Venktesh Pandey

Ph.D. Candidate, Department of Civil, Architectural, and Environmental Engineering
The University of Texas at Austin

(737) 222 8473 | venktesh@utexas.edu | https://venktesh22.github.io/

EDUCATION

Doctor of Philosophy, The University of Texas at Austin — May 2020 (Expected)
Department of Civil, Architectural, and Environmental Engineering
Dissertation title: *Dynamic Pricing and Long-term Planning Models for Managed Lanes with Multiple Entrances and Exits*
Certification in Engineering Education

Masters of Science, The University of Texas at Austin — August 2016
Department of Civil, Architectural, and Environmental Engineering
Thesis title: *Optimal Dynamic Pricing for Managed Lanes with Multiple Entrances and Exits* (**Winner, Milton Pikarsky Award, 2017**)

Bachelor of Technology with Honors, Indian Institute of Technology, Bombay — May 2014
Department of Civil Engineering
Minor: Center of Studies in Resource Engineering
Thesis: *Developing Simulation Model for Indian Road Networks Using TRANSIMS*

WORK EXPERIENCE

Graduate Research Assistant, The University of Texas at Austin — August 2014- Current

Project titles:

- Operational Effectiveness of Active Traffic Management (ATM) Strategies for Texas Corridors
- Decentralized Modeling of Large-scale Transportation Networks for Consistent Statewide Planning Models
- Modeling Managed Lanes in Long-term Planning Models

Assisted in writing proposals funded by Texas Department of Transportation (TxDOT) and North Central Texas Council of Governments (NCTCOG)

Research Intern, IBM Research, Dublin, Ireland — May 2018- Dec 2018

- Developed algorithms for modeling cooperation and competition in multi-company ridesharing problem while working remotely and collaborating with an international team
- Coded programs in Java and Python for large scale modeling of the algorithms

Research Assistant, Center for Transportation Research, Austin — May 2017-August 2017

- Performed statistical analysis on the National Performance Management Research Data Set (NPMRDS) and developed an online data interpretation interface in R-shiny to evaluate corridor performance metrics
- Aggregated and analyzed real-time Wi-Fi data for travel time estimation using City of Austin Wi-Fi detectors

- Collaborated with Texas Advanced Computing Center (TACC) in developing deep learning algorithms for automatic vehicle detection and safety quantification on intersection using traffic videos

Research Intern, Future Cities Laboratory, Singapore May 2013- July 2013

- Improved the meta-model of incorporating signal delays in agent based simulation software, MATSIM, by handling agent arrival events at an intersection using 1000+ lines of Java code, leading to a 10% reduction in computation time

AWARDS AND HONORS

Recipient, People's Choice Award, Three-minute Thesis Competition, Organized by Graduate School, The University of Texas at Austin 2019
Winner, Three-minute Thesis Competition: Concise Portrayal of Research Discovery to Non-specialist Audience, Organized by Young Member Council, Transportation Research Board 2019
Winner, Transportation Technology Tournament, Organized by National Operations Center of Excellence (NOCoE) and the U.S. DOT 2018
Recipient, Kolodzey Travel Grant, Department of Civil, Architectural, and Environmental Engineering 2018
Recipient, Milton Pikarsky Award for Outstanding Master's Thesis in Science and Technology 2017
Recipient, ITS Texas Scholarship for Graduate Study in Intelligent Transportation Systems 2015
Winner, Texas District Collegiate Traffic Bowl, Institute of Transportation Engineers 2015
Recipient, Undergraduate Research Award 2013, IIT Bombay 2013
Awarded Certificate of Merit, Indian National Mathematics Olympiad 2013
Recipient, National Talent Search Examination Scholarship (awarded to 700 applicants out of 300,000 by the Government of India) 2008

JOURNAL PUBLICATIONS

6. **Pandey, V.**, Monteil, J., Gambella, C., and Simonetto, A. (2019). On the needs for MaaS platforms to handle competition in ridesharing mobility. *Transportation Research Part C: Emerging Technologies*, 108, 269-288. https://doi.org/10.1016/j.trc.2019.09.021.
5. **Pandey V.**, and Boyles, S. D. (2019). Comparing route choice models for managed lanes with multiple entrances and exits. *Transportation Research Record,* 2673(10), 381–393. https://doi.org/10.1177/0361198119848706.
4. **Pandey V.**, and Boyles, S. D. (2018). Dynamic pricing of managed lanes with multiple entrances and exits. *Transportation Research Part C: Emerging Technologies*, 96, 304-320. https://doi.org/10.1016/j.trc.2018.09.017.
3. **Pandey, V.**, and Ruiz-Juri, N. (2018). Using National performance management research data set (NPMRDS) for corridor performance measures: a US 281N corridor case study. *Transportation Research Record*. https://doi.org/10.1177/0361198118796972.
2. Yahia, C., **Pandey, V.**, and Boyles, S. D. (2018). Network partitioning algorithms for solving the traffic assignment problems using a decomposition approach. *Transportation Research Record*. https://doi.org/10.1177/0361198118799039.
1. Jafari, E., **Pandey, V.**, and Boyles, S. D. (2017). A decomposition approach to the static traffic assignment problem. *Transportation Research Part B: Methodological*, 105, 270-296. https://doi.org/10.1016/j.trb.2017.09.011.

Currently under review

2. **Pandey, V.**, Perrine, K. A., and Levin, M.W. (2019). Dynamic user equilibrium with recourse and variable message signs. Under review.
1. **Pandey, V.**, Wang, E., and Boyles, S. D. (2019). Deep reinforcement learning algorithm for dynamic pricing of express lanes with multiple access locations. Under review. Preprint: https://arxiv.org/abs/1909.04760.

REFEREED CONFERENCE PROCEEDINGS

14. **Pandey, V.**, Wang, E. and Boyles, S. D. (2020). Deep Reinforcement Learning Algorithm for Dynamic Pricing of Express Lanes with Multiple Access Locations. To be presented at 99th Annual Meeting of the Transportation Research Board, Washington, DC.
13. **Pandey, V.**, Monteil, J., Gambella, C., and Simonetto, A. (2019). On the needs for MaaS platforms to handle competition in ridesharing mobility. Presented at the Tenth Triennial Symposium on Transportation Analysis (TRISTAN), Hamilton Island, Australia.
12. **Pandey, V.** and Boyles, S. D. (2019). Multiclass user equilibrium with recourse model for long-term planning of managed lanes. Presented at 15th World Conference on Transport Research, Mumbai, India.
11. **Pandey, V.** and Boyles, S. D. (2019). Comparing route choice models for managed lanes with multiple entrances and exits. Presented at 98th Annual Meeting of the Transportation Research Board, Washington, DC.
10. **Pandey, V.** and Boyles, S.D. (2018). Multiagent reinforcement learning model for distributed dynamic pricing of managed lanes. Presented at the 21st IEEE International Conference on Intelligent Transportation Systems, Lahaina, HI. **(Candidate, Best paper award)**
9. Perrine, K. A., **Pandey, V.**, and Levin, M. W. (2018). Dynamic user equilibrium with recourse with variable message signs. Presented at the 7th International Symposium on Dynamic Traffic Assignment: June 2018, Hong Kong, China.
8. **Pandey V.** and Boyles, S. D. (2018). Dynamic pricing for managed lanes with multiple entrances and exits. Presented at 97th Annual Meeting of the Transportation Research Board, Washington, DC.
7. **Pandey V.**, Li, J., Yahia, C., and Boyles, S. D. (2018). Evaluation of active traffic management (ATM) strategies under recurring and non-recurring congestion: an IH-35 corridor case study. Presented at 97th Annual Meeting of the Transportation Research Board, Washington, DC.
6. **Pandey, V.** and Ruiz-Juri, N. (2018). Using National performance management research data set (NPMRDS) for corridor performance measures: a US 281N corridor case study. Presented at 97th Annual Meeting of the Transportation Research Board, Washington, DC.
5. Yahia, C., **Pandey, V.**, and Boyles, S. D. (2018). Network partitioning algorithms for solving the traffic assignment problems using a decomposition approach. Presented at 97th Annual Meeting of the Transportation Research Board, Washington, DC.
4. **Pandey V.**, Xu, W., Huang, L., Liu, S., and Ruiz-Juri, N. (2018). Processing large-scale video data to support transportation safety, planning, and operations: a flexible approach to data storage and integration. Presented at 97th Annual Meeting of the Transportation Research Board, Washington, DC.
3. Huang, L., Weijia, X., Liu, S., **Pandey, V.**, Ruiz-Juri, N. (2017). Enabling versatile analysis of large scale traffic video data with deep learning and HiveQL. Presented at the 2017 IEEE International Conference on Big Data, Boston, MA.

2. Jafari, E., **Pandey, V.**, and Boyles, S. D. (2016). Static traffic assignment: a decentralized approach. Presented at 95th Annual Meeting of the Transportation Research Board, Washington, DC.
1. Saxena N., **Pandey, V.**, and Patil, G. R. (2013). Developing simulation model for urban road networks in developing countries using TRANSIMS. Presented at the Conference on Agent-Based Modeling in Transportation Planning and Operations, Blacksburg, VA.

TECHNICAL REPORTS

4. Boyles, S. D., Patil, P. N., **Pandey, V.**, and Yahia, C. (2019). Beyond Political Boundaries: Constructing Network Models for Megaregion Planning. USDOT Tier 1 Center: Cooperative Mobility for Competitive Megaregions. (*in press*).
3. Boyles, S. D., **Pandey, V.**, Alexander, W. E., and Cheng, C. (2018). Modeling Managed Lanes for Long-term Planning Purposes. North Central Texas Council of Governments. (*in press*).
2. Boyles, S. D., Walton, C. M., Duthie, J., Jafari, E., Jiang, N., Khani, A., Li, J., Osorio, J., **Pandey, V.**, Rambha, T., and Yahia, C. (2017). A Planning Tool for Active Traffic Management Combining Microsimulation and Dynamic Traffic Assignment. Texas Department of Transportation Report FHWA/TX-17/0-6859-1.
1. Boyles, S. D., Bhat, C., Duthie, J., Jiang, N., Dias, F., Jafari, E., **Pandey, V.**, Singh, A., and Yahia, C. (2017). Methods for Improving Consistency between Statewide and Regional Planning Models. Texas Department of Transportation Report FHWA/TX-17/0-6900-1.

CONFERENCE PRESENTATIONS

6. **Pandey, V.**, Rambha, T., and Boyles, S.D. (2019). Sensitivity analysis for user equilibrium models with recourse. Presented at the 2019 Annual Meeting of the Institute for Operations Research and Management Sciences, Seattle, WA.
5. **Pandey V.**, Patil, P. N., and Boyles, S. D. (2018). Comparison of route choice model for managed lanes with multiple entrances and exits. Presented at Annual Meeting of the Institute for Operations Research and Management Sciences, Pheoniz, AZ.
4. **Pandey V.** and Boyles, S. D. (2017). Optimal pricing for managed lanes with multiple entrances and exits. Presented at Annual Meeting of the Institute for Operations Research and Management Sciences, Houston, TX.
3. **Pandey V.** and Boyles, S. D. (2017). Real-time estimation of value of time distribution using measurements on managed lane networks. Presented at Annual Meeting of the Institute for Operations Research and Management Sciences, Houston, TX.
2. Yahia, C., **Pandey, V.**, and Boyles, S. D. (2017). Network partitioning algorithms to reduce computation time for parallel traffic assignment problems. Presented at Annual Meeting of the Institute for Operations Research and Management Sciences, Houston, TX.
1. **Pandey V.** and Boyles, S. D. (2016). Optimal dynamic pricing for managed lanes with multiple entrances and exits. Presented at Annual Meeting of the Institute for Operations Research and Management Sciences, Nashville, TN.

TEACHING EXPERIENCE

Certifications and Training

Certification in Engineering Education, The University of Texas at Austin Spring 2017-Current

- Courses completed: Teaching Engineering, Curriculum and Assessment Design, Teaching Practicum, Advanced Instructional Systems Design
- Designed an introductory course on Probability and Statistics including the design of learning objectives, syllabus, assessment plan, lesson plan, and one week's worth of learning activities
- Taught an interactive 1.5-hour guest lecture session on the applications of Probability to a class of 40 students

Participant, International Teaching Assistants connect with Undergraduate Teaching Ambassadors (ITA/UTA Connect) Program, Faculty Innovation Center, The University of Texas at Austin Spring 2018

- Delivered two 12-minute lectures to an audience of fellow international graduate students, undergrads, and pedagogy experts at the Faculty Innovation Center and received detailed feedback about teaching and activity plans
- Gained first-hand exposure to facets of undergraduate life such as undergraduate learning groups, undergraduate advising, residence hall life, and extracurricular activities through small group experiences

Classroom Teaching

Teaching Assistant, Probability and Statistics, The University of Texas at Austin Fall 2017, Spring 2018

- Taught one-hour lab sessions every week by designing learning activities and modules in R
- Designed homework and online testing modules for grading assessment. Assisted in design of mid terms and finals
- Used classroom assessment techniques to monitor student learning progress in the semester
- Held weekly office hours and organized review sessions before the exams
- Overall Teaching Assistant Rating (**4.3**/**5.0**)

Teaching Assistant, Physics and Differential Equations, IIT Bombay Fall 2012, Spring 2014

- Taught one-hour tutorial session every week for helping students with problem solving
- Organized office hours and held review sessions before the exams

MENTORING EXPERIENCE

Graduate Student Mentor, Graduate Linked with Undergraduates in Engineering (GLUE). The University of Texas at Austin Spring 2016, Fall 2017–present

- Guided and trained sophomore students for research in areas including active traffic management strategies, network equilibrium models, and dynamic pricing of express laness
- Served as a panelist on graduate student panel for preparing undergraduates for graduate school
- Undergraduates mentored: Anne Jillian Monsanto, Jordan Hammond, Abigail Beck, Andres Najera, Evana Wang, Manisha Ganesh

Undergraduate Thesis Supervisor, The University of Texas at Austin Spring 2018

- Supervised the research conducted by Christine Cheng on value of time analysis for managed lanes
- Assisted her in experimental designs and review of drafts

Head, Department Academic Mentorship Program, Department of Civil Engineering, IIT-Bombay Fall 2013, Spring 2014

- Spearheaded the team of 17 mentors in developing a support program for under-performing students with involvement from faculty advisors
- Assisted 8 students through one-to-one counseling helping them clear their backlogs

LEADERSHIP EXPERIENCE

Traffic Bowl Coach, Institute of Transportation Engineers, International Collegiate Traffic Bowl Championship, The University of Texas at Austin January 2017-Current

Overall Project Coordinator, Association for India's Development, Austin Chapter August 2015- August 2017

Vice President, Institute of Transportation Engineers, Student Chapter Nov 2014- Oct 2015
The University of Texas at Austin

Founding Manager, Abhyuday, Social Festival of IIT Bombay Jan 2014- April 2014

PROFESSIONAL INVOLVEMENT

Transportation Research Board (TRB),

Member, Institute for Operations Research and Management Sciences (INFORMS),

Member, IEEE Intelligent Transportation Systems Society (IEEE-ITSS),

Active with the Institute of Transportation Engineers (ITE) and Intelligent Transportation Society of America (ITS-America)

RESEARCH SERVICE

Paper Referee, Transportation Research Board (TRB) annual meeting (2017- Current)

Paper Referee, Journal for Case Studies on Transport Policy (2018- Current)

Paper Referee, Transportation Research Part-B: Methodological (2019- Current)