Yang Li, Ph.D.

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EDUCATION

The University of North Carolina at Charlotte August 2017-December 2020

Ph.D. Transportation Engineering

Thesis: *The Use of Machine Learning Method for Modeling and Analyzing Pedestrian Crash Data and Comparisons with Traditional Discrete Choice Modeling Methods*

Clemson University

M.S. Civil Engineering/Transportation Engineering August 2015-May 2017

M.S. Industrial Engineering August 2013-May 2015

Tongji University

B.S. Civil Engineering/Geological Engineering September 2006-July 2010

PROFESSIONAL EXPERIENCE

Research Associate, University of Wisconsin-Milwaukee, Milwaukee, WI February 2021-Present

Institute for Physical Infrastructure and Transportation (IPIT)

- Conduct research projects focusing on a variety field of transportation, including traffic safety analysis, road user behaviors, transportation big data, and data analytics
- Being Involved in several local/national level research projects and support proposal preparations, including NCHRP 22-47 "Incorporating Driver Behavior and Characteristics into Safety Prediction Methods" and NCHRP 08-139 "Guide for Preventing and Mitigating the Risk of Bridge and Tunnel Strikes by Motor Vehicles"
- Support the management and operation of IPIT, including the regular staff meeting and the maintenance of the website

*Some abovementioned works have resulted in **three** technical reports and **multiple** publications in preparations. Those work are funded by the United States Department of Transportation, Wisconsin Department of Transportation, National Cooperative Highway Research Program, and local agencies, such as Milwaukee Metropolitan Sewerage District.*

Research Assistant, The University of North Carolina at Charlotte, Charlotte, NC 2017-2020

USDOT Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)

Department of Civil and Environmental Engineering

- Worked on three USDOT funded projects, involved in one NCDOT Research Project
- Developed a new metric (a transit gap index) to evaluate the performance of public transit system, and proposed optimization models to improve public transit equity and accessibility
- Conducted traffic accident data, particularly pedestrian crash related research with statistical, econometric models, and machine learning methods to help improve traffic safety

*The abovementioned works resulted in **three** technical reports and **more than ten** publications in transportation journals, including several high impact ones (Analytic Methods in Accident Research, Accident Analysis & Prevention, etc.). Six other manuscripts are under review. Most of the work were founded by the United States Department of Transportation, University Transportation Center through the Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE) at The University of North Carolina at Charlotte (Grant Number: 69A3551747133).*

Graduate Research Assistant, Clemson University, Clemson, SC August 2015-May 2017

Glenn Department of Civil Engineering

- Involved in one SCDOT Asset Data Collection Assessment Project with assisting analyses on the efficiency and performance of data management in SCDOT
- Studied different types of incident related information extracted from tweets by coding using Python and explored the feasibility of using tweets to detect incident

Assistant HR Manager, LG Electronics Co. Ltd., Shanghai, China July 2010-August 2012

Department of Human Resource

- Provided guidance and support to management on employee arrangements and policies
- Produced files for compensation projects including merit budget, and variable pay plans

FUNDED RESEARCH ACTIVITIES

Contributions to Funded Research

Dec 2022-Present — *Estimating Statewide Bicycle Volumes Using Crowdsourced Data*

Principal Investigator: Xiao Qin, Ph.D.

USDOT and Wisconsin DOT, $75,000

Role: Co-PI. I guide student assistant to complete the all the tasks.

Aug 2022-Present — *BTSCRP BTS-20 Strategies to Address Misreporting of Impaired and Distracted Driving in Motor Vehicle Crashes*

Principal Investigator: Xiao Qin, Ph.D.

The National Academies, UW-Madison, $450,000

Role: Lead Researcher. I guide student assistant to complete the literature review and modeling tasks.

July 2022-Present

WisDOT Data Governance Phase II

Principal Investigator: Andrew J. Graettinger, Ph.D.

Wisconsin DOT, $86,188

Role: Co-PI. I independently undertake all project tasks and all necessary document preparations.

June 2021-Present

NCHRP 08-139 Guide for Preventing and Mitigating the Risk of Bridge and Tunnel Strikes by Motor Vehicles

Principal Investigator: Xiao Qin, Ph.D.

Wisconsin DOT, $500,000

Role: Lead researcher. I performed major project tasks, including data collections, data analyses, statistical modelling and evaluations, and composed the final report

Feb 2021-Sep 2021

Comprehensive Evaluation of DT4000 Data Quality for Pedestrian and Bike Crashes

Principal Investigator: Xiao Qin, Ph.D. and Robert Schneider, Ph.D.

USDOT and Wisconsin DOT, $65,000

Role: Lead researcher. I performed major project tasks, including data collections, data analyses, statistical modelling and evaluations, and composed the final report.

Feb 2021-Apr 2022

Wisconsin DOT Data Inventory/Catalog

Principal Investigator: Andrew J. Graettinger, Ph.D.

Wisconsin DOT, $88,168

Role: Lead researcher. I independently undertake all project tasks, including literature review, data discovery survey design, data catalog/inventory, and all necessary document preparations.

Feb 2021-June 2021

Technology Development and Demonstration of Grit Assisted Patch (GAP): Improvement and Field Test

Principal Investigator: Xiao Qin, Ph.D.

Milwaukee Metropolitan Sewerage District and Marquette University, $9,024

Role: Key researcher. I performed field tests for the GAP material and market research for conducting relevant economic analyses for the project, and composed the final report.

Oct 2019-Sep 2020

Optimization of Long-Term Highway Work Zone Scheduling

Principal Investigator: Wei Fan, Ph.D. and Martin Kane, Ph.D.

Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE), USDOT University Transportation Center, $ 90,006

Role: Co-author. My work on development of optimization model for long-term highway work zone scheduling was the basis for this award. I wrote the grant with Dr. Fan and Dr. Kane, developed one optimization model, and conducted related analyses.

Sep 2018-July 2021

Research Idea ID: 2020-043, Bicycle Volume: Counting Machine Validation & Correction, Estimating & Forecasting, and Analysis of Injury Risk

Principal Investigator: Wei Fan, Ph.D.

NCDOT FY 2020 Research Program, $ 236,952

Role: Co-author. My work on development of the analysis of injury risk of bicyclist in North Carolina was part of the basic ideas for this award. I participated in the writing of the full proposal.

Oct 2018-Sep 2019

Optimizing Transit Equity and Accessibility by Integrating Relevant GTFS Data Performance Metrics

Principal Investigator: Wei Fan, Ph.D. and Martin Kane, Ph.D.

Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE), USDOT University Transportation Center, $ 90,006

Role: Co-author. My work on development of optimization models for improving public transit equity and accessibility was the basis for this award. I wrote the grant with Dr. Fan and Dr. Kane, developed optimization models, and conducted related analyses.

Oct 2017-Sep 2018

Using General Transit Feed Specification (GTFS) Data as a Basis for Evaluating and Improving Public Transit Equity

Principal Investigator: Wei Fan, Ph.D. and Martin Kane, Ph.D.

Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE), USDOT University Transportation Center, $ 90,006

Role: Co-author. My work on development of GTFS related transit gap index for assessing public transit system was the basis for this award. I wrote the grant with Dr. Fan and Dr. Kane, developed two optimization model, and conducted related analyses.

Contributions to Grants Under Review

Aug 2022-Oct 2022 — *Develop a community-based driving and traffic safety educational program to support members of underserved communities in Milwaukee*

Johnson Controls, Marquette University, and University of Wisconsin-Milwaukee, estimated budget: $75,000

Role: Co-PI. Lead the effort of the full proposal preparation, and responsible for coordination.

Contributions to Prior Declined Grants

Aug 2022-Sep 2022 — *Connected and Automated Vehicles Attitudes and Perceptions*

USDOT and Wisconsin DOT, estimated budget: $75,000

Role: Co-PI. Supported proposal preparation and undertook writing assignments for several key tasks of the project.

June 2021-July 2021 — *NCHRP: 17-100, Leveraging Artificial Intelligence and Big Data to Enhance Safety Analysis*

NCHRP, estimated budget: $650,000

Role: Co-author. Supported proposal preparation and undertook writing assignments for several key tasks of the project.

Mar 2021-May 2021 — *NCHRP: 17-97, Strategies to Improve Pedestrian Safety at Night*

NCHRP, estimated budget: $500,000

Role: Co-author. Supported proposal preparation and undertook writing assignments for several key tasks of the project.

Sep 2018-Oct 2018 — *Research Idea ID: 2020-044, Study of Practical Transit Equity Modeling Methods and Identifying Transit Gap in North Carolina*

NCDOT FY 2020 Research Program, estimated budget: $121,583

Role: Co-author. My idea on studies of practical transit equity modeling methods and identifying transit gap in North Carolina

was the basis for this award. I wrote the full proposal with Dr. Fan.

PUBLICATIONS

Published in Peer-Reviewed Journals

1. Liu, S.*, **Li, Y.***, & Fan, W. D. (2021). Mixed logit model based diagnostic analysis of bicycle-vehicle crashes at daytime and nighttime. *International Journal of Transportation Science and Technology*. **(*contributed equally to this study)**
2. Song, L., Fan, W. D., & **Li, Y.** (2021). Time-of-day variations and the temporal instability of multi-vehicle crash injury severities under the influence of alcohol or drugs after the Great Recession. *Analytic Methods in Accident Research*, *32*, 100183. **[IF: 14.556, rank 2nd]**
3. **Li, Y.**, & Fan, W. D. (2021). Bi-level optimization of long-term highway work zone scheduling considering elastic demand. *Smart and Resilient Transport*.
4. Liu, S., Fan, W. D., & **Li, Y.** (2021). Injury severity analysis of rollover crashes for passenger cars and light trucks considering temporal stability: A random parameters logit approach with heterogeneity in mean and variance. *Journal of safety research*.
5. Song, L.*, **Li, Y.***, Fan, W., & Liu, P. (2021). Mixed logit approach to analyzing pedestrian injury severity in pedestrian-vehicle crashes in North Carolina: Considering time-of-day and day-of-week. *Traffic injury prevention*, 1-6. **(*contributed equally to this study)**
6. **Li, Y.,** Song L., & Fan, W. D. (2021). Day-of-week variations and the temporal instability of factors influencing pedestrian injury severity in pedestrian-vehicle crashes: a random parameters logit approach with heterogeneity in means and variances. *Analytic Methods in Accident Research, 29,* 100152. **[IF: 14.556, rank 2nd]**
7. **Li, Y.**, & Fan, W D. (2021). Optimizing Transit Equity and Accessibility of the City of Charlotte, North Carolina, by Integrating Transit Gap Index, a General Transit Feed Specification Data-Relevant Performance Metric. *Journal of Transportation Engineering, Part A: Systems*, *147*(4).
8. Song, L., Fan, W. D., **Li, Y.**, & Wu, P. (2021). Exploring pedestrian injury severities at pedestrian-vehicle crash hotspots with an annual upward trend: A spatiotemporal analysis with latent class random parameter approach. *Journal of safety research*, *76*, 184-196.
9. **Li, Y.,** & Fan, W. D. (2020). Modeling and evaluating public transit equity and accessibility by integrating general transit feed specification data: case study of the City of Charlotte. *Journal of Transportation Engineering, Part A: Systems*, *146*(10). [**Featured as ***Editor's Choice***]
10. Song, L.*, **Li, Y.*,** Fan, W. D., & Wu, P. (2020). Modeling pedestrian-injury severities in pedestrian-vehicle crashes considering spatiotemporal patterns: insights from different

hierarchical Bayesian random-effects models. *Analytic Methods in Accident Research, 28, 100137.* **(*contributed equally to this study) [IF: 14.556, rank 2nd]**

11. **Li, Y.,** & Fan, W. (2020). Mixed logit approach to modeling the severity of pedestrian-injury in pedestrian-vehicle crashes in North Carolina: Accounting for unobserved heterogeneity. *Journal of Transportation Safety & Security*, 1-22.
12. **Li, Y.,** & Fan, W. (2020). Modelling the severity of pedestrian injury in pedestrian-vehicle crashes in North Carolina: A partial proportional odds logit model approach. *Journal of Transportation Safety & Security*, *12*(3), 358-379.
13. **Li, Y.,** & Fan, W. D. (2019). Modelling severity of pedestrian-injury in pedestrian-vehicle crashes with latent class clustering and partial proportional odds model: a case study of North Carolina. *Accident Analysis and Prevention*, 131, 284–296.
14. **Li, Y.,** & Fan, W. (2019). Pedestrian injury severities in pedestrian-vehicle crashes and the partial proportional odds logit model: accounting for age difference. *Transportation research record*, *2673*(5), 731-746.

Submitted Manuscripts

15. **Li, Y.**, Fan, W. D., Song, Li., & Liu, S. Combining Emerging Hotspots Analysis with XGBoost for Modeling Pedestrian Injuries in Pedestrian-Vehicle Crashes: A Case Study of North Carolina. (*manuscript in review in Journal of Transportation Safety & Security*)

Manuscripts in Preparation

16. Hossain, M. T., **Li, Y.**, Qin, X. Modeling Distractive Driving Crashes at Urban Highway Intersection.
17. **Li, Y.**, Amer, M. W., Hossain, M. T., Qin, X. Modeling Over-Height Vehicle Collision with Bridge.
18. **Li, Y.,** & Qin, X. A Systematic Review of Machine Learning Methods for Traffic Crash Data Modeling and Analysis.

PRESENTATIONS

Oral Presentations

1. **Li, Y.,** & Fan, W. D. Optimizing transit equity and accessibility by integrating transit gap index a relevant GTFS data performance metrics. *the 2020 NCDOT Research & Innovation Summit*, North Carolina, October 14, 2020.
2. **Li, Y.,** & Fan, W. D. Optimizing transit equity and accessibility by integrating relevant GTFS data performance metrics. *The North Carolina Section of the Institute of Transportation Engineers (NCSITE) Annual Meeting*, McKimmon Center, North Carolina State University, Raleigh, North Carolina, November 21, 2019.

3. **Li, Y.,** & Fan, W. D. Using General Transit Feed Specification (GTFS) Data as a Basis for Evaluating and Improving Public Transit Equity. *The North Carolina Section of the Institute of Transportation Engineers (NCSITE) Annual Meeting*, McKimmon Center, North Carolina State University, Raleigh, North Carolina, November 15, 2018.

Poster Presentations

1. **Li, Y.,** Al-Mahameed, F. J., Qin, X., & Schneider, R. J. (2022). New Insights on Vulnerable Road User Safety Analysis Through Crash Database Improvement, TRB 101st Annual Meeting, Washington, D.C.
2. **Li, Y.,** & Fan, W. D. Using General Transit Feed Specification (GTFS) Data as a Basis for Evaluating and Improving Public Transit Equity. *Second Annual CAMMSE Research Symposium*, The University of North Carolina Charlotte Center City, November 7, 2019, Charlotte, NC.
4. **Li, Y.,** & Fan, W. D. Optimizing transit equity and accessibility by integrating transit gap index a relevant GTFS data performance metrics. *the 2019 NCDOT Research & Innovation Summit*, North Carolina Agricultural and Technical State University (NCAT), Greensboro, North Carolina, October 14, 2019.
3. **Li, Y.,** & Fan, W. D. Pedestrian-injury severities in pedestrian-vehicle crashes and the partial proportional odds logit model: accounting for age difference. *Transportation Research Board 98th Annual Meeting,* January 14, 2019, Washington, DC.
4. **Li, Y.,** & Fan, W. D. Using General Transit Feed Specification (GTFS) Data as a Basis for Evaluating and Improving Public Transit Equity. *The 19th COTA International Conference of Transportation Professionals (CICTP 2019)*, Nanjing, China, July 7, 2018.

TEACHING EXPERIENCE

Instructor

Course: Civil Engineering 592 – Traffic Control Fall 2022

Students: 14

Responsibilities: Served as co-instructor for lab sections for Synchro and HCS.

Graduate Teaching Assistant, Clemson University, Clemson, SC

Course: Civil Engineering 2100 – Statics Spring 2017

Students: 30

Responsibilities: Completed grading works for both assignments and exams.

Course: Civil Engineering 3520 - Economic Evaluation of Projects Fall 2016

Students: 30

Responsibilities: Supervised exams and completed grading works for both assignments and exams.

Course: Civil Engineering 6100 - Traffic Engineering: Operations Fall 2015

Students: 50

Responsibilities: Supervised exams and completed grading works for both assignments and exams.

Course: Industrial Engineering 4820 - Systems Modeling Spring 2014

Students: 90

Responsibilities: Assisted development of assignments/project assignments, quiz, and exam questions. Held office hours, co-taught classes with professor, supervised labs, and completed grading works.

LEADERSHIP & PROFESSIONAL SERVICES

Ad Hoc Peer Reviewer 2018-Present

Reviewed more than 30 manuscripts on various topics such as traffic safety analysis, transportation network design and optimization, connected and autonomous vehicles, for the following peer-reviewed journals:

Since 2022:

- Traffic Injury Prevention
- PLOS ONE

Since 2021:

- Accident Analysis and Prevention
- Journal of Transportation Safety and Security

Since 2020:

- Transportation Research Record: Journal of the Transportation Research Board

Since 2019:

- IEEE Transactions on Intelligent Transportation Systems

Since 2018:

- Journal of Transportation Engineering, Part A: Systems
- International Journal of Transportation Science and Technology.

Conferences:

- Transportation Research Board (TRB) 101st Annual Meeting, 2022
- Transportation Research Board (TRB) 100th Annual Meeting, 2021
- 18th COTA International Conference for Transportation Professionals (CICTP2018)

President, Institute of Transportation Engineering (ITE) April 2019-April 2020

ITE Student Chapter of The University of North Carolina at Charlotte, Charlotte, NC

- Took charge of organization development and conducted outreach activities for events.

Treasurer, Institute of Transportation Engineering (ITE) August 2018-April 2019

ITE Student Chapter of The University of North Carolina at Charlotte, Charlotte, NC

- Handled budgets for events and managed memberships and assisted presidents.

HONORS & AWARDS

Don Blackburn Memorial Scholarship (Tier III) 2020

The North Carolina Section of the Institute of Transportation Engineers (NCSITE)
Amount: $3,000

Roy Williams Memorial Scholarship (Tier II) 2019

The North Carolina Section of the Institute of Transportation Engineers (NCSITE)
Amount: $3,000

SUMMARIES OF SKILLS

Programming/Modeling: SAS; Python; NLOGIT; R; SPSS (Statistics/Modeler); MATLAB; ArcGIS; AutoCAD; Civil 3D; VISSIM; SYNCHRO

Document Management: Microsoft Office (Access, Word, Excel, PowerPoint, Visio); Qualtrics

Specific skills:

Data Mining Data/Visualization and Presentation
Spatial-temporal Analysis
Statistical Analysis (Logit/Probit Regression; Bayesian Analysis)
Machine Learning (XGBoost; AdaBoost; Deep Neural Network)
Transportation Planning/Highway Design
Travel Demand Forecasting/Traffic Modeling and Simulation
Traffic Impact Analysis/Site Impact Analysis