

Sergio A. Dorado-Rojas

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Education

Ph.D. in Electrical Engineering (expected graduation - May 2023)

Rensselaer Polytechnic Institute
Troy, NY, USA

Jan 2019 – Present

GPA: 3.80/4.00

Research Group: **ALSETLab**

Advisor: Prof. Luigi Vanfretti Ph.D.

Masters of Science - Electrical Engineering (expected graduation - May 2021)

Rensselaer Polytechnic Institute
Troy, NY, USA

Jan 2019 – Present

Advisor: Prof. Luigi Vanfretti Ph.D.

Masters of Engineering - Industrial Automation

Universidad Nacional de Colombia - Sede Bogotá
Bogotá D.C., Colombia

Feb 2017 – Present

GPA: 5.00/5.00; 3.00 is the minimum grade to pass

Thesis Topic: *Decentralized Load Frequency Control for a Power System with High Penetration of Wind and Solar Photovoltaic Generation* (pending submission)

Bachelor of Science - Electrical Engineering (Honors Degree)

Universidad Nacional de Colombia - Sede Bogotá
Bogotá D.C., Colombia

Feb 2011 – Nov 2016

GPA: 4.70/5.00; 3.00 is the minimum grade to pass

Work Experience

Rensselaer Polytechnic Institute

Graduate Research Assistant
Troy, NY, USA

January 2019 – Present

– Data scientist in a research project lead by RPI with New York Power Authority. Tasks include automation of power system dynamic simulations for synthetic data generation to train Machine Learning modules.

IBM-RPI AIRC Collaboration

Extern
Troy, NY, USA

May 2020 – Aug 2020

– Development a novel Recurrent Neural Network architecture inspired by discrete-time dynamical systems concepts. Patent and publication pending.

Rolls-Royce Deutschland Ltd & Co KG

Intern in Controls and Data Services
Component Engineering EEC & Hydromech
Berlin, Germany

May 2015 – Nov 2015

– Modeling of functional requirement patterns for various engine controller interfaces using Unified Modeling Language (UML). Development of a course and training of 30 engineers on "How to use requirement boilerplates".

Universidad Nacional de Colombia - Sede Bogotá

Graduate Teaching Assistant
Bogotá D.C., Colombia

Feb 2017 – Dec 2018

Awards and Distinctions

Colombian Society of Engineers (*Sociedad Colombiana de Ingenieros*)

(2018) - *Manuel Ponce de León Award* · Awarded to the undergraduate from the Faculty of Engineering of Universidad Nacional de Colombia with the highest ranking among the graduated class (GPA above 92%). First Electrical Engineer to receive this distinction

German Academic Exchange Service (*DAAD - Deutscher Akademischer Austauschdienst*)

(2014-2015) - *Young Engineers Colombia* · One-year scholarship for exchange studies at Technische Universität München in Germany

Computer Skills

Programming Languages: Python · Julia · Modelica · C · C++ · Java · Mathematica

Tools: Dymola · MATLAB/Simulink · PSS/E · TensorFlow · PyTorch · Git · Microsoft Office · Microsoft Visio

Language Skills

Spanish · Native language

English · C1 - Advanced (IELTS 7.5)

German · C1 - Advanced (TestDaF 4)

Italian · B1 - Intermediate

French · A2 - Basic

Selected Publications

Conference Papers

[C1] *Performance Benchmark of Modelica Time-Domain Power System Automated Simulations using Python*

Sergio A. Dorado-Rojas, Manuel Navarro Catalan, Marcelo de Castro Fernandes, Luigi Vanfretti

American Modelica Conference 2020

[C2] *ADRC for Decentralized Load Frequency Control with Renewable Energy Generation*

Sergio A. Dorado-Rojas, John Cortés-Romero, Sergio Rivera, Eduardo Mojica-Nava

2019 IEEE PES Powertech Milano

[C3] *Synthetic Training Data Generation for ML-based Small-Signal Stability Assessment*

Sergio A. Dorado-Rojas, Marcelo de Castro Fernandes, Luigi Vanfretti

2020 IEEE SmartGridComm

[C4] *Performance Comparison of Neural Network Architectures for Small-Signal Stability Assessment* (in preparation)

Sergio A. Dorado-Rojas, Tetiana Bogodorova, Luigi Vanfretti

[C5] *Automation of Massive Modelica-based Power System Simulations using Multithreading and Multiprocessing in Python* (in preparation)

Sergio A. Dorado-Rojas, Elkin Cruz, Luigi Vanfretti

[C6] *Python-based Power Flow Automation for Initialization of Power System Time-Domain Modelica Simulations* (in preparation)

Sergio A. Dorado-Rojas, Galilea Olvera, Ricardo Rincón, Giuseppe Laera, Marcelo de Castro Fernandes, Luigi Vanfretti

[C7] *Forecasting Sequential Data using Laguerre Orthogonal Recurrent Neural Networks* (in preparation)

Sergio A. Dorado-Rojas, Bhanu Vinzamuri, Luigi Vanfretti

Journal Articles

[J1] *Analysis between Graph-Based and PTDF-Based Model Reduction Methods in Electric Power Systems*

Diego A. Monroy-Ortiz, **Sergio A. Dorado-Rojas**, Eduardo Mojica-Nava, Sergio Rivera

International Journal of Emerging Electric Power Systems. 2020.

[J2] *Rejection of Varying-Frequency Periodic Load Disturbances in Wind-Turbines through Active Disturbance Rejection-based Control*

Horacio Coral-Enríquez, John Cortés-Romero, **Sergio A. Dorado-Rojas**

Renewable Energy. Volume 141. pp. 217-235. 2019.

Patent Inventions

[P1] *Method and Apparatus for Designing Ladder and Laguerre Orthogonal Recurrent Neural Network Architectures inspired by Discrete-Time Dynamical Systems* (US Patent Pending)

Sergio A. Dorado-Rojas, Bhanu Vinzamuri, Luigi Vanfretti

RPI/IBM AIRC Program