Abhilasha Saroj

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EDUCATION

Georgia Institute of Technology, Atlanta, US   August 2016 – August 2020
Ph.D. in Civil Engineering, GPA: 3.88/4.00
Minor in Computer Science
Dissertation Title: Development of a real-time connected corridor data-driven digital twin and data imputation methods

Georgia Institute of Technology, Atlanta, US   August 2014 – August 2016
M.S. in Civil Engineering, GPA: 4.00/4.00

Indian Institute of Technology Bombay, Mumbai, India   July 2008 – May 2012
B.Tech. in Civil Engineering, GPA: 7.52/10.00

CONFERENCE PRESENTATIONS WITH REFREED PROCEEDINGS

1. **Saroj, A.** A Sensitivity Analysis Study to Measure Impact of Real-Time Traffic Volume Data Imputations on Traffic Performance Measures. Winter Simulation Conference, National Harbor, Maryland, 2019. (Ph.D. Colloquium - Extended Abstract, Podium Presentation, & Poster Presentation)
2. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Operational Evaluation of Don't Block the Box Campaigns. Transportation Research Board, Washington, D.C., 2019. (Extended Abstract & Poster Presentation)
3. **Saroj, A.**, S. Roy, R. Fujimoto, A. Guin, & M. Hunter. Smart City Real-Time Data-Driven Simulation. Winter Simulation Conference, Gothenburg, Sweden, 2018. (Podium Presentation)
4. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Video Tool for Manually Extracting Complex Traffic Data. Transportation Research Board, Washington, D.C., 2018. (Podium Presentation Delivered by Co-Author)
5. **Saroj, A.**, S. Harris, A. Guin, M. Rodgers, & M. Hunter. Analysis of Vehicle Blocking Behavior on Intersection Performance. Transportation Research Board, Washington, D.C., 2017. (Poster Presentation)

PEER-REVIEWED JOURNAL PUBLICATIONS (in preparation)

1. **Saroj, A.**, A. Guin, & M. Hunter. Deep LSTM Recurrent Neural Networks for Arterial Traffic Volume Data Imputation. Journal of Big Data Analytics in Transportation. 2020. (submitted)
2. **Saroj, A.**, S. Roy, A. Guin, & M. Hunter. Impact of Connected Corridor Volume Data Imputations on Digital Twin Performance Measures. 2020. (in preparation)
3. **Saroj, A.**, S. Roy, A. Guin, & M. Hunter. Feasibility of a Connected Corridor Real-Time Data-Driven Traffic Simulation Model – Digital Twin. 2020. (in preparation)
4. **Saroj, A.**, A. Guin, & M. Hunter. Applicability of Long Short-Term Memory Traffic Volume Imputation Model to Drive Connected Corridor Simulation. 2020. (in preparation)
5. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Measuring Effectiveness and Operational Performance of Do Not Block the Box Campaigns. 2020. (in preparation)

TECHNICAL REPORTS

1. Hunter, M. P., R. L. Guensler, A. Guin, **A. Saroj**, and S. Roy. "Smart Cities Atlanta - North Avenue." City of Atlanta, Atlanta, Georgia, December 2019.

2. Guin, A., M. P. Hunter, M. O. Rodgers, **A. Saroj**, N. Choudhary, and H. G. Kim. "Operational Evaluation of Do Not Block the Box Campaigns in Georgia." Georgia Department of Transportation, Atlanta, Georgia, Report No. FHWA-GA-18-1443, April 2018.
3. Guin, A., M. P. Hunter, M. O. Rodgers, and **A. Saroj**. "Enhanced Role of Activity Center Transportation Organizations in Regional Mobility." Georgia Department of Transportation, Atlanta, Georgia, Report No. FHWA-GA-16-1316, February 2017.

CONFERENCE AND WORKSHOP PRESENTATIONS

1. Hunter, M., A. Guin, **A. Saroj**, & S. Roy. Data Analysis for Smart Transportation, North Avenue Digital Twin. Invited presentation (online) for Midwest Energy Research Consortium (M-WERC). April 9th, 2020. (Approx. 10 real-time logins). *(Speaker - Dr. Hunter)*
2. Hunter, M., A. Guin, **A. Saroj**, & S. Roy. Smart City Real-Time Data Driven Simulation, North Avenue Digital Twin. Invited presentation (online) for A Better Half: Using Digital Twins to Improve City Infrastructure, Engineering News-Record (ENR), March 30th, 2020. (Approx. 250+ real-time logins). *(Speaker - Dr. Hunter)*
3. **Saroj, A.**, S. Roy, R. Fujimoto, A. Guin, & M. Hunter. Smart City Connected Digital Twin. GDOT/GTRI Research Expo, Atlanta, Georgia, September 13th, 2019.
4. Roy, S., **A. Saroj**, A. Guin, & M. Hunter. Connected Infrastructure Data Loss Patterns. GDOT/GTRI Research Expo, Atlanta, Georgia, September 13th, 2019.
5. Hunter, M., **A. Saroj**, S. Roy, R. Fujimoto, R. Guensler, & A. Guin. Smart City Real-Time Data Driven Simulation – North Avenue Digital Twin. ITE Summer Seminar, St. Simons Island, Georgia, July 21st to July 24th, 2019. *(Speaker - Dr. Hunter)*
6. Hunter, M., **A. Saroj**, S. Roy, R. Fujimoto, R. Guensler, & A. Guin. North Avenue Smart City Digital Twin. Georgia Power – A Southern Company, Atlanta, Georgia, July 25th, 2019. *(Speaker - Dr. Hunter)*
7. **Saroj, A.**, S. Roy, R. Fujimoto., R. Guensler, A. Guin, & M. Hunter. Smart City Digital Twin – Connected Data-Driven Traffic Simulation Model. Automated Vehicles Symposium, Orlando, Florida, July 15th to 18th, 2019.
8. Roy, S., **A. Saroj**, A. Guin, & M. Hunter. Investigation of Data Loss Patterns in Real-Time Connected Transportation Infrastructure Data. Automated Vehicles Symposium, Orlando, Florida, July 15th to 18th, 2019.
9. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Operational Evaluation of Don't Block the Box Campaigns. Southeastern Transportation Research, Innovation, Development, & Education Center Student Poster Competition, Washington, D.C., January 13th to 17th, 2019.
10. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Operational Evaluation of Don't Block the Box Campaigns. Transportation Research Board Annual Meeting, Washington, D.C., January 13th to 17th, 2019.
11. **Saroj, A.**, S. Roy, A. Guin, & M. Hunter. Smart Corridor Real-Time Dynamic Simulation. University Transportation Center Conference for the Southeastern Region, Clemson, South Carolina, October 24th to 25th, 2018.
12. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Operational Evaluation of DBTB Campaigns in Georgia. University Transportation Center Conference for the Southeastern Region, Clemson, South Carolina, October 24th to 25th, 2018.
13. Hunter, M., A. Guin, R. Guensler, R. Fujimoto, M. Rodgers, **A. Saroj**, S. Roy, J. Bolen, & A. Biswas. Smart Cities Atlanta – Real-Time Data-Driven Transportation Simulation. GDOT/GTRI Research Expo., Atlanta, Georgia, September 6th, 2018.
14. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, S. Harris, C. Maddox, M. O. Rodgers, & M. Hunter. Operational Evaluation of DBTB Campaigns in Georgia. GDOT/GTRI Research Expo., Atlanta, Georgia, September 6th, 2018.
15. **Saroj, A.**, N. Choudhary, H. Kim, A. Guin, M. Rodgers, & M. Hunter. Analysis of Vehicle Blocking Behavior on Intersection Performance. University Transportation Center Conference for the Southeastern Region, Gainesville, Florida, November 16th to 17th, 2017.

16. Hunter, M., R. Guensler, A. Guin, M. O. Rodgers, R. Fujimoto, J. Bolen, A. Biswas, S. Roy, and **A. Saroj**. Energy, Emissions, and a Smarter North Avenue – City of Atlanta Demonstration Project, Smart Cities Advisory Board Meeting, Atlanta, Georgia, October 2017.
17. **Saroj, A.**, A. Guin, S. Harris, C. Maddox, M. O. Rodgers, & M. Hunter. Operational Evaluation of DBTB Campaigns in Georgia. GDOT/GTRI Research Expo., Atlanta, Georgia, October 5th, 2017.
18. **Saroj, A.**, A. Guin, S. Harris, C. Maddox, M. O. Rodgers, & M. Hunter. Enhanced Role of Activity Center Transportation Organizations in Regional Mobility & Operational Evaluation of DBTB Campaigns in Georgia. GDOT/GTRI Research Expo., Atlanta, Georgia, September 13th, 2016.
19. **Saroj, A.**, S. Harris, A. Guin, M. O. Rodgers, & M. Hunter. Sensitivity Analysis of Vehicle Blocking Behavior on Intersections. University Transportation Center Conference for the Southeastern Region, Knoxville, Tennessee, March 31st to April 1st, 2016.
20. **Saroj, A.**, A. Guin, S. Harris, C. Maddox, M. O. Rodgers, & M. Hunter. Enhanced Role of Activity Center Transportation Organizations in Regional Mobility. GDOT/GTRI Research Expo., Atlanta, Georgia, September 22nd, 2015.

RESEARCH EXPERIENCE

Postdoctoral Fellow, Transportation Systems Engineering, Georgia Tech   Starting October 2020

Graduate Research Assistant, Transportation Systems Engineering, Georgia Tech

Guidance for Design of Vissim Simulation Models   Summer 2020
Sponsored by Georgia Department of Transportation
- Developed guidance manual to design freeway interchange simulation model in PTV's Vissim 11 traffic simulation software

Smart Cities Atlanta – "North Avenue Smart Corridor" Digital Twin   Spring 2018 – Spring 2020
Sponsored by City of Atlanta
- Developed Digital Twin of the North Avenue Smart Corridor in Atlanta, Georgia, capable of leveraging connected corridor data to drive traffic simulation and estimate and visualize the traffic and environmental performance measures at near real-time rate
- Link to visualization website - http://realtime.ce.gatech.edu/coa/now/
- Investigated characteristics of gaps in the connected corridor data streams
- Investigated performance of univariate and multivariate Long Short-Term Memory Recurrent Neural Networks to impute connected corridor data stream gaps
- Explored impacts of imputation methods – temporal neighboring imputation method and LSTM RNN predictive model on Digital Twin generated travel time measures

Operational Evaluation of the "Don't Block the Box" Campaigns   Fall 2014 – Fall 2017
Sponsored by Georgia Department of Transportation
- Investigate the effectiveness of "Don't Block the Box" (DBTB) treatments in impacting driver's blocking behavior at an intersection
- Performed sensitivity analysis of vehicle blocking behavior to quantify the impact of vehicle blocking behavior in terms of intersection delay and loss of capacity on the developed Vissim probabilistic simulation model
- Built a python-based software application – Georgia Tech Multi Video Player to aid video traffic data extraction to study vehicle's blocking behavior at intersections. Link to website - http://transportation.ce.gatech.edu/node/64
- Conducted Before-After Comparative Analysis: Measured effectiveness of DBTB treatments by comparing estimates of propensity of a vehicle to block before and after the DBTB treatments at six selected field intersections in Atlanta, GA

Research Assistant, Transportation Systems Engineering, IIT Bombay   Fall 2013 – Spring 2014
- Worked on a methodology to measure street walkability index based on walking facilities, user perception survey and street connectivity
- Developed a VISSIM model to simulate the congestion impact from Bandra Worli Sea Link
- Assisted in conduct of road safety audit of Pilot Bus Rapid Transit System Corridor at Pune, India

TEACHING EXPERIENCE

Co-Instructor, Georgia Tech   Spring 2020
Course: CEE 6300 – Traffic Engineering, Graduate Level, Mentor – Dr. Michael Hunter
- Designed syllabus, lecture content, and laboratory assignment for two-week duration on the topic of Traffic Simulations for graduate level course
- Delivered asynchronous video recorded lectures and synchronous online lectures

Graduate Teaching Assistant, Georgia Tech   Spring 2017, Fall 2017, and Spring 2018
Course: CEE 4600 – Transportation Planning and Design, Undergraduate Level
- Conducted laboratory lectures to teach fundamentals of traffic engineering and roadway design
- Advised student groups on semester project of roadway design.
- Graded coursework – homework, laboratory reports and semester project reports

CERTIFICATIONS

- **Center for the Integration of Research, Teaching, and Learning (CIRTL) Associate Level Certificate**, May 2020
- **Tech to Teaching Certificate** in college teaching, Center for Teaching and Learning, Georgia Tech, May 2020
- **Deep Learning Specialization Certificate**, Coursera – DeepLearning.AI, Series of five courses – Neural Networks and Deep Learning, Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Structuring Machine Learning Projects, Convolutional Neural Networks, and Sequence Models, May 2020
- **DeepLearning.AI TensorFlow Developer Professional Certificate**, Coursera – DeepLearning.AI, Series of four courses - Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning, Convolutional Neural Networks in TensorFlow, Natural Language Processing in TensorFlow, and Sequences, Time Series, and Prediction, July 2020
- **Fundamentals of Reinforcement Learning Course Certificate,** Coursera – University of Alberta, August 2020
- **Predictive Modelling with Azure Machine Learning Studio Course Certificate,** Coursera, September 2020
- **Machine Learning Pipeline with Azure ML Studio Course Certificate,** Coursera, September 2020

AWARDS AND HONOURS

- 2020/21 Civil and Environmental Engineering Future Faculty Fellow, Georgia Tech, 2020
- National Science Foundation Travel Grant for Winter Simulation Conference, NSF, 2019
- National Center for Sustainable Transportation Dissertation Fund, NCST, 2019
- 2nd Best Poster, Southeastern Transportation Research, Innovation, Development & Education Center Student Poster Competition, 2019
- Winter Simulation Conference Travel Grant, Winter Simulation Conference Foundation, 2018
- Helen M. Overly Memorial Scholarship, Women's Transportation Seminar Atlanta, 2018
- John D. Edwards Memorial Scholarship, Institute of Transportation Engineers Georgia Section, 2017
- Institute of Transportation Engineers Scholarship, Institute of Transportation Engineers Georgia Section, 2016
- Traffic Bowl Winner Team, Institute of Transportation Engineers Georgia Section, 2015
- BA's Best Employee Award, Project: "Power Conversion Market Assessment of India", Boston Analytics, 2013
- National Certificate of Merit, Central Board of Secondary Education; Central Board Secondary Exam, India, 2005

LEADERSHIP

- Board Member, Graduate Student Advisory Council, CEE, Georgia Tech — 2016-20
- Mentor, Stempower Mentoring Program, Georgia Tech — 2018-19
- President, Institute of Transportation Engineers, Georgia Tech — 2017-18
- Vice President – Communications, Institute of Transportation Engineers, Georgia Tech — 2016-17
- Secretary, Institute of Transportation Engineers, Georgia Tech — 2015-16
- Social and Outreach Chair, American Society of Highway Engineers, Georgia Tech — 2015-16
- Publicity Manager, Annual Technical Festival of Department of Civil Engineering, IIT Bombay — 2010-11

PROFESSIONAL ASSOCIATIONS

- Friend and Peer Reviewer, Transportation Research Board Committees – AHB45 (1), ABJ70, ABE70 — Spring 2019 –
- Program Committee Member and Peer Reviewer, Winter Simulation Conference 2020 – Agent Based Modeling Track
- Member: ACM SIG SIM, Women's Transportation Seminar Atlanta, Intelligent Transportation Systems Georgia, and American Society of Civil Engineers

COMMUNITY INVOLVEMENT

- TEAMBuzz Georgia Tech Volunteering Service (Spring & Fall 2017)
- Grader, 2016 MATHCOUNTS Georgia Competition at Marietta High School, Engineering Outreach Event, Institute of Transportation Engineers Georgia
- Teach for India – Tutored underprivileged students in Mumbai suburban school
- Event Assistant, Woodruff Arts Center: Create ATL Family Fun Event

LIST OF REFERENCES

1. **Dr. Michael P. Hunter**
   Professor (Ph.D. Adviser)
   School of Civil and Environmental Engineering
   Georgia Institute of Technology
   790 Atlantic Drive NW
   Atlanta, Georgia – 30332, USA
   Phone No: +1 404.385.1243
   Email: michael.hunter@ce.gatech.edu

2. **Dr. Randall L. Guensler**
   Professor (Dissertation Committee Member)
   School of Civil and Environmental Engineering
   Georgia Institute of Technology
   790 Atlantic Drive NW
   Atlanta, Georgia – 30332, USA
   Phone No: +1 404.894.0405
   Email: randall.guensler@ce.gatech.edu

3. **Dr. Michael O. Rodgers**
   Regents Researcher (Dissertation Committee Member)
   School of Civil and Environmental Engineering
   Georgia Institute of Technology
   790 Atlantic Drive NW
   Atlanta, Georgia – 30332, USA
   Phone No: +1 404.385.0569
   Email: michael.rodgers@ce.gatech.edu

4.   **Dr. Angshuman Guin**
            Senior Research Engineer (Dissertation Committee Member)
            School of Civil and Environmental Engineering
            Georgia Institute of Technology
            790 Atlantic Drive NW
            Atlanta, Georgia – 30332, USA
            Phone No: +1 404.894.5830
            Email: angshuman.guin@ce.gatech.edu