NISHU CHOUDHARY

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EDUCATION

Ph.D. Candidate, Traffic Operations Research (Minor: Statistical Machine Learning) Expected June 2023
Dissertation Title: Identification of Traffic Congestion Precursors using Machine Learning Approaches
Georgia Institute of Technology, USA

Bachelor of Technology with Honors in Civil Engineering Fall 2016
Indian Institute of Technology Bombay, India

SKILLS

Programming Languages	Python, R, SQL, Bash
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

SELECTED 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 75% accuracy 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 incident delay estimation methods using VISSIM model for 12 incident scenarios

Traffic Engineering Intern, POND & Company Summer 2018
Project: State Route (SR) -6 Congestion Reduction Design

- 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

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 2023)
- **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]

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