Nikhil Ravi

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Doctoral student with research experience in complex networked dynamic systems, with a focus on energy systems. Advanced understanding of linear algebra, statistics, stochastic processes, optimization, and probability theory. Skilled in time-series predictive modeling, causal inference, and hypothetical testing. Looking for full-time data science/quantitative research roles starting May 2023.

SKILLS

Programming: Python (NumPy, pandas, scikit-learn, statsmodels, sphinx, plot.ly, folium, Streamlit, TensorFlow/PyTorch), JavaScript, React.jsm ReactNative, MATLAB, R, GCP, Django, REST API, Git, LaTeX, SQL.

Personal Projects: Django-based Pokémon Trading Card collection tracking webpage, Chess-insights drawn from chess games of a player on Chess.com.

EDUCATION

Cornell University　　　　　　　　　　　　　　　　　　　　　　**Expected in May 2023**
Ph. D., Electrical and Computer Engineering　　　　　　　　　　　　　　　　*New York, NY*
- Research Assistant; *Dissertation*: "Differentially Private Smart Grid"; 3.97/4.0 GPA.
- Awarded the 2022 *PiTech Impact Fellowship* at the City of Ithaca's Green New Deal Program.
- *Relevant Coursework*: Statistical Machine Learning, Applied Probability and Stochastic, Reinforcement Learning and Optimal Control, Distributed Optimization, Bayesian Methods in ML, Causal Learning, and Inference.
- Grader for ECE 5260: Graph-Based Data Science for Networked Systems (Fall 2022).

Arizona State University　　　　　　　　　　　　　　　　　　　　　**August 2021**
M.S., Electrical Engineering　　　　　　　　　　　　　　　　　　　　　*Tempe, AZ*
- Research Assistant, *Thesis*: "Decentralized Optimization in Adversarial Environments", GPA: 4.0/4.0.
- Received the 2021 *Ira A. Fulton Schools of Engineering Graduate Fellowship*.

PES Institute of Technology　　　　　　　　　　　　　　　　　　　　　**May 2017**
B.E., Electronics and Communication Engineering　　　　　　　　　　　　　*Bangalore, India*
- Graduated with Distinction, First Class; 9.9/10 GPA.
- Awarded the *Prof. MRD Scholarship* and the 2015 *Indian Academy of Sciences Summer Research Fellowship*.

WORK EXPERIENCE

Kevala, Inc.　　　　　　　　　　　　　　　　　　　　　**May 2022 – August 2022**
Data Science Intern　　　　　　　　　　　　　　　　　　　　　*New York, NY*
- Developed a deep reinforcement learning-based tool on GCP Vertex AI to maximize batteries and plug-in electric vehicles' electricity price arbitrage value via charge schedule optimization, based on electricity price, solar irradiation, and load forecasts.
- Built a pipeline to ingest day-ahead and real-time market electricity prices into Google BigQuery.
- Developed a methodology to estimate feeder-level electricity generation carbon social prices.
- Created data visualization dashboards using Streamlit, translating complex data sets into comprehensive visual representations.
- Researched and published an internal blog on the use of racial features in BESS adoption models.

Lawrence Berkeley National Laboratory　　　　　　　　　　　**May 2021 – August 2021**
Research Intern　　　　　　　　　　　　　　　　　　　　　　　*Remote, USA*
- Developed a pipeline to ingest and clean large time-series AMI data of an electric ISO's consumers onto a PostgreSQL database.
- Designed algorithms to publish differentially private summary statistics about consumer energy data.
- Proposed a differentially private clustering algorithm to classify consumers and generate typical average load shapes of houses.
- Developed a differential privatized cyber-physical attack detection methodology for SCADA systems.

Arizona State University　　　　　　　　　　　　　　　　**August 2017 – August 2021**
Graduate Research Assistant　　　　　　　　　　　　　　　　　　　　*Tempe, AZ*
- Designed the Electron Volt Exchange, a secure Hyperledger Fabric-based distributed ledger for Transactive Energy.
- Proposed a distributed optimization algorithm to verify users' compliance with power schedules and to mitigate the impact of false data injection.
- Developed gradient-based edge-cutting mechanisms to build Byzantine fault-tolerant decentralized optimization algorithms.
- Designed an algorithm to infer socioeconomic preference from crowd movement dynamics data.
- Managed the SINE Lab's compute resource cluster including VM management, networking, and administration.

SELECTED PUBLICATIONS

- **Ravi, N.**, et al. "Differentially Private K-means Clustering Applied to Meter Data Analysis and Synthesis." IEEE Transactions on Smart Grid (2022).
- Saha, S., **Ravi, N.**, et al. "A secure distributed ledger for transactive energy: The Electron Volt Exchange (EVE) blockchain." Applied Energy (2021).
- **Ravi, N.**, Scaglione, A. "Detection and Isolation of Adversaries in Decentralized Optimization for Non-Strongly Convex Objectives." In IFAC Workshop on Distributed Estimation and Control in Networked Systems (2019 NECSYS).
- **Ravi, N.**, Scaglione, A. & Nedić, A. "A Case of Distributed Optimization in Adversarial Environment." In IEEE International Conference on Acoustics, Speech, and Signal Processing (2019 ICASSP).
- **Ravi, N.**, et al. "Network Inference and its Application to the Estimation of Crowd Dynamics from IoT Sensors." In 2018 IEEE International Workshop on Signal Processing Advances in Wireless Communications (2018 SPAWC).