

List of Publications by Research Thrust

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1. Thrust 1. Artificial Intelligence in Transportation

This thrust covers a wide range of machine learning, deep learning, data mining, and generative AI models to quantify crash risk, and uncover patterns affecting vulnerable road users, work zones, and infrastructure. The studies in this thrust translate these analytics into practical decision-support tools, XAI frameworks, and generative AI applications that help agencies diagnose high-risk conditions and design targeted safety interventions.

1.1. Machine Learning and Deep Learning

1. [Das, S.](#) (2022). Artificial Intelligence in Highway Safety. CRC Press.
2. Huang, X., Ye, X., Stewart, K., & [Das, S.](#) (Eds.). (2025). Urban Human Mobility: Practices, Analytics, and Strategies for Smart Cities. CRC Press.
3. [Das, S.](#) (2026). Artificial Intelligence in Highway Engineering: Optimizing Infrastructure and Mobility. Elsevier.
4. [Das, S.](#) (2027). Artificial Intelligence and Generative AI in Civil Engineering: A Practical Guide to Data Driven Solutions. CRC Press.
5. [Das, S.](#), Tsapakis, I., Khan, M. N., Liu, J., Mills, D., Miller, M., ... & Qi, Y. (2023). Leveraging Artificial Intelligence (AI) Techniques to Detect, Forecast, and Manage Freeway Congestion: Technical Report (No. FHWA/TX-23/0-7131-R1). TxDOT.
6. Weng, Y., [Das, S.](#), & Paal, S. G. (2023). Applying few-shot learning in classifying pedestrian crash typing. Transportation research record, 2677(8), 563-572.
7. Hasan, A. S., Kabir, M. A. B., Jalayer, M., & [Das, S.](#) (2023). Severity modeling of work zone crashes in New Jersey using machine learning models. Journal of Transportation Safety & Security, 15(6), 604-635.
8. Wei, Z., [Das, S.](#), & Zhang, Y. (2022). Short duration crash prediction for rural two-lane roadways: applying explainable artificial intelligence. Transportation research record, 2676(12), 535-549.
9. Faroughi, S. A., Pawar, N. M., Fernandes, C., Raissi, M., [Das, S.](#), Kalantari, N. K., & Kourosh Mahjour, S. (2024). Physics-guided, physics-informed, and physics-encoded neural networks and operators in scientific computing: Fluid and solid mechanics. Journal of Computing and Information Science in Engineering, 24(4), 040802.
10. [Das, S.](#), Datta, S., Zubaidi, H. A., & Obaid, I. A. (2021). Applying interpretable machine learning to classify tree and utility pole related crash injury types. IATSS research, 45(3), 310-316.
11. [Das, S.](#), Sun, X., & Sun, M. (2021). Rule-based safety prediction models for rural two-lane run-off-road crashes. International journal of transportation science and technology, 10(3), 235-244.
12. [Das, S.](#) (2021). Traffic volume prediction on low-volume roadways: a Cubist approach. Transportation planning and technology, 44(1), 93-110.
13. Hosseini, P., Jalayer, M., [Das, S.](#), & Zhou, H. (2021). Identifying Wrong-Way Driving (WWD) Crashes in Police Reports Using Text Mining Techniques (No. TRBAM-21-01970).
14. [Das, S.](#), Dutta, A., & Brewer, M. A. (2020). Case study of trend mining in Transportation Research Record articles. Transportation research record, 2674(10), 1-14.
15. Dutta, A., & [Das, S.](#) (2020, August). Tweets about self-driving cars: Deep sentiment analysis using long short-term memory network (lstm). In International Conference on Innovative Computing and Communications: Proceedings of ICICC 2020, Volume 1 (pp. 515-523). Singapore: Springer Singapore.
16. [Das, S.](#), Dutta, A., Dixon, K., Minjares-Kyle, L., & Gillette, G. (2018). Using deep learning in severity analysis of at-fault motorcycle rider crashes. Transportation research record, 2672(34), 122-134.
17. Sun, X., [Das, S.](#), & Broussard, N. (2016). Developing crash models with supporting vector machine for urban transportation planning. In 17th International Conference Road Safety On Five Continents (RS5C 2016), Rio de Janeiro, Brazil, 17-19 May 2016.. Statens väg-och transportforskningsinstitut.

18. 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.
19. Antariksa, G., Tamakloe, R., Liu, J., & Das, S. (2025). Automated and Explainable Artificial Intelligence to Enhance Prediction of Pedestrian Injury Severity. *IEEE Transactions on Intelligent Transportation Systems*.
20. Somvanshi, S., Tusti, A. G., Chakraborty, R., & Das, S. (2025). Applying Tabular Deep Learning Models to Estimate Crash Injury Types of Young Motorcyclists. *arXiv preprint arXiv:2503.10474*.
21. Somvanshi, S., Chakraborty, R., Das, S., & Dutta, A. K. (2025). Crash severity analysis of child bicyclists using arm-net and mambanet. *arXiv preprint arXiv:2503.11003*.
22. 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. *arXiv preprint arXiv:2503.11008*.
23. Magidanga, V., Kutela, B., Novat, N., & Das, S. (2025). Understanding the Lifecycle of Federal-level Artificial Intelligence (AI) Tools. A Case of Department of Homeland Security (January 23, 2025).
24. Antariksa, G., Koeshidayatullah, A., Das, S., & Lee, J. (2025). XAI-driven contamination for self-supervised denoising with pixel-level anomaly detection in seismic data. *Journal of Applied Geophysics*, 238, 105723.
25. Chakraborty, R., Mills, D., & Das, S. (2025). Children on wheels: Identifying crash determinants using cluster correspondence analysis. *Accident Analysis & Prevention*, 216, 108025.
26. Ye, X., Newman, G., Zhai, W., Retchless, D., Das, S., Ham, Y., ... & 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*, 114(1), 65-97.

1.2. Data Mining

27. Das, S., Dutta, A., Jalayer, M., Bibeka, A., & Wu, L. (2018). Factors influencing the patterns of wrong-way driving crashes on freeway exit ramps and median crossovers: Exploration using 'Eclat' association rules to promote safety. *International journal of transportation science and technology*, 7(2), 114-123.
28. Das, S., Kong, X., Wei, Z., Xiao, X., Mills, D., & Hossain, A. (2024). Probing into driver speeding patterns and their influence on child occupancy in urban areas. *Transportation research record*, 2678(5), 162-173.
29. Hossain, M. M., Zhou, H., Sun, X., Hossain, A., & Das, S. (2024). Crashes involving distracted pedestrians: Identifying risk factors and their relationships to pedestrian severity levels and distraction modes. *Accident Analysis & Prevention*, 194, 107359.
30. Rahman, M. A., Das, S., Codjoe, J., Mitran, E., Sun, X., Abedi, K., & Hossain, M. M. (2023). Applying data mining methods to explore animal-vehicle crashes. *Transportation research record*, 2677(11), 665-681.
31. Hossain, A., Sun, X., Islam, S., Rahman, A., & Das, S. (2024). Single-vehicle roadway departure crashes at rural two-lane highway curved segments: a diagnosis using pattern recognition. *International Journal of Transportation Science and Technology*, 15, 298-318.
32. Hossain, M. M., Zhou, H., & Das, S. (2023). Data mining approach to explore emergency vehicle crash patterns: A comparative study of crash severity in emergency and non-emergency response modes. *Accident Analysis & Prevention*, 191, 107217.
33. Kutela, B., Msechu, K. J., Kidando, E., Das, S., & Kitali, A. E. (2023). Eliciting the influence of roadway and traffic conditions on hurricane evacuation decisions using regression-content analysis approach. *Travel behaviour and society*, 33, 100623.
34. Das, S., Tamakloe, R., Kutela, B., & Hossain, A. (2023). Pattern recognition from injury severity types of frontage roadway crashes. *Journal of Transportation Safety & Security*, 15(7), 659-680.
35. Tamakloe, R., Das, S., Adanu, E. K., & Park, D. (2025). Key factors affecting motorcycle-barrier crash severity: an innovative cluster-regression technique. *Transportmetrica A: Transport Science*, 21(1), 2230310.
36. Hossain, A., Sun, X., Thapa, R., Hossain, M. M., & Das, S. (2023). Exploring association of contributing factors to pedestrian fatal and severe injury crashes under dark-no-streetlight condition. *IATSS research*, 47(2), 214-224.
37. Das, S., Tabesh, M., Dadashova, B., & Dobrovolny, C. (2023). Diagnosis of encroachment-related work-zone crashes by applying pattern recognition. *Transportation research record*, 2677(7), 222-236.
38. Rahman, M. A., Das, S., Sun, X., Sun, M., & Hossain, M. M. (2023). Using unsupervised learning to investigate

- injury-associated factors of animal-vehicle crashes. *International Journal of Injury Control and Safety Promotion*, 30(2), 210-219.
39. Das, S., Hossain, M. M., Ashifur Rahman, M., Kong, X., Sun, X., & Al Mamun, G. M. (2023). Understanding patterns of moped and seated motor scooter (50 cc or less) involved fatal crashes using cluster correspondence analysis. *Transportmetrica A: transport science*, 19(2), 2029613.
 40. Hossain, M. M., Zhou, H., Das, S., Sun, X., & Hossain, A. (2023). Young drivers and cellphone distraction: Pattern recognition from fatal crashes. *Journal of Transportation Safety & Security*, 15(3), 239-264.
 41. Rahman, M. A., Das, S., & Sun, X. (2023). Single-vehicle run-off road crashes because of cellphone distraction: finding patterns with rule mining. *Transportation research record*, 2677(3), 1261-1277.
 42. Rahman, M. A., Das, S., & Sun, X. (2023). Understanding the drowsy driving crash patterns from correspondence regression analysis. *Journal of safety research*, 84, 167-181.
 43. Das, S., Dutta, A., Rahman, M. A., & Sun, X. (2022). Pattern recognition from light delivery vehicle crash characteristics. *Journal of Transportation Safety & Security*, 14(12), 2055-2073.
 44. Kong, X., Das, S., Zhang, Y., Wu, L., & Wallis, J. (2022). In-depth understanding of near-crash events through pattern recognition. *Transportation research record*, 2676(12), 775-785.
 45. Das, S., Dey, K., & Rahman, M. T. (2022). Pattern recognition from cyclist under influence (CUI) crash events: application of block cluster analysis. *Journal of substance use*, 27(6), 585-590.
 46. Hossain, M. M., Zhou, H., Rahman, M. A., Das, S., & Sun, X. (2022). Cellphone-distracted crashes of novice teen drivers: Understanding associations of contributing factors for crash severity levels and cellphone usage types. *Traffic injury prevention*, 23(7), 390-397.
 47. Ashifur Rahman, M., Das, S., & Sun, X. (2022). Using cluster correspondence analysis to explore rainy weather crashes in Louisiana. *Transportation research record*, 2676(8), 159-173.
 48. Tamakloe, R., Sam, E. F., Bencekri, M., Das, S., & Park, D. (2022). Mining groups of factors influencing bus/minibus crash severities on poor pavement condition roads considering different lighting status. *Traffic injury prevention*, 23(5), 308-314.
 49. Das, S., Mousavi, S. M., & Shirinzad, M. (2022). Pattern recognition in speeding related motorcycle crashes. *Journal of Transportation Safety & Security*, 14(7), 1121-1138.
 50. Kong, X., Li, Z., Zhang, Y., & Das, S. (2022). Bridge deck deterioration: Reasons and patterns. *Transportation research record*, 2676(7), 570-584.
 51. Das, S., Sun, X., Dadashova, B., Rahman, M. A., & Sun, M. (2022). Identifying patterns of key factors in sun glare-related traffic crashes. *Transportation research record*, 2676(2), 165-175.
 52. Tsapakis, I., Das, S., Anderson, P., Jessberger, S., & Holik, W. (2022). Improving stratification procedures and accuracy of annual average daily traffic (AADT) estimates for non-federal aid-system (NFAS) roads. *Transportation research record*, 2676(2), 393-406.
 53. Das, S., Sun, X., Goel, S., Sun, M., Rahman, A., & Dutta, A. (2022). Flooding related traffic crashes: findings from association rules. *Journal of Transportation Safety & Security*, 14(1), 111-129.
 54. Sakib, N., Paul, T., Das, S., & Hossain, A. (2025). Exploring the factors affecting injury severity in highway and non-highway crashes in Bangladesh applying machine learning and SHAP. *IATSS Research*, 49(2), 259-270.
 55. Kutela, B., Menon, N., Herman, J., Ruseruka, C., & Das, S. (2024). A regression-content analysis approach to assess public satisfaction with shared mobility measures against COVID-19 pandemic. *Journal of Transport & Health*, 38, 101873.
 56. Chakraborty, R., Das, S., & Khan, M. N. (2024). Uncovering pedestrian midblock crash severity patterns using association rules mining. *Transportmetrica A: Transport Science*, 1-48.
 57. Das, S., Kutela, B., & Menon, N. (2024). Unlocking the narrative: using text mining to reveal the hidden factors behind suicide related traffic crashes. *Archives of suicide research*, 28(3), 877-891.
 58. Rahman, M. A., Das, S., Hossain, A., Codjoe, J., Mitran, E., & Sun, X. (2024). Exploring Attribute Associations in Pedestrian-Involved Hit-and-Run Crashes through Cluster Correspondence Analysis. *Transportation Research Record*, 2678(11), 1079-1098.
 59. Das, S., & Kong, X. (2022). Quantifying bridge element vulnerability over time. *Transportation research record*, 2676(1), 460-471.
 60. Das, S. (2021). Identifying key patterns in motorcycle crashes: findings from taxicab correspondence analysis. *Transportmetrica A: transport science*, 17(4), 593-614.
 61. Kong, X., Das, S., & Zhang, Y. (2021). Patterns of near-crash events in a naturalistic driving dataset: applying

- rules mining. *Accident Analysis & Prevention*, 161, 106346.
62. Kong, X., [Das, S.](#), & Zhang, Y. (2021). Mining patterns of near-crash events with and without secondary tasks. *Accident Analysis & Prevention*, 157, 106162.
 63. [Das, S.](#), Kong, X., & Tsapakis, I. (2021). Hit and run crash analysis using association rules mining. *Journal of Transportation Safety & Security*, 13(2), 123-142.
 64. [Das, S.](#), Tran, L. N., & Theel, M. (2021). Understanding patterns in Marijuana impaired traffic crashes. *Journal of Substance Use*, 26(1), 21-29.
 65. [Das, S.](#), & Dutta, A. (2021). Light Delivery Vehicles Crashes: Identifying Insights using Joint Dimension Reduction and Clustering (No. TRBAM-21-02366).
 66. [Das, S.](#) (2021). Fatal Crash Reporting in Media: A Case Study on Bangladesh. *Transportation Research Record: Journal of Transportation Research Board*.
 67. Kong, X., [Das, S.](#), Jha, K., & Zhang, Y. (2020). Understanding speeding behavior from naturalistic driving data: Applying classification based association rule mining. *Accident Analysis & Prevention*, 144, 105620.
 68. [Das, S.](#), Chatterjee, S., & Mitra, S. (2020). Improper passing and lane-change related crashes: Pattern recognition using association rules negative binomial mining. In *Computational Methods and Data Engineering: Proceedings of ICMDE 2020*, Volume 1 (pp. 561-575). Singapore: Springer Singapore.
 69. [Das, S.](#), Jha, K., & Dutta, A. (2020, January). Vision zero hashtags in social media: understanding end-user needs from natural language processing. In the *Proceedings of Transportation Research Board Annual Meeting*, Washington DC (pp. 12-16).
 70. [Das, S.](#), Aware, M., Junghare, A., & Khubalkar, S. (2018). Energy/fuel efficient and enhanced robust systems demonstrated with developed fractional order PID controller. *Innov Ener Res*, 7(182), 2576-1463.
 71. Minjares-Kyle, L., [Das, S.](#), Medina, G., & Henk, R. (2018). Knowledge about Crash Risk Factors and Self-Reported Driving Behavior: Exploratory Analysis on Multi-State Teen Driver Survey. In *97th Annual Meeting of the Transportation Research Board*, Washington, DC.
 72. [Das, S.](#), Dutta, A., & Zupancich, M. (2017). Text mining on 100 years of air crash narratives: Key findings. In *96th Annual Meeting of the Transportation Research Board*, Washington, DC.
 73. [Das, S.](#), & Sun, X. (2016). Association knowledge for fatal run-off-road crashes by multiple correspondence analysis. *IATSS Research*, 39(2), 146-155.
 74. Khattak, M. J., Khattab, A., Rizvi, H. R., [Das, S.](#), & Bhuyan, M. R. (2015). Imaged-based discrete element modeling of hot mix asphalt mixtures. *Materials and Structures*, 48(8), 2417-2430.
 75. [Das, S.](#), & Sun, X. (2014). Exploring clusters of contributing factors for single-vehicle fatal crashes through multiple correspondence analysis. In *Transportation research board 93rd annual meeting*.
 76. [Das, S.](#) (2012). *Evaluating Safety Improvement From Edge Lines on Rural Two-Lane Highways* (Doctoral dissertation, University of Louisiana at Lafayette).
 77. [Das, S.](#), & Jha, K. N. (2011). Factors affecting precast concrete systems and their productivity. *Indian Concrete Journal*, 85(9), 47.
 78. Chakraborty, R., Javed, S. A., [Das, S.](#), Kutela, B., & Khan, M. N. (2024). Impact of level 2 automation on driver behavior: A study using association rules mining. *Transportation Research Part F: Traffic Psychology and Behaviour*, 107, 937-950.
 79. Rahman, M. A., Chakraborty, R., [Das, S.](#), Mohammed, N. H., Hossain, M. M., & Junaed, S. (2025). Identifying attribute associations in fatal speeding crashes using latent class clustering and association rule mining. *Journal of Transportation Safety & Security*, 17(5), 510-549.
 80. [Das, S.](#), Dzinyela, R., Liu, J., Dadashova, B., & Silvestri-Dobrovolsky, C. (2025). Understanding patterns of factor influences in motorcycle crashes with fixed objects. *Journal of Transportation Safety & Security*, 17(5), 483-509.
 81. Chakraborty, R., [Das, S.](#), Mimi, M. S., & Kutela, B. (2025). Investigating Factor Associations in Barrier Crashes through Cluster Correspondence Analysis. *Transportation Research Record*, 2679(4), 860-879.
 82. Hossain, A., [Das, S.](#), Sun, X., Hasan, A. S., Jalayer, M., & Rahman, M. A. (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*, 217, 108066.
 83. Tamakloe, R., Khorasani, M., [Das, S.](#), & Kim, I. (2025). Pattern recognition in crash clusters involving vehicles with advanced driving technologies. *Accident Analysis & Prevention*, 218, 108072.
 84. Javed, S. A., Barua, S., Tusti, A. G., Pollock, S. B. B., Chowdhury, T. I., & [Das, S.](#) Behavioral Patterns and

- Severity Outcomes in E-Scooter Crashes: An Association Rule Mining Approach Using the Lift Increase Criterion. Available at SSRN 5337078.
85. Javed, S. A., & Das, S. Uncovering Behavioral Risk Patterns in U-Turn Crash Severity Using Multimodal Data and Lift Increase Criterion in Association Rule Mining. Available at SSRN 5321004.
 86. Chakraborty, R., Javed, S. A., Hossain, A., Mills, D., & Das, S. (2025). Identifying patterns in backing maneuver crashes utilizing differential evolution optimization algorithm. *Journal of Transportation Safety & Security*, 17(11), 1348-1376.
 87. Das, S., Liu, J., Dzinyela, R., Dadashova, B., & Silvestri-Dobrovolsky, C. (2025). Clustering patterns of roadway departure related motorcycle crashes using dimension reduction analysis. *Journal of Transportation Safety & Security*, 17(11), 1290-1318.
 88. Chakraborty, R., Liu, J., Tusti, A. G., Mimi, M. S., & Das, S. (2025). Impact of lighting conditions on nighttime crash severity among older and elderly drivers. *Journal of Transportation Safety & Security*, 1-41.
 89. Javed, S. A., Barua, S., Tusti, A. G., Pollock, S. B. B., Chowdhury, T. I., & Das, S. Built Environment and Injury Risk: Association Rule-Based Exploration of E-Scooter Crashes in Texas Cities. Available at SSRN 5387446.
 90. Javed, S. A., Chakraborty, R., Pollock, S. B. B., Geedipally, S. R., Tamakloe, R., & Das, S. Uncovering Age-Specific Patterns in Cannabis-Involved Fatal Crashes: A Behavior-Oriented Association Rule Mining Approach. Available at SSRN 5408388.
 91. 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.
 92. Chakraborty, R., & Das, S. (2025). A Dimensionality-Reduced XAI Framework for Roundabout Crash Severity Insights. *arXiv preprint arXiv:2509.12524*.
 93. 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.
 94. Momin, M. S. M. I., Cho, E., & Das, S. (2025). Hydrodynamic Simulation and Validation of Coastal Flooding in Galveston County, Texas: 2008 Hurricane Ike Case Study and 100-Year Flood Map Development. *AGU25*.
 95. Javed, S. A., Pollock, S. B. B., Aghabayk, K., Barua, S., & Das, S. (2025). Pattern Recognition and Risk Analysis in U-Turn Crashes. *Transportation Research Record*, 03611981251372467.
 96. Javed, S. A., Chakraborty, R., Hossain, A., & 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*, 1-33.

1.3. Generative AI

97. Das, S., Oliabee, A. H., Le, M., Pratt, M. P., & Wu, J. (2023). Classifying pedestrian maneuver types using the advanced language model. *Transportation research record*, 2677(7), 599-611.
98. Oliabee, A. H., Das, S., Liu, J., & Rahman, M. A. (2023). Using Bidirectional Encoder Representations from Transformers (BERT) to classify traffic crash severity types. *Natural language processing journal*, 3, 100007.
99. Hossain, A., Sun, X., Alam, S., Das, S., & Sheykhfard, A. (2024). Crash contributing factors and patterns associated with fatal truck-involved crashes in Bangladesh: findings from the text mining approach. *Transportation research record*, 2678(7), 706-725.
100. Dobrovolsky, C. S., Dadashova, B., Tabesh, M., Das, S., Kwon, H., Bligh, R., ... & Hallmark, S. (2023). Determination of Work Zone Encroachments (No. NCHRP Project 03-134).
101. Das, S., & Zubaidi, H. A. (2023). City transit rider tweets: understanding sentiments and politeness. *Journal of Urban Technology*, 30(1), 111-126.
102. Das, S., Aman, J. J., & Rahman, M. A. (2023). Content Analysis on Homelessness Issues at Airports by News Media Mining. *Transportation Research Record*, 2677(2), 635-647.
103. Das, S., & Sarkar, S. (2024). News media mining to explore speed-crash-traffic association during COVID-19. *Transportation Research Record*, 2678(12), 349-366.
104. Kutela, B., Chengula, T. J., Ngeni, F., Lippu, C., Kidando, E., Liu, J., & 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*, 151(9), 04025071.
105. Das, S., Dutta, A. (2022). Twelve-Year Analysis of Transportation Research Board Annual Meeting's Official

- Hashtag. Transportation Research Record, 2676(1), 763-772.
106. Kutela, B., Shita, H., **Das, S.**, Kapaya, L., & Tarimo, E. (2024). Exploring the Role of Sponsoring Agencies in Shaping the MUTCD Using Supervised and Unsupervised Text Mining. *Journal of Transportation Engineering, Part A: Systems*, 150(11), 04024076.
 107. **Das, S.**, Tipword, J., & Kutela, B. (2024). Unlocking Urban Sentiments about 15-Min City through Hashtags. In *International Conference on Transportation and Development 2024* (pp. 158-169).
 108. Kutela, B., Li, S., **Das, S.**, & Liu, J. (2024). Is ChatGPT a Reliable Source of Transportation Equity Information for Scientific Writing?. In *International Conference on Transportation and Development 2024* (pp. 525-537).
 109. **Das, S.** (2021). Understanding fatal crash reporting patterns in Bangladeshi online media using text mining. *Transportation research record*, 2675(10), 960-971.
 110. **Das, S.**, Dutta, A., & Tsapakis, I. (2021). Topic models from crash narrative reports of motorcycle crash causation study. *Transportation research record*, 2675(9), 449-462.
 111. **Das, S.**, & Theel, M. (2021). Pandemic and Transportation Research: Bibliometric Analysis and Topic Modeling (No. TRBAM-21-02405).
 112. **Das, S.** (2021). Exploratory Analysis of Unmanned Aircraft Sightings Using Text Mining. *Transportation Research Record*, 2675(5), 291-300.
 113. **Das, S.**, & Griffin, G. P. (2020). Investigating the role of big data in transportation safety. *Transportation research record*, 2674(6), 244-252.
 114. **Das, S.**, & Griffin, G. P. (2020, January). Big data and transportation safety: connecting the dots. In *Proc. Transp. Res. Board Annu. Meeting* (pp. 12-16).
 115. **Das, S.**, Dutta, A., Mudgal, A., & Datta, S. (2019, December). Non-fear-based road safety campaign as a community service: contexts from social media. In *International Conference on Innovations for Community Services* (pp. 83-99). Cham: Springer International Publishing.
 116. **Das, S.**, Dutta, A., Lindheimer, T., Jalayer, M., & Elgart, Z. (2019). YouTube as a source of information in understanding autonomous vehicle consumers: Natural language processing study. *Transportation research record*, 2673(8), 242-253.
 117. **Das, S.**, Dixon, K., Sun, X., Dutta, A., & Zupancich, M. (2017). Trends in transportation research: Exploring content analysis in topics. *Transportation research record*, 2614(1), 27-38.
 118. **Das, S.**, Sun, X., Dutta, A., & Zupancich, M. (2017). Twitter in Circulating Transportation Information: A Case Study on Two Cities (No. 17-03840).
 119. **Das, S.**, Sun, X., & Dutta, A. (2016). Text mining and topic modeling of compendiums of papers from transportation research board annual meetings. *Transportation Research Record*, 2552(1), 48-56.
 120. **Das, S.**, & Sun, X. (2015). User sentiment analysis with louisiana social media data for effective crash countermeasures. Final Report, June.
 121. **Das, S.**, Sun, X., & Dutta, A. (2015). Investigating user ridership sentiments for bike sharing programs. *Journal of Transportation Technologies*, 5(2), 69-75.
 122. Trueblood, A. B., Pant, A., Kim, J., Kum, H. C., Perez, M., **Das, S.**, Shipp, E. M. (2019). A semi-automated tool for identifying agricultural roadway crashes in crash narratives. *Traffic injury prevention*, 20(4), 413-418.
 123. Hossain, A., Sakib, N., Asif, A. A., & **Das, S.** (2025). Patterns Associated with Fatal Motorcycle-Involved Crashes in Bangladesh: Applying Text Mining Techniques and Structural Topic Modeling. Available at SSRN 5621592.

2. Thrust 2. Emerging Technologies for Safer Transportation

This thrust advances connected and automated vehicle safety with a strong focus on vulnerable road users, combining crash data, police narratives, social media, and survey data to understand AV–pedestrian/bicyclist conflicts, pre-crash modes, and safety perceptions. The research works in this thrust span Bayesian networks, latent class models, topic modeling, NLP-based media mining, and deep spatio-temporal graph networks to extract risk patterns, crash typologies, and emerging concerns around AV operations, cyberattacks, and low-visibility environments.

2.1. Connected and Automated Vehicle Safety

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3. Data-Driven Transportation Safety Analytics

This thrust advances data-driven transportation safety by developing and applying statistical, econometric, and machine learning models to predict crashes, classify severity, and derive Crash Modification Factors (CMFs) across diverse roadway, environmental, and operational contexts. It emphasizes vulnerability-focused analytics—particularly for pedestrians, cyclists, e-scooter users, older drivers, and work zones—to generate actionable, context-specific countermeasures and decision-support tools for agencies.

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4. Safe System, Policy, and Public Health

This thrust integrates Safe System tools, AI-driven decision-support frameworks, and data-driven policy analysis to eliminate serious traffic harm while managing infrastructure more proactively. It bridges roadway safety, governance, and public health by linking speed management, roadway design, and social and health disparities to system-level interventions that advance Vision Zero goals.

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5. Advanced Computing Surveys

This thrust develops advanced, synthesis-style surveys at the intersection of AI theory and scientific/transportation computing, covering physics-informed and physics-encoded networks, deep tabular learning, bio-inspired optimization, KANs, TinyML/TinyDL, structured state space models, JEPAs/world models, mechanistic interpretability, generative AI in TSMO, PINNs, MCPs, and post-quantum cryptography. Complementary frameworks and tools papers translate these advances into transportation equity, quantum computing in transportation, synthetic data generation, safety and behavioral analytics, and communication patterns, creating reusable methodological foundations for future research and practice.

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