Songning Lai

songninglai@hkust-gz.edu.cn ◇ Phone: +86-17660645997 ◇ xll0328.github.io

Educational Background

Shandong University Average score: 86.3

Bachelor's Degree in communications engineering & Chongxin College Honor Degree 2020.9 – 2024.7

- Core Courses: C Programming, Information theory and coding, Machine learning, Deep learning.

Research Experience

Shandong University Prof: Zhi Liu

Research intern on computer vision. 2022.4 - 2023.4

KAUST Prof: Di Wang

Remote research intern on Trustworthy AI. 2023.4 - 2024.4

The Hong Kong University of Science and Technology (Guangzhou) Prof: Yutao yue

Research Assistant on Trustworthy AI. 2024.4 - Present

Research Intrest

My primary research interest lies in the domain of Trustworthy AI, encompassing explainability, robustness, faithfulness, and safety of AI. Specifically, I have focused extensively on Concept Bottleneck Models (CBMs) within the realm of explainability. My past research includes an investigation into the robustness and generalization of CBMs in unsupervised settings (ICLR 2024), application of CBMs in multimodal contexts for unsupervised tasks (Under Review in AAAI 2025), pioneering work on continual learning with CBMs (ACM MM 2025), as well as the first exploration of CBMs in the context of security, particularly backdoor attacks (Under review 1; Under review 2). Furthermore, my research has extended to applying CBMs in medical fields (NeurIPS 2024; ECML 2025) and autonomous driving applications (ICRA 2025, IJCAI 2025).
Beyond my work with CBMs, I have also explored issues related to robustness and faithfulness in time series (ICML 2025; ACM MM 2025), continual learning for time series classification tasks (Under review), and image segmentation tasks (ACM MM25). Prior to these endeavors, my research efforts were directed towards computer vision (IVC; ICASSP 2025), multimodal sentiment analysis (IJCNN 2024; Displays), and community detection (Neurocomputing).

Publication

2025

- [Accepted&Oral] "Learning New Concepts, Remembering the Old: Continual Learning for Multimodal Concept Bottleneck Models [pdf]"
  Songning Lai, Mingqian Liao, Zhangyi Hu, Jiayu Yang, Wenshuo Chen, Hongru Xiao, Jianheng Tang, Haicheng Liao, Yutao Yue, **ACM MM 2025 Brave New Idea Track** (CCF A, Core A*) <BNI Papers are considered outstanding ACM MM full papers, and accepted BNI papers will apear in the main proceedings>.
- [Accepted] "From Guesswork to Guarantee: Towards Faithful Multimedia Web Forecasting with TimeSieve"
  Songning Lai, Ninghui Feng, Jiechao Gao, Hao Wang, Haochen Sui, Xin Zou, Jiayu Yang, Wenshuo Chen, Hang Zhao, Xuming Hu, Yutao Yue, **ACM MM 2025** (CCF A, Core A*).
- [Accepted] "DRIVE: Dependable Robust Interpretable Visionary Ensemble Framework in Autonomous Driving [pdf]"
  Songning Lai, Ninghui Feng, Jiechao Gao, Hao Wang, Haochen Sui, Xin Zou, Jiayu Yang, Wenshuo Chen, Hang Zhao, Xuming Hu, Yutao Yue, **ICRA 2025** (CCF B, Core A*).
- [Accepted] "Stable Vision Concept Transformers for Medical Diagnosis [pdf]"
  Lijie Hu*, **Songning Lai*** Yuan Hua, Jingfeng Zhang, Pan Zhou, Di Wang, **ECML-PKDD 2025** (CCF B, Core A).
- [Accepted] "IMTS is Worth Time X Channel Patches: Visual Masked Autoencoders for Irregular Multivariate Time Series Prediction [pdf]"
  Zhangyi Hu, Jiemin Wu, Hua Xu, Minqian Liao, Ninghui Feng, Bo Gao, **Songning Lai**, Yutao Yue, **ICML 2025** (CCF A, Core A*).

2024

- [Accepted] "Faithful Vision-Language Interpretation via Concept Bottleneck Models [pdf]"
  Songning Lai, Lijie Hu, Junxiao Wang, Laure Berti and Di Wang, **ICLR 2024** (Core A*).
- [Accepted] "Towards Multi-dimensional Explanation Alignment for Medical Classification [pdf]"
  Lijie Hu*, **Songning Lai***, Wenshuo Chen*, Hongru Xiao, Hongbin Lin, Lu Yu, Jingfeng Zhang, Di Wang, **NeurIPS 2024** (CCF A, Core A*).

Awards

- NeurPIS 2024 Travel Award
- ICRA 2025 Travel Award
- IEEE/EI (CISP-BMEI 2022) Best Paper Award
- Outstanding graduates of Shandong Province and Shandong University
- First Prize in China Undergraduate Mathematical Contest in Modeling **(Top 0.6%)**
- First Prize in MathorCup University Mathematical Modeling Challenge National **(Top 3%)**

Service

- Review service: ECAI2024, EMNLP2024, ESWA, IJCNN2024, ICML2024, KDD2024, ICLR2025, ICASSP2025, AISTATS2025, ACM Computing Surveys, CVPR2025, IJCNN2025, ICDM 2025, ACM MM2025, ICML2025
- Monitor of Chongxin School of Shandong University (the class was rated as excellent class of Shandong Province and Top Ten class of Shandong University), excellent graduate of Shandong University and outstanding graduate of Shandong Province
- Outstanding volunteer of Shandong University, with a total volunteer time of 120h

Skills

- Programming: Python, MATLAB, C.
- Machine Learning Frameworks: PyTorch, Scikit-learn.
- Data Analysis: Pandas, NumPy.
- Research Impact: Google Scholar Citations: 280+.