHM Algorithms", International Journal of Prognostics and Health Management: Special Issue PHMAP17 Highlights. doi.org/10.36001/ijphm.2018.v9i3.2746

Conference Publications

1. Perez, A., **Rozas, H.**, Jaramillo, F., Quintero, V., and Orchard, M., "A Simulation Engine for the Characterization of Capacity Degradation Processes in Lithium-ion Batteries Undergoing Heterogeneous Operating Conditions", PHM CONF, 2019. doi.org/10.36001/phmconf.2019.v11i1.855
2. **Rozas, H.**, Munoz-Carpintero, D., Perez, A., Medjaher, K., and Orchard, M, "An Approach to Prognosis-Decision-Making for Route Calculation of an Electric Vehicle Considering Stochastic Traffic Information", Fourth European Conference of the Prognostics and Health Management society, 2018. doi.org/10.36001/phme.2018.v4i1.440
3. **Rozas, H.**, Clavería, R., Medjaher, K., and Orchard, M., "Residual-based scheme for detection and characterization of faults in lithium-ion batteries", 10th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, SAFEPROCESS - 2018. doi.org/10.1016/j.ifacol.2018.09.578
4. Perez, A., Quintero, V., **Rozas, H.**, Jimenez, D., Jaramillo, F., and Orchard, M., "Lithium-Ion Battery Pack Arrays for Lifespan Enhancement", IEEE ChileCon 2017, October 18th-20th, Pucón, Chile. doi.org/10.1109/CHILECON.2017.8229537
5. Perez, A., Quintero, V., **Rozas, H.**, Jaramillo, F., Moreno, R., and Orchard, M., "Modelling the Degradation Process of Lithium-Ion Batteries when Operating at Erratic State of Charge Swing Ranges", 4th International Conference on Control, Decision and Information Technologies - CoDIT'17, April 5th-7th, 2017, Barcelona, Spain. doi.org/10.1109/CoDIT.2017.8102703

Conference and Workshop Activities

- ▷ Session chair–"Optimization in Quality and Reliability", IISE 2023, New Orleans, USA.
- ▷ Presenter–"Joint Optimization of Maintenance Scheduling and Spares Provisioning in Deep Space Habitats", IISE 2023, New Orleans, USA.
- ▷ Poster presenter–"Joint Optimization of Maintenance Scheduling and Spares Provisioning in Deep Space Habitats", SmartHab Workshop, San Antonio, USA.

Awards and Recognitions

Stewart Fellowship (2020)
▷ Fellowship awarded by Georgia Institute of Technology

FULBRIGHT Scholarship (2018)
▷ International Scholarship to pursue doctoral studies in the US, awarded by FULBRIGHT CHILE.

CONICYT - Master's Scholarship (2018)
▷ National Grant to pursue master studies in Chile, awarded by CONICYT.

Distinguished student (2014, 2015, 2016, 2017, 2018)
▷ Recognition awarded by the Schools of Engineering and Sciences of the University of Chile for achieving outstanding performance while pursuing B.Sc or M.Sc.

Teaching Experience

Teaching assistant
▷ 3030 - Basic Statistical Methods *August 2020 - May 2021*
H. Milton Stewart School of Industrial and Systems Engineering
Georgia Institute of Technology

▷ EL3002 Applied Electromagnetism *March 2016 - July 2016*
Department of Electrical Engineering , University of Chile.

▷ FI2002 Electromagnetism *August 2016 - December 2016*
Department of Physics, University of Chile.

▷ EL4003 Signals and Systems II *March 2018 - July 2018*
Department of Electrical Engineering , University of Chile.

Lab Demonstrator
▷ EL5205 Advanced Control Laboratory *August 2017 - December 2017*
Department of Electrical Engineering , University of Chile.

Additional skills

Computing Skills
▷ **Programming:** Python, Matlab, Simulink.
Languages
▷ English (Fluent), Spanish (Native speaker)

Contacts for references

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