

# 2025 ANNUAL REPORT



**ARTIFICIAL INTELLIGENCE  
IN TRANSPORTATION (AIT) LAB**

**Director: Subasish Das, Ph.D.**

Ingram School of Engineering,  
Texas State University,  
San Marcos, TX

## Director's Message

On behalf of our entire team, I am pleased to present the Annual Report 2025. This year has been marked by significant achievements, innovative projects, and a strong commitment to excellence in research, teaching, and community engagement. Our lab continues to explore cutting-edge applications of artificial intelligence in transportation, renewable energy, and urban analytics, while fostering interdisciplinary collaboration and knowledge sharing. Throughout 2025, we focused on expanding our research portfolio, strengthening partnerships, and promoting practical, data-driven solutions to real-world challenges. Our efforts spanned multiple domains, including pedestrian safety, autonomous vehicle simulation, renewable energy worker safety, mental health analytics, and smart city infrastructure.



Some of the key accomplishments and activities in 2025 include:

- Since 2022, the AIT Lab has managed approximately \$5 million in externally funded research across more than 30 active and completed projects sponsored by the National Academies (NCHRP, BTSCRP), TxDOT, MnDOT, FRA, AAA Foundation, USDOT UTCs, and internal Texas State programs.
- In 2025–2026, the Lab added over 15 new funded projects as PI/Co-PI, including major awards on automated traffic enforcement (BTS-42), Safe System-oriented centerline buffers (NCHRP 17-134), substance-impaired driving “last leg” countermeasures (BTS-39), pedestrian and AV safety, coastal community risk, and multiple TxDOT safety and operations studies.
- The current AIT Lab team includes 1 director (PI), 1 postdoctoral researcher, 3 PhD students, more than 10 MS students, and over 5 undergraduate researchers and temporary staff drawn from civil engineering, computer science, GIS, business, mathematics, and data analytics.
- As PI or site PI, Dr. Das currently leads more than 20 externally funded projects simultaneously, covering roadway departure, pedestrian and bicyclist safety, rail trespass, pavement markings, innovative intersections, shared-use paths, AV and ADAS safety, coastal flooding, and non-motorized exposure modeling.
- On Google Scholar, Dr. Das has over 13,000 citations and an h-index of about 43.
- In 2025 alone, AIT Lab members contributed more than 50 peer-reviewed journal articles and several major technical reports for state DOTs and national organizations, including AAA Foundation, TxDOT, and Ohio DOT.
- The Lab has launched and is actively prototyping multiple AI-driven tools and frameworks—including TinyVision-SLM, AVLocal, PedSense, SafeR, and exposure/safety scoring systems—positioning AIT as a leading group in TinyML, explainable AI, and tabular deep learning for real-world transportation safety applications.

In addition to these achievements, our team has emphasized mentorship, fostering a collaborative environment where researchers, students, and staff can grow professionally while contributing to high-quality research. Our publications, workshops, and community initiatives reflect our dedication to making a measurable impact both locally and globally. Looking ahead to 2026, we aim to broaden our research initiatives, develop AI-driven solutions for emerging challenges, and further strengthen collaborations with partners across academia, industry, and government. We remain committed to innovation, safety, sustainability, and excellence in all our endeavors.

**Sincerely,**

Subasish Das, Ph.D.

Assistant Professor, Civil Engineering

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# Our Team

## Leadership

- Dr. Subashish Das  – Director, Assistant Professor, Civil Engineering

## Postdoctoral Researcher

- Dr. Amir Rafe 

## PhD Students

- Mr. Shriyank Somvanshi  – MSEC
- Mr. Sawgat Ahmed Shuvo  – Civil Engineering
- Mr. David A. Mills  – Geographic Information Science

## Graduate Students

- Mr. Md Monzurul Islam  – Civil Engineering
- Mr. Sazzad Bin Bashar Polock  – Civil Engineering
- Mr. Tausif Islam Chowdhury  – Civil Engineering
- Mr. Arka Chakraborty  – Civil Engineering
- Mr. Sharif Ahmed Rafat  – Civil Engineering
- Ms. Anika Baitullah  – Civil Engineering
- Mr. Shamyo Brotee  – Computer Science
- Ms. Salma Akter Laboni  – Business Administration

## Undergraduate Students

- Mr. Gaurab Chhetri  – Computer Science
- Mr. Biplov Pandey  – Civil Engineering
- Mr. Darrell Anderson  – Civil Engineering
- Mr. Irfan Sarwar Pranjol  – Mechanical Engineering
- Ms. Bidisha Shrestha  – Civil Engineering

## Temporary Staff Members

- Ms. Mahmuda Sultana Mimi  – Civil Engineering (MS)
- Mr. Michael J Starewich – Mathematics (MS)
- Mr. Venkata Surya Bellamkonda  – Data Analytics and Information Systems (MS)
- Mr. Pavan Hebli  – Data Analytics and Information Systems (MS)
- Mr. Mohammed Wasim Ansari  – Data Analytics and Information Systems (MS)

# Research Funding

## New Funded Projects

1. **(PI-TXST)** Examining the Pre-Crash Circumstances Leading to Pedestrian Fatalities, AAA Foundation (\$105,004), 2025–2027.
2. **(PI)** BTSCRP BTS-42: Guidelines for Authorizing, Implementing, and Operating Automated Traffic Enforcement Programs, National Academies of Sciences, Engineering, and Medicine (\$450,000) [with JHU and Exponent], 2026–2028.
3. **(PI-TXST)** TxDOT 0-7259: Perform Assessment of TxDOT Safety Scoring Tools to Determine Effectiveness and Calibration, TxDOT (\$70,008), 2026–2027.
4. **(PI-TXST)** TxDOT 0-7275: Cost Effective Roundabouts: Evaluate Options for Reducing Roundabout Footprints and Construction Costs, TxDOT (\$40,007), 2026–2027.
5. **(PI)** Role of Emerging Transportation Technologies and Safety Initiatives in Mitigating Crashes in Coastal Communities, USDOT (UTC CREATE) (\$79,909), 2026.
6. **(PI)** TinyVision-SLM: An On-Device Vision–Language Model for Real-Time Traffic Scene Understanding and Safety Alerts, FIAP, Texas State University (\$5,000), 2025–2026.
7. **(PI)** Sheaf-Theoretic Identifiability in Technology-Enhanced Multi-Sensor Safety Infrastructure, REP, Texas State University (\$12,000), 2026.
8. **(PI)** AVLocal: Safe AV Maneuvers on Local Roads, FIAP, Texas State University (\$11,000), 2025–2026.
9. **(PI)** PedSense: Alerting Pedestrians while Crossing Roads or Rail Grade Crossing, FIAP, Texas State University (\$11,000), 2025.
10. **(PI-TXST)** TxDOT 0-7274: Synthesis on Evaluate Effectiveness of Pedestrian Elements Constructed through Competitive Funding Mechanisms, TxDOT (\$65,000), 2025–2026.
11. **(PI)** Developing Fatigue Management Decision Support System for the U.S. Rail Industry, Federal Railway Administration (\$260,000), 2025–2027.
12. **(PI-TXST)** TxDOT 0-7263: Optimize Tradeoffs between Centerline Buffers, Lane Width, and Shoulders for Rural Undivided Highways, TxDOT (\$40,007), 2025–2027.
13. **(PI-TXST)** TxDOT 0-7265: Evaluate Emerging Transportation Technologies and Advancements in Engineering and Roadway Safety Efforts Impact on Crashes, TxDOT (\$114,680), 2025–2027.
14. **(PI)** NCHRP 17-134: Center Line Buffer Areas for Safety: Implementation Guidelines and Tool, National Academies of Sciences, Engineering, and Medicine (\$250,000) [with TTI], 2025–2027.
15. **(PI)** BTS-39: Toolkit for Reducing Substance-Impaired Driving for the Last Leg of the Journey, National Academies of Sciences, Engineering, and Medicine (\$250,000) [with PSU and Exponent], 2025–2027.
16. **(PI-TXST)** NCHRP 17-133: Applicability of the 85th Percentile for Setting Speed Limits on Freeways, Expressways, and Rural Highways, National Academies of Sciences, Engineering, and Medicine (\$40,000), 2025–2027.

## Completed Projects in 2025

1. **(PI)** Big Data Leveraged Intersection Safety System (BLISS), FIAP, Texas State University (\$11,000), 2024–2025.
2. **(PI-TXST)** Social and Community Factors Contributing to Pedestrian Trespass Behaviors (and Motorist Incursions) on Railroad Systems, FRA (\$264,000), 2024–2026.
3. **(PI)** SafeR: Safe Routing Tool, NSF I-Corps (\$61,000), 2023–2025.
4. **(PI-TXST)** TxDOT 0-7183: Develop Crash Modification Factors for Super 2 Highways, TxDOT (Sub-contractor to TTI) [TXST Budget: \$68,695], 2023–2025.
5. **(PI-TXST)** TxDOT 0-7187: Exploring and Developing Innovative Methods for Estimating VMT on Local Roads in Texas, TxDOT (Sub-contractor to TTI) [TXST Budget: \$40,166], 2023–2025.
6. **(PI-TXST)** TxDOT 0-7171: Barrier Striping for the Reduction of Accidents, TxDOT (Sub-contractor to TTI) [TXST Budget: \$70,000], 2023–2025.
7. **(PI-TXST)** Increasing Equity in Traffic Safety, AAA Foundation (Sub-contractor to UW Tacoma) [TXST Budget: \$60,000], 2023–2025.
8. **(PI-TXST)** Evaluation of NJDOT Hardened Traffic Paint Markings and Stripes Performance, NJ-

DOT (Sub-contractor to Rowan University) [TXST Budget: \$83,000], 2023–2025.

## Ongoing Projects

1. **(PI)** NCHRP 56-05: Traffic Analysis Practices for Non-Motorized Modes (Vulnerable Road Users), National Academies of Sciences, Engineering, and Medicine (\$55,000), 2025–2027.
2. **(PI-TXST)** Refining the Understanding of Parking Space Requirements and Its Impact on Vehicle Miles Travelled, MnDOT (\$44,999), 2025–2027.
3. **(PI-TXST)** TxDOT 0-7215: Predicting Field Performance of Pavement Markings Statewide in Texas, TxDOT (\$85,178.75), 2024–2028.
4. **(PI-TXST)** TxDOT 0-7230: Improve Safety and Decrease Vehicle Fatalities by Improving Pavement Markings, TxDOT (\$74,292.50), 2024–2027.
5. **(PI-TXST)** TxDOT 0-7226: Analyze Operational and Safety Improvements Associated with Implemented Innovative Intersections in Texas, TxDOT (\$36,000), 2024–2026.
6. **(PI-TXST)** TxDOT 0-7222: Develop Crash Predictive Methods for Frontage Roads Including Ramp Terminals and Intersections with Crossroads in Texas, TxDOT (\$70,000), 2024–2026.
7. **(Co-PI)** Identification of Unprecedented Coastal Flooding Hotspots for Highway Network Durability and Social Justice, CREATE UTC, USDOT (\$151,448), 2024–2025.
8. **(PI-TXST)** Social and Community Factors Contributing to Pedestrian Trespass Behaviors (and Motorist Incursions) on Railroad Systems, FRA (\$264,000), 2024–2026.
9. **(PI-TXST)** Roadside Feature Placement and Pedestrian Safety on Low and Intermediate Speed Road, Minnesota DOT (\$58,891), 2024–2026.
10. **(PI-TXST)** TxDOT 0-7189: Safety Assessment of Shared Use Paths at Roadway Crossings using Exposure-based Models, TxDOT (Sub-contractor to TTI) [TXST Budget: \$77,000], 2023–2025.
11. **(PI)** NCHRP 17-113: Incorporating Safe System Approach into the NCHRP Report 500 Series, National Academies (\$700,000) [with VHB and Rowan University], 2023–2026.

# Publications

## Books

1. Huang, X., Ye, X., Stewart, K., **Das, S.** (2025). *Urban Human Mobility: Practices, Analytics, and Strategies for Smart Cities*. CRC Press, Boca Raton, FL. [doi](#) [Link](#)

## Peer Reviewed Reports

1. Kitali, A., Kalambay, P., Miyaho, M., Sesko, A., Kidando, E., Lippu, C.O., **Das, S.**, and Liu, J. (2025). *Social and Infrastructure Factors Shaping Road Safety: A Multi-Level Analysis of Crashes in Ohio, Texas, and Washington*. AAA Foundation for Traffic Safety. [url](#) [Link](#)
2. Finley, M., Lopez, N., **Das, S.**, Wei, H., Lin, W., Nian, D., and Ash, J. (2025). *Investigation of Commercial Motor Vehicle (CMV)-Related Crashes in Ohio Work Zones*. Ohio DOT. [url](#) [Link](#)
3. Brewer, M., Geedipally, S., **Das, S.**, Javed, S.A., and Fitzpatrick, K. (2025). *Crash Modification Factors for Super 2 Highways*. TxDOT. [url](#) [Link](#)

## Journal Articles

1. Somvanshi, S., Islam, M. M., Chhetri, G., Chakraborty, R., Mimi, M. M., Shuvo, S. A., Islam, K. S., Javed, S. A., Rafat, S. A., Dutta, A., and **Das, S.** (2025). *From Tiny Machine Learning to Tiny Deep Learning: A Survey*. *ACM Computing Surveys*. [doi](#) [Link](#)
2. Ye, X., Newman, G., Zhai, W., Retchless, D., **Das, S.**, Ham, Y., Zou, L., Huang, X., and Zhang, Z. (2025). Toward Coastal Infrastructure Resiliency: An AI-Enabled Decision Support Framework for Multiscale Comprehension and Stakeholder Empowerment. *Transactions of the American Philosophical Society*. [doi](#) [Link](#)
3. Banihashemi, M., **Das, S.**, Dadvar, S., and Liu, J.\* (2025). COVID-19 Era Crash Fatality/Severe Injury and Proven Speed–Crash Relations. *Transportation Research Record*. [doi](#) [Link](#)
4. Hossain, A.\*, Das, A., Javed, S. A.\* **Das, S.**, and Mills, D.\* (2025). Analyzing Pedestrian–Automated Vehicle Crash Dynamics: A Comparative Study of Autonomous and Conventional Precrash Mode. *Transportation Research Record*. [doi](#) [Link](#)
5. Oliaee, A. H., **Das, S.**, and Le, M. (2025). Automating Pedestrian Crash Typology Using Transformer Models. *Transportation Research Record*. [doi](#) [Link](#)
6. **Das, S.**, Chakraborty, R.\*, Sheykhfard, A., Kutela, B., and Ye, X. (2025). Using Perceptual Cycle Model and Text Mining to Investigate Ambulance Traffic Crashes. *Transportation Research Record*. [doi](#) [Link](#)
7. Liu, J.\*, Antariksa, G.\* , Somvanshi, S.\* , and **Das, S.** (2025). Revealing equity gaps in pedestrian crash data through explainable artificial intelligence clustering. *Transportation Research Part D: Transport and Environment*. [doi](#) [Link](#)
8. Geedipally, S., **Das, S.**, Wu, L., and Pratt, M. P. (2025). Safety Performance Functions for Frontage Roads. *Transportation Research Record*. [doi](#) [Link](#)
9. Sheykhfard, A., Haghghi, F., Saeidi, S., SafariTaherkhani, M., Fountas, G., and **Das, S.** (2025). Behavioral modeling of drivers near speed control cameras: A dual perspective from micro and macro data. *Transportation Research Record*. [doi](#) [Link](#)
10. Chakraborty, R.\*, **Das, S.**, Mimi, M.\* , and Kutela, B. (2025). Investigating Factor Associations in Barrier Crashes through Cluster Correspondence Analysis. *Transportation Research Record*. [doi](#) [Link](#)
11. Kinero, A., Kutela, B., **Das, S.**, and Hossain, A.\* (2025). Who should be responsible for setting standards for how automated vehicles are used? Insights of the US perspective from a 2021 Nationwide Survey. *Sustainable Futures*. [doi](#) [Link](#)
12. Hossain, A.\*, Dzinyela, R., Jafari, M.\* , Barua, S.\* , Chakraborty, R.\* , and **Das, S.** (2025). Assessing risk factors in ambulance-involved collisions: understanding the impact of COVID-19 pandemic. *Transportmetrica A: Transport Science*. [doi](#) [Link](#)
13. Sheykhfard, A., Haghghi, F., Aziz Zadeh, A., **Das, S.**, Oshanreh, M. M., Shaaban, K., and Soltani, A. (2025). Evaluating U-left turn and direct left turn movements at signalized intersections using traffic conflict indices. *Journal of Traffic and Transportation Engineering (English Edition)*. [doi](#) [Link](#)

14. Hossain, A.\*, **Das, S.**, Jafari, M.\*, Starewich, M.\*, Chakraborty, R.\*, and Kutela, B. (2025). Behavioral and psychological determinants of pedestrian collisions on arterial roads with evidence from random parameter models. *Scientific Reports*. doi [Link](#)
15. Barua, S.\*, Chakraborty, R.\*, Mimi, M.\*, Islam, M. M.\*, and **Das, S.** (2025). Linking driver fatigue, safety rest area closures, and crash severity using cluster correspondence analysis. *Journal of Transportation Safety & Security*. doi [Link](#)
16. **Das, S.**, Sakib, N., Geedipally, S. R., and Wei, Z. (2025). Understanding pedestrian hit-and-run crash patterns using Louisiana data. *Transportation Safety and Environment*. doi [Link](#)
17. Kutela, B., Chengula, T. J., Ngeni, F., Lippu, C., Kidando, E., Liu, J., and **Das, S.** (2025). Examining Patterns of GPS-Related Traffic Crashes: Insights from a Matched Case–Control Approach through Crash Narratives. *Journal of Transportation Engineering, Part A: Systems*. doi [Link](#)
18. Barua, S.\*, Mimi, M.\*, Javed, S. A.\*, Tamakloe, R.\*, and **Das, S.** (2025). Impact of temporal, spatial, and roadway factors on driver overrides in Level 2 automation: A bivariate binary probit model analysis. *Transportation Research Part F: Traffic Psychology and Behaviour*. doi [Link](#)
19. Barua, S.\*, Chakraborty, R.\*, Islam, M. M.\*, and **Das, S.** (2025). A data-driven approach to child pedestrian crash analysis using dimension reduction, clustering, and explainable AI. *Accident Analysis & Prevention*. doi [Link](#)
20. Sheykhfard, A., Jones, S., Sadeghvaziri, E., Koppel, S., **Das, S.**, and Nankali, M. (2025). Integrating Empirical and Subjective Evidence on Young Drivers' Risk Perceptions and Crash Factors. *Transportation Research Record*. doi [Link](#)
21. **Das, S.**, Liu, J.\*, Dzinyela, R., Dadashova, B., and Silvestri-Dobrovolny, C. (2025). Clustering patterns of roadway departure related motorcycle crashes using dimension reduction analysis. *Journal of Transportation Safety & Security*. doi [Link](#)
22. Chakraborty, R.\*, Javed, S. A.\*, Hossain, A.\*, Mills, D.\*, and **Das, S.** (2025). Identifying patterns in backing maneuver crashes utilizing differential evolution optimization algorithm. *Journal of Transportation Safety & Security*. doi [Link](#)
23. Sheykhfard, A., Azmoodeh, M., **Das, S.**, Ye, X., and Koppel, S. (2025). Exploring factors influencing user re-ride intentions in shared autonomous shuttle vehicles. *Transport Policy*. doi [Link](#)
24. Javed, S. A.\*, Polock, S.\*, Aghabayk, K.\*, Barua, S.\*, and **Das, S.** (2025). Pattern Recognition and Risk Analysis in U-Turn Crashes. *Transportation Research Record*. doi [Link](#)
25. Javed, S. A.\*, Chakraborty, R.\*, Hossain, A.\*, and **Das, S.** (2025). Uncovering risk patterns in single and multiple ambulance crashes with association rules mining: evidence from Texas crash data. *Transportmetrica A: Transport Science*. doi [Link](#)
26. Chukwu, M., Huang, X., Audu, K., Wang, H., and **Das, S.** (2025). Unequal Paths to Nature: Mobile-Phone Insights into Park Visits in Nine Major Cities in the United States. *Urban Forestry & Urban Greening*. doi [Link](#)
27. Jafari, M.\*, Starewich, M.\*, **Das, S.**, Barua, S.\*, and Tamakloe, R. (2025). Temporal stability analysis of crash injury severity in school zones: A mixed logit modeling approach. *IATSS Research*. doi [Link](#)
28. Chakraborty, R.\*, Liu, J.\*, Tusti, A. G.\*, Mimi, M.\*, and **Das, S.** (2025). Impact of lighting conditions on nighttime crash severity among older and elderly drivers. *Journal of Transportation Safety & Security*. doi [Link](#)
29. Mimi, M.\*, Islam, M.\*, Sheykhfard, A., and **Das, S.** (2025). Crash Risk Patterns among Older Bicyclists: Insights from Hybrid XGBoost–Cluster Correspondence Analysis. *Journal of Safety Research*. doi [Link](#)
30. Chakraborty, R.\*, Polock, S.\*, Shuvo, S.\*, Pandey, B.\*, Dey, K., and **Das, S.** (2025). Uncovering Contextual Risk Patterns in Cannabis-Involved Fatal Crashes: A Data-Driven Approach to Public Health-Oriented Road Safety. *Journal of Safety Research* (in press). doi [Link](#)
31. Somvanshi, S.\*, Javed, S. A.\*, Islam, M. M.\*, Pandit, D.\*, and **Das, S.** (2025). A Survey on Kolmogorov–Arnold Network. *ACM Computing Surveys*. doi [Link](#)
32. Jafari, M.\*, **Das, S.**, Tamakloe, R., Khan, M. N., and Hossain, A\*. (2025). Uncovering Individual Heterogeneity in Pedestrian Crash Severity with Mixed Logit Models: A Louisiana Case Study. *Transportation Research Record*. doi [Link](#)
33. **Das, S.**, Sakib, N., Geedipally, S., and Wei, Z\*. (2025). Understanding Pedestrian Hit and Run Crash Patterns using Louisiana Data. *Transportation Safety and Environment*. doi [Link](#)

34. Kutela, B., **Das, S.**, Kabir, N.\*, and Vierkant, V\*. (2025). The autopilot paradox: public perception of sleeping while driving semi-automated cars. *Applied Mobilities*. doi [Link](#)
35. **Das, S.**, Jafari, M.\*, Dzinyela, R., Khan, M. N.\* (2025). Applying hybrid dimension reduction and econometric model to investigate rider behaviors in roadway departure motorcycle crashes. *Transportation Letters*. doi [Link](#)
36. Sakib, N., Paul, T., **Das, S.**, and Hossain, A\*. (2025). Exploring the factors affecting injury severity in highway and non-highway crashes in Bangladesh applying machine learning and SHAP. *IATSS Research*. doi [Link](#)
37. Hossain, A.\*, **Das, S.**, Sun, X., Hasan, A. S., and Jalayer, M. (2025). A Hybrid Data Mining Framework to Investigate Roadway Departure Crashes on Rural Two-Lane Highways: Applying Fast and Frugal Tree with Association Rules Mining. *Accident Analysis & Prevention*. doi [Link](#)
38. Jafari, M.\*, **Das, S.**, Barua, S.\*, Mimi, M. S.\*, and Starewich, M.\* (2025). Crash outcomes of yellow school buses: Random parameter and correlated random parameter logit models with heterogeneity in means. *Accident Analysis & Prevention*. doi [Link](#)
39. Sheykhfard, A., Qiao, F., **Das, S.**, and Lord, D. (2025). A predictive analysis of crash proneness among freight drivers: insight into latent risk dimensions. *Transportation Research Part F: Traffic Psychology and Behaviour*. doi [Link](#)
40. Tamakloe, R., Khorasani, M., **Das, S.**, and Kim, I. (2025). Pattern recognition in crash clusters involving vehicles with advanced driving technologies. *Accident Analysis & Prevention*. doi [Link](#)
41. Liu, J.\*, Chakraborty, R.\*, Somvanshi, S.\*, and **Das, S.** (2025). Impact of operating speed, roadway curvature, and precipitation on roadway departure risk in rural two-lane roads. *Travel Behaviour and Society*. doi [Link](#)
42. Islam, M. M.\*, Liu, J.\*, Chakraborty, R.\*., and **Das, S.** (2025). Evaluating crash risk factors of farm equipment vehicles on county and non-county roads using interpretable tabular deep learning (TabNet). *Accident Analysis & Prevention*. doi [Link](#)
43. Chakraborty, R.\*, Tusti, A. G.\*., Hossain, A.\*., Salehian, M., Javed, S. A.\*., and **Das, S.** (2025). Uncovering the role of restraint usage in driver ejection: a data mining investigation of fatal and injury crashes. *Traffic Injury Prevention*. doi [Link](#)
44. Kutela, B., **Das, S.**, Javed, S. A.\*., Sheykhfard, A., Ngeni, F., Lyimo, S. M., Shita, H., and Langa, N. (2025). Understanding the intersection of transportation safety and quality of life: Insights from community surveys in Austin, Texas. *Cities*. doi [Link](#)
45. Agheli, A., Aghabayk, K., Sadeghi, M., and **Das, S.** (2025). E-scooter crash severity in the United Kingdom: A comparative analysis using machine learning techniques and random parameters logit with heterogeneity in means and variances. *IATSS Research*. doi [Link](#)
46. Chakraborty, R.\*, Mills, D.\* and **Das, S.** (2025). Children on wheels: Identifying crash determinants using cluster correspondence analysis. *Accident Analysis & Prevention*. doi [Link](#)
47. Jafari, M.\*, Starewich, M.\*., Hossain, A.\*., Barua, S.\*., Alnawmasi, N., Ye, X., and **Das, S.** (2025). Assessing motorcyclist injury severity on curved road segments with temporal dynamics and unobserved heterogeneity. *Scientific Reports*. doi [Link](#)
48. Antariksa, G.\*., Koeshidayatullah, A., **Das, S.**, and Lee, J.\* (2025). XAI-driven contamination for self-supervised denoising with pixel-level anomaly detection in seismic data. *Journal of Applied Geophysics*. doi [Link](#)
49. Hossain, A.\*., Barua, S.\*., **Das, S.**, and Starewich, M.\* (2025). Ambulance crash risk dynamics: a baseline (2017–2019) vs. pandemic-era (2020–2022) comparative study using a random parameter logit model. *Transportmetrica A: Transport Science*. doi [Link](#)
50. Kinero, A., Kasubi, F., Hossain, A.\*., **Das, S.**, and Kutela, B. (2025). Perception of cyber attacks on automated vehicles and its influence on road sharing and ridership: Insights of the US perspective from a 2021 nationwide survey. *Transportation Research Part F: Traffic Psychology and Behaviour*. doi [Link](#)
51. Jafari, M.\*., **Das, S.**, Starewich, M.\*., and Barua, S.\* (2025). SUV-pedestrian crash severity modelling considering unobserved heterogeneity in means and variances. *Transportmetrica A: Transport Science*. doi [Link](#)
52. Antariksa, G.\*., Tamakloe, R., Liu, J.\*., and **Das, S.** (2025). Automated and Explainable Artificial Intelligence to Enhance Prediction of Pedestrian Injury Severity. *IEEE Transactions on Intelligent Transportation Systems*. doi [Link](#)

53. Dzinyela, R., Dadashova, B., Westfall, G., **Das, S.**, Silvestri-Dobrovolny, C., Adanu, K. E., and Lord, D. (2025). Analysis of motorcyclists crash severity using cluster correspondence and hierarchical binary logit models. *Multimodal Transportation*. doi [Link](#)
54. Kutela, B., Kinero, A., Shita, H., **Das, S.**, Ruseruka, C., Chengula, T. J., and Novat, N. (2025). Understanding spatial-temporal attributes influencing electric vehicle charging stations utilization: A multi-city study. *Green Energy and Intelligent Transportation*. doi [Link](#)
55. Mimi, M. S.\*, Chakraborty, R.\*, Barua, S.\*., **Das, S.**, Khan, M. N.\*., and Dadashova, B. (2025). Demographic risk factors and injury severity scores in substance-use behaviour related traffic crashes. *Transportation Research Part F: Traffic Psychology and Behaviour*. doi [Link](#)
56. Sheykhard, A., Azmoodeh, M., **Das, S.**, and Kutela, B. (2025). Analyzing purchase intentions of used electric vehicles through consumer experiences: A structural equation modeling approach. *Transport Policy*. doi [Link](#)
57. Kinero, A., Kutela, B., **Das, S.**, and Hossain, A.\* (2025). Who should be responsible for setting standards for how automated vehicles are used? Insights from the nationwide survey. *Sustainable Futures*. doi [Link](#)
58. Mimi, M. S.\*, Chakraborty, R.\*., Liu, J.\*., Barua, S.\*., and **Das, S.** (2025). Exploring patterns in older pedestrian involved crashes during nighttime. *Accident Analysis & Prevention*. doi [Link](#)

## Conference Papers

### TRBAM 2026 Accepted Papers

1. Javed, S., Barua, S., Tusti, A., Polock, S., Chowdhury, T., Das, S. Uncovering Patterns in E-Scooter Crash Severity Using the Lift Increase Criterion in Association Rule Mining. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
2. Liu, J., Barua, S., Chakraborty, R., Islam, M., Das, S. Fusing Text and Tabular Intelligence: A Hybrid AutoML Approach to E-Scooter Crash Severity Analysis. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
3. Barua, S., Somvanshi, S., Javed, S., Pandey, B., Das, S. Evaluating the Influence of Intersection Contexts on Urban E-Scooter Crash Severity using Structural Topic Modeling of Crash Narratives. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
4. Islam, M., Mimi, M., Somvanshi, S., Tusti, A., Chhetri, G., Das, S. Prompting Without Labels: Zero-and Few-Shot LLM Performance on e-Scooter Crash Prediction Tasks. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
5. Momin, M., Cho, E., Cho, E., Das, S. Coastal Flooding on Transportation Infrastructures: A Systematic Review of Patterns, Impacts and Methodologies. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
6. Liu, J., Barua, S., Somvanshi, S., Chakraborty, R., Das, S. Spatially-Enhanced AutoGluon for Estimation of Annual Average Daily Traffic on Local Road Networks. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
7. Mimi, M., Yuan, Y., Huang, X., Das, S. Artificial Intelligence and Spatial Modeling to Estimate Traffic Volume Measures on Local Roadways. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
8. Islam, M., Chowdhury, T., Tusti, A., Das, S. Deep Learning-Based Trespassing Surveillance System for Enhancing Safety at Highway-Rail Grade Crossings. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
9. Chakraborty, R., Chowdhury, T., Chakraborty, A., Baitullah, A., Kutela, B., Das, S. Identifying Latent Structures in Fatal Highway-Rail Grade Crossing Crashes using Dimensionality Reduction Methods. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
10. Islam, M., Barua, S., Chowdhury, T., Tusti, A., Das, S. Understanding Pedestrian Trespassing at U.S. Highway-Rail Grade Crossings: A Decade-Long Analysis Integrating Topic Modeling and Spatial Tools. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
11. Sheykhard, A., Lei, T., Saeidi, S., SafariTaherkhani, M., Fountas, G., Das, S., Kaisar, E. Behavioral Modeling of Drivers near Speed Control Cameras: A Dual Perspective from Micro and Macro Data. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
12. Hossain, A., Das, S., Jafari, M., Junaed, S., Codjoe, J. Investigating Older Driver Involved Crashes at

- High-Speed Signalized Intersections (HSSIs): A Random Parameter Ordered Probit Approach. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
13. Tusti, A., Dutta, A., Javed, S., Das, S. Driving Education Advancements of Novice Drivers, A Review of Studies in the United States. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  14. Tusti, A., Barua, S., Chakraborty, R., Somvanshi, S., Mimi, M., Das, S. Cooperative Dynamics in Older Age and Human-Automation Interactions in Automated Vehicle Crashes. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  15. Sakib, N., Rahman, M., Junaed, S., Khan, A., Das, S., Moomen, M., Codjoe, J., Gopu, V. Explainable Machine Learning for Analyzing Factors Influencing Emergency Medical Services Response Times on Interstate Highways. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  16. Barua, S., Chakraborty, R., Liu, J., Mimi, M., Pandey, B., Das, S. Explainable AI-Driven Hybrid Modeling for Crash Severity Analysis Near Bus Stops in Urban Areas. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  17. Barua, S., Chakraborty, R., Dadashova, B., Sheykhfard, A., Das, S. Analyzing Alcohol-Impaired Multi-Occupant Crashes through Hybrid Dimension Reduction and the Safe System Lens. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  18. Chakraborty, R., Polock, S., Pandey, B., Shuvo, S., Dey, K., Das, S. Revealing Contextual Patterns in Cannabis-Involved Fatal Crashes Using Data-Driven Association Mapping. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  19. Rahman, M., Das, S., Junaed, S., Dzinyela, R., Hossain, A., Mitran, E., Moomen, M., Codjoe, J., Sun, X. Analyzing Underage Drinking and Driving Crashes Using a Correlated Random Parameters with Heterogeneity in Means Approach. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  20. Kasubi, F., Kutela, B., Hossain, A., Das, S., Kinero, A. Perceived Safety of Automated Vehicles: A Bayesian Network Analysis of Predictors and Implications for Ridership and Road Sharing. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  21. Mimi, M., Islam, M., Tusti, A., Somvanshi, S., Das, S. ST-GraphNet: A Spatio-Temporal Graph Neural Network for Understanding and Predicting Automated Vehicle Crash Severity. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  22. Dzinyela, R., Shirazi, M., Das, S., Lord, D. The Negative Binomial Lindley Model with Spatiotemporal Random Parameters: Accounting for Spatiotemporal Effects in Crash Data Analysis. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  23. Chakraborty, R., Islam, M., Somvanshi, S., Barua, S., Das, S. Unmasking Vehicle Automation–Severity Interactions through Multimodal Association Rules Mining. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  24. Somvanshi, S., Islam, M., Javed, S., Das, S. Crash Severity Prediction in AEB-Equipped Vehicles Using Advanced Tabular Deep. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  25. Das, S. Quantifying Factors that Impact Ride-Hailing Use Among Older Californians. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  26. Mimi, M., Islam, M., Das, S., Dutta, A., Dadashova, B. Semantic Modeling of Pedestrian Behaviors at Shared-Use Path Crossings in Major Cities: Insights from BERT-Based Architectures and Structural Topic Modeling. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  27. Rahman, M., Tolford, T., Junaed, S., Das, S., Hossain, A., Moomen, M., Mitran, E., Codjoe, J. Pedestrian Fatalities on U.S. Interstates: A Pattern Mining Approach to Investigating Pedestrian Actions and Policy Implications. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  28. Barua, S., Starewich, M., Tusti, A., Javed, S., Alnawmasi, N., Das, S. Decoding Pedestrian Crash Complexity at Crosswalks using Hybrid Dimension Reduction and Random Parameter Models. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  29. Somvanshi, S., Antariksa, G., Das, S. Enhanced Balanced-Generative Adversarial Networks to Predict Pedestrian Injury Types. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  30. Mimi, M., Islam, M., Tusti, A., Chowdhury, T., Das, S. Understanding Contributing Factors to Pedestrian Failure-to-Yield Fatal Crashes: Maneuvers Classification Using AutoML and Model Interpretability Techniques. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  31. Momin, M., Cho, E., Cho, E., Das, S. Assessing Roadway Network Risk to Compound Flooding in Galveston County, Texas: An Integrated Hydrodynamic and Machine Learning Approach. 105th TRB

- Annual Meeting, Washington, D.C., Jan 11–16, 2026.
- 32. Karasneh, M., Dey, K., Ashraf, M., Mohan, A., Savolainen, P., Gates, T., Das, S. Assessing the Impact of Road and Roadside Features on Safety in Urban Highways: A Case Study in Red Wing City, Minnesota. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 33. Javed, S., Chakraborty, R., Hossain, A., Das, S. Uncovering Risk Patterns in Single and Multiple Ambulance Crashes with Association Rules Mining. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 34. Liu, J., Chakraborty, R., Polock, S., Javed, S., Alnawmasi, N., Das, S. Analyzing Factors Influencing Crash Severity in Vehicles with Automation Features using AutoGluon. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 35. Chakraborty, R., Javed, S., Islam, M., Liu, J., Das, S., Kutela, B. Crash Pattern Mining by SAE Automation Levels and Severity. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 36. Somvanshi, S., Tusti, A., Mimi, M., Islam, M., Dutta, A., Das, S. Applying MambaAttention, TabPFN, and TabTransformers to Classify SAE Automation Levels in Crashes. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 37. Somvanshi, S., Hebli, P., Chhetri, G., Das, S. Attention-Based and State-Space Models for Predicting Electric Vehicle Crash Severity. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 38. Mimi, M., Islam, M., Tusti, A., Das, S. Hybrid Dimension Reduction and Explainable AI Models to Explore Truck Crash Patterns at Intersections. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 39. Islam, M., Tusti, A., Mimi, M., Somvanshi, S., Das, S. Crash Risk Analysis of Non-Motorists using Interpretable Tabular Deep Learning. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 40. Javed, S., Das, S. Uncovering Robust Patterns in U-Turn Crash Severity Using Lift Increase Criterion in Association Rule Mining using Multimodal Data. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 41. Islam, M., Chakraborty, R., Tusti, A., Aghabayk, K., Das, S. A Multidimensional Analysis of E-Scooter Crash Severity: Integrating Cluster Correspondence and SHAP Interpretability. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 42. Chakraborty, R., Das, S. A Dimensionality-Reduction based XAI Framework for Roundabout Crash Severity Insights. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 43. Starewich, M., Barua, S., Tusti, A., Javed, S., Polock, S., Chowdhury, T., Das, S. On Any Sunday and Beyond: A SHAP Enabled Random Parameters Analysis of Older Motorcyclist Injury Severity. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 44. Tusti, A., Starewich, M., Barua, S., Javed, S., Polock, S., Das, S. Accounting for Unobserved Heterogeneity in Predicting Crash Injury Severities Among Young Motorcycle Riders. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 45. Somvanshi, S., Tusti, A., Chakraborty, R., Kutela, B., Das, S. Advancing Crash Severity Prediction for Young Riders Using Tabular Data Intelligence. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 46. Hossain, A., Sakib, N., Asif, A., Das, S. Patterns Associated with Fatal Motorcycle-Involved Crashes in Bangladesh: Applying Text Mining Techniques and Structural Topic Modeling. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 47. Barua, S., Chhetri, G., Chowdhury, T., Pandey, B., Das, S. Temporal Patterns and Risk Factors in Food Delivery Vehicle Crashes: Evidence from Structural Topic Modeling of Daytime and Nighttime Incidents. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 48. Barua, S., Dutta, A., Das, S. Analyzing Motorcycle Crashes on Rural Undivided Roads: A Data-Driven Approach. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.
  - 49. Hasan, A., Nayeem, M., Patel, D., Islam, M., Jalayer, M., Das, S., Pike, A. Evaluating State DOT Practices and Priorities in Pavement Marking Implementation and Maintenance: Insights from Multi-State Interviews and Comparative Analysis. 105th TRB Annual Meeting, Washington, D.C., Jan 11–16, 2026.

## TRBAM 2025 Presented Papers

1. Rahman, M. A., Junaed, S., Dzinyela, R., Hossain, A., Das, S., Moomen, M. Role of Gender and other Influencing Factors in Unlicensed Novice Driver Crashes using a Correlated Random Parameters with Heterogeneity in Means Approach. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
2. Hossain, A., Das, S., Sakib, N., Somvanshi, S. Leveraging Explainable Machine Learning Techniques to Estimate Crash Severity for Different Pedestrian Actions. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
3. Rahman, M. A., Mohammed, N.-H., Mimi, M., Das, S., Moomen, M., Codjoe, J. Mining Patterns of Pedestrian Crashes at Signalized and Stop-Controlled Intersections. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
4. Kutela, B., Ngotonie, M., Ngeni, F., Das, S., Lyimo, S. Understanding Sun Glare Crashes from Driver's Perspective: A Matched Case-Control Exploratory Study. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
5. Chakraborty, R., Hossain, A., Das, S., Javed, S., Kalambay, P. Examining Racial Disparities in Fatal and Severe Pedestrian Crashes at Midblock Locations. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
6. Sheykhard, A., Das, S., Saeedi, S., Oshanreh, M. M., Kutela, B. Adapting Vision Zero for Improving Pedestrian Safety in Developing Countries: Strategies and Priorities for Urban Roads. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
7. Dzinyela, R., Shirazi, M., Das, S., Lord, D. Time-Dependent Negative Binomial-Lindley Model for Addressing Temporal Variations and Excess Zeros in Crash Data. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
8. Chakraborty, R., Mimi, M., Barua, S., Das, S. Evaluating Lane Change Dynamics: A Study of Camera-Based vs. Mirror-Based Systems in Traffic Safety. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
9. Chakraborty, R., Javed, S., Das, S., Kutela, B., Khan, M. N. Impact of Level 2 Automation on Driver Behavior: A Study Using Association Rules Mining. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
10. Khanzada, F. A., Sun, X., Mitran, E., Chakraborty, R., Das, S., Codjoe, J. Analysis of Older Driver Crash Patterns at Signalized, Stop-Controlled, and Yield-Controlled Intersections. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
11. Junaed, S., Rahman, M. A., Sakib, N., Moomen, M., Das, S., Mitran, E., Codjoe, J. Roadway Crashes Involving 15-Year-Old Novice Drivers: Identifying Key Factors Using Correspondence Analysis. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
12. Chakraborty, R., Das, S., Mimi, M., Kutela, B. Insights into Texas Barrier Crashes: A Cluster Correspondence Approach. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
13. Kutela, B., Chengula, T., Lippu, C., Kidando, E., Liu, J., Das, S. Understanding GPS-related Crashes Using a Matched Case-Control Approach. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
14. Hossain, A., Das, S., Sun, X., Hasan, A. S., Jalayer, M. A Hybrid Data Mining Framework to Investigate Roadway Departure Crashes on Rural Two-lane Highways: Applying Fast and Frugal Tree with Association Rules Mining. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
15. Liu, J., Chakraborty, R., Somvanshi, S., Das, S. Impact of Operating Speed, Roadway Curvature, and Precipitation on Crash Risks in Rural Two-Lane Roads. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
16. Kutela, B., Das, S., Javed, S., Sheykhard, A., Lyimo, S., Shita, H., Langa, N. Understanding the Association Between Transportation Safety and Quality of Life in Austin Using Bayesian Networks. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
17. Mimi, M., Chakraborty, R., Barua, S., Das, S., Khan, M. N., Dadashova, B. Identifying Patterns in Risk Factors and Injury Severity Scores in Substance-Related Traffic Crashes. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
18. Anderson, D., Das, S. Shaping Urban Futures: News Media's Role in the 15-Minute City Discourse. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.

19. Sakib, N., Junaed, S., Hossain, A., Ahmed, M. I., Das, S. Enhancing Cyclist Safety in Dhaka: A Data-Driven Approach Using Ordinal Logistic Regression and Machine Learning Models. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
20. Das, S., Kutela, B. Bayesian Networks in Identifying Patterns between Pedestrian and Driver Behavioral Interactions. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
21. Dzinyela, R., Adanu, K., Gupta, H., Koirala, P., Alnawmasi, N., Das, S., Lord, D. Accounting for Gender and Age Differences in the Duration between a Previous Non-fatal Crash and a Fatal Crash. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.
22. Barua, S., Tamakloe, R., Chakraborty, R., Kutela, B., Das, S. Identifying Patterns and Risk Factors in SUV-Related Pedestrian Crashes Using Cluster Correspondence Analysis. 104th TRB Annual Meeting, Washington, D.C., January 5–9, 2025.

### **Peer-Reviewed Computer Science Conference Proceeding Papers**

1. Somvanshi, S., Hebli, P., Chhetri, G., and Das, S. Tabular data with class imbalance: Predicting electric vehicle crash severity with pretrained transformers (TabPFN) and Mamba-based models. The 24th IEEE International Conference on Machine Learning and Applications (ICMLA), Florida, USA, Dec. 3–5. [doi](#) [Link](#)
2. Chhetri, G., Anderson, D., Kutela, B., and Das, S. A transformer-based cross-platform analysis of public discourse on the 15-minute city paradigm. The 24th IEEE International Conference on Machine Learning and Applications (ICMLA), Florida, USA, Dec. 3–5. [doi](#) [Link](#)
3. Mimi, M. S., Islam, M. M., Tusti, A. G., Somvanshi, S., and Das, S. ST-GraphNet: A Spatio-Temporal Graph Neural Network for Understanding and Predicting Automated Vehicle Crash Severity. SpatialConnect '25: Proceedings of the 1st ACM SIGSPATIAL International Workshop on Spatial Intelligence for Smart and Connected Communities. [doi](#) [Link](#)
4. Somvanshi, S., Chakraborty, R., Das, S., and Dutta, A. Crash severity analysis of child bicyclists using Arm-Net and MambaNet. 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA. [doi](#) [Link](#)
5. Somvanshi, S., Liu, J., and Das, S. A survey on generative AI in transportation systems management and operation. 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA. [doi](#) [Link](#)
6. Antariksa, G., Tamakloe, R., Liu, J., and Das, S. Automated and explainable artificial intelligence to enhance prediction of pedestrian injury severity. 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA.
7. Somvanshi, S., Tusti, A. G., Chakraborty, R., and Das, S. Applying tabular deep learning models to estimate crash injury types of young motorcyclists. 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA. [doi](#) [Link](#)
8. Barua, S., Dutta, A., and Das, S. Modeling distracted driving: Analyzing driver gaze, vehicle positioning, and psychological response for enhanced traffic safety. 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA. [doi](#) [Link](#)
9. Antariksa, G., Chakraborty, R., Somvanshi, S., Das, S., Jalayer, M., and Patel, D. R. Comparative analysis of advanced AI-based object detection models for pavement marking quality assessment during daytime. 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, CA. [doi](#) [Link](#)
10. Das, S. HyperSumm-RL: A dialogue summarization framework for modeling leadership perception in social robots. HT 2025: 36th ACM Conference on Hypertext and Social Media. [doi](#) [Link](#)

## Awards and Recognitions

### Faculty Awards (2025)

- Presidential Distinction Award, College of Science and Engineering, Texas State University
- Research Big Spender Award, Texas State University
- Research Millionaire Award, Texas State University

### Student Awards (2025)

- **Mahmuda Sultana Mimi** was awarded prestigious 2025 Eno Fellowship.
- **Md Monzurul Islam** and **Sharif Ahmed Rafat** won the BobCatalyst Innovation Accelerator Program (BIAP) Award (\$5,000).
- **Md Monzurul Islam** received the 2025 CASITE Scholarship (\$1,500).
- **Md Monzurul Islam** won the American Society of Highway Engineers (ASHE) award (\$2,000).
- **Shriyank Somvanshi** received the Graduate College Scholarship (\$1000).
- **Biplov Pandey** received a URF grant for a project: Enhancing Grid Resilience by Incorporating Sustainable EV Charging Networks in Texas (\$2,000).
- **Gaurab Chhetri** received a URF grant for a project: Integrating AI and IoT Technologies for Heat Stress Prediction in Solar Energy Facilities Using Synthetic Data (\$2,000).
- **Darrell Anderson** received a URF grant for a project: Case Study: Ensuring Walkability in San Marcos, TX Using Machine Learning and GIS to Assess the Feasibility of the 15-Minute City Concept (\$1,160).
- **Mills A. David** received the FY25 New Ventures Award (\$10,000).
- **Mahmuda Sultana Mimi** received the WTS Helene Overley Memorial Scholarship (\$5,000).

## **Highlighted Projects**

### **NCHRP 17-113: Incorporating Safe System Approach into the NCHRP Report 500 Series**

Dr. Das has been leading this project with VHB and Rowan University. NCHRP Report 500 series identifies proven, tried, and experimental safety strategies for each of the emphasis areas in the American Association of State Highway and Transportation Officials' (AASHTO's) original 1998 Strategic Highway Safety Plan. The Federal Highway Administration (FHWA) and state departments of transportation (DOTs) partnered through a pooled fund study to develop reliable estimates of the effectiveness of the safety improvements identified as strategies in the NCHRP Report 500 series. Information presented in the NCHRP Report 500 series predates the Safe System approach, which is an internationally adopted framework for road safety management that works by building and reinforcing multiple layers of protection to prevent crashes from happening in the first place and minimize the harm caused to those involved when crashes do occur (UN Resolution). An increasing number of localities and states are moving toward a Safe System approach in road planning, design, and operation. To assist transportation owners and operators, FHWA developed a series of guidance documents and associated tools outlining application to the Safe System in the U.S. context (FHWA Brochure). To further support this process, there is an immediate need to provide updated, evidence-based countermeasure information for priority crash types addressed in the NCHRP Report 500 series to reflect the current knowledge base. The objective of this project is to develop a searchable electronic toolkit that builds on the NCHRP Report 500 series to align with Safe System principles and AASHTO's current priorities, as well as reflect the most recent research and identify new innovations to help achieve the goal of zero deaths on the nation's roads. Successful completion of this project will

- help transportation officials consider a broader list of countermeasures applicable to the majority of crash types
- improve the efficiency of countermeasure selection, link to state analysis tools, and enhance usability of the NCHRP Report 500 series
- provide access to the most current information
- advance implementation of the Safe System approach
- increase practitioner awareness of the NCHRP Report 500 series

### **BTSCRP BTS-42: Guidelines for Authorizing, Implementing, and Operating Automated Traffic Enforcement Programs**

Dr. Das has been leading this project with Exponent and JHU. Automated traffic enforcement technology is widely used as a supplement to law enforcement officers. Deployment of automated enforcement in the United States has increased in recent years for a number of reasons, including improved deterrence of targeted traffic violations, societal questioning of the use of law enforcement officers for routine traffic enforcement, and increasing officer vacancy rates in many law enforcement agencies. Despite widespread and growing use of automated enforcement and reported safety benefits, a number of questions are routinely raised.

- How effective are different types of automated traffic enforcement in the United States, and how widely are they accepted?
- How can automated traffic enforcement programs best be designed, implemented, and managed to (1) inspire confidence and trust and (2) increase compliance with traffic safety laws?
- What program approaches and program architecture are best suited to address (1) the perception that automated traffic enforcement is used primarily to generate revenue; (2) the belief by some that privacy infringements outweigh documented safety benefits; and (3) concerns that certain communities are overrepresented and overburdened by this traffic enforcement strategy?

Answering such questions would help state highway safety offices (SHSOs), policymakers, and other stakeholders shape traffic safety laws and public policy on the use of automated traffic enforcement. To the extent possible, guidelines developed through this project shall be relevant to current and future applications of automated traffic enforcement, including (1) various types of violations targeted, and (2) various technologies deployed.

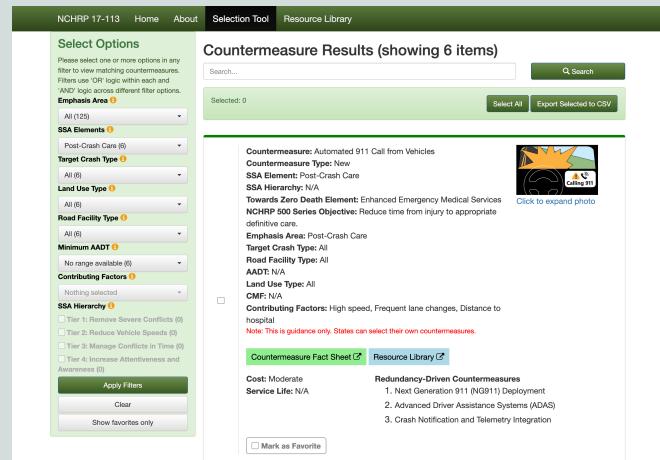
- authorizing, implementing, and operating automated traffic enforcement programs that inspire confidence and trust and
- assessing public opinion and concerns regarding automated traffic enforcement by jurisdictions using, or considering the use of, this technology.

## Highlighted Tools

### NCHRP 17-113: Safe System Approach Countermeasure Selection Tool | [Link](#)

The Safe System Approach Countermeasure Selection Tool was developed under NCHRP 17-113 to support agencies in selecting context-appropriate roadway safety countermeasures. The project refines the original 22 emphasis areas from the NCHRP 500 Series to seven core emphasis areas that reflect current national safety priorities, recent fatal crash trends, and alignment with State Strategic Highway Safety Plans. The tool helps practitioners apply Safe System principles in daily safety management. It emphasizes redundancy, meaning multiple overlapping layers of protection are intentionally incorporated into the transportation network so that human mistakes do not result in fatal or serious injury outcomes. Rather than recommending isolated treatments, the tool encourages comprehensive and layered strategies. The interface allows users to filter countermeasures based on emphasis area, crash type, roadway facility type, land use context, and contributing factors. This helps agencies move from reactive responses toward proactive risk management. The tool supports applications including Vision Zero initiatives, SS4A programs, and SHSP updates.

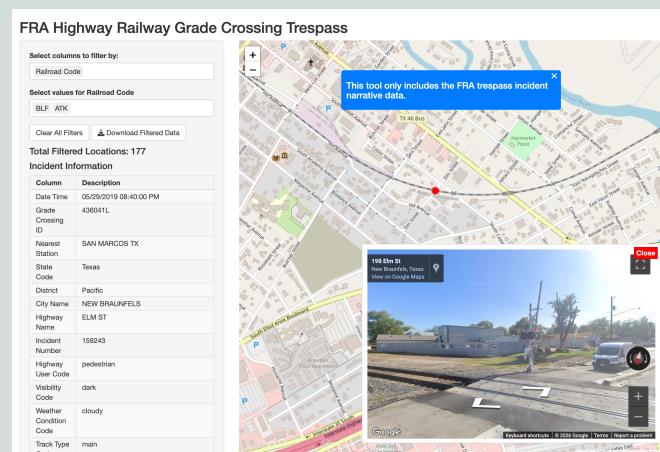
- Refines earlier NCHRP 500 emphasis areas from 22 to 7 priority areas
- Integrates Safe System principles with practical countermeasure guidance
- Supports multi-filter, context-sensitive countermeasure selection
- Promotes redundancy through layered safety strategies
- Aligns with SHSP development and Vision Zero planning



### FRA Highway Railway Grade Crossing Trespass Tool | [Link](#)

This interactive analytical tool visualizes Federal Railroad Administration (FRA) highway railway grade crossing trespass incidents. It enables users to filter and explore incident narratives geographically, while also providing key contextual attributes such as weather, time of day, railroad code, visibility conditions, and user type. The platform integrates map-based visualization with incident tables and Google Street View imagery. This helps practitioners better understand the spatial and situational characteristics of trespass events, support site reviews, and identify risk factors that contribute to repeated trespass activity. The tool supports proactive safety applications including field investigation support, visualization of high-risk locations, and prioritization of mitigation strategies such as fencing, enforcement presence, and public education interventions.

- Provides nationwide FRA trespass incident data with narrative fields
- Supports spatial filtering and location-based safety analysis
- Integrates map display with Street View imagery for site visualization
- Enables review of environmental and behavioral contributing factors
- Assists agencies in prioritizing treatments at high-risk trespass locations



## New Lab Member Profiles

### Amir Rafe, Ph.D., Postdoctoral Researcher

Dr. Amir Rafe is a Postdoctoral Researcher in the Artificial Intelligence in Transportation (AIT) Lab at Texas State University. His work focuses on causal AI, computational epistemology in AI, complexity, and safety, with an emphasis on how intelligent systems reason and operate in safety-critical environments. His PhD research, EvacuAIDI, developed a causal-informed, disability-inclusive AI framework for probabilistic evacuation guidance by integrating AI, human behavior modeling, and causal reasoning. Amir has more than fifteen years of experience as a transportation engineering consultant, contributing to projects on pedestrian safety, crowd evacuation, transportation master plans, freight logistics, and airport design in multiple countries. He began programming at age twelve in Fortran and now primarily works in Python, with expertise in AI-driven modeling, complex systems simulation, probabilistic reasoning, and decision-support tools. He is also active in scientific outreach, hosting the Decoding Causality podcast, managing an Evacuation Science page on LinkedIn, and engaging in teaching and student mentorship. His podcast has been listed among the Top 15 causality podcasts. He holds a College Teaching Certificate from Utah State University and is dedicated to advancing safer and more epistemically grounded intelligent systems.



### Publications (2025)

- Somvanshi, S., Islam, M. M., **Rafe, A.**, Tusti, A. G., Chakraborty, A., Baitullah, A., Chowdhury, T. I., Alnawmasi, N., Dutta, A., and Das, S. Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. *ACM Computing Surveys*. doi [Link](#)

### Personal Links

Website | Google Scholar | ORCID | LinkedIn | GitHub | Email

### Sawgat Ahmed Shuvo, Ph.D. Student, Civil Engineering

Sawgat Ahmed Shuvo is a PhD student in Civil Engineering at Texas State University and a Doctoral Assistant in the AIT Lab under the supervision of Dr. Subashish Das. He completed his Bachelor's in Civil Engineering from BUET in 2011, majoring in Transportation Engineering with a minor in Structural Engineering, and his undergraduate thesis examined pedestrian crossing behavior in Dhaka. He later earned a Master of Urban Planning from the University of Melbourne in 2019, focusing on transportation planning, where his thesis addressed improving bus network efficiency in Melbourne. He has about thirteen years of professional experience across multiple areas of civil engineering. His career includes service in the Bangladesh Civil Service at the Public Works Department, work at the Institute of Water Modelling on wave and littoral drift modeling, and roles in construction supervision and management. He is affiliated with the Institute of Engineers, Bangladesh, the Bangladesh Earthquake Society, and the Bangladesh Civil Service Public Works Engineers' Association, and holds Structural Engineer registration from IEB. His research interests include public transport, active transportation, structural analysis, and policy analysis.



### Publications (2025)

- Somvanshi, S., Islam, M. M., Chhetri, G., Chakraborty, R., Mimi, M. S., **Shuvo, S. A.**, Islam, K. S., Javed, S., Rafat, S. A., Dutta, A., & Das, S. (2025). From tiny machine learning to tiny deep learning: A survey. *ACM Computing Surveys*, 58(7), Article 168. doi [Link](#)

## Personal Links

 Google Scholar |  ORCID |  LinkedIn |  Email

### Tausif Islam Chowdhury, M.Sc. Student, Civil Engineering

Tausif Islam Chowdhury is a Master's student in Civil Engineering (Transportation) at Texas State University, working under the guidance of Dr. Subasish Das and currently serving as a Graduate Instructional Assistant at the Ingram School of Engineering. He joined the Artificial Intelligence in Transportation (AIT) Lab in Spring 2025. His research interests include transportation safety, infrastructure resilience, artificial intelligence applications in transportation, and sustainable urban mobility. He earned his bachelor's degree in Building Engineering and Construction Management from Khulna University of Engineering & Technology (KUET) in 2023.



## Publications (2025)

- Somvanshi, S., Islam, M. M., Rafe, A., Tusti, A. G., Chakraborty, A., Baitullah, A., **Chowdhury, T. I.**, Alnawmasi, N., Dutta, A., and Das, S. Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. *ACM Computing Surveys*.  [Link](#)

## Personal Links

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### Arka Chakraborty, M.Sc. Student, Civil Engineering

Arka Chakraborty has embarked on a new journey, joining Texas State University as a graduate student in Civil Engineering. Under the guidance of Dr. Subasish Das, he is a Graduate Research Assistant, dedicating his time to a cause he believes in deeply: making our world safer. He has pursued his Bachelor's degree in Industrial Engineering from Khulna University of Engineering and Technology. Arka's research focuses on road safety, transportation safety, pedestrian safety, crash risk assessment, and driver behavior analysis, utilizing machine learning, statistical models. He has also proficiency in R and Python programming language. Along with academic activities, Arka loves travelling and playing cricket. He believes the world can be a better and safer one with the responsible contribution in the field of technology and science. With that motivation, he wants to contribute in transportation safety to make the world a safer one.



## Publications (2025)

- Somvanshi, S., Islam, M. M., Rafe, A., Tusti, A. G., **Chakraborty, A.**, Baitullah, A., Chowdhury, T. I., Alnawmasi, N., Dutta, A., and Das, S. Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. *ACM Computing Surveys*.  [Link](#)

## Personal Links

 Google Scholar |  ORCID |  LinkedIn |  Email

## Sharif Ahmed Rafat, M.Sc. Student, Civil Engineering

Sharif Ahmed Rafat is a Master's student in Civil Engineering (Transportation) at Texas State University, working as a Graduate Research Assistant with the supervision of Dr. Subasish Das from Fall 2025. A BUET graduate, he has over six years of experience in the transportation field, specializing in intelligent transportation systems (ITS), transportation planning and safety, traffic microsimulation, and demand forecasting, and has contributed to major projects in Bangladesh using tools such as PTV Vissim and AutoCAD Civil 3D. He also has two years of teaching experience in civil engineering and programming. His current research focuses on transportation safety, travel behavior, and integrating artificial intelligence into ITS.



### Publications (2025)

- Somvanshi, S., Islam, M. M., Chhetri, G., Chakraborty, R., Mimi, M. S., Shuvo, S. A., Islam, K. S., Javed, **S., Rafat**, S. A., Dutta, A., & Das, S. (2025). From tiny machine learning to tiny deep learning: A survey. *ACM Computing Surveys*, 58(7), Article 168. [doi](#) [Link](#)

### Honors and Awards (2025)

- BobCatalyst Innovation Accelerator Program (BIAP) Award (2025)

### Personal Links

[Website](#) | [Google Scholar](#) | [ORCID](#) | [LinkedIn](#) | [GitHub](#) | [Email](#)

## Anika Baitullah, M.Sc. Student, Civil Engineering

Anika Baitullah is a Master's student in Civil Engineering (Transportation) at Texas State University, working as a Graduate Research Assistant under the guidance of Dr. Subasish Das. She joined the Artificial Intelligence in Transportation (AIT) lab in Fall 2025. Her research interests include safety assessment in shared-use paths, transportation safety, crash data analysis, driver behavior, and the application of GIS-based techniques for sustainable urban mobility. She earned her bachelor's degree in civil engineering from Rajshahi University of Engineering and Technology in 2021. Before pursuing graduate studies, she worked as a Transmission Line Engineer, utilizing GIS-based software to enhance the sustainability of electrical transmission line infrastructure. Outside of academics and research, Anika enjoys reading novels and is committed to contributing to more sustainable infrastructure development.



### Publications (2025)

- Somvanshi, S., Islam, M. M., Rafe, A., Tusti, A. G., Chakraborty, A., **Baitullah, A.**, Chowdhury, T. I., Alnawmasi, N., Dutta, A., and Das, S. Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. *ACM Computing Surveys*. [doi](#) [Link](#)

### Honors and Awards (2025)

- Graduate Merit Fellowship (2025, 2026)

### Personal Links

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## **Shamyo Brotee, M.Sc. Student, Computer Science**

Shamyo Brotee is currently a Master's student in Computer Science at Texas State University, beginning in Fall 2025. He works as a Graduate Research Assistant under the supervision of Dr. Subasish Das and Dr. Anandi Dutta. Originally from Bangladesh, he earned his Bachelor's degree in Computer Science and Engineering from the University of Dhaka. His past research focused on multi-agent deep reinforcement learning for autonomous vehicles, and his overall research interests include applying machine learning in autonomous vehicles, transportation, and other autonomous systems. Before graduate school, he gained industry and academic experience as a software developer and a university lecturer in Bangladesh. He is proficient in Python, C++, SQL Server, and data visualization using Power BI, with experience in applying machine learning in diverse applications. He is an inquisitive person who is always willing to learn more.



### **Personal Links**

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## **Salma Akter Laboni, MBA Student, Business Administration**

Salma Akter Laboni is a master's Student in McCoy College of Business (MBA) at Texas State University, working as a Graduate Research Assistant under the guidance of Dr. Subasish Das. She joined the Artificial Intelligence in Transportation (AIT) lab in Fall 2025. Laboni has authored and co-authored several peer-reviewed journal articles, including studies on travel agency operations, export potential of Bangladesh's flower and leather industries, the role of information technology and blockchain in logistics supply chains, and the socio-economic implications of gig work. She earned her bachelor's and master's degrees in the International Business Department from the University of Dhaka in 2019 and 2020, respectively. Before graduate school, she joined City University as a faculty member in the Department of Business Administration and Economics. Outside of academics and research, Laboni enjoys travelling and is an inquisitive person who is always willing to learn more.



### **Honors and Awards (2025)**

- Graduate Merit Fellowship (2025, 2026)

### **Personal Links**

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## **Irfan Sarwar Pranjol, B.Sc. Student, Mechanical Engineering**

Irfan Sarwar Pranjol is an undergraduate Mechanical Engineering student at Texas State University and an undergraduate research assistant in the Artificial Intelligence in Transportation (AIT) Lab. Originally from Dhaka, Bangladesh, he has a strong academic record, including a perfect GPA in high school and college and a 1450 SAT score. His research interests include artificial intelligence, sustainability, and engineering applications. He has significant leadership experience as Secretary General of the Notre Dame Eco and Space Club, where he organized national events and workshops, and he co-founded Bangladesh's first astronomy-themed high school exhibition. He has guided student teams in national and international science competitions and is skilled in productivity and communication tools. Outside academics, he enjoys soccer, swimming, working out, and badminton.



## Personal Links

 LinkedIn |  Email

### Bidisha Shrestha, B.Sc. Student, Civil Engineering

Bidisha is an undergraduate student in Civil Engineering Program at Texas State University. Originally from Nepal, she is interested in hydraulics and transportation engineering with a focus on developing safe, efficient and sustainable infrastructure. Her research interest centers on improving transportation systems and water resource management to better support communities.



## Personal Links

 LinkedIn |  Email

## Current Lab Member Profiles

### Shriyank Somvanshi, Ph.D. Candidate, MSEC

Shriyank Somvanshi is a PhD student and doctoral research assistant at Texas State University, conducting research in artificial intelligence and transportation analytics. His work focuses on deep learning techniques for predictive modeling, data-driven decision-making, and model interpretability, with strong interest in explainable AI methods such as SHAP to improve transparency and trust in real-world AI systems. He earned his MS in Civil Engineering from Texas State University and his BS in Civil Engineering from Dr. A.P.J. Abdul Kalam Technical University in India. His research excellence has been recognized through multiple awards, including the 2025 CSAITE Award. In addition to his research, he is actively engaged in mentoring students, participating in workshops, and collaborating on interdisciplinary projects related to transportation safety, autonomous vehicles, and urban mobility analytics.



## Publications (2025)

- **Somvanshi, S.**, Javed, S. A., Islam, M. M., Pandit, D., & Das, S. (2024). A survey on kolmogorov-arnold network. ACM Computing Surveys. [doi](#) [Link](#)
- **Somvanshi, S.**, Islam, M. M., Rafe, A., Tusti, A. G., Chakraborty, A., Baitullah, A., Chowdhury, T. I., Alnawmasi, N., Dutta, A., and Das, S. Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. ACM Computing Surveys.
- **Somvanshi, S.**, Islam, M. M., Chhetri, G., Chakraborty, R., Mimi, M. S., Shuvo, S. A., Islam, K. S., Javed, S., Rafat, S. A., Dutta, A., & Das, S. (2025). From tiny machine learning to tiny deep learning: A survey. ACM Computing Surveys, 58(7), Article 168. [doi](#) [Link](#)
- Mimi, M. S., Islam, M. M., Ghosh Tusti, A., **Somvanshi, S.**, & Das, S. (2025). ST-GraphNet: A spatio-temporal graph neural network for understanding and predicting automated vehicle crash severity. In Proceedings of the 1st ACM SIGSPATIAL International Workshop on Spatial Intelligence for Smart and Connected Communities (pp. 5–14). [doi](#) [Link](#)
- Liu, J., Chakraborty, R., **Somvanshi, S.**, & Das, S. (2025). Impact of operating speed, roadway curvature, and precipitation on roadway departure risk in rural two-lane roads. Travel Behaviour and Society, 41, 101055. [doi](#) [Link](#)
- **Somvanshi, S.**, Liu, J., & Das, S. (2025, May). A Survey on Generative AI in Transportation Systems Management and Operation. In 2025 IEEE Conference on Artificial Intelligence (CAI) (pp. 829-832). IEEE. [doi](#) [Link](#)

- **Somvanshi, S.**, Tusti, A. G., Chakraborty, R., & Das, S. (2025). Applying tabular deep learning models to estimate crash injury types of young motorcyclists. In 2025 IEEE Conference on Artificial Intelligence (CAI), Santa Clara, California, USA. IEEE. doi [Link](#)
- **Somvanshi, S.**, Chakraborty, R., Das, S., & Dutta, A. K. (2025). Crash severity analysis of child bicyclists using ARM-Net and MambaNet. 2025 IEEE Conference on Artificial Intelligence (CAI). IEEE. doi [Link](#)
- Antariksa, G., Chakraborty, R., **Somvanshi, S.**, Das, S., Jalayer, M., Patel, D. R., & Mills, D. (2025). Comparative analysis of advanced AI-based object detection models for pavement marking quality assessment during daytime. In 2025 IEEE Conference on Artificial Intelligence (CAI). IEEE. doi [Link](#)
- Liu, J., Antariksa, G., **Somvanshi, S.**, & Das, S. (2025). Revealing equity gaps in pedestrian crash data through explainable artificial intelligence clustering. *Transportation Research Part D: Transport and Environment*, 139, 104538. doi [Link](#)
- **Somvanshi, S.**, Hebli, P., Chhetri, G., and Das, S. Tabular data with class imbalance: Predicting electric vehicle crash severity with pretrained transformers (TabPFN) and Mamba-based models. The 24th IEEE International Conference on Machine Learning and Applications (ICMLA), Florida, USA, Dec. 3–5. doi [Link](#)

### Personal Links

 Google Scholar |  ORCID |  LinkedIn |  GitHub |  Email

### David A. Mills, Ph.D. Candidate, Geographic Information Science

David A. Mills is a geospatial data analyst and software developer. He is a PhD Candidate in Geographic Information Science at Texas State University. David has been working for Dr. Das in the AIT Lab since 2022. David specializes in discovering and improving the understanding spatio-temporal phenomena. He builds pioneering smart technologies and leverages them using advanced geocomputational techniques. David is a former non-commissioned officer of the United States Army who developed cultural awareness, mechanical skills, and honed effective leadership while stationed in South Korea, Germany, and Afghanistan. He is detail-oriented, focused, and self-driven. David is a published researcher, a frequenter of scientific conferences, and an avid smart-technology enthusiast. He is committed to the task of promoting environmental and public safety awareness while improving communities through the application of leading-edge technologies and geospatial analysis.



### Personal Links

 Website |  Google Scholar |  LinkedIn |  GitHub |  Email

### Md Monzurul Islam, M.Sc. Student, Civil Engineering

Md Monzurul Islam is a Master's student in Civil Engineering (Transportation) at Texas State University, working as a Graduate Research Assistant under the supervision of Dr. Subasish Das. He holds a Master's degree in Architecture from the University of Tokyo and a Bachelor's degree in Civil Engineering from Bangladesh University of Engineering and Technology. His research focuses on transportation safety, crash risk assessment, and driver behavior analysis, using machine learning, statistical modeling, and GIS-based spatial analysis. He is proficient in developing R-based visualization tools and also has experience in software development, project management, and structural engineering. As Vice President of Outreach for the Institute of Transportation Engineers (TXST Chapter), he leads



community engagement, partnerships, event organization, and recruitment initiatives. Monzurul enjoys experimenting with a wide range of tools and technologies and describes himself as someone who "likes to play with everything."

## Publications (2025)

- Mimi, M. S., **Islam, M. M.**, Sheykhfard, A., & Das, S. (2025). Crash risk patterns among older bicyclists: Insights from hybrid XGBoost-Cluster Correspondence Analysis. *Journal of Safety Research*, 95, 301-317. [doi](#) [Link](#)
- Mimi, M. S., **Islam, M. M.**, Ghosh Tusti, A., Somvanshi, S., & Das, S. (2025). ST-GraphNet: A spatio-temporal graph neural network for understanding and predicting automated vehicle crash severity. In *Proceedings of the 1st ACM SIGSPATIAL International Workshop on Spatial Intelligence for Smart and Connected Communities* (pp. 5–14). [doi](#) [Link](#)
- Barua, S., Chakraborty, R., **Islam, M. M.**, & Das, S. (2025). A data-driven approach to child pedestrian crash analysis using dimension reduction, clustering, and explainable AI. *Accident Analysis & Prevention*, 222, 108229. [doi](#) [Link](#)
- Somvanshi, S., Javed, S. A., **Islam, M. M.**, Pandit, D., & Das, S. (2024). A survey on kolmogorov-arnold network. *ACM Computing Surveys*. [doi](#) [Link](#)
- Barua, S., Chakraborty, R., Mimi, M. S., **Islam, M. M.**, & Das, S. (2025). Linking driver fatigue, safety rest area closures, and crash severity using cluster correspondence analysis. *Journal of Transportation Safety & Security*, 1-35. [doi](#) [Link](#)
- **Islam, M. M.**, Liu, J., Chakraborty, R., & Das, S. (2025). Evaluating crash risk factors of farm equipment vehicles on county and non-county roads using interpretable tabular deep learning (TabNet). *Accident Analysis & Prevention*, 217, 108048. [doi](#) [Link](#)
- Somvanshi, S., **Islam, M. M.**, Rafe, A., Tusti, A. G., Chakraborty, A., Baitullah, A., Chowdhury, T. I., Alnawmasi, N., Dutta, A., and Das, S. Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. *ACM Computing Surveys*. [doi](#) [Link](#)
- Somvanshi, S., **Islam, M. M.**, Chhetri, G., Chakraborty, R., Mimi, M. S., Shuvo, S. A., Islam, K. S., Javed, S., Rafat, S. A., Dutta, A., & Das, S. (2025). From tiny machine learning to tiny deep learning: A survey. *ACM Computing Surveys*, 58(7), Article 168. [doi](#) [Link](#)

## Honors and Awards (2025)

- BobCatalyst Innovation Accelerator Program (BIAP) Award (2025)
- CASITE Scholarship (2025)
- American Society of Highway Engineers (ASHE) award (2025)

## Personal Links

 Website |  Google Scholar |  ORCID |  LinkedIn |  GitHub |  Email

## Sazzad Bin Bashar Polock, M.Sc. Student, Civil Engineering

Sazzad Bin Bashar Polock is a Master's student in Civil Engineering (Transportation) at Texas State University, working under the guidance of Dr. Subasish Das. Currently working as a graduate instructional assistant at the Ingram School of Engineering, he joined the Artificial Intelligence in Transportation (AIT) lab in Fall 2024. His research interests include traffic safety, crash data analysis, driver behavior, and the integration of autonomous vehicles within existing infrastructure. He earned his bachelor's degree in civil engineering from Ahsanullah University of Science and Technology in 2023.



## Publications (2025)

- Javed, S. A., **Polock, S. B.**, Aghabayk, K., Barua, S., & Das, S. (2025). Pattern Recognition and Risk Analysis in U-Turn Crashes. *Transportation Research Record*, 03611981251372467. [doi](#) [Link](#)

## Personal Links

 Google Scholar |  ORCID |  LinkedIn |  Email

## Gaurab Chhetri, B.Sc. Student, Computer Science

Gaurab is an undergraduate researcher in Computer Science at Texas State University, working in the Artificial Intelligence in Transportation (AIT) Lab. His work centers on artificial intelligence, natural language processing, data mining, and full-stack software development, with a focus on building complete systems that integrate machine learning workflows with usable web applications. At the AIT Lab, he has developed and deployed numerous data-driven research tools, worked with large mobility and crash datasets, and contributed to peer-reviewed publications in transportation safety and applied AI. He works extensively with Python and JavaScript or TypeScript ecosystems, including modern frameworks for web development and data engineering. His research interests include intelligent transportation systems, NLP-driven analytics, sentiment and narrative analysis, model-based safety analytics, and scalable computing systems. Originally from Nepal, he enjoys creating practical technology that has real-world impact and follows the personal motto "Do what you want, not what you can."



## Publications (2025)

- **Chhetri, G.**, Anderson, D., Kutela, B., and Das, S. A transformer-based cross-platform analysis of public discourse on the 15-minute city paradigm. *The 24th IEEE International Conference on Machine Learning and Applications (ICMLA)*, Florida, USA, Dec. 3–5. [doi](#) [Link](#)
- Somvanshi, S., Hebli, P., **Chhetri, G.**, and Das, S. Tabular data with class imbalance: Predicting electric vehicle crash severity with pretrained transformers (TabPFN) and Mamba-based models. *The 24th IEEE International Conference on Machine Learning and Applications (ICMLA)*, Florida, USA, Dec. 3–5. [doi](#) [Link](#)
- Somvanshi, S., Islam, M. M., **Chhetri, G.**, Chakraborty, R., Mimi, M. S., Shuvo, S. A., Islam, K. S., Javed, S., Rafat, S. A., Dutta, A., & Das, S. (2025). From tiny machine learning to tiny deep learning: A survey. *ACM Computing Surveys*, 58(7), Article 168. [doi](#) [Link](#)

## Honors and Awards (2025)

- Undergraduate Research Fellowship (URF) – Quanta Services, TXST

## Personal Links

 Website |  Google Scholar |  ORCID |  LinkedIn |  GitHub |  Email

## Biplov Pandey, B.Sc. Student, Civil Engineering

Biplov is currently an undergraduate student in the Civil Engineering Program at Texas State University, guided by Dr. Das. He joined the AIT Lab in Fall 2024 and works as an undergraduate research assistant. Originally from Nepal, Biplov is interested in transportation engineering and infrastructure development. His research focus includes transportation safety and sustainability.



He has prior experience as a Surveying Assistant at SadaShiva Infra Private Limited, where he contributed to site assessments and data collection for mapping and project planning. Biplov's projects include geological field studies and detailed surveying tasks with proficiency in total stations, theodolites, CAD software, SolidWorks, and Microsoft Office. Outside of academics, Biplov enjoys watching cricket, playing table tennis, and hiking.

### Honors and Awards (2025)

- Undergraduate Research Fellowship (URF) – Quanta Services, TXST

### Personal Links

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## Darrell Anderson, B.Sc. Student, Civil Engineering

Darrell is a senior at Texas State University, majoring in Civil Engineering (CE) and minoring in mathematics. In the summer of 2023, Darrell started working as an undergraduate research assistant at the Artificial Intelligence in Transportation (AIT) lab under Dr. Das Subash. While at AIT, Darrell was awarded the Dwight David Eisenhower Transportation Fellowship (DDETFP), which he presented at DC on the concept of 15-minute cities.



As a member of a few engineering and environmental groups, Darrell is passionate about the environment and water resources, and he is interested in the impact that urbanization, along with the increase in traffic systems, has on the environment. As a civil drafter/designer for a small urban planning and development company, he has helped design many sites currently under development. As a founding member of the Institute of Transportation Engineers – at Texas State University, he holds the treasurer position. In his free time, he enjoys cooking, baking, and reading and is working towards becoming a sommelier in his free time.

### Publications (2025)

- Chhetri, G., **Anderson, D.**, Kutela, B., and Das, S. A transformer-based cross-platform analysis of public discourse on the 15-minute city paradigm. The 24th IEEE International Conference on Machine Learning and Applications (ICMLA), Florida, USA, Dec. 3–5. [doi](#) [Link](#)

### Honors and Awards (2025)

- Undergraduate Research Fellowship (URF) – TXST

### Personal Links

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## Graduated Students in 2025

### Rohit Chakraborty, M.Sc., Civil Engineering

Rohit graduated as an MS student in the Civil Engineering Program at Texas State University, advised by Dr. Das. He joined the AIT Lab in Fall 2023 and worked as a graduate research assistant. Previously, Rohit completed his B.S. in Civil Engineering from Ahsanullah University of Science and Technology, Bangladesh. Rohit is interested in data mining applications in transportation safety and operations. His research expertise also includes traffic simulation, transportation modeling, and driving behavior analysis. Rohit enjoys cooking, cycling, and listening music.



Rohit has published **20 research papers** in top-tier venues (including journal articles, and CS conference papers) during his tenure at the AIT Lab.

### Swastika Barua, M.Sc., Civil Engineering

Swastika Barua pursued her Master's in Civil Engineering at Texas State University, under the supervision of Dr. Subasish Das. She joined the AIT Lab in Fall 2023 and worked as a Graduate Research Assistant. Swastika obtained her Bachelor's degree from Bangladesh University of Engineering and Technology, Bangladesh. Her research focuses on traffic safety and driver behavior analysis, with a specialization in classical statistical methods and machine learning techniques. Beyond her academic endeavors, Swastika actively participates in the TXST-ITE student chapter, contributing to initiatives aimed at enhancing transportation systems and safety.



Swastika has published **17 research papers** in top-tier venues (including journal articles, and CS conference papers) during her tenure at AIT Lab.

### Mahmuda Sultana Mimi, M.Sc., Civil Engineering

Mahmuda pursued her Master's in Civil Engineering at Texas State University under the supervision of Dr. Subasish Das. She joined the AIT lab in Fall 2023 as a Graduate Research Assistant. Previously, she earned her Bachelor's degree in Urban and Regional Planning from Bangladesh University of Engineering and Technology (BUET). Her research focuses on transportation safety, encompassing vulnerable road users, driver behavior, and micromobility, as well as travel behavior and demand modeling. She is deeply engaged in developing Machine Learning, and Deep Learning based models; Statistical and Econometric models; GIS-based spatial data analysis; and data mining in the field of transportation.



Mahmuda has published **18 research papers** in top-tier venues (including journal articles, and CS conference papers, and preprints) during her tenure at the AIT Lab.

### Syed Aaqib Javed, M.Sc., Civil Engineering

Syed Aaqib Javed completed his Master's degree in Civil Engineering, specializing in Transportation Engineering at Texas State University (TXST), and worked as a graduate research assistant at the Artificial Intelligence in Transportation (AIT) Lab under the supervision of Dr. Subasish Das since Fall 2023. Before joining TXST, he worked as a faculty member at Ahsanullah University of Science and Technology (AUST) in Dhaka, Bangladesh. He completed his B.Sc. in Civil Engineering at AUST. His research interests include transportation safety, transportation system planning, and travel behavior analysis.



Sayed has published **15 research papers** in top-tier venues (including journal articles, and CS conference papers) during his tenure at the AIT Lab.

## Thank You

We sincerely thank our dedicated team members, collaborators, industry partners, and supporting institutions for making 2025 a successful year. Your commitment and support continue to drive our research and innovation forward.

*"Innovation, collaboration, and impact continue to guide our journey. We look forward to advancing research and creating solutions that make a difference in communities worldwide."*

— Artificial Intelligence in Transportation (AIT) Lab, Texas State University



### Contact Us

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