Gonzalo E. Constante Flores

Assistant Professor

University of Colorado Boulder
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Education

Ph.D. in Electrical and Computer Engineering
The Ohio State University, Columbus, OH, USA — *Jul 2018 – Dec 2022*
Advisor: Antonio J. Conejo
Thesis: *Scheduling of Power Units via Relaxation and Decomposition*

M.Sc. in Electrical and Computer Engineering
The Ohio State University, Columbus, OH, USA — *Aug 2016 – Jul 2018*
Advisor: Mahesh S. Illindala
Thesis: *Conservation Voltage Reduction of Active Distribution Systems with Networked Microgrids*

Diploma in Electrical Engineering
Escuela Politécnica Nacional, Quito, Ecuador — *Sep 2008 – Oct 2014*

Appointments

Assistant Professor
University of Colorado Boulder, Boulder, CO, USA — *January 2026 – present*

Visiting Researcher
University of Waterloo, Waterloo, ON, Canada — *2025*
Host: Claudio Cañizares

Postdoctoral Scholar
Purdue University, West Lafayette, IN, USA — *Jan 2023 – Sep 2025*

Research Aide
Argonne National Laboratory, Lemont, IL, USA — *May 2019 – Aug 2019*
Supervisor: Dongbo Zhao and Feng Qiu

Lecturer
Escuela Politécnica Nacional, Quito, Ecuador — *Jun 2014 – Jul 2016*

Honors & Awards

IEEE PES Outstanding Dissertation Award, Finalist — *2024*
IEEE Power and Energy Society

Presidential Fellowship — *2022*
The Ohio State University

Outstanding Reviewer — *2019*
IEEE Transactions on Power Delivery

Fulbright Scholarship — *Jul 2016 – May 2018*
U.S. Department of State

Knowledge Generation Program Award — *2014*
Vice Presidency of Ecuador

Research and funding grants

Awarded

Office of Naval Research
Mathematical and Resource Optimization program *2024*
Title: *"Machine Learning Aided Global Optimization of MINLP"*
Awarded: $348,076.
Role: Collaborator

Amazon Research Awards
Sustainability program *2024*
Title: *"Design and Analysis of Sustainable Supply Chains Using Optimization and Large Language Models"*
Awarded: $50,000 + $40,000 in AWS cloud computing credits.
Role: Collaborator

Publications

Citations (as of December 2025)

Google Scholar	550 (h-index = 11, i10-index = 12)
Scopus	311 (h-index = 8, i10-index = 7)

Percentage of self-citations $\approx 3\%$.

Books

[B1] **G. Constante-Flores**, A. Conejo, "Optimization via Relaxation and Decomposition: Application to Large-Scale Engineering Problems", Springer, New York, 2025.

Peer-reviewed Journals

[J21] **G. Constante-Flores**, C. Li, "A Quadratically-Constrained Convex Approximation for the AC Optimal Power Flow," Optimization and Engineering, 2026.

[J20] H. Chen, **G. Constante-Flores**, K. Mantri, S. Kompalli, A. Ahluwalia, C. Li, "OptiChat: Bridging Optimization Models and Practitioners with Large Language Models," *INFORMS Journal on Data Science*, 2025.

[J19] A. Mollaali, G. Zufferey, **G. Constante-Flores**, C. Moya, C. Li, G. Lin, "Conformalized Prediction of Post-Fault Voltage Trajectories Using Pre-trained and Finetuned Neural Operators," *Neural Networks*, 2025.

[J18] A. Khan, R. Nahar, H. Chen, **G. Constante-Flores**, C. Li, "FaultExplainer: Leveraging Large Language Models for Interpretable Fault Detection and Diagnosis," *Computers and Chemical Engineering*, 2025.

[J17] H. Chen, **G. Constante-Flores**, C. Li, "Diagnosing infeasible optimization problems using large language models," *INFOR: Information Systems and Operational Research*, 2024.

[J16] H. Chen, **G. Constante-Flores**, C. Li, "Physics-Informed Neural Networks with Hard Linear Equality Constraints," *Computers & Chemical Engineering*, 2024.

[J15] R. Lima, **G. Constante-Flores**, A. Conejo, O. Knio, "An effective hybrid decomposition approach to solve the network-constrained stochastic unit commitment problem in large scale power systems," *EURO Journal on Computational Optimization*, 2024.

[J14] A. Ramanujam, **G. Constante-Flores**, C. Li, "Distributed manufacturing for electrified chemical processes in a microgrid," *AIChE Journal*, 2023.

[J13] **G. Constante-Flores**, A. J. Conejo, F. Qiu, "Daily scheduling of generating units with natural-gas market constraints," *European Journal of Operational Research*, 2023.

[J12] **G. Constante-Flores**, A. J. Conejo, "Security-constrained unit commitment: A decomposition approach embodying Kron reduction," *European Journal of Operational Research*, 2023.

[J11] X. Liu, A. J. Conejo, **G. Constante-Flores**, "Stochastic unit commitment: Model reduction via learning," *Current Sustainable/Renewable Energy Reports*, vol. 10, 2023.

[J10] **G. Constante-Flores**, A. J. Conejo, R. Lima, "Stochastic unit commitment with weekly energy storage: A hybrid decomposition approach," *International Journal of Electrical Power & Energy Systems*, vol. 145, 2022.

[J9] **G. Constante-Flores**, A. J. Conejo, S. Constante-Flores, "Solving certain complementarity problems in power markets via convex programming," *TOP*, 2022.

[J8] **G. Constante-Flores**, A. J. Conejo, J.K. Wang, "Stealthy monitoring control attacks to disrupt power system operations," *Electric Power Systems Research*, 2022.

[J7] **G. Constante-Flores**, A. J. Conejo, F. Qiu, "AC network-constrained unit commitment via relaxation and decomposition," *IEEE Transactions on Power Systems*, 2022.

[J6] **G. Constante-Flores**, A. J. Conejo, F. Qiu, "AC network-constrained unit commitment via conic relaxation and convex programming," *International Journal of Electrical Power & Energy Systems*, 2022.

[J5] **G. Constante-Flores**, A. J. Conejo, and J.K. Wang, "Sensitivity-based vulnerability assessment of state estimation," *Journal of Modern Power Systems and Clean Energy*, 2021.

[J4] A. J. Conejo, S. Chen, and **G. Constante**, "Operations and long-term expansion planning of natural-gas and power systems: A market perspective," *Proceedings of the IEEE*, 2020.

[J3] J.K. Wang, **G. Constante**, C. Moya, and J. Hong, "A semantic analysis framework for protecting the power grid against monitoring-control attacks," *IET Cyber-Physical Systems: Theory & Applications*, 2020.

[J2] **G. Constante**, J. Abillama, M. Illindala, "Conservation voltage reduction of networked microgrids", *IET Generation, Transmission, & Distribution*, 2019.

[J1] **G. Constante**, M. Illindala, "Data-driven probabilistic power flow analysis for a distribution system with renewable energy sources using Monte Carlo simulation," *IEEE Transactions on Industry Applications*, 2019.

Journals Submitted for Publication

[S2] **G. Constante-Flores**, C. Li, "Stability-Constrained Optimal Power Flow using a Data-Tuned Low-Fidelity Surrogate Model."

[S1] A. Anrrango, A. Quisaguano, **G. Constante-Flores**, C. Li, "Self-Supervised Learning of Parametric Approximation for Security-Constrained DC-OPF."

Journals Under Preparation

[U1] A. Quisaguano, **G. E. Constante-Flores**, and C. Li, "Learning to Tune Low-Fidelity Optimization Proxies."

Peer-Reviewed Conference Proceedings

[C3] **G. Constante-Flores**, H. Chen, C. Li, "Enforcing Hard Linear Constraints in Deep Learning Models with Decision Rules," *in Advances in Neural Information Processing Systems* (*NeurIPS*), 2025.

[C2] **G. E. Constante-Flores**, A. Quisaguano, A. J. Conejo and C. Li, "AC-Network-Informed DC Optimal Power Flow for Electricity Markets", *in 58th Hawaii International Conference on System Sciences* (*HICSS*), 2025.

[C1] C. Staiger, B. Sim, **G. E. Constante**, J.K. Wang, "Predicting the impact of increasing plug-in electric vehicle loading on bulk transmission systems", *in 2019 IEEE Power Energy Society General Meeting* (*PESGM*), 2019.

Teaching

University of Colorado Boulder

Department of Electrical, Computer & Energy Engineering *Spring 2026*

- ECEN 2410 Renewable Sources and Efficient Electrical Energy Systems

Escuela Politécnica Nacional

Lecturer *Oct 2014 – Jul 2016*

- IEE573 Electrical and Communication Installations
- Seminar on Power Quality
- Seminar on Power Systems Modeling and Analysis
- IEE7B2 Power Systems Laboratory
- IEE6O2 Introduction to Power Systems Laboratory
- IEE584 Electric Machinery Laboratory

Undergraduate Teaching Assistant *Jan 2014 – Aug 2014*

- IEE7B2 Electric Power Systems Laboratory
- IEE6O2 Introduction to Power Systems Laboratory
- IEE8S3 Protective Relaying Laboratory
- IEE584 Electric Machinery Laboratory
- Recitations: Power Systems Analysis, Power Systems Operations, and Power Systems Stability

The Ohio State University

Invited Lecturer *Spring 2018, Autumn 2022*

- ISE 5225 Electricity Market Analytics
- ECE 7843 Advanced Topics in Power Systems

Mentoring

Purdue University *2023 – present*

- Asha Ramanujam - Ph.D. student
- Hao Chen - Ph.D. student
- André Quisaguano - Undergraduate student
- Anderson Anrrango - Undergraduate student
- Gabriel Zufferey - Undergraduate student
- Kevin Solano - Undergraduate student

The Ohio State University *2018 – 2022*

- Peimeng Guan - Undergraduate student (Now a Ph.D. student at Georgia Tech)
- Zachary O'Toole - M.Sc. student
- Jorge Ramírez - Ph.D. student
- Xuan Liu - Ph.D. student

Conference presentations

INFORMS Annual Meeting, Atlanta, GA, USA *Oct 2025*

"*Learning to Tune Low-Fidelity Surrogates for Graph-Structured Optimization Problems with One Training Sample*"

INFORMS Annual Meeting, Seattle, WA, USA *Oct 2024*
"*AC-Network-Informed DC Optimal Power Flow for Electricity Markets*"

AIChE Annual Meeting, San Diego, CA, USA *Oct 2024*
"*Physics-Informed Neural Networks with Hard Linear Equality Constraints*"
"*GPU Accelerated Approximation Algorithm for Multi-Parametric Linear Programming*"
"*Diagnosing Infeasible Optimization Problems Using Large Language Models*"

IEEE PES General Meeting, Seattle, WA, USA *Jul 2024*
"*Scheduling of Generating Units via Relaxation and Decomposition*"

International Conference on Stochastic Programming (ICSP), Davis, CA, USA *Jul 2023*
"*Security-constrained unit commitment problem via a hybrid decomposition technique with Kron reduction*"

Clemson University Power Systems Conference, Clemson, SC, USA *Sep 2018*
"*Hierarchical mechanism of voltage instability with active distribution networks*"

Transportation Electrification Conference and Expo (ITEC), Long Beach, CA, USA *Jun 2018*
"*Visualizing the impact of PEV on power distribution grids*"

IEEE/IAS 53rd I&CPS Technical Conference, Niagara Falls, ON, Canada *May 2017*
"*Data-driven probabilistic power flow analysis for a distribution system with renewable energy sources using MCS*"

Invited Talks

University of Colorado Boulder, Boulder, CO, USA *Mar 2025*
"*Learning Adaptive Surrogate Models for Electricity Market Applications*"

University of Texas at El Paso, El Paso, TX, USA *Feb 2025*
"*Integrating Machine Learning for Safe and Sustainable Power System Operations*"

Stevens Institute of Technology, Hoboken, NJ, USA *Jan 2025*
"*Integrating Machine Learning for Safe and Sustainable Power System Operations*"

INFORMS Annual Meeting, Phoenix, AZ, USA *Oct 2023*
"*Learning Convex Approximations for the AC-OPF with Zero-Injection Feasibility Guarantees*"

IEEE PES General Meeting 2022, Denver, CO, USA *July 2022*
Panel: Frontier of Power System Optimization and Simulation,
"*AC Network-Constrained Unit Commitment via Relaxation and Decomposition*"
Panel: Managing Uncertainty in Grid Operations,
"*A Grid that is Risk Aware for Clean Electricity*"

INFORMS/ENRE Online Scientific Event Series *Mar 2021*
"*AC Unit Commitment*"

Professional activities

Proposal Reviewer
Fulbright Commission in Slovakia *2025*
Review and evaluate project proposals for candidates to the Fulbright Visiting Scholar Program.

Selection Committee
Fulbright Commission in Ecuador *2020 – 2022*
Interview the candidates on STEM programs and evaluate their application, letters of reference, essays, and transcripts.

Technical Papers Review (> 50)
Journals: Nature Communications, IEEE Transactions on Smart Grid, IEEE Transactions on Power Systems, IEEE Transactions on Industry Applications, IEEE Transactions on Power Delivery, IEEE Transactions on Sustainable Energy, IEEE Control Systems Letters, IEEE Power Engineering Letters, Applied Energy,

International Journal of Power & Energy Systems, IEEE Transactions on Sustainable Energy, Optimization and Engineering

Conferences: IEEE PES General Meeting, Clemson University Power Systems Conference, Power Systems Computation Conference

Conference Organization

Session Chair, INFORMS Annual Meeting, 2024 - 2025

Society Memberships

Institute for Electrical and Electronics Engineers (IEEE) *2014 – present*
Member: Power and Energy Society, Industry Applications Society

INFORMS *2023 – present*
Member: Energy, Natural Resources, and the Environment

Skills

Programming languages: Python, Julia, MATLAB

Algebraic modeling languages for optimization: JuMP, Pyomo, GAMS

Sofware: MATLAB/Simulink, DIgSILENT PowerFactory

Last update: *January 25, 2026*