Priyadarshan Patil, Ph.D.

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Employment

Electrotempo Inc. - Operations Research Scientist and Team Lead	*Apr '22 - Current*
Amazon Inc. - Applied Scientist, Worldwide Operations (Supply Chain)	*Aug '22 - Mar' 23*

Education

Ph.D. - Operations Research, The University of Texas at Austin	*Summer '22*
Graduate Certificate - Engineering Education, The University of Texas at Austin	*Fall '20*
M.S.E. - Civil Engineering (Transportation), The University of Texas at Austin	*Fall '16*
B.Tech. - Civil Engineering, Indian Institute of Technology Madras	*Summer '15*

Refereed publications

9. Chauhan D.R., Unnikrishnan A., Boyles S.D., Patil P., Robust Maximum Flow Network Interdiction Considering Uncertainty in Arc Capacity and Resource Consumption. (Accepted, Annals of Operations Research)

8. Patil P., Kazemzadeh K., Bansal P., Integration of Charging Behavior into Infrastructure Planning of Electric Vehicles: A Systematic Review and Framework. *Sustainable Cities and Society, 104265.*

7. Patil P., Walthall R., Boyles S.D., Budget-constrained rail electrification modeling using symmetric traffic assignment - a North American case study. *Journal of Infrastructure Systems, 28(2), 04022007.*

6. Gokalp C., Patil P., Boyles S.D., Post-disaster recovery sequencing strategy for road networks. *Transportation Research Part B, 153, 228-245.*

5. Venkatraman R., Boyles S.D., James R., Unnikrishnan A., Patil P., Adaptive routing behavior with real-time information under multiple travel objectives. *Transportation Research Interdisciplinary Perspectives, 10(100395).*

4. Andrews M.E. & Patil P., A systematic review of argument assessment frameworks in engineering education. *ASEE Annual Conference and Exposition, Conference Proceedings (2021).*

3. Patil P., Ross K., and Boyles S., Convergence behavior for traffic assignment characterization metrics. *Transportmetrica A: Transport Science, 17(4), 1244-1271.*

2. Astroza S., Patil P., Smith K., and Bhat C., Transportation planning to accommodate needs of wind energy projects.*Transportation Research Record: Journal of the Transportation Research Board, (2669), 10-18.* - **Ryuichi Kitamura paper award, 2017**

1. Patil P., Dubey S., Pinjari A., Cherchi E., Daziano R., Bhat C.R., Simulation evaluation of emerging estimation techniques for multinomial probit models, *Journal of Choice Modelling, 23, 9-20.*

Under Review

3. Patil P., Liao C., Boyles S., Effects of origin-destination matrix errors on user equilibrium. (*Under review*)

2. Patil P., A fresh look at symmetric traffic assignment and algorithm convergence. (*Under review*)

1. Pandey V., Patil P., Computationally-Efficient Decomposition Heuristic for the Static Traffic Assignment Problem. (*Under review*)

Conference/Symposium Presentations

18. Patil P.,Medium- and Heavy-duty vehicle electrification: current planning challenges and insights *Virtual Inter-University Symposium on Infrastructure Management 2023, Northwestern University*

17. Patil P., Railroad network electrification and traffic assignment. *Virtual Inter-University Symposium on Infrastructure Management 2023, Northwestern University*

16. Patil P., Walthall R., Boyles S.D., Rail network electrification using symmetric traffic assignment. *10th INFORMS Transportation Science and Logistics Society Workshop, Norway*

15. Patil P., Boyles S.D., Symmetric traffic assignment solution algorithms. *10th INFORMS Transportation Science and Logistics Society Workshop, Norway*

14. Patil P., Workshop on Doctoral Research in Transportation Policy, Planning, and Analysis. *Invited speaker, 101st Annual Meeting of the Transportation Research Board - Washington, DC/Virtual*

13. Patil P., Walthall R., Boyles S.D., Budget-constrained rail network electrification problem. *101st Annual Meeting of the Transportation Research Board - Washington, DC/Virtual*

12. Patil P., Boyles S.D., A fresh look at symmetric traffic assignment and algorithm convergence. *101st Annual Meeting of the Transportation Research Board - Washington, DC/Virtual*

11. Andrews M.E. & Patil P., A systematic review of argument assessment frameworks in engineering education. *ASEE Annual Conference and Exposition 2021 - Long Beach, CA*

10. Gokalp C., Patil P., Boyles S., Post-disaster recovery sequencing strategy for road networks. *100th Annual Meeting of the Transportation Research Board - Washington, DC/Virtual*

9. Patil P., Liao C., Boyles S., Effects of origin-destination matrix errors on user equilibrium. *100th Annual Meeting of the Transportation Research Board - Washington, DC/Virtual*

8. Gokalp C., Patil P., Khosvirikia F., Boyles S., Post-disaster recovery sequencing strategy for road networks. *INFORMS Annual Meeting, 2020 - Maryland/Virtual*

7. Patil P., Liao C., Boyles S., Effects of origin-destination matrix errors on user equilibrium. *INFORMS Annual Meeting, 2020 - Maryland/Virtual*

6. Pandey V., Patil P., Ganesh M., and Boyles S., Computationally-efficient decomposition heuristic for the static traffic assignment problem *2020 INFORMS Transportation Science and Logistics Society Conference - Arlington, VA*

5. Patil P., Ross K., and Boyles S., Convergence behavior for traffic assignment characterization metrics. *99th Annual Meeting of the Transportation Research Board - Washington, DC*

4. Patil P., Ross K., and Boyles S., Convergence behavior for traffic assignment characterization metrics. *INFORMS Annual Meeting, 2019 - Seattle, WA*

3. Pandey V., Patil P., and Boyles S., Online routing of heterogeneous vehicles on stochastic time-varying managed lane networks. *INFORMS Annual Meeting, 2018 - Phoenix, AZ*

2. Boyles S., Patil P., and Alexander W., Quantifying disruption impact across transportation networks, *INFORMS Annual Meeting, 2018 - Phoenix, AZ*

1. Astroza S., Patil P., Smith K., and Bhat C., Transportation planning to accommodate needs of wind energy projects. *96th Annual Meeting of the Transportation Research Board - Washington, DC*

Technical Report

2. Boyles S., Patil P., Pandey V., and Yahia C., Beyond political boundaries: Constructing network models for megaregion planning.*USDOT Tier 1 Center: Cooperative Mobility for Competitive Megaregions, CM2-11.*

1. Astroza S., Patil, P., Smith K., Kumar V, Bhat C., Zhang Z., Texas transportation planning for future renewable energy projects, *Texas Department of Transportation, FHWA/TX-16/0-6850-1*

Awards

8. **Best student paper Award, 2022** - Awarded by Texas chapter of ITE International for best student transportation paper in Texas

7. **Professional Development Award, 2021** - Awarded by the Graduate School at UT Austin for presentations at the 2022 TRB annual meeting

6. **Professional Development Award, 2020** - Awarded by the Graduate School at UT Austin for presentations at the 2020 INFORMS annual meeting and 2021 TRB annual meeting

5. **Winner, fORged by Machines competition, 2019** - Awarded by INFORMS computing society cluster and AWS for the best demand prediction/inventory control model

4. **Professional Development Award, 2019** - Awarded by the Graduate School at UT Austin for presentations at the 2019 INFORMS annual meeting

3. **Scholarship for Graduate Study in ITS, 2018** - Awarded by Intelligent Transportation Society Texas chapter for academic achievements

2. **Professional Development Award, 2018** - Awarded by the Graduate School at UT Austin for presentations at the 2018 INFORMS annual meeting

1. **Ryuichi Kitamura paper award, 2017** - Best Paper award for a professor- student pair awarded by Travel analysis methods section (ADB00) of the Transportation Research Board

Research Service

Professional appointment: Member and Communications Coordinator, Standing Committee on Railroad Operating Technologies, Transportation Research Board

Section Editor: Modern Transportation

Grant Referee:
– National Science Foundation
– National Academy of Sciences Airport Cooperate Research Program grant - $400,000
– National Academy of Sciences National Cooperative Highway Research Program - $350,000
– Amazon Research Awards - $80,000

Paper Referee:
– Transportation Research Part B

- Transportation Research Part C
- Transportmetrica A: Transport Science
- Transportation Letters
- Networks and Spatial Economics
- Transportation Research Record
- Transportation Research Interdisciplinary Perspectives
- Transportation Research Board annual meeting
- Energies
- Future Transportation
- Sustainability
- Cogent Social Sciences
- Frontiers in Education conference
- American Society for Engineering Education annual conference

Past Leadership and Misc. Service

- EER Mentored Proposal Reviewer Program fellow, Journal of Engineering Education.

- Shuttle Bus Committee, UT Austin.

- East Campus Graduate Housing Project committee, UT Austin.

- Secretary, ITE/ITS student chapter, UT Austin (*Best TX student chapter award, 2019*)

Teaching Experience

Graduate Teaching Assistant: Probability and Statistics (Spring 2019, Spring 2020), Civil engineering systems (Fall 2018), Transportation systems (Fall 2016)
- **Probability and Statistics:** Assisted course design, evaluation design, and handled grading, in addition to weekly lab sessions and office hours (Overall Rating: 4.33/5)
- **Civil Engineering Systems:** Created new modules on data analysis and linear regression, in addition to conducting regular lab sessions, office hours, and grading (Overall Rating: 4.46/5)
- **Transportation Systems:** Conducted regular discussion sessions, office hours, and grading

Certification in Engineering Education, The University of Texas at Austin (Completed, Fall 2020)
- Courses completed: Knowing/learning in STEM education, Supervised teaching in engg., Assessment/curriculum design in engg., Teaching practicum, Argumentation in engineering education
- Designed an introductory course on network analysis including design of learning objectives, syllabus, assessment plan, lesson plan, and one weeks worth of learning activities
- Taught an interactive 1.5-hour guest lecture session on probability applications to a class of 60 students
- My research (as a part of the certification) resulted in a peer-reviewed publication (See pub. no. 4)

Mentoring Experience

Graduates Linked with Undergraduates in Engineering (GLUE) mentor (Fall '18 - Spring '19)
- Mentored two undergraduate sophomores (Ms. Katherine Ross, Ms. Bradley Gladdens) on transportation and hurricane evacuation research
- Ms. Ross aided in experimental work on a publication and Ms. Gladdens helped with a literature review used for proposal writing

MiTR mentor, IIT Madras (Fall '14 - Spring '15)
- Mentored 8 freshmen undergraduate students and supported their academic journey on campus.

Relevant Technical Skills

Languages: Python, MATLAB, R, AMPL, SQL
Tools/Packages: SPSS, Stata, TransCAD, OpenCV, Vissim, ArcGIS
Python libraries: Pandas, Numpy, Scipy, visualization libraries (matplotlib, seaborn, plotly), Optimizers (Xpress, CPLEX, Gurobi), SimPy, ML/DS libraries (sklearn, tensorflow pytorch, keras, xgboost, etc.)
Certifications: AWS cloud practitioner (CLF-001, June 2023)

Coursework Highlights

UT Austin (PhD) - Data Science Lab, Public Transportation Engineering, Network Optimization, Linear Programming, Integer Programming, Applied Engg. Data Analysis/Visualization/Optimization, Applied Stochastic Processes, Markov Decision Processes, Queueing Theory, Production/Inventory Control, Decision Analysis
UT Austin (MS) - Transportation Network Analysis, Transportation Systems Management, Logistic Regression/Discrete Choice, Dynamic Traffic Assignment, TransCAD GIS, Logistics Analytics

IIT Madras - Transportation Network Analysis, Computer Applications in Traffic & Highway
Engineering, Probability-Statistics and Stochastic Processes, Calculus I & II

Thesis

Doctoral : Traffic assignment models – applicability and efficacy
Advisor: Dr. Stephen D. Boyles, UT Austin
Masters : Simulation Evaluation of Emerging Estimation Techniques for Multinomial Probit Models
Advisor: Dr. Chandra Bhat, UT Austin
Bachelors : Network Algorithms for Sustainability Objective
Advisor: Dr. Karthik K Srinivasan, IIT Madras

Selected Projects

1. Simulation of liver transplant systems for multiple liver quality thresholds
   – Designed and simulated liver transplant systems for heterogeneous patient groups under various
     liver allocation policies.
2. Intersection redesign study as Consultant for the city of West Lake Hills
   – Conducted a traffic count study and traveler satisfaction survey for multiple traffic control inter-
     ventions at the intersection under study
   – Presented results of the study to the city council and members of the public; providing recommen-
     dations for changing intersection configuration
3. Modeling inequity through dynamic traffic assignment (DTA)
   – Designed a parking search problem with departure time choice to model inequity
   – Derived analytical solutions for the parking search problem with PQ model integration
4. Planning for environmental effect of pollutants by Visualization in TransCAD
   – Performed 4-step planning process, linked trip distribution to emission density and prepared
     visualizations to pinpoint areas of maximum impact for easy remedial measures

Miscellaneous

– National Intercollegiate Racquetball Player, UT Austin.

– 99.99 %ile in CAT 2014 (conducted by IIMs), ranked among top 25 among over 1,70,000 candidates.

– KVPY fellowship granted by the Dept. of Science and Technology, Govt. of India.