Liuhui Zhao, PhD

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EDUCATION

M.S. in Analytics, Georgia Institute of Technology — Atlanta, GA | 2022
Ph.D. in Transportation, New Jersey Institute of Technology — Newark, NJ | 2016
M.S. in Geography, The University of Alabama — Tuscaloosa, AL | 2011
B.S. in Resources, Beijing Normal University — Beijing, China | 2009

WORK EXPERIENCE

New Jersey Institute of Technology | Senior Transportation Engineer — 2020-present

- Designed a pipeline to automatically validate crash records in database and generate reports of crash traffic impact, and deployed a web portal for statewide historical crash analysis.
- Provided safety insights for a long-term construction site, by exploring crash frequency with survival analysis and quantifying work zone impact with logistic regression model.
- Established a smart bus system, by integrating mobile app-online database-server for dynamic bus operations in C# environment, reduced average passenger travel time by up to 12% and waiting time by 18%.

University of Delaware | Postdoctoral Researcher — 2017-2019

- Developed optimization algorithms to enhance traffic performance in bottlenecks, achieved a 25% improvement in fuel efficiency and 15% savings in travel time compared to uncontrolled cases.
- Led a team from 3 university research groups, to integrate and deliver code for implementing vehicle control algorithms in a project self-driving car, and validate the performance of control algorithms in Mcity.

Greenman-Pedersen Inc. | Transportation Engineer — 2017-2019

- Modified and validated a large-scale traffic simulation network, developed a toolbox to automate network calibration and data collection process, and facilitated the process by saving ~10% manual calibration efforts for the entire traffic simulation team.

PROJECTS

Housing Market Analysis — Python (Scikit-Learn, XGBoost, Plotly Dash, Keras), Heroku

- Predicted house prices with 4 regression models in a local housing market. The best model with XGBoost achieved a 4% improvement over the second random forest and a 29% boost from Lasso regression.
- Published a website to assist decision making with data explorer and prediction functionality, earned 80% satisfactory in website functionality and 90% satisfactory in user friendliness from 34 survey responses.

Topic Modeling on Research Trends — Python (BeautifulSoup, Gensim, NetworkX)

- Collected paper information from 3 journals, analyzed research trends in past decade with topic modeling, and explored research communities with network analysis. Provided a deeper understanding of research status on an interdisciplinary direction.

Chicken Welfare Detection with Video Analytics — Python (OpenCV, Scikit-Image, Pytorch)

- Detected individual chickens through instance segmentation, developed spatial distribution metrics for evaluating chicken welfare, and identified chicken behavior changes and growth patterns through graph analysis and time series decomposition.
- Presented the applicability of the algorithms in real-time chicken environment monitoring and delivered implementable code to the project sponsor.

SKILLS

Languages: Python, R, C++, C#, SQL
Web Development: Plotly Dash, JavaScript (D3.js), HTML/CSS
Professional Software: ArcGIS, QGIS, VISSIM, Aimsun
Statistics: Matlab, SPSS, Minitab
Platforms: Hadoop, Spark, Git, AWS