YUNCHANG ZHANG

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550 W Stadium Ave.
West Lafayette, IN, USA 47907

PERSONAL WEBSITES

Personal Webpage: https://yzhang-genghis.github.io/

Google Scholar: https://scholar.google.com/citations?user=AHXbIzcAAAAJ&hl=zh-CN

LinkedIn: https://www.linkedin.com/in/yunchang-zhang-9758b2167/

GitHub: https://github.com/YZhang-Genghis

EDUCATION

Purdue University, West Lafayette, IN
Ph.D. Candidate in Civil Engineering   May 2019 – May 2022 (anticipated)
   Dissertation Title: "*Smart Interaction and Smart Control: Pedestrians, cyclists, and vehicles in a Smart Crosswalk Environment*".
   Advisor: Dr. Jon D. Fricker
   Overall GPA: 3.75/4.0

Purdue University, West Lafayette, IN
M.S. in Civil Engineering   August 2017 – May 2019
   Thesis Title: *"Pedestrian-Vehicle Interactions at Semi-Controlled Crosswalks: Explanatory Metrics and Models".*
   Advisor: Dr. Jon D. Fricker
   Overall GPA: 3.75/4.0

Jilin University, Jilin Province, China
B.S. in Traffic Engineering   September 2013 – July 2017
   Thesis Title: *"Optimal Locations and Operational Effects of U-Turn Median Openings".*
   Advisor: Dr. Dexin Yu
   Overall GPA: 89.66/100

RESEARCH & WORK EXPERIENCE

Purdue University   September 2017 – Present
Graduate Research Assistant, Dept. of Civil Engineering

- Implementing smart traffic signal control strategies in urban transportation networks. URL: https://github.com/YZhang-Genghis/deep-reinforcement-learning-pedestrian-signal-design.
- Human motion prediction using large-scale spatial-temporal trajectory data. URL: https://github.com/YZhang-Genghis/XwalkTrajectory.
- Human mobility studies using large-scale crowdsourced data. URL: https://github.com/YZhang-Genghis/Bayesian-Causal-Inference.

PUBLICATIONS

Fricker, J. D., & Zhang, Y. (2019). Modeling pedestrian and motorist interaction at semi-controlled crosswalks: the effects of a change from one-way to two-way street operation. Transportation research record, 2673(11), 433-446.

Zhang, Y., Qiao, Y., & Fricker, J. D. (2020). Investigating Pedestrian Waiting Time at Semi-Controlled Crossing Locations: Application of Multi-State Models for Recurrent Events Analysis. *Accident Analysis & Prevention*, 137, 105437.

Zhang, Y., & Fricker, J. D. (2020). Multi-State Semi-Markov Modeling of Recurrent Events: Estimating Driver Waiting Time at Semi-Controlled Crosswalks. *Analytic Methods in Accident Research*, 100131.

Yabe, T., **Zhang, Y**., & Ukkusuri, S. V. (2020). Quantifying the economic impact of disasters on businesses using human mobility data: a Bayesian causal inference approach. *EPJ Data Science*, 9(1), 36.

Zhang, Y., & Fricker, J. D (2021). Investigating temporal variations in pedestrian crossing behavior at semi-controlled crosswalks: A Bayesian multilevel modeling approach. *Transportation Research Part F: Traffic Psychology and Behaviour*, 76, 92-108.

Zhang, Y., & Fricker, J. D. (2021). Quantifying the impact of COVID-19 on non-motorized transportation: A Bayesian structural time series model. *Transport Policy*, 103, 11-20.

Zhang, Y., & Fricker, J. D. (2021). Incorporating conflict risks in pedestrian-motorist interactions: A game theoretical approach. Accident Analysis & Prevention, 159, 106254.

Zhang, Y., Fricker, J. (2021). "Investigating Smart Traffic Signal Controllers at Signalized Crosswalks: A Reinforcement Learning Approach". *Accepted by IEEE Intelligent Transportation Systems Magazine.*

Zhang, Y., Fricker, J. (2022). "Forecasting the Motion and Behavior of Heterogenous Road Users at Crosswalks: A Spatial-Temporal Graph-Based LSTM Approach". *Under Review by IEEE International Conference on Robotics and Automation.*

Zhang, Y., Fricker, J. (2022). "CrosswalkTrajectory: A Large-scale Spatial-Temporal Trajectory Dataset for Heterogeneous Road Users Behavior Prediction". *Pre-print.* URL: https://yzhang-genghis.github.io/Yunchang-Zhang.github.io/research.html.

PRESENTATIONS

Yunchang Zhang (2020). "A Semi-Markov Approach for Modeling Pedestrian Delay at Unsignalized Crosswalks". *Transportation Research Board 99th Annual Meeting,* January 2020.

Yunchang Zhang, Jon, D. Fricker (2020). "Multi-State Semi-Markov Models: An Application to Drivers' Gap Acceptance in front of Approaching Pedestrians at Unsignalized Crosswalks". *Transportation Research Board 99th Annual Meeting,* January 2020.

Jon, D. Fricker, **Yunchang Zhang** (2019) Modeling Pedestrian and Motorist Behavior at Semi-Controlled Crosswalks: The Effect of a Change from One-Way to Two-Way Street Operation. *Transportation Research Board 98th Annual Meeting,* January 2019.

NATURAL LANGUAGE PROCESSING PROJECTS

1. Identifying the entity (Named Entity Recognition) and the sentiment directed towards the entity using Bi-LSTM Max Entropy Markov Random Field Model (Bi-LSTM MEMM). **GitHub Repository link**: https://github.com/YZhang-Genghis/Bi-LSTM-Maximum-Entropy-Markov-Model.
2. Leveraging behavioral and social information for classification of political framing using congressional tweets. **GitHub Repository link**: https://github.com/YZhang-Genghis/Political-Frame-Prediction-using-Congressional-Tweets.

RESEARCH & WORK INTERESTS

Pedestrian Dynamics; Multi-Agent Reinforcement Learning; Graph Neural Networks

HONORS & AWARDS

Nellie Munson Teaching Assistant Award   April 2021
Dept. of Civil Engineering, Purdue University

STV Civil Engineering Grad Assistantship Endowment   September 2020
Dept. of Civil Engineering, Purdue University

STV Civil Engineering Grad Assistantship Endowment   September 2018
Dept. of Civil Engineering, Purdue University

ACTIVITIES & AFFILIATIONS

Purdue Institute of Transportation Engineering (ITE)   May 2019 – May 2020
Event Coordinator, Dept. of Civil Engineering, Purdue University

Jilin University National Model United Nations Association   September 2016 – June 2017
Honorable Member, Jilin University, Changchun, China

SOFTWARE & SKILLS

Working-Based Software (from most to least experience):
SUMO, VISSIM, Microsoft, CARLA, AutoCAD.

Programming Languages (from most to least experience):
Python, PyTorch, R, C++, MATLAB, SQL, Stata