Manuel Navarro Catalán, M.Sc.

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PROFESSIONAL EXPERIENCE

Operations Engineer II (Shift Engineering) – *Electric Reliability Council of Texas (ERCOT), Austin, TX* 03/22-Present
-NERC Certified System Operator - Reliability Coordinator.
-Provided real time engineering analysis and technical support for GE/e-terra EMS and SCADA systems to ensure reliable operations in compliance with NERC standard, ERCOT protocols and Market Guidelines.
-Implement and maintain real time system model changes, develop tools and procedures for the control room.
-Perform system studies (PowerFlow, Contingency Analysis, Voltage Stability), develop solutions to current/future system issues, report findings, recommendations and lessons learned.

Modeling Engineer I (Engineer Development Program) – *Electric Reliability Council of Texas (ERCOT), Austin, TX* 01/21-03/22
-Member of ERCOT's Engineering Development Program.
-Rotation Program through the following teams: Network Model Maintenance, Network Model Administration, Transmission Planning, Resource Integration, Operations Analysis, Forward Markets, Market Analysis & Validation, Grid and Market Solutions, Shift Engineering and Operations Support.
-Projects: Data Analysis on Operations Data, NREL's dGen software implementation, Extract Transform Load (ETL) Tool maintenance and development.

Operations Analysis Intern – *Electric Reliability Council of Texas (ERCOT), Austin, TX* 05/20-08/20
- Created Python based Data Analysis scripts for ancillary service requirements.
- Designed a program and method to read ERCOT's load and generation minute data, calculate ancillary service requirements, display results and determine service requirements with no user input.
- Determined regulation requirements for coming years.
- Analyzed, processed and performed Python based data analysis on 1 minute interval electric load/generation data.

Renewable Energy Intern – *Pan American Energy, Buenos Aires, Argentina* 06/18-08/18
- Mapped the electrical system of Argentina using ArcMap.
- Created action plans for the future expansion of the renewable energy division within Pan American Energy.
- Created a georeferenced database of the wind energy sources in Argentina.

EDUCATION

Rensselaer Polytechnic Institute	Masters of Science, Electrical Engineering
	Specialization: Power Systems
The University of Texas at Austin	Bachelors of Science, Electrical Engineering
	Specialization: Power Systems
KTH Royal Institute of Technology	Exchange Program, Stockholm, Sweden
Peking University	Globex Exchange Program, Beijing, China

ACADEMIC EXPERIENCE

Research Assistant – *Rensselaer Polytechnic Institute, Troy, NY* 08/18-12/20
- Conducting research for ALSET Laboratory under the supervision of Dr. Luigi Vanfretti.
- Test and develop applications for electrical models for computer simulation.
- Research on cyber-physical systems, exploring the transition of electric systems to the digital world.
- Developing a mass model translation Python based application for Smart Grids for New York Power Authority.

Undergraduate Research Assistant – *KTH Royal Institute of Technology , Stockholm, Sweden* 04/17-05/18
- Worked under the supervision of Dr. Luigi Vanfretti at the Electric Power and Energy Department.
- Created a Linux installation manual for Dymola and OpenModelica software.
- Created a user manual for OpenModelica and for Dymola under Linux of computer assignments for a Modelica course.
- Created a user manual of the OpenIPSL library under Linux using OpenModelica and Dymola.

Teaching Assistant – *Dominion Energy, Richmond VA* 05/19
- Course: Introduction to Power Systems Modeling and Simulation using the Modelica Language.

Teaching Assistant – *McMaster University, Hamilton ON* 05/19
- Course: Introduction to Modeling and Simulation using the Modelica Language.

PUBLICATIONS .

M. Navarro Catalan and L. Vanfretti, "Over Current Relay Modeling using Modelica with Cross-Verification against a Validated Model," 7th Workshop on Modeling and Simulation of Cyber-Physical Energy Systems, 15 April 2019, Montreal, Canada.

S. Dorado Rojas, **M. Navarro Catalan,** M. de Castro Fernandes and L. Vanfretti, "Performance Benchmark of Modelica Time-Domain Power System Automated Simulation using Python" 2nd American Modelica Conference, 23-25 March 2019, Boulder, Colorado.

Navarro Catalan, M., Du, P., Mago, N., Gonzalez, E., Lee, R., Li, W., & Vera, S. P. (2021, July). Ancillary Service Requirements Analysis with Increasing Solar Generation in the ERCOT Interconnection. In *2021 IEEE Power & Energy Society General Meeting (PESGM)* (pp. 1-5). IEEE.

M. de Castro, D. Winkler, L. Vanfretti, G. Laera, S. A. Dorado-Rojas, T. Rabuzin, B. Mukherjee and **M. Navarro Catalan**, "Version [OpenIPSL 2.0.0] - [iTesla Power Systems Library (iPSL): A Modelica library for phasor time-domain simulations]," submitted to SoftwareX, 2022

M. de Castro, G. Laera, L. Vanfretti, **M. Navarro Catalan**, G. Halley and G. Stefopoulos, "Template-Based Model Transformation Between Proprietary Tools and Modelica: Increasing Portability of Power System Models," prepared for Sustainable Energy, Grids and Networks, 2022.

M. de Castro, G. Laera, L. Vanfretti, **M. Navarro Catalan** and G. Halley, "Template-Based Model Transformation Tool for Modelica-based Power System Representations," in preparation for SoftwareX.

SKILLS .

Certifications: NCEES (Engineer In Training), NERC (Reliability Coordinator System Operator).
Programming Languages: C, C++, C#, Modelica, Python, Latex, Markdown, Visual Basic, HTML, CSS, SQL.
Software Tools: OpenModelica, Dymola, MatLab, Octave, Simulink, Git, Docker, Travis-CI, GitHub, BitBucket, UPLAN Altos, Bash, Windows, Linux, ETL.
Power Systems Tools: PSS/E, PowerWorld, Modelica, ASPEN, dGen, GE/e-terra EMS, SCADA, RTDMS.
Languages: Fluent in English, Spanish, and French.
Personal Website: https://manuelnvro.github.io/Manuel-Navarro-Catalan/