Thomas (Zih Kuan) Chuang

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Education

University of California, Berkeley Aug 2025 – May 2026
Concurrent Enrollment Student, Computer Science Berkeley, CA
- Relevant Coursework: CS 61C (Machine Structures), CS 162 (Operating Systems), Data 100 (Data Science)
- Planned Coursework: CS 164 (Compilers), CS 161 (Computer Security)

National Chengchi University Sep 2020 – Jun 2026
B.A. Risk Management and Land Economics; Minor in Management Information Systems Taipei, Taiwan
- GPA: 3.86/4.00 | CS Field GPA: 3.98/4.00
- Relevant Coursework: Data Structures (A+), Algorithms (A+), DBMS (A+), Software Engineering (A+)

Peking University Feb 2024 – Jun 2024
Exchange Student Beijing, China
- Relevant Coursework: Deep Learning Models and Applications, Data Visualization

Professional Experience

Ultralytics Aug 2024 – Present
Associate Software Engineer / AI Research Engineer Remote
- Architected real-time collaboration via FastAPI WebSockets and Redis, enabling concurrent multi-user editing with sub-100ms latency.
- Engineered distributed state management (optimistic locking, ETags) to resolve conflicts and ensure integrity during race conditions.
- Integrated Segment Anything Model (SAM) for auto-labeling, reducing manual annotation time by 40% for vision datasets.
- Orchestrated CI/CD pipelines for the open-source repository (48.5k+ stars), automating testing and release cycles for global users.

Esri R&D Center Apr 2024 – Aug 2024
Product Engineer Intern Beijing, China
- Optimized ArcGIS Earth 3D rendering, identifying bottlenecks to reduce frame drops and improve interaction latency.
- Prototyped a GPT-4o powered geospatial assistant, implementing NLP to automate SQL queries and map generation.
- Enhanced product reliability via rigorous regression testing and code reviews, ensuring stability for enterprise deployments.

Research Experience

Academia Sinica Jul 2023 – Dec 2024
Undergraduate Researcher (PI: Dr. Chiao-Ling Kuo) Taipei, Taiwan
- Spearheaded research integrating YOLOv5 and SAM, achieving automated feature extraction for historical cartography.
- Engineered a full-stack vectorization system (Flask, PostgreSQL, Docker, OpenLayers) for interactive map verification.

Selected Publications and Awards

- **Chuang, T.**, & Kuo, C.-L. (2024). Feature Recognition and Vectorization of Historical Maps of Taiwan Using YOLOv8. *Proceedings of the Taiwan Geographic Information Society (TGIS) Annual Conference* — Best Paper Award.
- **Chuang, T.**, & Kuo, C.-L. (2023). Historical map image recognition based on YOLOv5 and integrated with the Segment Anything model for digitalization. Presented at the *Chinese Cartographic Association (CCA) Annual Conference*.
- **Chuang, T.**, Huang, Y.-N., & Xiong, H.-C. (2023). Where to Open the Next Convenience Store? Spatiotemporal Analysis of Taipei Stores. *GeoDigital Life: Spatial Digital Living* — Invited student article selected by TGIS & the Ministry of the Interior, Taiwan.

Technical Skills

- Languages: Python, TypeScript/JavaScript, SQL, C/C++, R, Rust
- Frameworks/Tools: FastAPI, Flask, Node.js, React, Docker, K8s, Redis, Kafka, Jenkins, AWS, GCP, Git
- ML/GIS: PyTorch, YOLOv8, Segment Anything (SAM), OpenLayers, ArcGIS

Leadership

- **President**, Land Economics Student Association (NCCU): Led 8-member team, organized Urban Planning Forum.
- **Head TA**, AI in Business Applications (NCCU): Led 60+ students, guided TensorFlow projects.
- **Technical Writer**, Medium: Authored 10+ articles on Spatial Analysis (11k+ views).