

Priyadarshan Patil

APPLIED SCIENTIST · AMAZON (WORLDWIDE OPERATIONS)

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Summary

- Driven, collaborative, and hands-on researcher with 8 publications (4 as first author) and 16 conference presentations. Has experience in predictive modeling, applied science, regression and classification algorithms, and optimization
- A highly motivated, data driven, and analytical collaborator with a natural ability to think strategically and effectively communicate technical concepts to both technical and non-technical audiences

Work Experience

Electrotempo Inc.

Arlington, VA

APPLIED SCIENTIST

April 2023 - Current

- Developed and implemented a joint electric forlift and charger optimizer for the Port of Virginia
- Designed and implemented an end-to-end solution for power and energy demand estimation for depots
- Working on a site equipment sizing product incorporating behavioral and scheduling data with joint site and fleet optimization.

Amazon.com

Seattle, WA

APPLIED SCIENTIST

August 2022 - March 2023

- Developed and automated the short-term (11 weeks) plan for flow and carrier allocation on Amazon's US network. The plan includes adherence to third-party contracts, a glide path for event days, and guidance for staffing
- The developed python MILP model reduced Amazon network staffing costs by 2%, while reducing plan WAPE from 5% to 3.3% which increases plan robustness. We also reduced annual contract violation penalties by \$600M
- Improved last mile topology optimizer performance by generating and using historical/prediction regression methods, reducing WAPE from 16% to 9% to improve robustness. This tool is used to determine mid-term and long-term jurisdiction planning

Center for Transportation Research, The University of Texas at Austin

Austin, TX

RESEARCH ASSISTANT

Aug 2015 - July 2022

- Proposed usage of neural networks to quantify disruption impact across urban transportation networks. Over 98% of disruption impacts were predicted within 1% threshold, while reducing computation time
- Used SVM and KNN ensemble for traffic incident detection based on inductive loop data. The proposed method provided >90% accuracy and 0.86 F-score across all tested corridors.
- Used dynamic programming and convex optimization methods to improve post-disaster recovery sequencing for road networks, improving solution complexity from factorial to exponential
- Developed efficient algorithms for symmetric traffic assignment problem, reducing solution time by 50%. Proposed usage of this algorithm for rail road network electrification within a bi-level problem structure
- Used graph algorithms to optimize oversize/overweight vehicle routing for Texas DOT, reducing transportation and pavement repair costs by 23%

Relevant Projects

- Developed a joint demand forecasting/inventory control model using generalized regression models for the 2019 'fORged by machines' competition sponsored by AWS and INFORMS computing cluster. The model won the first prize nationally
- Served as consultant for city of West Lake Hills, TX to propose data driven traffic control interventions, reducing accidents and traveler delays. Presented results to city council in a town hall meeting
- Designed and simulated liver transplant systems for heterogeneous patient groups under various liver allocation policies.

Education

The University of Texas at Austin

Austin, TX

PH.D. IN OPERATIONS RESEARCH AND INDUSTRIAL ENGINEERING

2022

M.S. in Transportation Engineering, Certification in Engineering Education

Indian Institute of Technology Madras

Chennai, India

B.TECH. IN CIVIL ENGINEERING

2015

Relevant Information

- Skills: Python, Optimizers (Xpress, CPLEX, Gurobi), ML/DS libraries (sklearn, tensorflow pytorch, xgboost, etc.), visualization libraries (matplotlib, seaborn, plotly), SimPy, SQL, R, Git
- Certifications: AWS cloud practitioner CLF-001 (June 2023)
- Coursework: Data Science Lab, Linear regression/Discrete choice methods, Network Optimization, Production/inventory control, Econometrics, Applied probability, Linear/Integer programming, Applied Engg. data analysis/visualization/optimization
- Awards: Best student paper award 2022, TexITE; Graduate study award 2019, ITS Texas; Ryuichi Kitamura paper award, 2017
- Leadership/service: Panel expert for ACRP and NHCPR for grants worth \$750K, Referee for Amazon Research award grants, Research paper referee (6 Journals and 2 conferences).