Xiang Li

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Education

University of Chicago Sep. 2023 – Mar. 2025
M.S Computer Science *Chicago, IL*

Sichuan University-Pittsburgh Institute Sep. 2019 – Jun. 2023
B.S Industrial Engineering | Dean's List (5%), Outstanding Graduate (7%) *Chengdu, China*

Research Experience

Geometry-based trajectory analysis for LLM confidence prediction Mar. 2025 – Present
Research Assistant | Advised by Prof. Jiawei Zhou *Chicago, IL*

- Developed geometry heuristic metrics on hidden-state trajectories to predict LLM generation correctness without ground-truth labels, outperforming SOTA methods.
- Analyzed activation patterns as high-dimensional "images" across token, layer, and dimension axes, identifying anomaly signatures for hallucination/correctness detection.
- Applied a compact, physics-inspired metric suite for correctness detection, revealing distinct trajectory signatures of reasoning modes and improving AUROC by 8% on seven datasets over Strong Baseline.

Unsupervised cluster-as-lens for LLMs Mar. 2025 – Present
Research Assistant | Advised by Prof. Jiawei Zhou *Chicago, IL*

- Developed layer-wise clustering in hidden-state space to track cluster emergence/splitting/merging across depth, revealing concept formation and information bottlenecks.
- Identified cluster transitions to improve hallucination detection, safety checks, and knowledge editing.

Time-series forecasting of emergency department visits Jun. 2022 – Jul. 2023
Research Assistant | Advised by Prof. Yang Liu *Chengdu, China*

- Integrated ED visits (2019–2021) with weather, air-quality, and COVID-19 data for time-series forecasting.
- Benchmarked 10+ models, including traditional ML (SVM, Random Forest) and time-series methods (ARIMA, LSTM), identifying a hybrid **VMD-LSTM** model as best-performing (**MAPE 5.29%, RMSE 51.89**).
- Optimized VMD-LSTM via hyperparameter tuning and covariate analysis; ran sensitivity and scenario analyses to assess robustness and support ED capacity/staffing planning.

Publications

Study on the optimization of emergency medical staff regional dispatch considering the ratio of doctors and nurses **ISAIMS 2022**
Li Luo, Yiting Luo, Yuyu Geng, **Xiang Li**, Yuanchen Fang, and Yipeng Yang.

Projects

End-to-end Cell Recognition via BERT-style Translation Sep. 2025 – Present

- Designed a BERT-style Transformer that represents 3D cell point clouds as token sequences, using **masked point modeling** and **contrastive learning** for self-supervised pre-training on synthetic high-overlap cell pairs.
- Built an encoder–decoder that translates point clouds directly to cell identities, achieving **AUROC $>$ 0.85** with **$\sim$1 ms** inference latency per cell, removing the need for traditional multi-stage cell tracking pipelines.

Teaching Experience

Teaching Assistant, MPCS 52060 Parallel Programming, UChicago Jan. 2025- Mar. 2025, Sep. 2025 – Present
Teaching Assistant, Engineering Management, SCU Sep. 2022 – Jan. 2023
Teaching Assistant, Probabilistic Methods in Operations Research, SCU Feb. 2022 – Jun. 2022
Teaching Assistant, Statistical Testing and Regression, SCU Sep. 2021 – Jan. 2022

Honors & Awards

Outstanding Graduate Student Award (**Top 10%**), Sichuan University (2023)
Dean's List (**4/78**), Sichuan University (2022)
Outstanding Student Leader Award, Sichuan University (2019, 2020, 2021)
University-Level Comprehensive Scholarship, Sichuan University (2020, 2021)

Skills

Programming: Python, Java, C, Golang, SQL, Latex
Tools & Frameworks: PyTorch, Hugging Face Transformers, Docker, vLLM, Slurm