Xiaohua (Nemo) Luo, Ph.D.

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Education:

2016-2019 Ph.D. in Civil Engineering
Jackson State University, Jackson, Mississippi
Dissertation: *"Performance Evaluation, Threshold Updating, and Decision Modeling of the Pavement Warranty Program in Mississippi"*

2014-2017 M.S. in Intelligent Traffic Technology
Zhejiang Normal University, Zhejiang, China
Thesis: *"Microscopic Stabilization Mechanism and Macroscopic Mechanical Strength Analysis of Ionic Soil Stabilized Clay"*

2010-2014 B.S. in Transportation Engineering
Zhejiang Normal University, Zhejiang, China
Thesis: *"Traffic Operations Scheme Design under Emergency Conditions"*

Research Interests:

- Data Analysis for Transportation Asset
- Pavement Management Systems
- Automated Pavement Condition Survey
- AI enhanced 3D Image Processing for Pavement Condition Evaluation
- Alternative Delivery Projects (Design Build/Warranty Projects)
- Life-cycle Cost Analysis of Pavement

Academic and Research Experiences:

2024 - present Assistant Professor of Instruction, Ingram School of Engineering, Texas State University, San Marcos, Texas

* Serve as Co-PI for FHWA/TxDOT funded project 0-7211 "Determine Hydroplaning Potential Using Existing Pavement Asset Data." Conducting research about determine hydroplaning for transpiration safety.

* Teach Civil Engineering undergraduate courses and Engineering graduate courses.

* Serve as PI and Program Director for TxDOT funded Summer Transportation Camp (STC) program.

2022 - 2024 Lecturer, Ingram School of Engineering, Texas State University, San Marcos, Texas

* Teach Civil Engineering undergraduate courses and Engineering graduate courses.

* Course material preparation and data collection for ABET evaluation for Civil Engineering of Ingram School of Engineering at Texas State University

* Advise 103 Freshman students in career/profession in Civil Engineering Program.

* Serve as Co-PI for NSF funded Partnerships for Innovation-Technology Translation Program (PFI-TT) "Using artificial intelligence to improve the accuracy of automated pavement condition data collection." Conducting research about using machine learning to improve the accuracy and precision of the automated pavement condition survey.

* Serve as Co-PI for FHWA/TxDOT funded project 0-7150 "Artificial Intelligence for Pavement Condition Assessment from 2D/3D Surface Images." Conducting research about using machine learning to improve the pavement condition 2D/3D image processing.

* Serve as PI and Program Director for TxDOT funded Summer Transportation Camp (STC) program (2024).

* Serve as PI and Program Director for FHWA/TxDOT funded National Summer Transportation Institute (NSTI) summer camp program (2023).

* Serve as PI for FHWA/US DOT funded Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University (2024).

* Serve as Co-PI and Project Coordinator for FHWA/US DOT funded Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University (2022 and 2023). Promote and encourage motivated undergraduate and graduate students at Texas State University to be engaged in transportation-related research and degree education to become future transportation workforce of the nation.

2021 - 2022 Adjunct Lecturer, Ingram School of Engineering, Texas State University, San Marcos, Texas

* Teach an undergraduate course CE1210 Introduction to Smart Infrastructure.

2019 - 2022 Postdoctoral Research Associate, Ingram School of Engineering, Texas State University, San Marcos, Texas

* Conduct research and develop publications and proposals for funding from various funding agencies related to pavement management systems, automated pavement data collection, and alternative delivery projects.

* Serve as Co-PI and Key Personnel for FHWA/TxDOT funded project 0-7072 "Improve Data Quality for Automated Pavement Distress Data Collection." Conducting research about data quality assurance to improve the quality of the automatically collected pavement condition data.

* Serve as Co-PI and Technical Leader for NSF funded Innovation Corps (I-Corps) project "StarImage: Automated pavement condition survey system to improve cost-effectiveness." Gained valuable information and investigated the market and potential customers of using a cost-effectiveness automated pavement condition survey system to collect the pavement condition data.

* Serve as Co-PI and Project Coordinator for FHWA/US DOT funded Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University (2020 and 2021).

* Serve as Co-PI and Program Coordinator for FHWA/TxDOT funded National Summer Transportation Institute (NSTI) summer camp program (2019 and 2021). Recruit motivated high school students of diversified background in the program on Texas State University campus to expose the students in transportation industry careers and STEM education opportunities. Teach traffic engineering and signal design classes, mentor transportation VISSIM simulation project, lead field trips, and schedule and organize daily activities for students.

* Serve various functions in teaching support, undergraduate and graduate student supervision, and building transportation engineering lab for the new Civil Engineering program in Ingram School of Engineering at Texas State University.

2016 - 2019 Instructor and Graduate Research Assistant, Department of Civil and Environmental Engineering, Jackson State University, Jackson, Mississippi

* As instructor taught one undergraduate course in transportation engineering.

* Conducted research for Mississippi DOT project titled "Update and Documentation of MDOT Warranty Process and Distress Thresholds." Evaluated pavement performance of warranty and non-warranty in Mississippi using survival analysis method; rebuilt the warranty distress thresholds for pavement warranty program in Mississippi employing bootstrapping analysis, confusion matrix, and various statistical methods; implemented new thresholds by developing an application using Visual Basic programming; analyzed influencing factors for maintenance decisions of warranty pavements adopting statistical Z-test, Chi-square test, Pearson correlation coefficient, and Cramer's V correlation coefficient; developed maintenance decision model for warranty pavements utilizing Mixed-effect Logistic regression model; validated automated pavement cracking measurements by analyzing data precision and accuracy using Levene's test; and made recommendations for highway agencies to make sound decisions regarding warranty programs.

2014 - 2016 Graduate Research Assistant, College of Engineering, Zhejiang Normal University, Jinhua City, Zhejiang Province, China

* Participated in research project "Development of constitutive model of the viscoelastic creeping performance for asphalt-aggregate interface and mesomechanics based mixture," funded by the Ministry of National Natural Science Foundation of China. Designed and carried out laboratory experiments to analyze the collected data using finite element program ABAQUS.

* Participated in research project "Study of Pavement Performance and Micro-treatment Mechanism using Ionic Soil Stabilizer Improved Clay" funded by the Ministry of Science and Technology of Zhejiang Province, China. Characterized the ionic soil stabilizer treated clay utilizing scanning electron microscope (SEM), X-ray powder diffraction (XRD), and Brunauer-Emmett-Teller (BET) tests; and analyzed the compressive strength of the treated clay using liquid-plastic limit test and compaction test; explored the microscopic stabilization mechanism and macroscopic mechanical strength of the treated clay to improve

the effectiveness of ionic soil stabilizer by applying nonlinearity mapping BP neural network model.

2015 - 2015 Engineering Assistant (internship), Jinhua City Planning and Design Institute, Jinhua City, Zhejiang Province, China

* Developed project proposals and specifications for the Province sponsored project on urban roadway network improvements for City of Haikou.

* Collected traffic data and assisted traffic signal design & traffic management for the Province funded project of urban transportation planning and traffic management for the tourism City, Qiandaohu.

* Received rotation training in multiple offices in highway design, traffic signal and traffic sign design, traffic management, and intelligent transportation systems.

Teaching Experiences:

- CE1210 "Introduction to Smart Infrastructure", Instructor of record, undergraduate course, Texas State University – from Fall 2021 to Spring 2026.
- CE3360 "Transportation Planning and Infrastructure", Instructor of record, undergraduate course, Texas State University - Spring 2024, Fall 2024, and Spring 2025.
- ENGR 5310 "Probability, Random Variables, & Stochastic Processes for Engineers", Instructor of record, graduate course, Texas State University – Fall 2023
- CE 5390 "Infrastructure System Analysis", Instructor of record, graduate course, Texas State University - Spring 2023
- CIV390 "Introduction of Transportation Engineering", Instructor of record, undergraduate course, Jackson State University - Spring 2019 (30% of teaching load) (student evaluation: 10/10)
- CIV431/CIV531 "Traffic Engineering", Guest lecturer, undergraduate/graduate courses, Jackson State University - Fall 2016, Fall 2017, and Fall 2018 (four lectures per year semester)
- Rail Transit Signal and Communication, Instructor of record, undergraduate course, Zhejiang Normal University, China - Spring 2016
- Urban Rail Transit Station Management, Instructor of record, undergraduate, Zhejiang Normal University, China - Spring 2016
- Engineering Mechanics, Teaching assistant, undergraduate course, Zhejiang Normal University, China - Fall 2015
- Rail Transit Operation, Teaching assistant, undergraduate course, Zhejiang Normal University, China - Fall 2015
- Strength of Materials, Teaching assistant, undergraduate course, Zhejiang Normal University, China - Spring 2015

- Measurement Engineering, Teaching assistant, undergraduate course, Zhejiang Normal University, China - Fall 2014

Funded Research Projects:

1. PI for FY 2026 Summer Transportation Camp (STC). $ 65,024.73, 06/2026-10/2026. Funded by Texas Department of Transportation.
2. PI for FY 2025 Summer Transportation Camp (STC). $ 64,761.94, 06/2025-10/2025. Funded by Texas Department of Transportation.
3. Co-PI for project "Determine Hydroplaning Potential Using Existing Pavement Asset Data." $496,746.67, 09/2024-08/2026. Funded by Texas Department of Transportation.
4. PI for FY 2024 Summer Transportation Camp (STC). $57,941, 06/2024-10/2024. Funded by Texas Department of Transportation.
5. PI for CREATE Tier 1 UTC research project "Analyzing Pre- and Post-Coastal Hazard Pavement Conditions to Optimize Response Strategies for Coastal Infrastructure Resilience." $110,988, 09/01/2024-02/28/2026. Funded by USDOT.
6. PI for 2024 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University. $25,500, 11/2024-08/2025. Funded by the Federal Highway Administration (FHWA) and U.S. Department of Transportation.
7. PI for FY 2023 National Summer Transportation Institute (NSTI). $64,000, 06/2023-10/2023. Funded by the Federal Highway Administration (FHWA) and Texas Department of Transportation.
8. Co-PI for FY 2023 Texas State University New Venture Competition, "Roadway Asset Server System (RASS)." $20,000, 06/2023-06/2025. Funded by Texas State University.
9. Co-PI for CREATE Tier 1 UTC research project "Development of deep learning based automated data collection technology for coastal highway pavements." $115,136, 09/2023-02/2025. Funded by USDOT.
10. Co-PI for 2023 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University. Funded by the Federal Highway Administration (FHWA) and U.S. Department of Transportation.
11. Co-PI for the Partnerships for Innovation-Technology Translation Program (PFI-TT) research project "Using artificial intelligence to improve the accuracy of automated pavement condition data collection." $250k, 09/2022-06/2024. Funded by National Science Foundation (NSF).
12. Co-PI for project "Artificial Intelligence for Pavement Condition Assessment from 2D/3D Surface Images." $451,875, 09/2022-06/2025. Funded by Texas Department of Transportation.
13. Co-PI for 2022 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University. Funded by the Federal Highway Administration (FHWA) and U.S. Department of Transportation.

14. Co-PI for Texas State I-Corps Site for Entrepreneurship project "Automated Roadway Inventory Survey Service." $8,000, 04/2022-12/2022. Funded by the National Science Foundation.
15. Co-PI for the National Innovation Network Teams Program (I-Corps Teams) research project "StarImage: cost-effectiveness improved automated pavement condition survey system." $50k, 01/2021-06/2022. Funded by National Science Foundation (NSF).
16. Co-PI for project "Improve the Data Quality for Automated Pavement Distress Data Collection." $450k, 09/2020-06/2023. Funded by Texas Department of Transportation.
17. Co-PI for FY 2021 National Summer Transportation Institute (NSTI). $57,826, 06/2021-10/2021. Funded by the Federal Highway Administration (FHWA) and Texas Department of Transportation.
18. Co-PI for 2021 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University. Funded by the Federal Highway Administration (FHWA) and U.S. Department of Transportation.
19. Co-PI for 2020 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University. $25,500. Funded by the Federal Highway Administration (FHWA) and U.S. Department of Transportation.
20. PI for Texas State I-Corps Site for Entrepreneurship project "3D Image Processing for Automated Measurement of Air-void Systems in Concrete Samples." $3,000, 11/2019-04/2020. Funded by the National Science Foundation.
21. Co-PI for FY 2019 National Summer Transportation Institute (NSTI). $43.3k, 06/2019-10/2019. Funded by the Federal Highway Administration (FHWA) and Texas Department of Transportation.
22. PI for project "Mixture Proportion Design and Project Practice of Energy-intensive Substitutive Road Material." $2,131, 06/2015-09/2016. Funded by Zhejiang Department of Science and Technology, China.

Submitted, but not Funded Research Projects:

1. Co-PI for project "Leveraging Crowd-Sourced Data and Artificial Intelligence for Timely Detection of Roadway Anomalies for Enhanced Situational Awareness and Rapid Response." FY 2025, funded by Texas Department of Transportation.
2. Co-PI for project "Incorporating Resilience Considerations in Transportation Asset Management Planning and Project Selection Process." FY 2024, funded by Texas Department of Transportation.
3. Co-PI for project "Develop Texas Electric Vehicle Charging Infrastructure Readiness Plan." FY 2022, funded by Texas Department of Transportation.
4. Co-PI for FY 2020 Tier 1 UTC Center, Center of Technology Enhanced Mobility, Topic #2 Area: Communications Technology and E-Commerce Effects on Travel Demand. Funded by U.S. Department of Transportation.

5. Co-PI for project "Development of a Performance Related Test for Designing Seal Coats." FY 2019, funded by Texas Department of Transportation.
6. Co-PI for project "Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement." FY 2019, funded by Texas Department of Transportation.
7. Senior Personnel for project "Development of Image Processing Based Field Test Technology for Performance Measurement of Seal Coats." FY 2019, funded by National Road Research Alliance (NRRA) and Minnesota Department of Transportation.
8. Co-PI for project "Development of 3D Image Processing Based Measurement for Air Void System of Concrete Infrastructure." FY 2020 Research Enhancement Program, funded by Texas State University.

Journal Publications:

1. Gong, H., Tao, J., **Luo, X.** and Wang, F., 2025. A Multi-Resolution Attention U-Net for Pavement Distress Segmentation in 3D Images: Architecture and Data-Driven Insights. Mathematics, 13(17), p.2752.
2. Tao, J., **Luo, X.,** Wang, F., Faieq, A., Gong, H. and Qiu, X., 2024. Achieving quality assurance in accepting automated pavement condition data: threshold development and error pattern analysis. International Journal of Pavement Engineering, 25(1), p.2433614.
3. **Luo, X**., Tao, J., Wang, F., Faieq, A., Gong, H. and Hong, F., 2024. Enhancing Reliability in Automated Pavement Condition Data with a Data Quality Check Approach for Highway Agencies. *Transportation Research Record*, p.03611981241246247.
4. Tao, J., Wang, F., **Luo, X.,** Gong, H., Faieq, A., and Qiu, X. Developing the quality assurance thresholds for screening automated pavement condition data using prediction interval methods. *International Journal of Pavement Engineering* (2023), 24(1), p2222335.
5. Gong, H., Tešić, J., Tao, J., **Luo, X.** and Wang, F. Automated Pavement Crack Detection with Deep Learning Methods: What Are the Main Factors and How to Improve the Performance? *Transportation Research Record (2023)*, p.03611981231161358.
6. Bhandari, S., **Luo, X.,** and Wang, F. Understanding the Effects of Structural Factors and Traffic Loading on Pavement Performance. *International Journal of Transportation Science and Technology* (2023), 12(1), pp.258-272.
7. **Luo, X**., Gong, H., Tao, J., Wang, F., Minifie, J. and Qiu, X. Improving Data Quality of Automated Pavement Condition Data Collection: Summary of State of the Practices of Transportation Agencies and Views of Professionals. *Journal of Transportation Engineering, Part B: Pavements (2022),* 148(3), p.04022042.
8. Tao, J., Gong, H., Wang, F., **Luo, X.,** Qiu, X. and Liu, J. Deep learning based automated segmentation of air-void system in hardened concrete surface using three dimensional reconstructed images. *Construction and Building Materials (2022)*, 324, p.126717.

9. Tao, J., Gong, H., Wang, F., **Luo, X**., Qiu, X., and Huang, Y. Automated Image Segmentation of Air Voids in Hardened Concrete Using Photometric Stereo Method. *International Journal of Pavement Engineering (2022), 23(14), 5168-5185.*
10. **Luo, X.,** Wang, F., Qiu, X., and Wang, N., Effectiveness Evaluation of Preventive Maintenance Treatments on Asphalt Pavement Performance Using LTPP Data. *International Journal of Pavement Research and Technology (2021)*, pp.1-16.
11. **Luo, X.,** Wang, F., Bhandari, S., Wang, N., and Qiu, X., Effectiveness Evaluation and Influencing Factor Analysis of Pavement Seal Coat Treatments using Random Forests. *Construction and Building Materials (2021)*, 282, p.122688.
12. Tao, J., **Luo, X.,** Qiu, X., and Wang, F., Data quality assessment of automated pavement cracking measurements in Mississippi. *International Journal of Pavement Research and Technology,*2021,14(2), 117-128.
13. **Luo, X.,** Wang, F., Wang, N., Qiu, X., and Tao, J., Evaluation of Warranty and Non-warranty Pavement Performance Using Survival Analysis. *Journal of Transportation Engineering, ASCE*, Vol.146(1), 2020.
14. **Luo, X.,** Wang, F., Wang, N., Amini, F., Qiu, X., and Tao, J., Factor analysis of maintenance decisions for warranty pavement projects using mixed-effects logistic regression. *International Journal of Pavement Engineering* (2020): 1-12.
15. **Luo, X.,** Wang, F., Wang, N., Tao, J., Qiu, X. and Amini, F., Rebuilding the Distress Thresholds for Pavement Warranty Program in Mississippi. *Journal of TRB, Transportation Research Record*, 2019, Vol. 2673(2) pp: 323–334.
16. Qi, Y., Wang, F., El-Gendy, A., **Luo, X.,** Evaluation of Pavement Warranty Thresholds based on Survey Study and Analysis of Pavement Management System Data. *Advances in Transportation Studies*, Issue No. XLV, July 2018.
17. **Luo, X.,** Yang, Q., Qiu, X., and Xiao, S., Detecting and Expressing of Asphalt Materials Modulus Considering Temperature Effect. *Key Engineering Materials*, Vol.667 (2016), pp: 347-352.
18. Yang, Q., **Luo, X.,** Qiu, X., and Wu, J., Analysis on Mechanical Behavior Characteristics of Stabilized Clay under the Coexistence Condition of Acidic and Alkalic Additives. *Journal of Highway Transportation Research and Development*, Vol. 2016, 33(6), pp: 46-53.
19. Yang, Q., **Luo, X.,** Qiu, X., Huang, X., and Tao, J., Selection Analysis of Road Material based on Multi-level Fuzzy Comprehensive Evaluation Method. *Journal of Zhejiang Normal University (Natural Science)*, Vol. 2016, 39(01), pp: 101-107.
20. **Luo, X.,** Qiu, X., Wang, Y., Wu, J., and Xiao, S., Micro-treatment Mechanism Study on Ionic Soil Stabilizer Improving Clay. *Key Engineering Materials*, Vol.667 (2016), pp: 370-375.
21. Yang, Q., **Luo, X.,** Qiu, X., and Wu, J., Analysis of Microstructure Characteristics and Stabilization Mechanism of Ionic Soil Stabilizer Treated Clay. *Journal of Highway and Transportation Research and Development*, Vol. 2015, 32(11), pp: 33-40.

22. **Luo, X.,** Yang, Q., and Qiu, X., Study on Correction Method of Subgrade Modulus Based on FWD. *Key Engineering Materials*, Vol. 579 (2014), pp: 862-865.
23. Qiu, X., **Luo, X.,** and Yang, Q., Influence of Cracking Damage on Deflection Basin Test Data of FWD. *Key Engineering Materials*, Vol. 620 (2014), pp: 55-60.
24. Kan, Y., Qiu, X., Lin, X., and **Luo, X.,** Research on Typical Structures of Asphalt Pavement in African Desert District. *Key Engineering Materials*, Vol. 178 (2012), pp: 1234-1237.

Conference Papers and Presentations:

1. Pokharel, A., **Luo, X.,** Wang, F., and Bai, Y. Analyzing Pavement Conditions Before and After Coastal Natural Disasters Using Historical Pavement Management System Data. 105th TRB, Washington DC, January 2026.
2. Shampa, S. B., Luo, X., and Wang, F. A Critical Review of Rainfall Disaggregation Models for Hydroplaning Risk Assessment. 105th TRB, Washington DC, January 2026.
3. Mahajan, G. R., Hong, F., **Luo, X.,** and Wang, F. Quantification and Prediction of Pavement Flushing Using Survey, Texture, and Traffic Data. 105th TRB, Washington DC, January 2026.
4. Bai, Y., Wang, F., Gong, H., and Luo, X. Evaluation of Deep Learning Strategies Using Two Different Image Datasets for Automated Pavement Distress Detection. 105th TRB, Washington DC, January 2026.
5. **Luo, X.,** Mahajan, G. R., Wang, F., Gong, H., Hong, F., and Tao, J. Precision Assessment of Automated Pavement Condition Data Collection Using Annual Rating Data. 104th TRB, Washington DC, January 2025.
6. Tao, J., **Luo, X.,** Faieq, A., Wang, F., Gong, H., and Qiu, X. Achieving Quality Assurance in Receiving Automated Pavement Condition Data: Threshold Development and Error Pattern Analysis. 103rd TRB, Washington DC, January 2024.
7. Gong, H., **Luo, X**., Wang, F., and Tao, J. Study of Key Factors in Pavement Distress Segmentation Using Deep Learning Techniques. 103rd TRB, Washington DC, January 2024.
8. Gong, H., Tao, J., **Luo, X**., and Wang, F. Improved One-stage Object Detection Model for Pavement Distress Detection Using 3D Pavement Surface Images. 102nd TRB, Washington DC, January 2023.
9. Tao, J., Gong, H., Wang, F., Qiu, X., **Luo, X.,** and Liu, J. Three-Dimensional Automated Segmentation of Air Voids in Hardened Concrete Using Photometric Stereo Method, Washington DC, January 2022.
10. Gong, H., Tešić, J., Tao, J., **Luo, X.,** and Wang, F. Automated Pavement Crack Detection with Deep Learning Methods: What Are Main Factors and How to Improve the Performance? will present at the 101st TRB, Washington DC, January 2022.
11. Tao, J., Gong, H., Wang, F., **Luo, X.,** Qiu, X., and Huang, Y. Three-Dimensional Automated Segmentation of Air Voids in Hardened Concrete Using Photometric Stereo Method, presented at the 100th TRB, Washington DC, January 2021.

12. Bhandari, S., Sanchez, C., **Luo, X.,** and Wang, F. Evaluation of Effectiveness of Seal Coat Treatment Using Field Data from LTPP Program, presented at the 100th TRB, Washington DC, January 2021.
13. **Luo, X.,** Wang, F., Wang, N., Tao, J., and Qiu, X., Factor analysis of maintenance decisions for warranty pavement projects in Mississippi, presented in AFD10 PMS Committee Meeting at the 99th TRB, Washington DC, January 12-16, 2020.
14. **Luo, X.,** Wang, F., Bhandari, S., Wang, N., and Qiu, X., Effectiveness Evaluation and Influencing Factor Analysis of Pavement Seal Coat Treatments, presented at the 10th Annual Workshop of the International Association of Chinese Infrastructure Professionals (IACIP) at the 99th TRB, Washington DC, January 12, 2020.
15. Tao, J., **Luo, X.,** Qiu, X., and Wang, F., Statistical Analyses of Data Quality of Automated Pavement Cracking Measurements, presented at the 98th TRB, Washington DC, January 13-17, 2019.
16. **Luo, X.,** Wang, F., Wang, N., Tao, J., Qiu, X., and Amini, F., Rebuilding the Distress Thresholds for Pavement Warranty Program in Mississippi, presented at the 98th TRB, Washington DC, January 13-17, 2019.
17. **Luo, X.,** Wang, F., Wang, N., Qiu, X., and Tao, J., Survival Analysis of Warranty and Non-warranty Pavement Performance Using Pavement Management System Data, presented at the 97th TRB, Washington DC, January 7-11, 2018.
18. **Luo, X.,** Wu, S., Tao, J., Wang, F., and Wang, N., Developing Mixed-Effect Logistic Regression Classification for the Maintenance Decision of Pavement Warranty Program, presented at the 8th Annual Workshop of the International Association of Chinese Infrastructure Professionals (IACIP) at the 97th TRB, Washington DC, January 7, 2018.
19. **Luo, X.,** and Wang, F., Revisiting Distress Thresholds of MDOT's Pavement Warranty System, presented at the Southeast Symposium on Contemporary Engineering Topics (SSCET), New Orleans, September 15, 2017.
20. Smith, C., Wang, F., Qi, Y., El-Gendy, A., and **Luo, X.,** Evaluation of MDOT's Distress Thresholds for Maintained Pavement Projects, presented at the 96th TRB, Washington DC, January 7-11, 2017.

Technical Reports:

1. Wang, F., Amini, F. **Luo, X.**, and Tao, J., Update and Documentation of MDOT Warranty Process and Distress Thresholds (No. FHWA/MDOT-RD-18-273). Jackson State University, Jackson, MS, September 2018.
2. Wang, F., **Luo, X.**, Tao, J., Mahajan, G. R., and Faieq, A., Improve Data Quality for Automated Pavement Distress Data Collection. Texas State University, San Marcos, TX, August 2024.
3. Wang, F., Tesic J., **Luo, X.**, and Gong, H. Artificial Intelligence for Pavement Condition Assessment from 2D/3D Surface Images. Texas State University, San Marcos, TX, August 2025.

4. Wang, F., Sanchez, C., Bai, Y., and Luo, X. Deep Learning Based Automated Data Collection Technology for Coastal Highway Pavements. Texas State University, San Marcos, TX, August 2025.

Student Supervisions:

5. Supervising undergraduate student Suvekshya Niroula with Molitoris Leadership Scholarship from the WTS Heart of Texas Chapter ($5,000), 2025.
6. PhD Dissertation research for Gauri Mahajan ("Improving pavement distress measurement with deep learning"), Texas State University, 2025.
7. MS Thesis research (Committee chair) for Aashima Pokharel ("Pavement Resilience Assessment Using Pavement Condition Data Before and After Hurricane Harvey"), Texas State University, 2025.
8. MS Thesis research for Sadia Shampa ("Quantifying Hydroplaning Risk: A Monte Carlo Simulation Approach for Enhancing Roadway Safety in Texas"), Texas State University, 2025.
9. MS Thesis research for Muhammed Fatih Tokgoz ("The Influence of Emerging Vehicle Technologies on Microscopic Lane-Changing Behavior and Freeway Efficiency"), Texas State University, 2025.
10. NSF I-Corps Site for Entrepreneurship and National I-Corps Teams Program technical leader for PhD students Haitao Gong and Jueqiang Tao, Texas State University, 2022.
11. PhD Dissertation research for Haitao Gong ("Improving pavement distress measurement with deep learning"), Texas State University, 2024.
12. PhD Dissertation research for Jueqiang Tao ("Three-Dimensional Segmentation of Air-Void System in Hardened Concrete Using Photometric Stereo and Artificial Intelligence Methods"), Texas State University, 2023.
13. MS Thesis research and TxDOT research project mentor for Ajmain Faieq ("Improve the Data Quality for Automated Pavement Distress Data Collection"), Texas State University, 2023.
14. STEM Undergraduate Research Experience (SURE) Program mentor for Carlos Sanchez ("Analysis of Pavement Distresses on Long-Term Pavement Performance Asphalt Sections from Specific Pavement Studies 6 (SPS-6) along Interstate 35"), Texas State University, 2021.
15. MS Thesis research for Sushmita Bhandari ("*Performance Evaluation and Factor Analysis of Chip Seal Treatment*"), Texas State University, 2021.
16. Capstone Senior Design Project for Gerall Smalls, Quentin Graham, Asean Davis, Mario Brown, and Mohamed Yousif Mustafa ("*Reunion Parkway Design*"), Jackson State University, 2019.

17. Capstone Senior Design Project for Anthony Moore, Antonio Felix, Andre Nichols, Chris Stewart, and Markus Barksdale ("*Transportation Improvement Project*"), Jackson State University, 2018.

Honors and Awards:

2019	Top 3% papers of 6,000 paper submissions as first author at the 98th TRB, as primary author
2017	High-value research in safety and maintenance awarded by AASHTO, as researcher
2016	Outstanding Student Award (Master's)
2015	National Scholarship
2014	Outstanding Graduate Student Award (Bachelor's)
2013	The First-Class Academic Scholarship
2012-2014	Outstanding Volunteer
2011-2013	Research and Innovation Individual Scholarship
2011-2013	Merit Student
2011-2012	The Second-Class Academic Scholarship

Patents:

1. Wang, F., Tao, J., Gong, H., and **Luo, X**. Three-dimensional Photometric Reconstruction based Automated Air-void Segmentation System for Hardened Concrete. (VR39977.P073US).
2. **Luo, X.,** Qiu, X., Xiao, S., and Wang, Y., A Size Test Equipment. Patent for Utility Models, Patent No.201520305280.7, 2015. (Authorized in China)
3. Qiu, X., **Luo, X.,** Wang, Y., and Xiao, S., An Anti-erosion Test Equipment Based on Geotextile Material. Patent for Utility Models, Patent No. 201520187008.3, 2015. (Authorized in China)
4. Yang, Q., **Luo, X.,** Qiu, X., Wang, Y., Xiao, S., A Monitoring and Control for Asphalt Incorporation Equipment. Patent for Utility Models, Patent No. 201520404686.0, 2015. (Authorized in China)
5. Qiu, X., Yang, Q., Wu, J., Lin, W., and **Luo, X.,** Aggregate Ultrasonic Cleaning Equipment. Patent for Utility Models, Patent No.201520042419.3, 2015. (Authorized in China)
6. Qiu, X., Yang, Q., Wu, J., **Luo, X.,** Dustproof Equipment of Screens. Patent for Utility Models, Patent No. 201520044845.0, 2015. (Authorized in China)
7. **Luo, X.,** He, X., Gao, C., Ding, Y., Xie, C., and Wang, B., A New Road Sweeping Brush. Patent for Utility Models, Patent No.201220128160.0, 2012. (Authorized in China)

Academic and Community Services:

Technical Committee	Friends of TRB standing committees AKT10 Pavement Management Systems, AKP10 Pavement Condition Evaluation, AKT20 Pavement Preservation, and AKC30 Quality Assurance Management.
Journal Reviewer	• *Transportation Research Record*, SAGE (10) • *Applied Sciences*, MDPI (2) • *Journal of Open Innovation: Technology, Market, and Complexity,* MDPI (2) • *Journal of Transportation Engineering: Part B, Pavement, ASCE (2)* • *Sustainability*, MDPI (10) • *International Journal of Environmental Research and Public Health*, MDPI (1) • *Advances in Transportation Studies*, Scopus (18) • *International Conference on Managing Pavement Assets* (1) • *International Journal of Pavement Research and Technology*, Elsevier (5) • *Advances in Materials and Pavement Performance Prediction Conference*, Taylor & Francis (2) • *Traffic Injury Prevention*, Taylor & Francis (1) • *Reliability Engineering and System Safety*, Elsevier (2) • *International Journal of Sustainable Engineering*, Taylor & Francis (2) • *International Journal of Digital Earth,* Taylor & Francis (1) • *The International Journal of Transportation Research,* Taylor & Francis (1)
Department Service	• ABET Data Collection for Civil Engineering FY 2025-2-26 • CE PhD Admission Committee FY 2025-2026 • CE Professional and Career Advising FY 2025-2026 • Pre-major in Engineering Program Development FY 2025 • Pre-major in Engineering Program Development-US1100 Content Development FY 2026 • Scholarship Committee FY 2025-2026 • Advise 103 freshmen students in Fall 2022 • Course material preparation and data collection for ABET evaluation for Civil Engineering of Ingram School of Engineering at Texas State University
Program Director	• FY 2023 National Summer Transportation Institute • FY 2024 Summer Transportation Camp • FY 2025 Summer Transportation Camp • FY 2024 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University
Program Coordinator	• FY 2019 National Summer Transportation Institute • FY 2021 National Summer Transportation Institute • FY 2020 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University

	• FY 2021 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University • FY 2022 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University • FY 2023 Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Local Competition at Texas State University
Program Facilitator	• NSF I-Corps Program Texas State Site Program for Entrepreneurship (2020 - present) • Texas State University Faculty Innovation Accelerator Program (2023-2025)
Competition Judge	• 2018 Mississippi Science and Engineering Fair Region I • 2019 Mississippi Science and Engineering Fair Region II • 38th JSU Mathematics and Engineering Fair • 39th JSU Mathematics and Engineering Fair • 10th International Association of Chinese Infrastructure Professionals (IACIP) Annual Workshop Poster Session