

# Priyadarshan Patil, Ph.D.

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## Employment

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<b>Electrotempo Inc.</b> - Operations Research Scientist	Apr '22 - Current
<b>Amazon Inc.</b> - Applied Scientist, Worldwide Operations (Supply Chain)	Aug '22 - Mar' 23

## Education

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

## Refereed publications

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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. Chauhan D.R., Unnikrishnan A., Boyles S.D., Patil P., Robust Maximum Flow Network Interdiction Considering Uncertainty in Arc Capacity and Resource Consumption. (*Under 2nd 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

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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*

#### Under Review

1. Grossman A., Fong A., Jaishankar R., Patil P., Xu Y., Developing an Equity-Informed Charging Infrastructure Planning Tool: Recent Applications in Houston and Austin (*Under review*)

#### Technical Report

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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

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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

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**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

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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

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**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

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**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

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**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

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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

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Section Editor, Modern Transportation

Grant Referee:

- National Academy of Sciences Airport Cooperative 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
- Transportation Research Record
- Transportation Research Interdisciplinary Perspectives
- Transportation Research Board annual meeting
- Sustainability
- Frontiers in Education conference
- American Society for Engineering Education annual conference

## Leadership and Misc. Service

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- 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

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- 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.