Priyadarshan Patil, Ph.D.

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Employment

Amazon Inc. - Applied Scientist, Worldwide Operations (Supply Chain) *Aug '22 - Current*

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

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

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 Presentations and Invited Talks

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

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
Tools/Packages: SPSS, Stata, TransCAD, OpenCV, Vissim, ArcGIS
Python libraries: Pandas, Numpy, Scipy, visualization libraries (matplotlib, seaborn, plotly), ML/DS libraries (sklearn, tensorflow pytorch, keras, xgboost, etc.), Optimizers (Xpress, CPLEX, Gurobi), SimPy, SQL, R, AWS cloud (S3, redshift, EC2, etc.), Git

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 interventions at the intersection under study
   - Presented results of the study to the city council and members of the public; providing recommendations 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

Research Service

Grant Referee:

- National Academy of Sciences Airport Cooperate Research Program grant - $450,000
- National Academy of Sciences National Cooperative Highway Research Program - $400,000
- Amazon Research Awards - $80,000

Paper Referee:

- Transportation Research Part C
- Transportation Letters
- Transportation Research Record

- Transportation Research Interdisciplinary Perspectives
- Transportation Research Board annual meeting
- Journal of Engineering Education
- American Society for Engineering Education annual conference

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*)
- Member, INFORMS
- Member, Institute of Transportation Engineers and Intelligent Transportation Society of America

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.

References

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