

HANYANG TANG

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Education	• Massachusetts Institute of Technology Sep 2024 – Present <i>Master of Science in Transportation, expected 2026 GPA: 5.0 / 5.0</i> ◦ Coursework: Transportation Planning, Deep Learning, Modeling & Simulation, Demand Modeling • National University of Singapore Aug 2019 – Dec 2023 <i>Bachelor of Science, Business Analytics (Machine Learning), First Class Honors GPA: 4.77 / 5.0</i> <i>Bachelor of Social Science, Economics (Quantitative Economics), First Class Honors GPA: 4.89 / 5.0</i> ◦ Coursework: Linear Algebra, Probability & Statistics, Data Structures & Algorithms, Database Systems, Big Data Systems, Intelligent Systems, Econometrics, Time Series Forecasting, Geospatial Analytics.
Research	• DC Student Travel Sep 2024 – Sep 2026 <i>MIT Transit Lab × Washington Metropolitan Area Transit Authority (WMATA)</i> <i>Manuscripts in preparation for Transportation Research Part C and Part A.</i> ◦ Developed WMATA's first stop-level, event-driven ridership inference pipeline by fusing automatic passenger counts with school calendars and bell schedules under incomplete fare validation. ◦ Built PASS, a synthetic population and assignment framework integrating Census microdata, school enrollment, and privacy-suppressed OD data; generated 90,000+ home-school assignments using KL projection and entropy-regularized transport; achieved strong agreement with external validation targets. ◦ Conducted a systematic policy evaluation of three WMATA bus-network scenarios using bell-time-constrained routing to quantify systemwide and subgroup changes in scheduled school accessibility. • VIGO: Open-Source Transit Routing Engine Jun 2026 – Present ◦ Built a high-performance routing engine using Customizable Contraction Hierarchies for streets and the Connection Scan Algorithm for transit; developed an integrated desktop environment for GTFS network visualization, point-to-point routing and accessibility analysis. (TR-C manuscript in preparation) ◦ Measured median core timetable-routing latency of 0.627 ms in Boston and 0.644 ms in Washington, DC, on network inputs with up to 14.9 million OSM nodes. ◦ Formulated NGRP, a generalized activity-chain planning framework for jointly optimizing destination choice and routing across sequential activities via LLM-based task formulation and deterministic routing. • Optimal Bidding Overtime Strategy for Online Art Auctions Jan 2023 – Nov 2023 <i>NUS Honors Thesis ICIS 2024 Best Student Paper First Runner-Up Outstanding Undergraduate Research Project</i> ◦ Partnered with six art auction houses; assembled a dataset of 1,800 lots, estimated bidding dynamics using econometric and structural models, and evaluated alternative overtime strategies through Monte Carlo simulation. Recommendations were adopted by partner auction houses.
Engineering & Industry	• VEXTA: Integrated Research Workspace vexta.cc Apr 2026 – Present ◦ Built a local-first research workspace for LaTeX, Markdown, Typst and notebooks, with near-instant rendering, Git-based version control, collaboration, algorithm and citation review, and publication export. ◦ Developed LLM-assisted research workflows using Qwen and OpenAI-compatible models for document editing, autonomous research, question answering, and structured review across project materials. • MapEX: Schematic Transit Map Generation Jun 2026 – Aug 2026 ◦ Built a Python system that converts GTFS into editable schematic transit maps, enabling agencies to rapidly generate, revise and publish network maps in SVG/PDF/HTML formats; demonstrated robust topology performance across 30 systems, including New York, Madrid, and Tokyo. (Submitted to TRB) • Land Transport Authority Singapore Jan 2023 – May 2023 <i>Information System Developer (Capstone Project)</i> ◦ Built an internal finance operations platform with interactive analytics dashboards and workflow automation for LTA Finance's cashflow management team (Python, Django, Plotly.js, VBA), leading to a ~10x increase in efficiency. • Shanghai Airport Authority Jul 2021 – Aug 2021 <i>Information Technology Executive (Intern)</i> ◦ Prototyped CCTV-based passenger and baggage detection with exploratory passenger-baggage association using OpenCV and YOLOv4.
Teaching	• NUS Department of Economics Aug 2022 – Nov 2022 ◦ Undergraduate TA, EC2102 Macroeconomics I; led two tutorial sections (~50 students) and exam preparation.
Skills	• Methods: Urban mobility • Scalable data systems • Machine learning • Simulation • Generative AI • Programming: Python • SQL • Rust • JavaScript • Java • R • Global experience: 62 countries, 160+ cities and transit systems; 141 airlines