Xuanran Li

Shenzhen, China | Undergraduate Student | 12312110@mail.sustech.edu.cn

EDUATION

Southern University of Science and Technology, SUSTech Sept. 2023 - Jun. 2027
Undergraduate in Mathematics and Applied Mathematics Shenzhen, China

- **GPA:** 3.62/4 **Weighted Average Score:** 87.23/100
- **Coursework (CS track):** Digital Logic, Data Structure and Algorithm Analysis, Algorithm Design and Analysis, Artificial Intelligence, Deep Learning, Operating Systems, Principle of Database Systems, Advanced Natural Language Processing (*Graduate*)

RESEARCH EXPERIENCE

Research Assistant, Department of Computer Science and Engineering, SUSTech Jun. 2025 - Present
Advisor: Associate Professor Ming Tang

Learning without Global Backpropagation via Synergistic Information Distillation.
Xuanran Li*, Wentao Dai*, Yuxiang Zhang, Zixuan Wang, Ming Tang†, Chao Huang†. [NeurIPS'26, under review]

- Proposed SID, a BP-free training paradigm that reformulates DL as sequential local belief refinement. It adresses update locking problem and allows modules to be trained in parallel, reducing activation-memory overhead while preserving the standard feed-forward inference pipeline.
- Constructed a refined framework that separates depthwise refinement dynamics from timewise optimization; formalized and controlled teacher-bias and realization-error perturbation terms, and derived both convex convergence and nonconvex stationarity guarantees.

SFL-DiMask: Split Federated Learning with Gradient-Saliency Masking for Domain Generalization.
Shuo Wang, Guanghao Li, **Xuanran Li**, Ming Tang†, Chao Huang†. [ACM MM'26, under review]

- Proposed a new FL framework, SFL-DiMask, which splits the model, enabling clients to only train the front part and upload intermediate representations. Proposed the GSM algorithm, which constructs saliency scores and generates personalized masks for clients to precisely suppress domain-specific features.
- **Personal work:** Used the mutual information theory to characterize the problem of domain information leakage in the representations of the cutting layer. Proposed and proved that GSM can effectively suppress domain features while maintaining task information, theoretically explaining and supporting the cross-domain generalization ability of the proposed GSM algorithm.

PROJECT

Innovative LLM-based Educational Copilot Nov. 2025 - Dec. 2025

- Designed and implemented a three-stage cascading agent system for a STEM education copilot based on Qwen2.5-7B model.
- Built synthetic SFT and preference datasets and curated high-quality training data with semantic deduplication and max-min diversity sampling.
- Completed the post-training pipeline based on LoRA for both SFT and preference optimization, and improved training stability by applying early stopping, refining rejected-sample construction, etc.
- Evaluated the system with DeepSeek-v3 as an LLM judge across multiple dimensions achieving a 16.5% improvement in overall score, while identifying alignment tax in difficult mathematical reasoning tasks.

SKILLS

Natural Languages: Mandarin (Native), English (**IELTS 7**), Japanese (Conversational), Spanish (Elementary)

Programming Languages and Tools: Python (PyTorch framework), Java, C/C++, SQL, LaTeX

Mathematial Skills: Mathematical Analysis, Linear Algebra, Probability, Mathematical Statistics, Discrete Mathematics, Complex Analysis, ODE, PDE, Convex Optimization