

Sizhe(Alex) Xu


Portfolio: mazeltovy.github.io
Github: github.com/MazelTovy

Location: New York, NY
Email: sx2490@nyu.edu
Mobile: (347)-712-0812


EDUCATION

- New York University** Sept 2024 - June 2026
 - Master of Science - Applied Urban Science and Informatics
 - Courses:** Urban Computing & AI, Applied Data Science, Computer Vision, Large Language and Vision Models
- Dalian Jiaotong University** Sept 2020 - June 2024
 - Bachelor of Engineering - Electronic Engineering
 - Courses:** Analog Electronics, Object-Oriented Programming, Algorithm Design, Machine Learning



RESEARCH

- A Hybrid Framework for Evaluating and Enhancing Syntactic and Semantic Diversity**  First Author, Association for Computational Linguistics (ACL) Under Review Sept 2024 - Feb 2025
 - Framework:** Designed and implemented a hybrid framework integrating probabilistic generative models with LLMs for synthetic data generation in low-resource scenarios.
 - Innovation:** Pioneered reference-free metrics for syntactic and semantic diversity evaluation, eliminating dependency on gold standards; leveraged LLMs for realistic text refinement while maintaining semantic integrity.
 - Performance:** Enhanced downstream classification with 13% F1-score improvement; generated text achieved higher human evaluation scores for naturalness and fluency while preserving key linguistic patterns.
- Intelligent School District Advisory Service** Guided Study Dec 2024 - Present
 - NYU Center for Urban Science and Progress
 - Data Engineering:** Designed scalable ETL pipeline for processing and integrating 15+ diverse educational datasets; implemented data quality monitoring with Great Expectations and optimized PostGIS queries for spatial joins.
 - Geospatial Analysis:** Developed interactive platform visualizing geographic and school performance data; implemented Gemini-powered recommendation system for personalized school selection advice.

EXPERIENCE

- Global Data Dive Competition - Skyline & Sustainability**  New York, NY Feb 2025
 - Best Technical Contribution Award Winner
 - Advanced LLM Integration:** Implemented LLaMA-3-8B model with custom RAG architecture for real-time building energy efficiency analysis; optimized vector retrieval for 3D building data querying and developed prompt engineering techniques for domain-specific responses.
 - Urban Sustainability Platform:** Created interactive 3D visualization of NYC buildings with energy compliance metrics; built end-to-end solution for policymakers and investors to assess sustainability impact through natural language queries and geospatial analytics.
- SnowFox Technology Co., Ltd.** Remote Dec 2022 - Apr 2024
 - Embedded System Developer (Intern)
 - Motion Capture & Real-time Processing:** Developed sensor fusion firmware for STM32F4 microcontrollers with MPU9250 9-DoF IMU arrays; implemented multi-rate EKF and quaternion-based orientation estimation with 200Hz sampling and efficient fixed-point computation for power-constrained wearable devices.
 - 3D Visual Analytics:** Created real-time biomechanical analysis pipeline with Unity HDRP renderer, IK solver optimization, and TensorFlow Lite for edge-deployed BiRNN movement classification (96.4% accuracy); integrated performance metrics dashboard and RESTful API for cloud synchronization through AWS IoT Core.
 - Impact:** Deployed at 5 ski resorts, increasing user satisfaction by 50% and expanding customer base over 1,000 users.

PROJECTS

- Multi-modal Context-aware RAG System** Dec 2024 - Present
 - Developed RAG system handling text, images, and structured data with hybrid search and hallucination detection.
 - Tech:** LangChain, Pinecone, FAISS, HuggingFace Transformers, CLIP
- Small Object Image Segmentation**  Mar 2024 - June 2024
 - Active contour framework integrating improved YOLOv8, enhancing boundary precision and segmentation accuracy.
 - Tech:** Python, PyTorch, OpenCV, YOLOv8, FPN, EMA, TensorRT
- TinyTikTok**  July 2023 - Oct 2023
 - Minimalistic TikTok backend with user authentication, uploading, liking, commenting, following, and messaging.
 - Tech:** Golang, Gin, MySQL, Redis, RabbitMQ, OSS, Nginx, Keycloak

HONORS AND AWARDS

- Best Technical Contribution Award - Global Data Dive Competition - Feb, 2025
- Finalist of NYU CUSP Public Data Challenge - Oct, 2024
- First Prize of National Intelligent Car Competition - Aug, 2024
- Bronze Medal in the China Collegiate Programming Contest (CCPC) - Oct, 2023