Shiuli Subhra Ghosh

Engineer, Data Scientist, Energy Systems Analyst

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About Me

- **Work authorization: H1B visa holder** (Exempted from 100k fees). **Eligible for EB2 NIW**.
- Electrical Engineer and Data Scientist with 5+ years of experience in power systems analytics and large-scale forecasting methodologies.
- Lead development of forecasting solutions for structurally shifting demand driven by hyperscale data centers, with a focus on uncertainty propagation and implications for system operations and market outcomes.
- Experienced in translating advanced statistical and machine learning models into decision-support tools for grid planning and operational strategy.
- Seeking to contribute to US energy markets and energy transition solutions.

Education

Rensselaer Polytechnic Institute **August 2022 – Dec 2024**
Master of Science - Electrical Engineering; GPA: 3.82/4.0 *Troy, New York*

Chennai Mathematical Institute **Jan 2021 – June 2022**
Master of Science - Data Science; GPA: 9.19/10 *Chennai, India*

National Institute of Technology, Durgapur **August 2014 – June 2018**
Bachelor of Technology - Electrical Engineering; GPA: 8.62/10 *Durgapur, India*

Technical Skills

Technical Languages: Python | MATLAB | R | SQL | Julia

Tools / Packages: PyTorch | Pandas | Numpy | scikit-learn | TimeGPT | StatsForecast | PyWhy | Tableau | Power BI | MySQL | PI | SEEQ | PSSE | PLEXOS

Experience

Engineer, Dominion Energy Virginia **February 2025 - Present**
Engineering Analytics and Modelling *Richmond, VA, United States of America*

- Leading the design of an enterprise forecasting platform for renewable generation and data center–driven load growth, enabling Transmission Planning and System Operations to make risk-informed decisions on interconnections, outage scheduling, and capacity adequacy under rapid load expansion.
- Developing and deploying day-ahead to long-term forecasting models (SARIMA, ETS, Prophet, LSTM, Transformers) integrating SCADA telemetry, grid topology, and weather models (GFS, HRRR), improving forecast reliability for 300+ transmission assets and directly informing PJM-facing operational and planning submissions.
- Designing probabilistic risk frameworks to quantify load curtailment and congestion exposure under planned outages and topology changes, supporting go/no-go outage decisions and contingency planning under forecast uncertainty.
- Architecting scalable data pipelines and automated agile CI/CD workflows by integrating multiple databases like telemetry from PI System, Billing data, etc. to ensure high-integrity inputs for reliability studies, and market-facing forecasts, reducing data latency and improving decision turnaround time.
- Modeling and clustering AI data center load behavior (hyperscaler, colocation, enterprise) using time-series methods and Gaussian Processes to estimate demand for new substations with limited history, supporting infrastructure investment prioritization and interconnection studies.
- Applying power spectral density and signal processing techniques to detect oscillatory and abnormal transmission behavior, enabling early operational intervention and enhancing system reliability margins.

Graduate Research Assistant **August 2022 – Dec 2024**
Information Systems Group *Jonsson Engineering Center, Troy, NY*

- Contributed to the application of causal inference methods for analyzing non-local cascading failure propagation in power transmission networks, in collaboration with IBM Research, improving grid resilience and risk assessment.
- Developed an unsupervised novel causal prediction framework using causal discovery algorithms.
- Compared our method with the ground truth scenarios given by steady state power flow solvers (MATPOWER), state-of-the-art influence graphs, and GNN models.

Associate Manager, Jindal Stainless Limited **July 2018 - Jan 2021**
Electrical and Automation *Odisha, India*

- Leading a 12+ member team with expertise in medium voltage electrical maintenance (Transformers, Switch Gears, UG Cables) in stainless steel manufacturing.
- Reduced plant downtime by analyzing historical breakdowns and performing preventive maintenance on 33 kV equipment; improved maintenance delivery time by 15% through weekly training and performance tracking.
- Served as an auditor for plant maintenance services by focusing on quality, discipline, and accurate results for internal and external customers. Well-versed in ISO standards (9001, 14001) and EnMS (ISO 50001).
- Developed stainless steel grade-wise power consumption prediction models using clustering (K-means, DBSCAN) and regression algorithms (Linear models, Random Forest, SVR, GMM).

Internships

ET Summer Intern, Dominion Energy, Virginia **May 2024 - August 2024**
Hierarchical Load Forecasting *Richmond, USA*

- Developed and conceptualized machine learning pipelines for load forecasting using version-controlled workflows, with automated training and deployment managed via Azure DevOps Actions.
- Deployed forecasting models with integrated monitoring using MLflow and custom Power BI dashboards for real-time tracking of forecast accuracy and data drift.
- Implementation of multiple algorithms (MinT, Mid-MinT, Bottom-up) for solving the forecast incoherency at each level of hierarchy.
- The solution involved forecast reconciliation, which empirically proved to be valuable in the Dominion Energy Electric Transmission System.

Research Intern, imec, Belgium **Jan 2022 - June 2022**
Deep Learning for Defect Detection *Leuven, Belgium*

- Utilized cutting-edge deep learning architectures such as YoloV5, RetinaNet, EfficientNet, P-Noise2Noise, etc., to investigate innovative methodologies for denoising and defect classification in CD-SEM images.
- Submitted master's thesis on "Defect Classification and Detection in Semiconductor Manufacturing".

Research Intern, INESC TEC, Portugal **Sept 2021 - Dec 2021**
Modelling Energy Data Market Using Online Learning framework *Porto, Portugal*

- Developed an Online Learning framework for modeling the incentive scheme for Energy Data Market by improving the data allocation and profit distribution algorithms.
- Performed mathematical model development and validation under the direction of experienced mentors.

AI Digital Intern, Legato Health Technologies **Jul 2021 - Sept 2021**
Model Bias Detection Framework using Statistical Hypothesis Testing *Bangalore, India*

- Actively participated in developing a prototype on Anthem AutoML.
- Conducted research on statistical hypothesis testing for "Model Bias Detection Framework" for binary class classification problems.
- Contributed and worked in a multi-site team setting.

Publications

Patents

- Shiuli Subhra Ghosh and Anmol Dwivedi and Ali Tajer and Kyongmin Yeo and Wesley M. Gifford, “Cascading Anomaly Prediction via Causal Inference", U.S. Patent Application No. 18/915,503

Journal Papers

- S. S. Ghosh, A. Dwivedi, A. Tajer, K. Yeo, and W. M. Gifford, “Cascading Failure Prediction via Causal Inference,” *IEEE Transactions on Power Systems*, pp. 1–12, 2024

Conference Papers

- (Accepted at PES General Meeting 2026) S. S. Ghosh, B. Luthra, J. De La Ree Jr, and K. D. Jones, “Non-conforming load pattern analysis,”
- (Accepted at IEEE T&D 2026) S. S. Ghosh, B. Luthra, J. De La Ree Jr, and K. D. Jones, “Hierarchical forecasting for data center loads,”
- S. Sarkar, A. Ghosh, and S. S. Ghosh, “Study of Cardiorespiratory and Sweat Monitoring Wearable Architecture for Coal Mine Workers,” in *2020 IEEE Region 10 Conference (TENCON)*, pp. 355–360, 2020
- S. Sarkar, A. Ghosh, and S. Subhra Ghosh, “Design of Imc & Imc Derived PID Controller for Interleaved Boost Converter,” in *2020 IEEE Region 10 Conference (TENCON)*, pp. 841–846, 2020
- S. Sarkar and S. S. Ghosh, “Traditional Imc & Imc Based PID Controller Design for Tri-State Boost Converter,” in *2020 IEEE 9th Power India International Conference (PIICON)*, pp. 1–6, 2020
- S. Sarkar and S. S. Ghosh, “Comparison of Advanced Analog Controllers for a DC-DC Boost Converter,” in *2020 IEEE 9th Power India International Conference (PIICON)*, pp. 1–6, 2020
- S. S. Ghosh and S. Sarkar, “Type-III Controller Design for Direct and Indirect Dual Mode Control of Tri-State Boost Converter,” in *2020 International Conference on Computer, Electrical & Communication Engineering (ICCECE)*, pp. 1–7, 2020
- S. Sarkar and S. S. Ghosh, “Comparison of Different Types of Internal Model Controller Architecture for a Boost Converter,” in *2020 IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy (PESGRE2020)*, pp. 1–6, 2020

Honors and Awards

- **Dominion Energy Diversity Scholarship:** Awarded for outstanding academic achievements and a demonstrated commitment to diversity, equity, and inclusion during the summer internship program in 2024.
- **J. Baliga Award:** Awarded for consistent grade point average, overall background, and recommendations from the faculty in the first year of Ph.D. program
- **Best Graduate Engineer Trainee:** Received and award for outstanding achievements in Graduate Engineering Training Program at Jindal Stainless Limited
- **NCQC Par Excellence Award:** Awarded for improving accuracy and efficiency by designing and executing the project on in-house development of Energy Monitoring System

-Last updated 10th February, 2026.