

HONGCHAO LIU, Ph.D., P.E.

Curriculum vitae

Department of Civil, Environmental & Construction Engineering Phone: (806)834-7853
911 Akron Ave. Fax: (806)742-4168
MS 1023 Email: hongchao.liu@ttu.edu
Lubbock, Tx 79409

EDUCATION HISTORY & ACADEMIC TRAINING

Postdoc (2001-2003) University of California, Berkeley
Ph.D. (1997-2000) in Transportation & System Engineering. University of Tokyo, Japan
M.E. (1993-1996) in Transportation Engineering. Tsinghua University, China
B.E. (1986-1990) in Civil Engineering. Hebei University of Technology, China

EMPLOYMENT HISTORY

Professor (2014 -) Texas Tech University
Associate Professor (2009-2014) Texas Tech University
Assistant Professor (2004-2009) Texas Tech University
Assistant Research Scientist (2003-2004) University of California, Berkeley
Research Associate (2000-2001) University of Tokyo
Assistant Engineer (1996-1997) Beijing Municipal Institute of City Planning & Design
Instructor (1990-1993) North China University of Science & Technology

PROFESSIONAL REGISTRATION

Professional Engineer, No. 104513, Texas.

COURSES TAUGHT

CE 3361 Transportation Engineering
CE 4430 Capstone Design (Transportation Section)
*CE 4371 Highway Geometric Design
*CE 5371 Advanced Highway System Design and Safety
*CE 5372 Advanced Traffic Engineering I: Highway Capacity Analysis
*CE 5373 Advanced Traffic Engineering II: Traffic Flow Theory and Operation
*CE 5331 Transportation Planning

*Marked by * are new courses I developed as part of the new education and research program in traffic engineering in the CECE department.*

TEACHING EVALUATION

Undergraduate Average: 4.5/5.0
Graduate Average: 4.7/5.0

STUDENT ADVISING

As major advisor and mentor:
Postdoctoral researchers & visiting scholars: 8
PhD Students: 19 (13 completed, 6 in progress)
MS Students: 37 (35 graduated, 2 in progress)
Undergraduates: 12 (9 graduated, 3 in progress)

STUDENT HIGHLIGHTS

Trey Dawson, (M.S., 2009). Executive Vice President, Pape-Dawson Engineers, Inc.
Rhett Dollins, (M.S., 2010). Senior Project Manager, Maldonado-Burkett, LLP.
Huaxin Gong, (PhD., 2010). Executive Director of the Machine Learning & Intelligence Operations Division, Consumer and Community Banking, JPMorgan Chase & Co., AT&T Chancellor's Fellowship (TTU).

Hao Xu, (Ph.D., 2011; Postdoc 2011-13). Associate Professor, University of Nevada, Reno. AT&T Chancellor's Fellowship (TTU).

Wesley Kumfer, (Ph.D., 2014; Postdoc 2014-17). Senior Research Associate, University of North Carolina, Chapel Hill. Fellowship of the Teaching Effectiveness and Career Enhance (TEACH) Program, 2013 (TTU); Student of the Year of the Southern Plains Transportation Center, 2014.

Dali Wei, (Ph.D., 2014). Engineering Manager, Airbnb. Horn Professor Graduate Student Achievement Award, 2014 (TTU). CH Foundation Scholarship (TTU). Postdoctoral researcher, University of California, Berkeley.

Jason Wu, (Ph.D., 2016; Postdoc 2016-19). Associate Research Scientist & Assistant Program Manager at the Texas Transportation Institute, Texas A&M University. ITS Scholarship, ITS Texas 2015.

Junxuan Zhao, (Ph.D., 2019; Postdoc 2020-21). Assistant Professor, Kennesaw State University. ITS Scholarship, ITS Texas 2017. Best Paper Award, the 25th ITS World Congress.

Yibin Zhang (PhD., 2023). Assistant Professor, Ninbo University of Technology, China. Student of the Year, TexITE, 2021.

Nischal Bhattarai (PhD., 2023). Transportation Engineer, Atkins Realis Inc. Distinguished Graduate Assistant Scholarship (TTU).

RESEARCH AREA

Applied transportation engineering with focus on traffic operation and control, highway safety, intelligent transportation systems, and connected vehicle and infrastructure systems.

PROJECT AWARDS

Number of projects at Texas Tech University: 35 (31 as project PI; 4 as TTU's PI in collaborative projects with other institutes)

Total awards at Texas Tech University: \$8,038,519

Prorated awards at Texas Tech University: \$6,610,982

Major funding agencies: Texas Department of Transportation, National Highway and Traffic Safety Administration, US Department of Transportation.

AWARDS AND HONORS

Pyke Johnson Best Paper Award. Transportation Research Board of the National Academies, 2023.

Best Paper Award for the North America region. The 25th World ITS Congress, Copenhagen, Denmark, July 2018.

George T. And Gladys Abell-Hanger Faculty Award, WCOE, 2015.

Early promotion to full professor, Texas Tech University, 2014.

Whitacre Research Award, WCOE, Texas Tech University, 2012.

Teacher of the Year, the CECE department, Texas Tech University, 2010.

Early tenure and promotion to associate professor, Texas Tech University, 2009.

Hemphill-Wells New Professor Excellence in Teaching Award, finalist of the WCOE, 2006.

Featured young faculty in ENVISION 2(2), Newsletter of the WCOE, 2006.

Japanese Government Scholarship, 1997-2000, the Ministry of Science and Education, Japan.

PUBLICATIONS

Journal Publications (Marked by * are current or former graduate students, postdoctoral researchers, and visiting scholars)

1. Luo, Q*, Z. Xu*, K. Jimee*, C. Fontalvo*, M. Igene*, T. Bataineh*, M. Soltanirad*, M. Lucero*, and **H. Liu** (2025). "Cross Modal Lane Level Map Construction for Roadside LiDAR Data." Forthcoming in *IEEE Sensors*. 10.1109/JSEN.2025.3619443. Impact factor 4.5.
2. Lin, C*, B. Gong *, Yu, J., and H. Liu (2025). "Point Cloud Instance Segmentation and Classification for Roadside LiDAR." *IEEE Sensors*, DOI: 10.1109/JSEN.2025.3613255. Impact factor 4.5.
3. Wang, Y., B. Gong,* C. Lin,* and **H. Liu** (2025). "Traffic Noise Evaluation at Intersection Using Roadside Light Detection and Ranging Sensor." *Transportation Research, Part D: Transport and Environment*, **Vol.** 144, 104750. Impact factor 7.4.
4. Gong, B*, Y. Wang, C. Lin*, and **H. Liu** (2025). "Roadside LiDAR-Camera Fusion Detection Based on Spatiotemporal Calibration." *IEEE Sensors*, **25**(16), 31313-31325. Impact factor 4.5.
5. Lin, C*, Y. Wang, B. Gong*, H. Liu, and **H. Liu** (2025). "Roadside-Onboard Point Cloud Registration for Vehicle-Infrastructure Cooperation Perception in Traffic Collision Zones." *IEEE Sensors*, **25**(15), 29533-29544. Impact factor 4.5.
6. Zhang, Y*, S. Zhang, Q. Luo*, S. Xie, and **H. Liu** (2025). "Anchor-free Real-time Vehicle Tracking Using LiDAR Data." *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0323287>. Impact factor: 2.9.
7. Lin, C.*, W. Sun, G. Sun, B. Gong*, and **H. Liu** (2025). "Onboard LiDAR-Camera Deployment Optimization for Pavement Marking Distress Fusion Detection." *Sensors*. **25**(13), 3875. <https://doi.org/10.3390/s25133875> (registering DOI). Impact factor: 3.9.
8. Lin, C.*, Y. Wang, B. Gong*, H. Liu, and **H. Liu** (2025). "Roadside LiDAR Deployment Optimization for Vehicle-Infrastructure Cooperative Perception in Urban Occlusion Environments." *IEEE Transactions on Instrumentation & Measurement*. **Vol.** 74, 1-14. Impact factor: 5.9.
9. Bhattarai, N.*, C. Lin.*, Y. Zhang*, and **H. Liu** (2025). "In-depth Investigation of Contributing Factors of Fatal/Severe-injury Crashes at Highway Merging Areas Using Machine Learning Classification Methods." *Journal of Traffic and Transportation Engineering*, **12**(2), 434-446. <https://doi.org/10.1016/j.jtte.2023.06.007>. Impact factor: 7.4.
10. Wang, Y., B. Gong*, C. Lin*, H. Liu, and **H. Liu** (2025). "Roadside LiDAR Deployment Optimization for Vehicle-Infrastructure Cooperative Perception in Urban Occlusion Environments." *IEEE Transactions on Instrumentation & Measurement*, **Vol.** 74, 9516314. Impact factor: 5.9.
11. Bataineh, T.*, N. Bhattarai,* K. Jimee, *Y. Zhang, *J. Zhao, *and **H. Liu** (2025). "Evaluating Driving Behavior and Intersection Safety Using Roadside LiDAR: A Study of Safety Indicators Across Collision Metrics." *Journal of Transportation Safety & Security*, **17**(10), 1105-1137. DOI: 10.1080/19439962.2025.2492593. Impact factor: 2.4.
12. Gong, B.*, J. Sun, C. Lin*, and **H. Liu** (2025). "Space Occupancy Rectangle-based Multivehicle Localization and Tracking Using Roadside 4D Millimeter-wave Radar. Measurement, **Vol.** 247. Impact factor: 5.2.
13. Luo, Q*, Z. Xu, Y. Zhang*, M. Igene*, T. Bataineh*, M. Soltanirad*, K. Jimee*, and **H. Liu** (2025). "Vehicle Trajectory Repair Under Occlusion and Limited Datapoints with Roadside LiDAR." *Sensors*, **25**(4), 1114. Impact factor: 3.7.

14. Lin, C.*, G. Sun, B. Gong*, H. Liu, and **H. Liu** (2025). "Pavement Marking Worn Identification and Classification Using Low-Channel LiDAR." *IEEE Transactions on Instrumentation & Measurement*. Vol.74, 1-10. Impact Factor: 5.6.
15. Gong, B.*, B. Zhao, Y. Wang, C. Lin*, and **H. Liu** (2025). "Vehicle Trajectory Extraction with Interacting Multiple Model for Low-channel Roadside LiDAR." *Expert Systems with Applications*. Vol. 262, 125662. Impact Factor: 7.5.
16. Igene, M.,* Q. Luo,* K. Jimée,* M. Soltanirad,* T. Bataineh,* and **H. Liu** (2024). "Integrating LiDAR sensor data into microscopic model calibration for proactive safety analysis." *Sensors*, **24**(13). Impact Factor: 3.7.
17. Lin, C.*, S. Deng, B. Gong*, and **H. Liu**. (2024). "Vehicle Reference-Based Point Cloud Registration for Low-Channel Roadside LiDARs." *IEEE Sensors*. **25**(1), 1198-1208. DOI: 10.1109/JSEN.2024.3496782. Impact Factor: 4.3.
18. Zhang, Y.,* Q. Luo*, S. Zhang, S. Xie, **H. Liu** (2024). "SORT-based Real-time Vehicle Tracking Using Converted 3D LiDAR Data." Forthcoming in *Remote Sensing*. Impact Factor: 4.9.
19. Lin, C.*, S. Zhang, B. Gong*, and **H. Liu** (2024). "Near-crash risk identification and evaluation for takeout delivery motorcycles using roadside LiDAR." *Accident Analysis & Prevention*. Vol. 199, 107520. Impact Factor: 5.9
20. Wang, Y. C. Lin*, B. Zhao, B. Gong*, and **H. Liu** (2024). "Trajectory-based Vehicle Emission Evaluation for Signalized Intersection Using Roadside LiDAR Data." *Journal of Cleaner Production*. Vol. 440. IF:11.0.
21. Gong, B.*, J. Sun, C. Lin*, **H. Liu**, and G. Sun (2024). "Louvain-based Traffic Object Detection for Roadside 4D Millimeter-Wave Radar." *Remote Sensing*. **16**(366). Impact Factor: 5.4.
22. Xie, C., C. Lin*, X. Zheng, B. Gong*, and **H. Liu** (2024), "Dense Sequential Fusion: Point Cloud Enhancement using Foreground Mask Guidance for Multimodal 3D Object Detection." *IEEE Transactions on Instrumentation & Measurement*. Vol.73, 9501015. DOI: [10.1109/TIM.2023.3332935](https://doi.org/10.1109/TIM.2023.3332935). IF: 5.6
23. Bhattarai, N.*, Y. Zhang*, **H. Liu**, Y. Pakzad*, H. Xu* (2024). "Proactive Safety Analysis using Roadside LiDAR based Vehicle Trajectory Data: A Study on Rear-end Crashes." *Transportation Research Record*. **2678** (3), 772-785. IF: 1.9
24. Zhao, J.*, H. Xu*, Z. Chen, and **H. Liu** (2023). "A Decoding-based Method for Fast Background Filtering of Roadside LiDAR data." *Advanced Engineering Informatics*. Vol.57, 102043. <https://doi.org/10.1016/j.aei.2023.102043>. IF: 8.8
25. Zhao, J.*, H. Xu*, Z. Chen, and **H. Liu** (2023). "Accurate Detection of Vehicle, Pedestrian, Cyclist and Wheelchair from Roadside Lidar Sensors." *Journal of Intelligent Transportation Systems: Technology, Planning, and Operations*. Vol. **28** (6), 904-920. IF: 4.3
26. Bhattarai, N.*, Y. Zhang*, H. Xu*, and **H. Liu** (2023). "Crash Frequency Prediction Based on Extreme Value Theory using Roadside Lidar-based Vehicle Trajectory Data." *Accident Analysis and Prevention*. Vol. 193, 107306. IF: 5.9.
27. Lin, C.,* J. Yang, B. Gong,* **H. Liu**, and G. Sun (2023). "Grid and Homogeneity-based Ground Segmentation Using Light Detection and Ranging Three-dimensional Point Cloud." *J. Appl. Remote Sens.* **17**(3), 038506, doi: 10.1117/1.JRS.17.038506. IF: 1.8.
28. Chen, Z., J. Zhao*, H. Xu* and **H. Liu** (2023). "A Novel Background Filtering Method with Automatic Parameter Adjustment for Real-Time Roadside LiDAR Sensing System." *IEEE Transactions on Instrumentation & Measurement*. Vol. 72, 1-10. IF: 5.6

29. Lin, C*., Y. Wang, B. Gong*, and **H. Liu** (2023). “Vehicle Detection and Tracking using Low-channel Roadside LiDAR.” *Measurement*. Vol. 218, 113159. <https://doi.org/10.1016/j.measurement.2023.113159>. IF: 5.6
30. Liu, H., C. Lin*, B. Gong*, and **H. Liu** (2023). “Lane-level and full-Cycle Multi-Vehicle Tracking Using Low-channel Roadside LiDAR.” *IEEE Transactions on Instrumentation & Measurement*. Vol. 72, 1-12. IF: 5.3
31. Lin, C.*., S. Zhang, G. Gong*, **H. Liu** and G. Sun (2023). “Identification and Tracking of Takeout Delivery Motorcycles using Low-channel Roadside LiDAR.” *IEEE Sensors*, **23**(9), 9786-9795. IF: 4.3
32. Gong, G*, B. Zhao, Y. Wang, C. Lin*, and **H. Liu** (2023). “Lane Marking Detection Using Low-Channel Roadside LiDAR.” *IEEE Sensors*, **23**(13), 14640-14649. IF: 4.3
33. Zhang, Q.*., N. Bhattarai,* H. Chen, H. Xu, and **H. Liu** (2023). “An Effective Method of Vehicle Trajectory Tracking using Adaptive Kalman Filter from Roadside LiDAR.” *ASCE Journal of Transportation Engineering, Part A: Systems*. **149**(6). IF: 2.1
34. Chen, Z., H. Xu*, J. Zhao*, and **H. Liu** (2023). “Curbside Parking monitoring with Roadside LiDAR.” *Transportation Research Record*. **2677**(10), 825-837. IF: 1.9. *The Pyke Johnson Award, Transportation Research Board of the National Academies*.
35. Zhang, Y.*., N. Bhattarai, J. Zhao*, **H. Liu** and H. Xu* (2022). “An Unsupervised Clustering Method for Processing Roadside LiDAR Data with Improved Computational Efficiency.” *IEEE Sensors*, **22**(11), 10684-10691. IF: 4.3
36. Zhao, J.*., H. Xu*, Y. Tian, and **H. Liu** (2022). “Towards Application of LiDAR Sensor to Traffic Detection: An Investigation of Its Built-in Features and Installation Techniques.” *Journal of Intelligent Transportation Systems*. **26**(2), 213-234. IF: 4.3
37. Chen, Z., H. Xu*, J. Zhao*, and **H. Liu** (2022). “Fast Spherical Projection Based Point Cloud Clustering Algorithm.” *Transportation Research Record*. **2676**(6), 315–329. IF: 1.9
38. Zhao, J.*., H. Xu*, Y. Zhang*, Y., V. Shankar, **H. Liu** (2022). “Automatic Identification of Vehicle Partial Occlusion in Data Collected by Roadside LiDAR Sensors.” *Transportation Research Record*, **2676**(5), 708–718. IF: 1.9
39. Zhao, J.*., H. Xu*, Y. Zhang*, Y. Tian, and **H. Liu** (2021). “Traffic Volume Detection Using Infrastructure-based LiDAR under Different Level of Service Conditions.” *ASCE Journal of Transportation Engineering, Part A: Systems*. **147**(11). Impact factor: 1.9
40. Zhang, Q.*., H. Chen, **H. Liu** et al. (2020). “Origin-Destination Based Travel Time Reliability under Different Rainfall Intensity: An Investigation Using Open Source Data.” *Journal of Advanced Transportation*. Vol. 2020. <https://doi.org/10.1155/2020/8816020>. Impact factor: 2.3
41. Duan, M.*., D. Wu*, and **H. Liu** (2020). “Bi-level Programming Model for Resource-Shared Parking Lots Allocation.” *Transportation Letters*. **12**(7), 501-511. Impact factor: 2.8
42. Lin, C.*., D. Wu*, **H. Liu**, X. Xia,* and N. Bhattarai* (2020). “Factor Identification and Prediction for Teen Driver Crash Severity Using Machine Learning: A Case Study.” *Applied Science*, **10**(5), 1675-1631. Impact factor: 2.9
43. Zhao, J.*., H. Xu*, and **H. Liu** (2019). “Probabilistic Prediction of Pedestrian Crossing Intention Using Roadside LiDAR Data.” *IEEE Access*, **7**(1), 93781-93790. Impact factor: 3.9

44. Zhao, J.*, H. Xu*, **H. Liu**, J. Wu, Y. Zheng, and D. Wu* (2019). "Detection and Tracking of Pedestrians and Vehicles using Roadside LiDAR Sensors." *Transportation Research Part C: Emerging Technologies*, Vol.100, 68-87. Impact factor: 8.3
45. Zhao, J.*, H. Xu*, J. Wu, Y. Zheng, and **H. Liu** (2019). "Trajectory Tracking and Prediction of Pedestrian's Crossing Intention using Roadside LiDAR." *IET Intelligent Transportation Systems*, **3**(5). 789-795. Impact factor: 3.1
46. Wei, D.*, W. Kumfer*, and **H. Liu** (2018). "Traffic Queuing at Unsignalized Crosswalks with Probabilistic Priority." *Transportation Letters*.**10**(3), 129-143. Impact factor: 2.8
47. Wu, D*, C. Yuan, and H. Liu (2018). "The Decoupling States of CO2 Emissions in the Chinese Transport Sector from 1994 to 2012: A Perspective on Fuel Types". *Energy and Environment*, **29**(4), 591-612. Impact factor: 4.2
48. Wei, D.*, C. Yuan*, **H. Liu**, D. Wu*, and W. J. Kumfer* (2017). "The Impact of Service Refusal to the Supply-Demand Equilibrium in the Taxicab Market." *Networks and Spatial Economics*, **17**(1), 225-253. Impact factor: 2.9
49. Yuan, C.*, D. Wu*, and **H. Liu** (2017). "Using Grey Relational Analysis to Evaluate Energy Consumption, CO2 Emissions and Growth Patterns in China's Provincial Transportation Sectors." *International Journal of Environmental Research and Public Health*, **14**(12), 1536. Impact factor: 4.6
50. Wu, D.*, J. Zhao*, and **H. Liu** (2017). "The Assessment of Damage to Texas Highways Due to Oversize and Overweight Loads Considering Climatic Factors." *International Journal of Pavement Engineering*. **20**(7), 853-865. Impact factor: 4.2
51. Kumfer, W.J.*, **H. Liu**, D. Wu*, D. Wei*, and S. Sama* (2017). "Development of a Supplementary Driver Education Tool for Teenage Drivers on Rural Roads." *Safety Science*. Vol. 98, 136-144. Impact factor: 6.4
52. Yuan, C.*, D. Wu*, D. Wei*, and **H. Liu** (2017). "Modeling and Analyzing Taxi Congestion Premium in Congested Cities." *Journal of Advanced Transportation*. Vol.6, 1-12. Impact factor: 2.3
53. Wu, D.*, W. Kumfer*, **H. Liu**, and C. Yuan* (2017). "A Life-cycle Optimization Model Using Semi-Markov Deterioration Process for Highway Bridge Maintenance." *Applied Mathematical Modeling*, Vol.43, 45-60. Impact factor: 5.3
54. Wu, D.*, C. Yuan*, and **H. Liu** (2017). "A Risk-based Optimization for Pavement Preventative Maintenance with Probabilistic LCCA: A China Case." In press, *International Journal of Pavement Engineering*. **18**(1), 11-25. Impact factor: 4.2
55. Feng, Z., Y. Lei, **H. Liu**, W. Kumfer*, W. Zhang, K. Wang, and S. Liu (2016). "Driving Anger in China: A Case Study on the Professional Drivers Group." *Transportation Research, Part F*, Vol. 42, 255-266. Impact factor: 4.3
56. Lin, W., **H. Liu**, and H.K. Lo (2016). "Editorial: Big Data for Driver, Vehicle, and System Control in ITS." *IEEE Transactions on Intelligent Transportation Systems*, **17**(6), 1663-1665. Impact factor: 9.6
57. Pang, B. *, H. Xu*, and **H. Liu** (2016). "Calculating the Approach Capacity of Diverging Diamond Interchanges with Consideration of Internal Queue Spillback." *Transportation Research Record*, No. 2553. Impact factor: 2.0
58. Wei, D.*, **H. Liu**, and Y. Qin (2015). "Modeling Cascade Dynamics of Railway Network under Inclement Weather." Vol.80, 95-122, *Transportation Research, Part E: Logistics and Review*. Impact factor: 10.0

59. Wei, D.*, **H. Liu**, and Z. Tian (2015). "Vehicle Delay Estimation at Unsignalized Pedestrian Crosswalks with Probabilistic Yielding Behavior." *Transportmetrica A: Transport Science*. **11**(2), 103-118. Impact factor: 3.3
60. Wei, D.*, H. Xu*, W. Kumfer*, **H. Liu**, and Z. Wang (2015). "Vehicular traffic capacity at unsignalized crosswalks with probabilistic yielding behavior." *Transportation Research Record* No. 2483, 80-90. Impact factor 2.0
61. Kumfer, W.J.*, D. Wei*, and **H. Liu** (2015). "Investigating the Effects of Demographic and Driver Factors on Single-Vehicle and Multi-Vehicle Fatal Crashes Using Multinomial Logistic Regression." *Transportation Research Record*, No.2518, 37-45. Impact factor: 2.0
62. Wei, D.*, and **H. Liu** (2013). "Analysis of Asymmetric Driving Behavior Using a Self-learning Approach." *Transportation Research Part B: Methodological* **46**(1), 1-14. Impact factor: 6.8
63. Xu, H.*, **H. Liu** and H. Gong* (2013). "Modeling the Asymmetry in Traffic Flow (a): Microscopic Approach." *Applied Mathematical Modeling*. Vol. 37, 9431-9440. Impact factor: 5.3
64. **Liu, H.**, H. Xu,* and H. Gong* (2013). "Modeling the Asymmetry in Traffic Flow (b): Macroscopic Approach." *Applied Mathematical Modeling*. Vol. 37, 9441-9450. Impact factor: 5.3
65. Chen, S.*, **H. Liu**, and H. Xu* (2013). "Timing Oversaturated Signals: What Can We Learn from Classic and State-of-the-art Signal Control Models." *Journal of Transportation Systems Engineering and Information Technology*, **13**(1), 97-110.
66. Wei, D.* and **H. Liu** (2013). "Adaptive Margin Support Vector Regression: Theory and Application to Short-term Traffic Forecasting." *Journal of Intelligent Transportation Systems*. **17**(4), 1-11. Impact factor: 3.8
67. Xu, H.* and **H. Liu** (2013). "Optimize Evacuation Route Considering Operational Cost as a Constraint." *International Journal of Transportation Science and Technology*, **2**(1), 65-78.
68. Xu, H.*, **H. Liu**, H. Fernando*, and S. Senadheera (2013). "Volume-to-Capacity Estimation of Signalized Road Networks for Metropolitan Transportation Planning." *Transportation Research Record*, No. 2395, 93-102. Impact factor: 2.0
69. Lu, G., and **H. Liu** (2012). "Ramp Metering." In *Transportation Research Circular: Artificial Intelligence Applications to Critical Transportation Issues* 70-76. Transportation Research Board, National Council of Science.
70. Feng, Z-X., H-Z., Yuan, J. Liu, W-H. Zhang, **H. Liu** (2012). "Influence of Driver Personal Characteristics on Vehicle Velocity." *Journal of Traffic and Transportation Engineering*. **12**(6), 89-96.
71. Sun, L. *, J. Rong, L. Yao, H. Xu*, and **H. Liu** (2011). "Entropy-based Estimation of Transfers in a Terminal." *Journal of Transportation Planning and Technology*, **5**(3), 303-315. Impact factor: 1.9
72. Eugene, D. H.*, **H. Liu**, and R.B. Machemehl (2011). "Assessing the Feasibility of Converting Two Way Left Turn Lane into Bus Rapid Transit Lane." *Transportation Research Record*, No. 2218, 39-47. Impact factor: 2.0
73. Xu, H.*, **H. Liu**, and Z. Tian (2011). "Control Delay at Diverging Diamond Interchanges." *Transportation Research Record*, No.2257, 121-130. Impact factor: 2.0

74. Lin, W. and **H. Liu** (2010) “Enhancing Realism in Modeling Merge Junctions in Models for System Optimal Dynamic Traffic Assignment.” *IEEE Transactions on Intelligent Transportation Systems*, **11**(4), 838-846. Impact factor: 9.6
75. Xu, H.*, and **H. Liu** (2010). “Development and Application of a Kalman Filter and GPS Error Correction Approach for Improved Map-matching.” *Journal of Intelligent Transportation Systems*, **14**(1), 27-36. Impact factor: 3.8
76. Xu, H.*, **H. Liu**, and Z. Tian (2010). “Control Delay at Signalized Interchanges Considering Internal Queue Spillback.” *Journal of Transportation Research Record*, No.2173, 123-132. Impact factor: 2.0
77. Quddus, M.A., O. Washington, and **H. Liu** (2010). “Editorial: Special Issue on Intelligent Vehicle Navigation (2).” *Journal of Intelligent Transportation Systems*, **14**(1), 1-2. Impact factor: 3.8
78. Tian Z., M. Kyte, and **H. Liu** (2009). “Vehicle Tracking and Speed Measurement at Signalized Intersections Using Video-Image Systems.” *ITE Journal*. **79**(1), 42-46.
79. Luis, G., R. L. Cheu, R. L. Machemehl, and **H. Liu** (2009). “Bus Rapid Transit Features and Deployment Phases for U.S. Cities.” *imp*, **12**(2), 23-38. Impact factor: 2.5
80. Chen, S.*, **H. Liu**, and D. H. Jeryl (2009). “Surrogate Safety Assessment for A Tight Urban Diamond Interchange Using Micro-simulation.” *Advances in Transportation Studies, an International Journal*, Vol. XVIII, 18-39.
81. Wei, H., T. Xu, and **H. Liu** (2009). “Route-Choice Models Reflecting the Use of Travel Navigation Information in a Vehicle-Based Microscopic Simulation System.” *International Journal of Vehicle Information and Communication Systems*, **2**(1/2), 27-39. Impact factor: 1.5
82. Tan, C-W, S. Park, **H. Liu**, Q. Xu, and P. Lau (2008). “Prediction of Transit Vehicle Arrival Time for Signal Priority Control: Algorithm and Performance.” *IEEE Transactions on Intelligent Transportation Systems*, **9**(4), 688-696. Impact factor: 9.6
83. Tan, C-W, M., Li, S. Park, **H. Liu**, P. Lau, and Q. Xu (2008). “A Supply-demand Model for Communication of Transit Signal Priority Requests.” *International Journal of Vehicle Information and Communication Systems*. **Vol. 1**, Nos. 3/4, 249-267.
84. Quddus, M.A., O. Washington, and **H. Liu** (2008). “Editorial: Special Issue on Intelligent Vehicle Navigation.” *Journal of Intelligent Transportation Systems*, **12**(4), 1-2. Impact factor: 3.8
85. **Liu, H.**, K. N. Balke, and W. Lin (2008). “A Reverse Causal-effect Modeling Approach for Real Time Signal Control of An Oversaturated Intersection.” *Transportation Research, Part C*, **16**(6), 742-754. Impact factor: 8.3
86. **Liu, H.**, H. Xu*, and Y. Bao (2008). “A Virtual Differential Map-matching Algorithm with Improved Accuracy and Computational Efficiency.” *Journal of Navigation*, **61**(3), 421-434. Impact factor: 2.5
87. J.* Zhang, D. Cheng, and **H. Liu** (2008). “Analytical Approach to Evaluating Transit Signal Priority.” *Journal of Transportation Systems Engineering and Information Technology*, **8**(2), 48-57.
88. Tian, Z., M. Varun, and **H. Liu**. (2008). “Effectiveness of Lead-lag Phasing on Progression Bandwidth.” *Journal of Transportation Research Record*. No. 2080, 22-27. Impact factor: 1.9
89. Cheng, D., Z. Tian, and **H. Liu** (2008). “Implementing Actuated Signal Controlled Intersection Capacity Analysis with Pedestrians.” *Journal of Transportation Research Record*, No. 2071, 125-130. Impact factor: 1.9

90. **Liu, H.**, W. Lin, and C-W. Tan (2007). "An Operational Strategy for Advanced Vehicle Location Based Transit Signal Priority." *ASCE Journal of Transportation Engineering*, **133**(9), 513-522. Impact factor: 2.1
91. Gong, H.*, **H. Liu**, and B. H. Wang (2007). "An Asymmetric Full Velocity Difference Car-following Model." *Journal of Physica A: Mathematical and Theoretical*, Vol.387, 2595-2602. Impact factor: 3.3
92. Li, L., W. Lin, and **H. Liu** (2006). "A Type-2 Fuzzy Logic Approach for Short-term Traffic Forecasting." *IET Journal of Intelligent Transport Systems*, **153**(1), 33-40. Impact factor: 2.7
93. **Liu, H.**, A. Skabardonis, and M. Li (2006). "Simulation of Transit Signal Priority Using the NTCIP Architecture." *Journal of Public Transportation*, **9**(3), 117-136. Impact factor: 2.0
94. **Liu, H.**, A. Skabardonis, and M. Li (2004). "Optimal Location of Detectors for Bus Signal Priority." *Journal of Transportation Research Record*, No. 1867, 144-150. Impact factor: 1.9

Refereed Conference Proceedings

1. Soltanirad M.*, S. Naseralavi, K. Jimenez*, Q. Luo*, T. Batainer*, M. Igene*, and **H. Liu**, "Development of a New Safety Indicator for Predictive Safety Analysis Based on Different Arbitrary Surrogate Safety Measures Using LiDAR Sensor Data." Proceedings of the Transportation Research Board Annual Meeting. Washington DC, January 5-9, 2025.
2. Zhao, J.*, H. Xu, and **H. Liu**. "Azimuth-Height Background Filtering Method for Roadside LiDAR Data." Proceedings of the 2019 IEEE Intelligent Transportation Conference (ITSC), Auckland, New Zealand, October 27-30, 2019.
3. Zhao, J.*, H. Xu, and **H. Liu**. "Real-time Estimation of Crossing Probabilities using Roadside LiDAR Sensors." Proceedings of the 98th Transportation Board Annual Meeting, Washington DC, January 13-7, 2019.
4. Zhao, J.*, H. Xu, and **H. Liu**. "Detection Range Analysis for Roadside LiDAR Sensors." Proceedings of the 98th Transportation Board Annual Meeting, Washington D.C., January 13-7, 2019.
5. F. Jing and **H. Liu**. "Detect Hidden Road Hazards combing Multiple Social Media Data." Proceedings of the IEEE 2018 Big Data Workshop, Seattle, December 2018.
6. J. Zhao*, H. Xu, and **H. Liu**. "An Artificial Neural Network to Identify Pedestrians and Vehicles from Roadside 360-Degree LiDAR Data." Proceedings of the 97th Transportation Research Board Annual Meeting. Washington, D.C., January 7-11, 2018.
7. Wu, D.*, C. Yuan, D., Wei, and **H. Liu**. "A Taxi Price Equilibrium Model with the Waiting Price for Congested Cities: Beijing Case Study." Proceedings of the 96th Transportation Research Board Annual Meeting. Washington, DC, January 8-12, 2017.
8. Wu, D.*, J. Zhao*, and **H. Liu**. "Evaluating the Impact of Oversize and Overweight Loads on Highways in Different Climate Zones: Texas Case Study." Proceedings of the 96th Transportation Research Board Annual Meeting, Washington, DC, January 8-12, 2017.

9. Wu, D.*, C. Yuan, and **H. Liu**. “Energy Consumption, CO2 Emissions, and Growth Patterns in China’s Provincial Transport Sectors: A Grey Relational Analysis.” Paper No. 17-03438. Proceedings of the 96th Transportation Research Board Annual Meeting, Washington, DC, January 8-12, 2017.
10. Wu, D.*, C. Yuan, and **H. Liu**. “A Quantitative Assessment Framework for Post-earthquake Transportation Network Resilience Using Fuzzy Logic.” Paper No. 16-3864. In the Proceedings of the 95th Transportation Research Board Annual Meeting, Washington, DC, January 2016.
11. Pang, B.,* H. Xu, and **H. Liu**. “Calculating the Approach Capacity of Diverging Diamond Interchanges with Consideration of Internal Queue Spillback.” Proceedings of the 95th Transportation Research Board Annual Meeting, January 10-14, Washington, DC, 2016.
12. Kumfer, W. J.,* D. Wei,* and **H. Liu**. “Investigating Teenage Driver Attitudes and Behaviors through Survey Analysis and Logistic Regression. Proceedings of the 95th Transportation Research Board Annual Meeting, January 10-14, Washington, DC, 2016.
13. Wei, D.*, and **H. Liu**. “Vehicular traffic capacity at unsignalized crosswalks with probabilistic yielding behavior.” Proceedings of the 94th Transportation Research Board Annual Meeting, Washington, DC, January 11-15, 2015.
14. Kumfer, W.J.*, D. Wei*, and **H. Liu**. “Investigating the Effects of Demographic and Driver Factors on Single-Vehicle and Multi-Vehicle Fatal Crashes Using Multinomial Logistic Regression.” Proceedings of the 94th Transportation Research Board Annual Meeting, Washington DC, January 11-15, 2015.
15. Ostrander, C.,* K. Wesley*, D. Wei,* and **H. Liu** “The Effect of Truck Lane Restrictions on Weaving Segments of Freeways.” Proceedings of 92nd Annual Meeting of Transportation Research Board, Washington, DC, January 13-17, 2014.
16. Yuan, C.,* D. Wei,* and H. Liu. “Impact of Service Refusal to Supply-Demand Equilibrium in Taxicab Market.” In the pre-print CD-ROM, the 92nd Annual Meeting of Transportation Research Board, Washington, DC, January 13-17, 2014.
17. Chen, Y., J. He, M. King, **H. Liu**, and W. Zhang. “Dynamic Load-sharing of Longitudinal-connected Air.” Proceedings of the 91st Annual Meeting of Transportation Research Board, Washington, DC, January 13-17, 2013.
18. Wei, D.,* **H. Liu**, and Z. Tian. “An Analytical Delay Model for Yielding Vehicles at Unsignalized Pedestrian Crossings.” Proceedings of the 91st Annual Meeting of Transportation Research Board, Washington, DC, January 13-17, 2013.
19. He, Q., W. H. Lin, **H. Liu**, and K.L. Head. “Heuristic Algorithms for Inline Traffic Signal Control with Cell Transmission Models.” Proceedings of the 90th Annual Meeting of Transportation Research Board, Washington, DC, January 2012.
20. Luo, B., Z. Lin, Z. Dong, M. Hämäläinen, **H. Liu**, and H. Xu*. “Developing a Real-time Decision Support System for Disaster Evacuation.” Proceedings of the International Conference of Decision Sciences Institute, July 12-16, Taipei, Taiwan. 2012.

21. Wei, D.* and **H. Liu.**” An Adaptive Margin Support Vector Regression for Short-term Traffic Forecasting.” Proceedings of the 90th Annual Meeting of Transportation Research Board, Washington, DC, January 2012.
22. He, Q., W. Lin, **H. Liu**, and L. K. Head. “Heuristic Algorithms to Solve 0-1 Mixed Integer LP Formulations for Traffic Signal Control Problems.” Proceedings of the IEEE/INFORMS International Conference on Services, Logistics, and Informatics, July 15-17, 2010, Qingdao, China.
23. Xu, F., T. Zong, and **H. Liu.** “Traffic Counting Errors Due to the Occlusion Effect of Video Image Vehicle Detection System.” Proceedings of the ICCTP Annual Conference, Beijing, August 4-8, 2010, Beijing, China.
24. **Liu, H.** and H. Xu.* “Simultaneous Correction of GPS Error and Map Error for Improved Map-matching: Algorithm and Application.” Proceedings of SPIE Geoinformatics Annual Meeting, Guangzhou, China, August 2008.
25. Xu, H.,* **H. Liu**, and Y. Bao. “An Enhanced Kalman Filter Approach for Improved Map-matching.” Proceedings of the 87th Annual Meeting of Transportation Research Board. Washington, DC, January 2008.
26. Xu, H.,* **H. Liu**, and Y. Bao, Y. “A Virtual Differential Map-matching Algorithm.” Proceedings of the IEEE 10th World Conference on Intelligent Transportation. June 2007.
27. Tan, C-W, M., Li, S. Park, P. Lau, and **H. Liu.** “A Supply-demand Model for Communication of Transit Signal Priority Requests.” Proceedings of the International Conference on Multimedia and Ubiquitous Engineering. April 2007.
28. Zheng, J., Y. Wang, **H. Liu**, and M. E. Hallenback. “Modeling Impact of Near-side Bus Stop on Transit Delay at Signal Priority Enabled Intersections.” Proceedings of the 86th Annual Meeting of Transportation Research Board, Washington DC, January 2007.
29. Tan, C-W, S. Park, K. Zhou, **H. Liu**, P. Lau, and M. Li. “Prediction of Transit Vehicle Arrival Times at Signalized Intersections for Signal Priority Control.” Proceedings of the IEEE 9th International Conference on Intelligent Transportation Systems, September 2006.
30. Li, L., W. Lin, and **H. Liu.** “Traffic Signal Priority/Preemption Control with Colored Petri Nets.” Proceedings of the IEEE 8th International Conference on Intelligent Transportation Systems, September 2005.
31. Lin, W. and **H. Liu.** “A Mathematical Programming Module for Merge Control in System Optimal Dynamic Traffic Assignment.” Proceedings of the IEEE 8th International Conference on Intelligent Transportation Systems, September 2005.
32. **Liu, H.**, J. Song and Y. Yin. “A Simplified Method for Estimation of Back of Queue and its Application.” Proceedings of IEEE Intelligent Vehicle Symposium. June 2005.
33. Zhu, L., J. Song, Q. Huang, M. Zhang, and **H. Liu.** “A Novel Module of Tracking Vehicles with Occlusion.” Proceedings of IEEE Intelligent Vehicle Symposium, 893-899. June 2005.
34. Li, M., Y. Yin, K. Zhou, **H. Liu**, and C-W. Tan. “Adaptive Transit Signal Priority on Actuated Signalized Corridors.” Proceedings of the 84th Annual Meeting of Transportation Research Board. January, 2005.

35. **Liu, H.**, M. Li, A. Skabardonis, K. Zhou, C-W. Tan, and S. Park. “Development and Application of a Simulation Tool for Transit Signal Priority.” Proceedings of the 83rd Annual Meeting of Transportation Research Board. January 2005.
36. **Liu, H.**, and A. Skabardonis. “A Dynamic Model for Adaptive Bus Signal Priority.” Proceedings of the 83rd Annual Meeting of Transportation Research Board. January 2005.
37. Yin, Y., **H. Liu**, and H. Benouar. “A Note on Equity of Ramp Metering.” Proceedings of the 7th IEEE International Conference on Intelligent Transportation Systems. October, 2004.

Edited Journal Issues and Book Chapters

1. Special Issue on Transportation Big Data. *IEEE Transactions on Intelligent Transportation Systems*, 17(6), 2016. With W. Lin and H.K. Lo.
2. Special Issue on Intelligent Vehicle Navigation (1). *Journal of Intelligent Transportation Systems*, 12(4), 2008. With Quddus, M.A. and O. Washington.
3. Special Issue on Intelligent Vehicle Navigation (2). *Journal of Intelligent Transportation Systems*, 14(1), 2010. With: Quddus, M.A. and O. Washington.
4. Transportation Research Circular EC168: Artificial Intelligence Applications to Critical Transportation Issues, 2012. Co-editors: Transportation Research Board of the National Academies Committee on Artificial Intelligence and Advanced Computing, ABJ70.

PROFESSIONAL SERVICES

Professional society

Editors of Archival Journals

Associate Editor (2021-), *Journal of Intelligent Transportation Systems*.

Editorial Board (2020-), *Journal of Traffic and Transportation Engineering*.

Editorial Board (2018-2021), *Transportation Research, Part C*.

Editor in Chief (2013-2016), *International Journal of Vehicle Information and Communication Systems*.

Associate Editor (2010-2013), *International Journal of Vehicle Information and Communication Systems*.

Guest Editor (2014), *IEEE Transactions on Intelligent Transportation Systems*. Special Issue on Big Data and Advanced Computing in Intelligent Transportation Systems, with Profs. Wei Lin at the University of Arizona and Hong Lo at the Hong Kong University of Science and Technology.

Guest Editor (2007), *Journal of Intelligent Transportation Systems*. Special Issue on Intelligent Vehicle Navigation Systems, with Profs. Q. A. Mohammed at Loughborough University, UK and W. Y. Ochieng at the Imperial College London, UK, 2007.

Major Conference and Professional Society Committees

Member, the International Program Committee of the 11th International Conference on Vehicle Technology and Intelligent Transport Systems. April 2-4, 2025, Porto, Portugal.

Member, the International Program Committee of the 10th International Conference on Vehicle Technology and Intelligent Transport Systems. May 2-4, 2024, Angers, France

Member, the International Program Committee of the 6th International Conference on

Vehicle Technology and Intelligent Transport Systems, May 2-4, 2020, Prague, Czech Republic.

Member, Transportation Research Board Committee AED50: Artificial Intelligence and Advanced Computing Applications. 2011-2018.

Member, the International Program Committee of the 2nd International Conference on Vehicle Technology and Intelligent Transport Systems, April 23-24, 2016. Rome, Italy.

Member of the Advisory Board, the 6th International conference on Green Intelligent Transportation Systems and Safety, July 2-6, 2015, Beijing, China.

Member of the Advisory Board, the 5th International conference on Green Intelligent Transportation Systems and Safety, July 1-3, 2014, Xi'an, China.

Member of the Advisory Board, the 4th International conference on Green Intelligent Transportation Systems and Safety, August 1-4, 2013, Beijing, China.

Member, Regional Coordination Transportation Group of the South Plains Association of Governments, 2012- 2015.

Member of the Program Committee and Associate Editor of the conference proceedings, 10th -13th International IEEE Conference on Intelligent Transportation Systems, 2008 - 2011.

Member of the Academic Committee, 9th ICCTP Annual Meeting, Harbin, China, August 2009.

Section Chair, "Transportation and Logistics" at the 2009 INFORMS Regional Meeting, Phoenix, AZ, April 2009.

Session Chair, "Network Planning and Design" at the 11th World Conference on Transport Research, Berkeley, CA, June 2007.

External Reviewer for Tenure and Promotion

University of Arizona (3), University of Texas at Tyler (1), Lamar University (1), University of North Carolina, Charlotte (1).

University

Member, Task Force of International Recruiting, Texas Tech University, 2013 - 2015

College

Member, Search Committee for Research Coordinator, 2022

Member, Tenure and Promotion Committee, 2010 - 2012; 2019 - 2023

Member, P K & Robert Koh Memorial Scholarship Committee, 2010 -2014

Member, Research Task Force, 2009 - 2010.

Department

Chair, Graduate Advising Committee (2025 -)

Chair, Award Committee (2012-2015; 2023 - 2025)

Chair, Faculty Search Committee, 2023

Member, Executive Advisory Committee, 2014-2016

Chair, Faculty Search Committee, 2013

Member, Faculty Search Committee, 2012

Member, Faculty Search Committee, 2008.

Member, Recruiting and Public Relations (2006 - 2009)

Member, Curriculum Committee (2005 - 2006, 2016 - 2018)

Student Organization

Founding faculty advisor, Institute of Transportation Engineers (ITE) Student Chapter at Texas Tech University, 2006- present.