Curriculum Vitae
Cesar Diaz Londono

Assistant Professor
Dipartimento di Elettronica Informazione e Bioingegneria
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Career path

Cesar Diaz Londono was born in Bogotá (Colombia). He received the B.Sc. (2014) and M.Sc. (2016) degrees in Electronics Engineering, both from *Pontificia Universidad Javeriana*, Colombia, and a double Ph.D. (2020) degree, the Ph.D. degree in Engineering from *Javeriana* and Ph.D. in Electrical, Electronics and Communications Engineering from the *Politecnico di Torino*, Italy. From 2018 to 2021, he was a Research Fellow with the Department of Energy at *Politecnico di Torino*. Cesar is currently Assistant Professor at the *Dipartimento di Elettronica, Informazione e Bioingegneria* at *Politecnico di Milano*, Italy. His main research interests include optimization techniques for charging electric vehicles, electrical networks analysis in Real-time simulators, integration of distributed energy resources, demand response for smart-grids, and flexible loads modelling.

Education

Jul 2015 Jul 2020	Ph.D. in co-tutelle • Ph.D. in Electrical, Electronics and Communications Engineering at **Politecnico di Torino**, Turin, Italy; and, • Ph.D. in Engineering at **Pontificia Universidad Javeriana**, Bogota, Colombia Thesis: *A Framework for Flexible Loads Aggregation* (Honors distinction) Advisor: Prof. Fredy Ruiz (Javeriana) and Prof. Gianfranco Chicco (Politecnico)
Jul 2014 Dec 2015	Master of Science in Electronics Engineering *(Cum Laude)* **Pontificia Universidad Javeriana**, Bogota, Colombia
Jul 2007 Dec 2013	Bachelor in Electronics Engineering **Pontificia Universidad Javeriana**, Bogota, Colombia

Work Experience

Jan 2022 *Present*	Assistant Professor (RTD-a) *Dipartimento di Elettronica, Informazione e Bioingegneria* Politecnico di Milano, Milan, Italy
Sep 2021 *Dec 2021*	Firmware Engineer PUNCH Torino Consultant at Brain Technologies, Turin, Italy
Mar 2021 *Dec 2021*	Part-time Researcher *Departamento de Electrónica* Pontificia Universidad Javeriana, Bogota, Colombia
Nov 2018 Sep 2021	Research Fellow *Dipartimento Energia* Politecnico di Torino, Turin, Italy

JAN 2017 DEC 2017	University Lecturer *Departamento de Electrónica* PONTIFICIA UNIVERSIDAD JAVERIANA, Bogota, Colombia
JAN 2016 JUN 2016	Teaching Assistant *Departamento de Electrónica* PONTIFICIA UNIVERSIDAD JAVERIANA, Bogota, Colombia
FEB 2014 SEP 2014	Research Assistant *Departamento de Electrónica* PONTIFICIA UNIVERSIDAD JAVERIANA, Bogota, Colombia

LANGUAGES

SPANISH:	Mother-tongue
ITALIAN:	Fluent
ENGLISH:	Fluent

HONOURS AND AWARDS

SEP 2020	Highest honors distinction for the Ph.D. Thesis.
MAR 2016	Cum Laude in Master's Degree.
MAY 2015	Scholarship for a 4-years Ph.D. Given by the program *"Rodolfo Llinás para la promoción de la formación avanzada y el espíritu científico en Bogotá"* from *"Secretaría de Desarrollo Económico de Bogotá"* and *"Fundación CEIBA"*.
NOV 2013	Best Bachelor degree thesis at "Expoelectrónica", *Pontificia Universidad Javeriana*

PARTICIPATION TO RESEARCH PROJECTS

MAR 2021 PRESENT	Pontificia Universidad Javeriana, Bogota, Colombia. *Project*:"Remuneration and optimal operation of aggregator-prosumer schemes in energy systems". *Role*: Part-time Researcher. *Responsibilities*: * Algorithms development for minimizing the energy cost of prosumers and electric vehicle charging stations in a smart grid. * Uncertainty models development of local demand and renewable generation considering robust optimization techniques. * Determine prosumers' remuneration levels by optimization processes, considering flexible loads such as EV chargers and BESS. * Implementation of coordination strategies for specific aggregators considering balancing markets.
NOV 2018 FEB 2021	Politecnico di Torino, Turin, Italy *Project*: H2020 European PLANET project "Planning and operational tools for optimising energy flows and synergies between energy networks". *Role*: Researcher. *Responsibilities*: * Simulation development of electricity distribution networks. * Software development for automatic creation of electrical network case studies able to manage a Real-Time simulator. * Integration of energy conversion systems for linking the multi-carrier distribution networks and maintaining the balance in the electrical network. * Co-simulations implementation of different energy conversion systems and networks that run in different physical platforms geographically distributed. * Implementation of the district-level multi-energy systems in an OPAL-RT simulator, considering Power Hardware-In-the-Loop tests.

Feb 2014	Pontificia Universidad Javeriana, Bogota, Colombia.
Sep 2014	*Project*: *Smart-grid SILICE III project*, "Hacia una ciudad inteligente: Diseño de una microred inteligente piloto".
	Role: Researcher.
	Responsibilities:
	* Design and manufacture of Remote Terminal Units (RTU) able to control the power flow in the nodes of a Smart Grid, based on electrical variables measurements.
	* Algorithm development for controlling the RTU response.
	* Implementation of wireless communication between the smart meter and a central station.
	* Development of monitoring station deployed in the LabVIEW software.

Teaching experience

Lecturer of Undergraduate Course – Pontificia Universidad Javeriana

- Signals Laboratory: Taught 2017-I,2017-II.

Laboratory Instructor of Graduate Course – Pontificia Universidad Javeriana

- Linear Systems Laboratory: Taught 2016-I.

Volunteer Instructor – Institución Educativa Andres Bello

- Science and Technology, vital tools for agriculture: Taught Jul 2016 (35 hours).

Technical association memberships and editorial activities

- Energia e Sistemi Elettrici (EnSIEL). Member since 2019.
- Institute of Electrical and Electronic Engineers (IEEE). Professional member since 2021, Student Member since 2015.
- 55th Universities Power Engineering Conference (IEEE UPEC 2020): Local Support Team, Sep 2020.
- IEEE LARC competition and CCAC conference: Logistics, Oct 2011.
- *Reviewer for journals:* IEEE Industry Applications Society, IEEE Transactions on Industrial Informatics, Applied Energy, Energy, Sustainable Energy, Grids and Network.
- *Reviewer for conferences:* International Federation of Automatic Control (IFAC) World Congress, IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT Europe), IEEE Colombian Conference on Automatic Control (CCAC).

Research interests and results

Optimal controllers for charging electric vehicles: I have proposed a model predictive control for managing the dispatch of electric vehicle charging stations that consider photovoltaic generation. The model and the flexibility of these chargers have been proposed. Moreover, day-ahead and real-time strategies are developed for these chargers considering Vehicle to-Grid (V2G).

Demand response for smart-grid: I have developed novel strategies for demand-side management able to modify the power demand by different aggregators, and at the same time provide electric balancing services to the network operator. In particular, three specific aggregators (EVCS Electric Vehicle Charging Station, TER ThermoElectric Refrigeration units, and WBPS Water Booster Pressure System) are coordinated for providing balancing services for the European market.

Flexible loads modelling and control: I have proposed linear and non-linear models considering deferrable and adjustable flexible loads. In particular, WBPS and TER dynamics are modeled and validated using experimental data from real devices. Moreover, optimal technics such as Model Predictive Control as well as classical technics as Proportional-Integrative-Derivative have been developed for controlling the mentioned models.

Electrical networks analysis in Real-time simulators: I have developed an electrical distribution grid in a real-time simulator for analyzing the possible reverse power flow when considering high renewable energy penetration. Likewise, power-to-gas integration is considered for reducing the reverse flow. Moreover, remote power Hardware-in-the-Loop co-simulations are developed taking into account the electrical grid and an actual motor.