

SHENG'AO YI

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Education

Temple University

Doctor of Philosophy - Geography and Urban Studies;
Courses: Geographic Inquiry, Spatial Database Design, Spatial Statistics
Advisor: Prof. Xiaojiang Li

Philadelphia, US
Aug. 2023 - Jun. 2027

University of Pennsylvania

Master of Science - Urban Spatial Analytics; GPA: 3.94/4.0
Courses: Spatial Statistics and Data Analysis, Geospatial Data Science in Python, Java Script Programming for Planners and Designers, Modeling Geographic Space, Database and Information Systems

Philadelphia, US
Aug. 2022 - Jun. 2023

Shenzhen University

Bachelor of Engineering - Geospatial Information Engineering; GPA: 84.9/100
Advisor: Prof. Wei Tu

Shenzhen, China
Sept. 2018 - Jun. 2022

Internship Experience

MIT Urban Mobility Lab

Research Intern

Jun. 2023 – Hereto
Online

- Conducting a research project focusing on investigating the impacts of misallocation of bus drivers by looking at socioeconomic characteristics associated with bus routes.

Tencent

Machine Learning Researcher Intern

Sept. 2021 – Jun. 2022
Shenzhen, China

- Completed an internship at Tencent, working on a project to detect fraudulent user behavior by analyzing multi-source spatio-temporal data and WeChat user trajectories.
- Contributed to the integration of multi-source spatio-temporal big data, including satellite images, open street maps, points of interest, and WeChat user trajectories, to construct a multi-view neural network model.
- Leveraged Tencent's internal machine learning platform (TaiJi) and database platform (IDEX), as well as PySpark, to process and analyze the data, store it in the appropriate format, and develop machine learning models for training.
- Demonstrated strong problem-solving skills and technical expertise in data processing and machine learning, contributing to the success of the project and gaining valuable experience in the field of anti-fraud technology.

Projects

2022 Smart Cities Innovation Competition | *Python, Web development*

Aug. 2022 - Dec. 2022

- Building an intelligent management platform and multi-dimensional analysis framework for taxi and online ride-hailing data.
- Comparing the spatio-temporal distribution characteristics between taxi and online ride-hailing, analyzing the reasons through the trajectory orders.
- Developing an intelligent platform for the electric operation of taxi and online ride-hailing based on deep reinforcement learning.
- Providing practical suggestions for promoting the electrification of the taxi and online ride-hailing market.

Street quality pattern mining based on multi-source urban big data | *Street View Image, Deep Learning*

- Collected urban road networks, street view images (SVIs), points of interest (POIs) and building footprints data in the Greater Bay Area through python applications.
- Constructed a set of evaluation index system of street space quality from two dimensions: subjective perceptions and objective physical space of streets.
- Identified the street elements from SVIs using deep learning.
- Analyzed the spatial aggregation of street quality and the correlation between each index factor, between the indexes and quality.
- Mined different patterns of street quality by means of the hierarchical clustering algorithm, summarized and compared the features of street patterns in each city in the Guangdong-Hongkong-Macao Greater Bay Area.

2021 SuperMap Cup University GIS Competition | *Data analytics, Web development*

Jun. 2021 - Aug. 2021

- Developed and implemented Python applications for cleaning and standardizing urban floating car trajectories and order data.

- Created a traffic analysis zone (TAZ) framework as the basic spatial unit for analyzing online ride-hailing and cruise car data, enabling more accurate and efficient analysis.
- Calculated and compared key performance indicators of online ride-hailing and cruise car services, such as empty-loaded rate, average loaded time, and average loaded distance. Conducted statistical analysis to identify patterns and trends.
- Applied clustering analysis techniques to online ride-hailing data to identify four distinct behavioral patterns among users.
- Explored spatio-temporal patterns in online ride-hailing and cruise car data, and developed recommendations for integrated development of these services. Leveraged data visualization and geospatial analysis tools to communicate findings and insights to stakeholders and decision-makers.

2020 Digital China Innovation Contest | *Deep Reinforcement Learning, Web development* **Sept. 2020 - Oct. 2020**

- Cleaned and processed large-scale trajectories and order data, integrating them with urban road network data using map matching algorithms. Split trajectories into segments and extracted relevant features for further analysis.
- Developed novel methods for extracting and analyzing urban spatio-temporal travel knowledge from the aspects transportation and travel demand.
- Assisted in fusing deep reinforcement learning and travel knowledge to build a smart operating model for electric unmanned networked vehicles, which includes intelligent matching of electric unmanned vehicles and individual travels; advance scheduling of idle unmanned vehicles; Charging arrangements for electric unmanned vehicles.
- Led the development of a web application for visualizing spatio-temporal data and models using react.js, mapbox and deck.gl.

Publications

GUO Xin, ZHANG Yixuan, **YI Shengao**, et al. Research on the Selection Mechanism and Quality Matching System of Frequently- Used Pedestrian Streets: Taking Shenzhen as an Example[J]. South Architecture, 2023(7): 55-65.

GUO Xin, ZHAO Lifang, ZHANG Yixuan, **YI Shengao**, et al. Urban design oriented assessment of area-based traffic congestion: A case study of Shenzhen’s metro station core area[J]. Design Community, 2023(02):12-23.

International Journal of Geographical Information Science Journal Paper is Under Review: Deep online recommendations for connected E-taxis by coupling trajectory mining and reinforcement learning.

Horns & Awards

- **International Award:** Third Prize of 2022 Smart City Research and Innovation Scheme (SCRIS). July. 2023
- **School Award:** 2022 Excellent Graduation Thesis. Jun. 2022
- **National Award:** The Third Prize of 2021 Super Map Cup University GIS Competition. Oct. 2021
- **Software Copyright:** Electric Unmanned Networked Fleet Intelligent Operation and Monitoring Prototype System. Jul. 2021
- **Software Copyright:** Parade Car and Online Car-hailing Operation Analysis System. Jul. 2021
- **National Award:** The Fourth Winner of Big Data Track Creativity Award in 2020 Digital China Innovation Competition. Oct. 2020

Skills Summary

- Languages:** Python, C++, JavaScript, R
- Frameworks:** TensorFlow, React.js, Flask, NodeJS, Kelper.gl, Deck.gl, Mapbox
- Tools:** Docker, GIT, PostgreSQL, MySQL
- GIS Software:** ArcGIS, QGIS, Envi