

# YUNCHANG ZHANG

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## PERSONAL WEBSITES

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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

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**Purdue University**, West Lafayette, IN

Ph.D. Candidate in Civil Engineering

May 2019 – Present

*Dissertation Title: “SMART INTERACTION – PEDESTRIANS AND VEHICLES IN A CAV 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: 3.71/4.0

**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

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**Purdue University**

September 2017 – Present

*Graduate Research Assistant, Dept. of Civil Engineering*

West Lafayette, IN

- Implementing deep reinforcement learning approaches to explore an optimal traffic signal control strategy in urban transportation networks.
- Forecasting the Motion and Behavior of Heterogenous Road Users at Crosswalks using graph-based LSTM techniques.

*Graduate Teaching Assistant - CE361/CE512, Dept. of Civil Engineering*

- Leading project discussions and answering student questions.
- Evaluating student essays, projects, labs, tests and other assessments.

## PUBLICATIONS

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- 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 Graph-Based LSTM Approach". *Submitted to IEEE International Conference on Robotics and Automation*.

## PRESENTATIONS

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- 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

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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>.

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## PROJECT REPORT

**Zhang, Yunchang** and Jon D. Fricker, Technical Report, " Pedestrian-Vehicle Interactions at Semi-Controlled Crosswalks: Explanatory Metrics and Models", Lyles School of Civil Engineering, May 2019.

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## RESEARCH & WORK INTERESTS

Pedestrian Dynamics; Multi-Agent Imitation Learning; Urban Computing

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## HONORS & AWARDS

<b>Nellie Munson Teaching Assistant Award</b> <i>Dept. of Civil Engineering, Purdue University</i>	April 2021
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<b>STV Civil Engineering Grad Assistantship Endowment</b> <i>Dept. of Civil Engineering, Purdue University</i>	September 2020
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<b>STV Civil Engineering Grad Assistantship Endowment</b> <i>Dept. of Civil Engineering, Purdue University</i>	September 2018
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## ACTIVITIES & AFFILIATIONS

<b>Purdue Institute of Transportation Engineering (ITE)</b> <i>Event Coordinator, Dept. of Civil Engineering, Purdue University</i>	May 2019 – May 2020
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<b>Jilin University National Model United Nations Association</b> <i>Honorable Member, Jilin University, Changchun, China</i>	September 2016 – June 2017
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## 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