

Zijie Xu

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EDUCATION

University of Michigan

Bachelor of Science in Data Science | GPA: 3.78/4.00

Ann Arbor, MI

Aug. 2024 – May 2027

Relevant Coursework: Data Structures & Algorithms, Practical Data Science, Machine Learning, Web Systems, Probability & Statistics, Applied Regression, Data Mining, Computer Vision, Database Management Systems

EXPERIENCE

Computer Vision Lab, Michigan State University

East Lansing, MI

Research Assistant

May 2025 – Aug 2025

- Created object-masked evaluation pipelines by integrating MaskDINO segmentation outputs into unified foreground masks for monocular depth estimation on KITTI and DDAD datasets.
- Performed range-based evaluations of Metric3D and UniDepth across depth intervals, revealing a 15–20% accuracy drop beyond 30 meters and highlighting limitations in long-range depth estimation.
- Compared full-image and object-masked evaluations on KITTI and DDAD, identifying accuracy trade-offs between global scene estimation and foreground objects.
- Utilized PyTorch, NumPy, and OpenCV for model evaluation, data preprocessing, performance metric computation, data analytics, and visualization.

ARTIST Group, University of Michigan

Ann Arbor, MI

Research Assistant

May 2025 – Present

- Built a Python data pipeline using the OpenRouteService API to calculate transport distances from cement plants to major cities across states, increasing data precision and completeness by 20%.
- Implemented a greedy minimum-cost flow algorithm to optimize cement distribution and reduce transportation-based carbon emissions across states.
- Analyzed 40+ samples of XANES data with Python to extract absorption features into a structured dataset for future model training and cutting manual data processing time by over 80%.

PROJECTS

VoiceLink | React, TypeScript, Python, MediaPipe

- Developed a real-time facial and head gesture recognition web app using MediaPipe and Python back-end processing, enabling users with motor impairments to interact with the world hands-free.
- Implemented gesture-based controls in React for app navigation and task execution via browser event handling.
- Collaborated efficiently in a fast-paced, cross-functional team to integrate front-end and back-end modules and deliver a fully functional demo within 24 hours for MHacks 2025.

League of Legends FF at 15? | Python, pandas, NumPy, scikit-learn, Plotly

- Cleaned and preprocessed 117K+ rows of pro-play match data, filtering and encoding features for model training.
- Applied supervised machine learning techniques including logistic regression, feature engineering, and classification modeling to predict match outcomes at 15 minutes of game time.
- Optimized model hyperparameters via GridSearchCV, achieving a testing recall of 0.76 and accuracy of 74%, improving from 0.59 recall and 64% accuracy baseline.

Natural Language Image Editor | Python, PyTorch, Gemma, GroundingDINO, SAM, Stable Diffusion

- Designed a modular AI language-vision pipeline where Gemma LLM parses natural language instructions into structured JSON directives for downstream edit execution through prompt engineering.
- Integrated GroundingDINO and SAM for zero-shot object detection and high-precision segmentation, enabling targeted region masking.
- Implemented Stable Diffusion inpainting to perform semantic edits via masked latent diffusion.

TECHNICAL SKILLS

Languages: Python, C++, Java, JavaScript, SQL, R, HTML/CSS

Frameworks: Spark, React, Flask, REST APIs

Libraries: PyTorch, scikit-learn, pandas, NumPy, OpenCV, MediaPipe, Matplotlib, seaborn

Developer Tools: Git, GitHub, AWS, VS Code, Jupyter Notebooks