Rina Y. Davila Severiano

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EDUCATION

Georgia Institute of Technology **| Atlanta, GA**
Ph.D. in Industrial Engineering *May 2027*

North Carolina State University **| Raleigh, NC**
B.S. in Industrial and Systems Engineering (GPA: 4.0) *May 2023*

Key Coursework: Linear and Discrete Programming, Stochastic Optimization, Regression Modeling, Airline Revenue Management

EXPERIENCE

Project Researcher **| Michigan Department of EGLE | Ann Arbor, MI** *Dec 2024 – Present*

- Evaluated behind-the-meter solar and energy storage across Michigan buildings, identifying up to $10M in 25-year savings for large commercial sites.
- Developed a mixed-integer programming model in Python with Gurobi, leveraging National Renewable Energy Laboratory (NREL) data to optimize cost-minimizing energy solutions, incorporating constraints to model real-world building energy use and grid interactions.
- Delivered actionable recommendations to the Michigan Solar for All program, presenting key findings on top-performing building types and utility regions to 20 industry experts.

Graduate Researcher **| Georgia Institute of Technology | Atlanta, GA** *Dec 2023 – Present*

Project: Characterizing Price-Responsive Demand Flexibility from Electrified Supply Chains

- Designed a mixed-integer programming model (MILP) integrating vehicle routing with electrified supply chains and power system planning, achieving 40% higher renewables utilization than battery energy storage systems by leveraging supply chain latencies.
- Implemented and solved the model in Python with Gurobi, identifying cost-efficient and feasible operational strategies using compiled datasets as model inputs.
- Conducted a case study to evaluate the model's impact on electrified cement supply chains, achieving a multi-day GWh-level load shifting and documenting results for publication.
- Leveraged Bender's Decomposition to decompose the MILP into tractable subproblems enhancing the model's ability to handle integrality using Pyomo modeling framework.

Project: Tipping Points for the Electrification of Heavy-Duty Vehicles

- Assessed the economic viability of heavy-duty trucks relative to diesel by incorporating capital costs, operating costs, charging strategies, and payback period analysis.
- Formulated a mixed integer linear program for long-haul fleet planning, jointly optimizing fleet composition, routing, charging infrastructure, supply chain decisions, and power system operations (e.g., on-site solar generation).
- Executed the optimization model in Python/Gurobi through a case study across three distinct geographic networks to assess the impact of location-specific factors.
- Integrated and synthesized comprehensive datasets, drawing from external data sources for parameters, product demand, manufacturing processes, renewable energy availability ensuring high data quality for model inputs.

Undergraduate Researcher **| North Carolina State University | Raleigh, NC**

Project: COVID-19 Mental Health Study *May 2022 – April 2023*

- Utilized SAS programming to analyze Healthcare Cost and Utilization Project (HCUP) Emergency Department data, investigating the impact of the COVID-19 pandemic on mental health outcomes.
- Identified key factors influencing changes in mental health during the pandemic through linear regression models.
- Presented preliminary findings to project partners and a scientific audience, facilitating discussions on mental health implications.

Project: SimOpt Application GUI Development *Jan 2022 – Sep 2022*

- Contributed as a developer to the front-end of the SimOpt Application Graphical User Interface (GUI), enhancing user-friendliness and overall accessibility.
- Improved the plotting capabilities of the existing GUI code, enabling more effective data visualization.
- Enforced proper documentation techniques and formatting in accordance with PEP8 guidelines, ensuring clarity and maintainability of the codebase.

TEACHING AND ADVISING

***Tutor* | Georgia Institute of Technology | Atlanta, GA** *Aug 2023 – May 2024*

- Guided undergraduate students at the Center for Academic, Success, and Equity to approach their studies critically, identifying gaps in understanding and providing one-on-one support to address them.
- Offered alternative resources and strategies to help students grasp challenging concepts, particularly in Supply Chain Modeling.
- Promoted effective study habits and problem-solving techniques for academic success.

PUBLICATIONS

[4] **R. Davila Severiano**, C. Crozier, Tipping Points for the Electrification of Heavy-Duty Vehicles, *Under Development*, 2026.

[3] Y. Ji, **R. Davila Severiano**, C. Crozier, Battery Swapping Stations for Long Haul Freight Charging Considering an Electrified Supply Chain, *IEEE North American Power Systems Conference*, 2025.

[2] **R. Davila Severiano**, C. Crozier, M. O'Malley, C. White, On the Potential of Electrified Supply Chains to Provide Long Duration Demand Flexibility, *Under Review*, 2025.

[1] **R. Davila Severiano**, C. Crozier, Scheduling Electrified Freight Transportation to Increase Renewable Generation Utilization, *IEEE North American Power Systems Conference*, 2024.

PRESENTATIONS

Paper Presentation

Davila Severiano, R., & Crozier, C. (2025, October). *On the Potential of Electrified Supply Chains to Provide Long Duration Demand Flexibility*. Paper presented at the 2025 Informs Annual Meeting (INFORMS 2025), Atlanta, GA.

Poster Presentation

Davila Severiano, R., & Crozier, C. (2025, July). *Quantifying the Potential of Electrified Supply Chains for Long Duration Demand Flexibility.* Poster presented at the 2025 IEEE Power & Energy Society General Meeting (PES GM), Austin, TX.

Paper Presentation

Davila Severiano, R., & Crozier, C. (2024, October). *Scheduling Electrified Freight Transportation to Increase Renewable Generation Utilization*. Paper presented at the 56th North American Power Symposium (NAPS 2024), El Paso, TX.

SKILLS

Languages: *Native:* English; *Fluent*: Spanish

Programming & Tools: *Proficient:* OPL, Simio, SAS, SQL; *Experience:* Python (Gurobi, Pandas, NumPy), R, RStudio, GitHub, Excel (Solver), JavaScript, Fusion 360, Six Sigma, PassengerSim

Concepts: Optimization, Constraint Design, Mixed-Integer Linear Programming (MILP), Benders Decomposition, Constraint Generation, Stochastics, Regression and Forecasting, Data Analysis and Visualization, Economic Analysis, Progressive Hedging

LEADERSHIP AND ACTIVITIES

- Women in Industrial and Systems Engineering *Aug 2024 – Present*
- COE Culture & Community, Graduate Representative *Aug 2024 – Present*
- Society of Women Engineers *Aug 2019 – May 2023*

HONORS AND AWARDS

- Anderson-Interface PhD Student Fellowship, 2025
- Dean's List, Fall 2019 **–** Spring 2023
- Summa Cum Laude, 2023