Ana M. Ospina

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AREAS OF INTEREST

Integration of renewable energy resources; analysis of dynamic resource allocation problems; online optimization and learning with applications in power and energy systems.

EDUCATION

University of Colorado, Boulder, CO, USA

- Ph.D. in Electrical Engineering *2019 - Present*
  - Advisor: Prof. Emiliano Dall'Anese.
- M.S. in Electrical Engineering *2019 - 2021*

Universidad de Los Andes, Bogotá, Colombia

- M.S. in Electrical Engineering *2012 - 2013*
  - Advisor: Prof. Nicanor Quijano.
- B.S. in Electrical Engineering *2007 - 2011*
- B.S. in Electronic Engineering (Minor: Bioengineering)

PUBLICATIONS

PREPRINTS

R1. **A. M. Ospina**, Y. Chen, A. Bernstein and E. Dall'Anese. *Learning-Based Demand Response in Grid-Interactive Buildings via Gaussian Processes.* XXII Power System Computation Conference, submitted October 2021, under review.

R2. **A. M. Ospina**, N. Bastianello and E. Dall'Anese. *Data-based Online Optimization of Network Systems with Infrequent Feedback.* IEEE Control Systems Letters, submitted September 2021, under review. [Online] arXiv preprint arxiv:2109.06343.

R3. **A. M. Ospina**, A. Simonetto and E. Dall'Anese. *Time-Varying Optimization of Networked Systems with Human Preferences.* IEEE Trans. on Control of Network Systems, submitted March 2021, under review. [Online] arXiv preprint arXiv:2103.13470.

R4. **A. M. Ospina**, K. Baker and E. Dall'Anese. *Estimation of Power System Sensitivities: Low-rank Approach and Online Algorithms.* IEEE Trans. on Power Systems, submitted May 2021, under review. [Online] arXiv preprint arXiv:2006.16346.

JOURNALS

J1. **A. M. Ospina** and N. Quijano. *Distributed Control of Small-Scale Power Systems using Noncooperative Games.* International Journal of Electrical Power and Energy Systems. April, 2016. Vol. 82, pp. 535-544.

CONFERENCES

C1. **A. M. Ospina**, A. Simonetto and E. Dall'Allnese. *Personalized Demand Response via Shape-Constrained Online Learning.* 2020 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (IEEE SmartGridComm'20). November 11-13, 2020. Virtual Conference.

C2. **A. M. Ospina** and M. Kezunovic. *A Data-Driven Framework for Optimal Placement of Grid-Connected Solar Generation.* 2019 IEEE Power & Energy Society General Meeting. August 4-8, 2019. Atlanta, GA USA.

RESEARCH EXPERIENCE

University of Colorado, Boulder January 2019 - Present
Graduate Research Assistant *Boulder, CO, USA*

- Synthesis and analysis of data-driven learning methods for power and energy systems.
- Measurement-based estimation methods and their applications in network systems.

Projects:

- *Autonomous energy system program*, funded by National Renewable Energy Laboratory (NREL).
- *Advancing Sustainability through Powered Infrastructure for Roadway Electrification (ASPIRE)*, funded by NSF.

Texas A&M University September 2017 - December 2018
Graduate Research Assistant *College Station, TX, USA*

- Development of methodologies for the integration of solar forecasting in power systems planning.

Projects:

- Integration of Solar Generation and Electrical Vehicles into the Smart Grid, funded by Qatar National Research Foundation (QNRF).
- *Smart Grids Big Data (SGBD)*, funded by National Science Foundation (NSF).

Universidad de Los Andes July 2013 - September 2014
Graduate Research Assistant *Bogotá, Colombia*

- Development an optimization model to minimize the load shedding and coordinate distributed energy resources in power systems.
- Identification of game theoretic applications in power systems.

Project:

- *Dynamic resource allocation using game and graph theory, with engineering applications*, funded by COLCIENCIAS.

Universidad de Los Andes July 2011 - November 2011
Professional Project Assistant *Bogotá, Colombia*

- Development methodologies for building AC and DC grounding related to rectifier substations.
- Validation of a methodology to determine the optimal allocation of active filters for compensation of harmonic distortion and reactive power supply.

Project:

- *Reliable Feeder and Electric Power Quality Management in Electrical Systems Mass Transit*, funded by CODENSA.

INDUSTRY EXPERIENCE

Sandia National Laboratories (SNL) October 2021 - Present
Intern - Electric Power Systems Research *Albuquerque, NM, USA*

- Intern at ARPA-E Performance-based Energy Resource Feedback, Optimization, and Risk Management (PERFORM) project.

National Renewable Energy Laboratory (NREL) May 2019 - August 2019
Intern - Power Systems Engineering Research Center *Golden, CO, USA*

- Design of a model-free predictive control via online learning for building energy management.

National Mining and Energy Planning Unit (UPME) September 2015 - August 2017
Specialized Engineer *Bogotá, Colombia*

- Provided technical and economical evaluation for the incorporation of energy sources in the national transmission system at different voltage levels.
- Supported the formulation of large-scale electrical infrastructure projects of national interest to meet the Colombian energy demand in the medium and long term.
- Performed power flow analysis, contingency analysis and short circuit analysis, as well as economic and technical evaluations of connection requests for the national transmission system.

Empresa de Energía de Cundinamarca S.A. E.S.P. December 2011 - September 2012
Junior Engineer *Bogotá, Colombia*

· Performed optimal detection of non-technical power losses in the distribution system of Cundinamarca.
· Identified load-profiles (residential, commercial and industrial) based on energy profiles.
· Controlled and supervised projects and indicators of the Control Loss Section.

TEACHING EXPERIENCE

Universidad de Los Andes, Bogota, Colombia:

2013	Graduate Teaching Assistant. Fundamentals of Circuits Theory.
2013	Graduate Teaching Assistant. Analysis and Synthesis of Circuits.
2011	Undergraduate Teaching Assistant. Fundamentals Circuits Theory.
2010	Undergraduate Teaching Assistant. Mathematics Department - Algebra and Differential, integral, and Vectorial Calculus.
2009	Undergraduate Teaching Assistant. Mathematics Department - Algebra and Differential, integral, and Vectorial Calculus.

SOFTWARE SKILLS

DigSILENT PowerFactory, OpenDSS, Matlab/Simulink, Labview (Certified LabVIEW Associate Developer), ArcGIS, Microsoft Office, LaTeX.

PROFESSIONAL SERVICES

Professional Memberships/Affiliations:

2012 - Present	IEEE Student Membership.
2017 - Present	IEEE Power and Energy Society Membership (PES), IEEE Industry Applications Society Membership (IAS), IEEE Women in Engineering Membership (WIE), IEEE Young Professional Membership, IEEE Women in Power.

Student Chapters Services at Texas A&M University:

2018	Committee Member for Texas Power and Energy Conference (TPEC 2019).
2017 - 2018	Committee Member for Texas Power and Energy Conference (TPEC 2018).
2017 - 2018	Officer Member in IEEE PES-PELS-IAS Joint Student Chapter.
2017 - 2018	Programming Officer/Treasurer in IEEE Women in Engineering Chapter.

Services at University of Colorado Boulder:

2020 - 2021	Graduate student representative at Climate Committee ECEE department.
2020 - 2021	Mentor at Graduate Peer Mentoring Program.

Referee for Journals and Conferences:
IEEE Transactions on Smart Grid; Electric Power Systems Research; Journal of Control, Automation and Electrical Systems; International Journal of Electrical Power and Energy Systems.

IEEE Workshop on Power Electronics and Power Quality Applications (PEPQA 2013, 2015, 2017); IEEE Texas Power and Energy Conference (TPEC 2018); IEEE International Conference on Compatibility, Power Electronics, and Power Engineering (CPEPOWERENG 2018); IEEE PES General Meeting (GM 2019); IEEE International Conference on Communication, Control, and Computing Technologies for Smart Grids (SmartGridComm 2019); IEEE Colombian Conference on Automatic Control (CCAC 2019); European Control Conference (ECC 2021); IEEE PES Innovative Smart Grid Technologies (ISGT 2022).

LANGUAGES

English: Fluent. Spanish: Native. French: Basic (Delf A1).

HONORS AND AWARDS

2019	Paper selected as one of the Best Conference Papers on Distribution Systems, Microgrids, and Renewables submitted to the 2019 IEEE PES General Meeting.
2018 - 2019	W. John & A. Neumann Graduate Scholarship Award, Texas A&M University.
2018	Department of Electrical and Computer Engineering, Texas A&M University award to participate in the 2018 IEEE Woman In Engineering (WIE) International Leadership Conference (ILC).
2018	Graduate Student Travel Grant, Department of Electrical and Computer Engineering, Texas A&M University.
2016	Executive Development Program in Energy Planning for Andean Region Fellowship, Latin American Energy Organization - OLADE, Bucaramanga, Colombia.
2014	Young Researcher Fellowship, Colombian Department of Science, Technology, and Innovation - COLCIENCIAS, Bogotá, Colombia.
2013/2011	Graduate Fellowship, Graduate Teaching and Research Assistant, Universidad of Los Andes, Electrical and Electronic Engineering Department, Bogotá, Colombia.
2010/2011	Top Ranked on National Exam for Electronics/Electrical Engineers, National Institute for the Evaluation of Education, Bogotá, Colombia.
2010/2009	Pentágono Fellowship, Department of Mathematics, Universidad de Los Andes, Bogotá, Colombia.