

# Yaxuan (Sean) Zhang

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Portfolio: [yaxuanseanzhang.github.io](https://yaxuanseanzhang.github.io) | GitHub: [github.com/YaxuanSeanZhang](https://github.com/YaxuanSeanZhang)

## INTRODUCTION

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As a self-driven person with over 5 years of quantitative experience and multi-disciplinary collaborations, I am passionate about applying analytics techniques to deliver data-driven decision-making solutions.

**Strengths:** Traffic Analysis & Planning, GIS, Cartography, Statistical Modeling, Machine Learning, Forecasting, Data Quality

## SKILLS

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**Technical Skill:** R (6 yrs), Python (2 yrs), SQL (1-2 yrs), Git, HTML, ArcGIS, PostGIS, Stata, SPSS, Microsoft Office

**Python Libraries:** Pandas, Numpy, sklearn, SciPy, PyTorch, TensorFlow, PyMC3, matplotlib, plotly, ArcPy, Geopandas

## PROFESSIONAL EXPERIENCES

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**Mobility Data Researcher**, University of Minnesota, Minneapolis, MN Jun 2022 – present

- Led a data collection process, designing surveys and collecting GPS travel data from 1000+ participants.
- Applied data mining and statistical models to study gender discrepancies in mobility patterns to promote social equity.
- Designed an interpretable Machine Learning algorithm to model health disparities related to mobility behaviors.
- Delivered a recommendation report to external stakeholders (MnDOT) to inform policy-making decisions.

**Transportation Planning Data Science Intern**, Metropolitan Council, Saint. Paul, MN June 2023 – Aug 2023

- Designed an ETL pipeline to fetch, clean, and process real-time traffic data into a web dynamic map dashboard.
- Implemented a Generalized Additive Model (GAM) for traffic volume forecasting.
- Conducted QAQC, exploratory analysis, and visualization for transit data and delivered insights to internal stakeholders.

**Mobility Data Analyst**, University of Minnesota, Minneapolis, MN Jun 2020 – May 2022

- Designed a data-driven framework to solve spatiotemporal quality issues in GPS mobility data, improving 25% accuracy.
- Adopted ML and trajectory analysis to identify human travel behaviors and measure person-based accessibility space.
- Created an R pipeline for GPS travel surveys, including data cleaning, mobility pattern analysis, and visualization.

## COURSE PROJECTS

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**Urban Mobility and Traffic Analytics** Sep 2023 – Dec 2023

- Designed hierarchical Bayesian models to predict NYC Uber pickup frequencies, improving model performance by 27%.
- Developed deep neural networks with gravity functions to predict human mobility flows between locations in cities.

**ResNet Convolutional Neural Networks (CNN) Classification** Jan 2023 – May 2023

- Performed feature extraction, AutoML, and CNN on large-scale medical data for heart disease classification.
- Designed a multi-level residual network using PyTorch, improving 9.5% accuracy versus baseline CNN.

**Invasive Species Geo-Simulation System** Jan 2023 – May 2023

- Designed and implemented a real-time pipeline with three spatial simulation models, achieving 95.9% accuracy.
- Published interactive web maps utilizing a comprehensive toolkit including ArcPy, PostGIS, Flask, and Google Cloud.

**Location Intelligence Business Analytics** Mar 2017 - Sep 2017

- Applied geospatial statistical models (e.g., GWR) to analyze spatial patterns of e-business in China.
- Utilized multi-source data (e.g., POI, parcel) to conduct location-based analysis for business hotspot selection.

## SELECTED PUBLICATIONS AND CONFERENCE PRESENTATIONS

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Selections from 8 publications and 12 presentations

**Zhang, Y.,** Li, C., Song, Y., Chai, Y., & Fan, Y. (2022). Personalizing the dichotomy of fixed and flexible activities in everyday life: deriving prism anchors from GPS-enabled survey data. *Transportation*, 1-26.

**Zhang, Y.,** Song, Y., & Fan, Y. (2022). Improving data quality of smartphone-based activity-travel survey: A framework for data post-processing. *Transactions in GIS*, 26(1), 475-504

## AWARDS

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- TRB Emerging Scholar • AAG Transportation Geography Travel Award • AAG Spatial Analysis & Modeling Travel Award
- UCGIS Student Scholarship Award • UMN Diversity Fellowship • (China) Microsoft Scholarship

## EDUCATION

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**Ph.D., Geographic Information Science (GIS)**, University of Minnesota - Twin Cities (UMN), MN May 2024

**M.S., GIS, Computer Science** (minor), University of Minnesota, MN (GPA: 3.84/4.0) May 2024

**B.Eng., GIS**, Wuhan University, Wuhan, China (GPA: 3.78/4.0) Jun 2018