Ma Tianhao (Ryan Ma)

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Master's student specializing in urban design and transport at The University of Hong Kong. Passionate about applying spatial analysis and data science to solve complex transportation and urban planning challenges.

EDUCATION

The University of Hong Kong **Hong Kong**
Master of Science in Urban design and Transport *Expected June 2027*

Chang'an University **Xi'an, China**
Bachelor of Engineering in Traffic Engineering *September 2021 - June 2025*

- GPA: 86.06/100.00
- Relevant coursework: Road Capacity Analysis, Discrete Mathematics, Operations Research and Traffic Systems Analysis, Python Programming, Traffic Engineering, Transportation Economics, Transportation Terminals, Principles of Urban Planning, Traffic Safety Engineering and Highway Facility Design, Transportation Planning, Traffic Design, Public Transportation

INTERNSHIP EXPERIENCE

Shenzhen Urban Planning and Design Institute **Shenzhen, China**
Intern, Second Municipal Engineering Institute *July 2024 - August 2024*

- Contributed to the design of road intersections for parts of the area in the "Shenzhen Bay Super Headquarters Base Municipal Transportation Infrastructure Project"
- Assisted road engineers in designing and modifying CAD drawings for road intersections, ensuring accuracy and compliance with standards, and verified ground building numbers on area plans
- Supported department leaders in preliminary project review meetings by managing the venue, distributing technical drawings to experts, and recording and summarizing their feedback
- Applied theoretical knowledge from traffic design courses to adjust lane widths and curve radii, enhancing the safety and feasibility of a complex intersection, which was recognized by the engineers
- Enhanced AutoCAD skills through practical experience, identified and resolved a critical marking issue that improved vehicle flow, and demonstrated effective cross-departmental communication by coordinating with the architectural team to correct building number discrepancies

PROJECT EXPERIENCE

Spatial Analysis of Jobs-Housing Relationship in Hong Kong's Northern Metropolis **Hong Kong**
Core Team Member *September 2025 - December 2025*

- Performed geographically weighted regression (GWR) analysis on four employment categories using integrated census data, Foursquare POIs, and transportation network data, demonstrating GWR's superior explanatory power ($R^2 > 0.5$) over OLS models and identifying significant spatial heterogeneity in variable impacts
- Analyzed spatial autocorrelation patterns and local R^2 distributions, revealing core-periphery explanatory patterns and quantifying variable significance across geographic areas
- Generated 2033 job distribution predictions for Hung Shui Kiu/Ha Tsuen New Development Area and developed policy recommendations for transit-oriented development and multi-center urban structure, directly informing Northern Metropolis Action Agenda planning strategies

Comprehensive Traffic Design Project at Yuxiang Gate Intersection **Xi'an, China**
Core Team Member *May 2024 - June 2024*

- Drew the overall layout plan for the Yuxiangmen intersection, utilizing CAD software to ensure precise and compliant design, adhering to road engineering and urban intersection design standards
- Designed traffic organization and signage for the intersection, considering traffic flow, lane configuration, and capacity, applying principles from traffic engineering and traffic control systems
- Wrote sections of the design report, documenting the design process, rationale, and adherence to relevant standards, demonstrating strong technical writing and research skills

Optimization of Channelization Design and Signal Control Plan for the Intersection of Fengcheng 7th Road and Weiyang Road **Xi'an, China**

Core Team Member *October 2023 - December 2023*

- Collected and analyzed traffic data, including volume, speed, and lane occupancy, using Excel and MATLAB for processing and statistical analysis, providing a foundation for signal optimization
- Developed traffic flow simulation models using VISSIM software to simulate and evaluate traffic conditions on road segments and intersections, demonstrating proficiency in simulation modeling and software operation
- Designed and optimized traffic signal control plans, incorporating simulation results to adjust signal timing, enhancing traffic efficiency and safety, utilizing in-depth knowledge of signal control theory and tools like Signal 4.0

EXTRACURRICULAR COMPETITIONS

Research on Overloaded Freight Vehicle Tire Classification and Recognition Using Computer Vision **Xi'an, China**

Core Team Member *July 2023 - April 2024*

- Contributed to provincial-level innovation project, developing tire classification and recognition system for overloaded freight vehicles using computer vision, enhancing road safety and efficiency
- Participated in project planning and design, documented research, and assisted in data collection, model training, validation, and result analysis, improving model generalization and practicality
- Integrated YOLOv8 and ResNet models for real-time detection and deep feature extraction, achieving high accuracy and robustness in complex traffic scenarios, and enabling automated, non-contact weight estimation, reducing reliance on traditional weighing devices

Research on Secondary Traffic Accident Early Warning Device Using Computer Vision Technology **Xi'an, China**

Core Team Member *June 2022 - May 2023*

- Participated in a national-level innovation project to develop a real-time secondary traffic accident early warning device using computer vision, enhancing traffic management and road safety
- Collected, organized, and analyzed project data using Python, identified accident patterns and trends with statistical tools, and supported the team in data-driven decision-making and project optimization
- Concluded the project with a utility model patent, improving the accuracy and response speed of the early warning system compared to traditional sensors, and providing intelligent management support for traffic authorities to optimize urban traffic management

2023 MCM/ICM Meritorious Winner **Xi'an, China**

Core Team Member *May 2023*

- Researched future trends of the online word game Wordle, predicting engagement changes and factors affecting player scores. Utilized CNN-LSTM to forecast solve distribution of specific words and EWM-TOPSIS decision tree for difficulty classification
- Processed and visualized data in Python, ensuring accuracy and presenting results intuitively through charts, and authored the introduction and model analysis sections of the paper, providing research background and methodology
- Successfully predicted Wordle engagement, found no significant correlation between word attributes and player scores, achieved high accuracy with CNN-LSTM, and used EWM-TOPSIS to classify word difficulty, revealing letter frequency and combination patterns

SKILLS & INTERESTS

- Languages: Chinese Mandarin (Native), English (Fluent)
- Technical skills: Python, ArcGIS PRO, Gis PRO, CAD, MS Office, Adobe illustrator, VISSIM
- Interests: Tennis, Go-Karting, Badminton, Swimming