Carlos Rodrigo **Cárdenas-Bravo**

PhD Candidate in Applied Mathematics

Professional Profile

My focus lies in developing innovative solutions to recent challenges. I'm deeply passionate about driving forward environmental energy research, with the aim of pioneering new approaches for a more sustainable future.

Human Profile

Life offers more than just work. Just having interesting conversations over lunch or sharing experiences while sharing a cup of coffee, makes a great day. If you have plans after work, let me know in advance to manage my agenda effectively. In my free time, I enjoy working on my personal projects and spending time with my family. Never forget: "Per aspera ad astra" (Through suffering to the stars).

Contact Details

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Personal Information

Citizenship: **Chilean**
Family: **Married**
Languages:
Spanish (native)
English (B2)
French (B1)

Skills

Python, Matlab
LaTeX
Team collaboration

Referees Contacts Details

PhD. Sylvain Lespinats:
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50 Av. du Lac Léman, Le Bourget du Lac, France

PhD. Esteban Gil:
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Av. España 1680, Valparaíso, Chile

Experience

Research Visitor
Khalifa University (United Arab Emirates). **Sep 2023**
Fresh perspective of a new reality at both the human and professional levels.

Project engineer
Universidad Técnica Federico Santa María (Chile). **May 2018 – Jul 2021**
Participation in: FONDEF ID17I10043, Atacama Module and System Technology Center (AtaMoS TeC), and Engineering 2030 14ENI2-26862.

Part-time professor
Universidad Técnica Federico Santa María (Chile). **Mar 2020 – Jul 2020**
Course taught: ELI270 – Basic Electrotechnics

Journal Papers

C. Cárdenas-Bravo, D. Dutykh, and S. Lespinats, "On the parameters domain of the single-diode model," *Solar Energy*. vol. 277, 112718, ISSN 0038-092X, Jul. 2024.

C. Cárdenas-Bravo, F. Morales, R. Barraza, A. Sánchez-Squella, and P. Valdivia, "Online crack detection on photovoltaic devices using a dynamic response analysis," *Energy*. **Submitted on May 2024**

R. Cortés-Severino, C. Cárdenas-Bravo, R. Barraza, A. Sánchez-Squella, P. Valdivia Lefort, and F. Castillo-Burns, "Optimal design and experimental test of a solar simulator for solar photovoltaic modules," *Energy Science & Engineering*, vol. 9, no. 12, pp. 2514–2528, Oct. 2021.

C. Cárdenas-Bravo, R. Barraza, A. Sánchez-Squella, P. Valdivia-Lefort, and F. Castillo-Burns, "Estimation of Single-Diode Photovoltaic Model Using the Differential Evolution Algorithm with Adaptive Boundaries," *Energies*, vol. 14, no. 13, p. 3925, Jan. 2021.

Conferences

C. Cárdenas-Bravo, S. Lespinats, and D. Dutykh, "A new robust methodology for the identification of parameters on the electrical response of photovoltaic systems through the application of polar coordinates," in *2024 European PVPMC Workshop*, Copenhagen, Denmark, Aug 2024. **Accepted as a poster on May 2024**

C. Cárdenas-Bravo, D. Dutykh, and D. L. Ha, "Computation of Faulty IV Curves Based on a Distributed Solar Cell Algorithm," in *8th World Conference on Photovoltaic Energy Conversion*, Milan, Italy, Sep 2022, pp. 701–703.

C. Cárdenas-Bravo, R. Cavieres, R. Barraza, D. Godoy, and P. Lefort, "Assessment of the Economic Impact and Management Techniques on Fault Modes present in Photovoltaic Systems," in *International Conference on Solar Heating and Cooling for Buildings and Industry SHC2019*, Santiago, Chile, Nov 2019, p. 10.

Patents

S. Lespinats and C. Cárdenas, "A method for determining a single-diode model for a photovoltaic array." **Submitted on Dec 2023 under N° EP23307170.3**

D.L. Ha, A. Mohamed, C. Cárdenas, and D. Dutykh, "Method for estimating the breakdown voltage of a photovoltaic cell.", EP4376296; WO2024110535, 2024.

R.A.C. Severino, C.R.C. Bravo, P.V. Lefort, A.A.S. Squella, and R.S.B. Vicencio, "System and method for determining the operating state of solar photovoltaic modules," US20240039473A1, 2024.

Education

PhD candidate in Applied Mathematics.
Doctoral School: Mathématiques, Sciences et technologies de l'information, Informatique ED MSTII (France). **Sep 2021–present**
Thesis title: *Coupled electrical and thermal models for photovoltaic module diagnostics.*

Master of Science in Electrical Engineering.
Universidad Técnica Federico Santa María (Chile). **Mar 2018 – Nov 2021**
Thesis title: *Failure mode characterization of solar photovoltaic modules based on their electrical response.*

Bachelor of Science in Electrical Engineering.
Universidad Técnica Federico Santa María (Chile). **Mar 2011 – Mar 2018**
Thesis title: *Characterization of the Operating Conditions of Solar Farms based on the Analysis of Electrical Variables.*