

NISHU CHOUDHARY

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PROFESSIONAL SUMMARY

Professional Summary: Ph.D. candidate in the Transportation Systems Engineering department, passionate about applied Machine Learning and statistical models. Expertise in time-series modeling, statistics, and Machine Learning algorithms. Experience in collaborative code development and academic paper preparation.

EDUCATION

Georgia Institute of Technology, USA

Ph.D., Transportation Engineering (Minor: Statistical Machine Learning) Expected June 2023

Dissertation Title: Identification of Traffic Congestion Precursors using Machine Learning Approaches

Masters of Science, Transportation Systems Engineering Spring 2019

Indian Institute of Technology Bombay, India

Bachelor of Technology with Honors in Civil Engineering Fall 2016

SKILLS

Modeling	Regression, SVM, Clustering, RNNs, Regularization, Dimensionality Reduction
Programming Languages	Python, R, SQL, Bash, MATLAB
MLOps	Scikit-Learn, PyTorch, NumPy, Pandas, DVC, MLflow
Visualization Libraries	Plotly, Seaborn, Matplotlib, Folium
Simulation Software	VISSIM, Synchro, SIMIO
Other	Git, Latex, ArcGIS, Microsoft Package

RESEARCH AND PROFESSIONAL EXPERIENCE

Graduate Research Assistant, Georgia Institute of Technology Fall 2016 - Present

Project: Prediction and Mitigation of the Onset of Congestion using Machine Learning Techniques

- Implemented Machine Learning pipeline (classification formulation) to predict the onset of traffic congestion
- Achieved **0.75** F1-score in the prediction of demand-related traffic congestion for real-life data [\[Webinar\]](#)
- Proposed a novel index that converts binary indicators of traffic instability density to the likelihood of congestion
- Time-to-event Analysis shows 70% probability of 'surviving' up to **30 minutes** after congestion alarm is triggered

Project: Automatic Incident Detection Technology on I-475: Feasibility Study

- Conducted cost-benefit analysis of video-based incident detection technology compared to Georgia 511
- Investigated potential of crowdsourced app-based incident detection in reducing the time-to-detection
- Compared real-time delay estimation methods using VISSIM (12+ scenarios); estimated 45% under-reporting

Project: Operational Evaluation of Don't Block the Box (DBTB) campaigns in Georgia

- Before-After analysis of blocking behavior for 7+ intersections undergoing DBTB implementation
- Mentored 4 Undergraduate Research Assistants for the field data collection effort

Graduate Teaching Assistant, Georgia Institute of Technology

Fall 2020, Spring 2018

CEE 4600- Transportation Planning & Design

- Delivered laboratory lectures to teach fundamentals of traffic engineering and roadway design
- Advised 6 undergraduate student groups on semester project and graded coursework

Traffic Engineering Intern, POND & Company

Summer 2018

Project: State Route (SR) -6 Congestion Reduction Design [\[Project Brief\]](#)

- Corridor-wide evaluation of Truck-friendly lanes using VISSIM, calibrated using probe-based trajectory data
- Sensitivity analysis to test impact of truck percentages on level-of-service for comparing design alternatives

HONORS & AWARDS

- Babs Abubakari Memorial Scholarship, ASHE Georgia, 2023
- Institute of Transportation Engineers Scholarship, ITE Georgia, 2022
- Julie Cunningham Legacy Scholarship, Conference Of Minority Transportation Officials (COMTO) National Scholarship Program, 2022
- Institute of Transportation Engineers Scholarship, ITE Georgia, 2021

SELECTED PEER-REVIEWED PROCEEDINGS & PUBLICATIONS

- **Choudhary N.**, Hunter M., Guin A., and Rodgers M. Applicability of Machine Learning Approaches for Identification of Congestion Precursors. 2023. (Under Review with Expert Systems with Applications)
- **Choudhary N.**, Hunter M., and Guin A. From Binary to Probability: A Performance Index for Traffic Congestion Prediction Model 2023. (In preparation)
- **Choudhary N.**, Guin A., and Hunter M. Practical Challenges with rapid estimation of incident-induced delay for Incident Management. Transportation Research Board, Washington, D.C., 2020. [\[Link\]](#)
- Saroj A., **Choudhary N.**, Kim H., Guin A., Rodgers M., and Hunter M. Operational Evaluation of Don't Block the Box Campaigns. Transportation Research Board, Washington, D.C., 2019. [\[Link\]](#)
- Saroj, A., **Choudhary N.**, Kim H., Guin A., Rodgers M., and Hunter M. Video Tool for Manually Extracting Complex Traffic Data. Transportation Research Board, Washington, D.C., 2018. [\[Link\]](#)

TECHNICAL REPORTS

- List G., Hunter M., Hadi M., Williams B., Abdallah A., Ahmed I., Guin A., **Choudhary N.**, Hector M., and Jabin A. Identifying and Mitigating Congestion Onset-Phase I. Southeastern Transportation Research, Innovation, Development, and Education Center. August 2022 [\[Link to Report\]](#)
- Guin, A., Hunter M., Kim, H., and **Choudhary N.** Automatic Incident Detection Technology on I-475: Feasibility study. Georgia Department of Transportation, Atlanta, Georgia, Report No. FHWA-GA-21-1720, October 2020 [\[Link to Report\]](#)
- Guin, A., Hunter, M., Rodgers, M., Saroj, A., **Choudhary, N.**, and Kim, H.,. 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 [\[Link to Report\]](#)

SERVICE TO PROFESSION & COMMUNITY

Reviewer Transportation Research Board (TRB) Committees Fall 2021-Present

- AED50: Artificial Intelligence and Advanced Computing Applications
- ACP80: Traffic Simulation Committee

Stem Professional School Partnership (SPSP) Program, Science ATL Fall 2022-Present

- Design Classroom Engagement STEM activity at Brumby Elementary School, Cobb county
- Create a cohort of STEM professionals and educators to expose K-12 to different STEM careers

Illinois Science & Technology Coalition Spring 2022-Present

- Mentoring 2 senior students in AP Capstone program on transportation-related research
- Mentored a senior in AP Capstone for research on 'How STEM affects a student's learning?'

Ph.D. Applicant Mentorship Program (PhAM), Georgia Institute of Technology Fall 2021-2022

- Panelist on '*Is grad school right for me? Master's or Ph.D.*' session
- Mentored undergraduate students through the Ph.D. application process

Treasurer, Institute of Transportation Engineers (ITE) at Georgia Tech Fall 2019-2020

- Allocated budgets and oversaw finances for student events conducted
- Managed event logistics for Southern District ITE Student Leadership Summit 2020