KAIZHEN TAN

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EDUCATION

Carnegie Mellon University Aug. 2025 - Aug. 2026
M.S. in Artificial Intelligence Systems Management *Pittsburgh, United States*

Tongji University Sept. 2021 - Jun. 2025
B.S. in Information Management and Information System *Shanghai, China*

- GPA: 90.24/100, 3.94/4.0 (WES Certified)
- Relevant Coursework: Data Structures | System Design | Database Application | Data Mining | Deep Learning

PUBLICATIONS

Huan, W., **Tan, K.**, Liu, X., Jia, S., Lu, S., Zhang, J., Huang, W. (2025). A spatiotemporal adaptive local search method for tracking congestion propagation in dynamic networks. *GIScience & Remote Sensing*. Under review.

Tan, K., Wu, Y., Liu, Y., & Zeng, H. (2025). A multidimensional AI-powered framework for analyzing tourist perception in historic urban quarters. In *Proceedings of the Global Smart Cities Summit cum The 4th International Conference on Urban Informatics (GSCS & ICUI 2025)*. Accepted.

Tan, K. (2025). Multimodal deep learning for ATCO command lifecycle modeling and workload prediction. In *Proceedings of the 2025 7th Asia Conference on Machine Learning and Computing (ACMLC 2025)*. Accepted.

RESEARCH EXPERIENCES

Modeling and Optimization of Air Traffic Management at Changi Airport Sept. 2024 - Dec. 2024
*Research Intern, Advisor: Dr. Yicheng Zhang, Dr. Sheng Zhang, A*STAR* *Singapore*

- Established a behavioral model for air traffic controllers to predict communication tasks and optimize workload using radiotelephony communication and aircraft trajectory data.
- Collected and cleaned historical and real-time air traffic data from various sources, conducted exploratory analysis to identify patterns, trends, and anomalies, and utilized statistical methods and visualization tools to uncover insights into traffic density, peak times, and common routes.
- Analyzed factors affecting air traffic, such as weather, airspace restrictions, and airport capacity; developed a hybrid CNN-transformer model to test various scenarios and strategies for efficient air traffic management.

Analysis of Tourists' Focal Preferences and Recreational Experience Jan. 2024 - Dec. 2024
Research Assistant, Advisor: Prof. Yujia Zhai, Tongji University *Shanghai*

- Assessed tourists' perception of historic urban quarters in Shanghai using deep learning methods.
- Crawled travel reviews from social media, integrated the SAM model for automatic labeling to form a training dataset, and developed a semantic segmentation model for focal point extraction by fine-tuning SOTA models.
- Categorized building facade colors using fuzzy quantization method, compared dominant colors in travel photos with actual street views, and analyzed tourists' preferences and expectations for urban street color schemes.
- Applied named entity recognition and sentiment analysis to calculate satisfaction scores for various dimensions (Activities, Built environment, Facilities, Business types) and employed BERT for multi-task learning.

Spatio-temporal Traffic Congestion Propagation Patterns Modelling Apr. 2024 - Sept. 2024
Research Assistant, Advisor: Prof. Wei Huang, Tongji University *Shanghai*

- Modeled traffic congestion propagation patterns (TCPP) using geospatial-temporal-semantic knowledge graphs.
- Mapped Shanghai's taxi trajectory data to real roads, calculated traffic state index to identify congestion, and built feature-embedded graphs by fusing node curvature, degree, spatial proximity, and semantic information.

- Proposed a novel spatiotemporal adaptive local search (STALS) method to track the propagation of traffic congestion by identifying multi-scale communities in the dynamic adjacency matrices.
- Identified the causality and correlation between TCPP and built environment by using causal inference and calculating weighted values of POIs within each buffer, and quantified the impacts through propagation probabilities.

CFGPT: Chinese Financial Generative Pre-trained Transformer Framework Jan. 2024 - Apr. 2024
Research Assistant, Advisor: Prof. Dawei Cheng, Tongji University *Shanghai*

- Established the datasets of CFGPT, an open-sourced Chinese financial large language model (LLM), and contributed to model refinement as a prompt engineer.
- Collected online financial content using distributed crawlers, filtered texts with regular expressions, banned word lists, and locality-sensitive hashing algorithm, to assemble a pre-training dataset.
- Designed text prompts for further supervised instruction tuning, enhancing the model's generalization ability across 6 specific downstream financial tasks, such as sentiment analysis, topic decomposition and stock prediction.
- Crafted real-world financial application cases to provide textual support for retrieval-augmented generation (RAG).

ACADEMIC PROJECTS

Pavement Disease Recognition Using Object Detection (AI Competition) Sept. 2023 - Nov. 2023
Member *Nanjing*

- Optimized YOLOv8 by enhancing small-target recognition and replacing the loss function with Wise-IoU.
- Increasied F1 by 26.3% and mAP50-95 by 25.1%, winning the Second Prize at national level (top 5%).

Design of a Medical Information Service Platform Website Jun. 2023 - Aug. 2023
Leader *Shanghai*

- Developed a medical service platform with Django and MySQL.
- Built an algorithm for personalized hospital recommendations based on symptoms and location.

Agent-based Modeling and Simulation System for Library Seat Selection Jun. 2023 - Aug. 2023
Leader *Shanghai*

- Collected data on reader behaviors, applied clustering & fuzzy analytics hierarchy process (FAHP) analysis.
- Built an AnyLogic-based simulation system; achieved 0.87 grey correlation.

INTERNSHIP

Shanghai Artificial Intelligence Lab Jan. 2025 - Jun. 2025
AI Product Manager Intern *Shanghai*

- Conducted end-to-end market research and competitive analysis for AI products (e.g., Migo, Auto-Research), benchmarking against 50+ vertical tools and delivered 5+ analytical reports to guide product positioning.
- Built operational data dashboard tracking KPIs, enabling granular analysis of user retention and behavior funnels.
- Established evaluation frameworks for Migo's InternLM model, enabling data-driven iteration cycles.

Shanghai Qiantan Emerging Industry Research Institute Jan. 2023 - Feb. 2023
Data Analyst Intern *Shanghai*

- Scraped global think tank data and performed NLP-based trend analysis.
- Conducted an industrial study using clustering and association algorithms.

SKILLS

Languages: IELTS 7.5 (L:9, R:8.5, W:6.5, S:6), GRE 331 (V:161, Q:170, AW:3)
Programming & Tools: Python, C++, C#, Java, HTML, SQL, Git, Docker, Tableau, ArcGIS, Stata
Coursera Certificates: IBM Data Science Specialization, Stanford Machine Learning Specialization