UNIVERSITY OF LIVERPOOL

Zihong Luo

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EDUCATION

The University of Liverpool (UOL)   Bachelor of Computing Science
Currently studying Year 2   *Expected June 2026*
- Liverpool, UK
- The average score in the Year 2 (Third year) was 83

Xi'an Jiaotong-Liverpool University (XJTLU) Bachelor of Science in Information and Computing Science
GPA: 3.75 out of 4.0   *Expected June 2024*
- SuZhou, China
- The average score in the freshman year was 73
- The average score in the Second year was 76

EXPERIENCE

Multi-modal Deletion Completion of OCT and Fundus Medical Images   Mar-Aug 2024
Summer Research Assistant, Supervised by Professor Yanda Meng   *University of Exeter*
- Developed the experimental setup and implemented the core code for an Incomplete Modality Disentangled Representation strategy.
- Disentangled features into modal-common and modal-specific components using mutual information and designed a joint proxy learning module to reduce intra-modality redundancy, enhancing multimodal representations and recovering missing semantics.
- Validated the approach across four ophthalmology datasets, achieving significant improvement over state-of-the-art methods.

Interpretable Machine Learning Models for Detecting Peripheral Neuropathy and Lower   2024
Extremity Arterial Disease
Research Contributor, Supervised by Professor Xiaoyun Xie   *TUSM*
- Developed machine learning models to predict diabetic peripheral neuropathy (DPN) and lower extremity arterial disease (LEAD).
- Performed data preprocessing and feature engineering to enhance model interpretability.
- Utilized SHAP values to identify critical shared and unique risk factors, aiding in diabetic foot ulcer (DFU) prevention.

A Deep Belief Network-Based Model for Modality Completion   Sep-Nov 2023
Research Assistant, Supervised by Professor Xiaobo Jin   *XJTLU*
- Developed a framework for handling incomplete multi-modal data using an encoder-decoder structure with attention fusion.
- Created two loss functions: one to improve the encoder's data completion accuracy and another to enhance data integration.
- Built an encoder-decoder model combining deep belief networks (DBNs) and attention mechanisms for better multi-modal data analysis.

A Multi-modal Time Series Analysis Model Based on Spiking Neural Network   Jun-Sep 2023
Research Assistant, Supervised by Professor Shuliang Zhao   *XJTLU*
- Developed a multi-modal pulse peak network for detecting heart rate anomalies.
- Integrated image and time series data to overcome limitations of single-modal approaches, achieving strong classification performance.
- Innovated the application of pulse peak networks in heart rate anomaly detection, enhancing speed and resource efficiency.

Projects

PG-SAM: Prior-Guided SAM with Medical for Multi-organ Segmentation 2025
- Processing in (**MICCAI2025**)
- Author List: Yiheng Zhong∗, **Zihong Luo**∗, Chengzhi Liu, Feilong Tang, Zelin Peng, Ming Hu, Yingzhen Hu, Jionglong Su, Zongyuan Geand, Imran Razzak
- PDF: <u>arXiv:2503.18227</u>

Incomplete Modality Disentangled Representation for Ophthalmic Disease Grading and Diagnosis 2024
- Accepted by The 39th Annual AAAI Conference on Artificial Intelligence (**AAAI2025**)
- Author List: Chengzhi Liu∗, Zile Huang∗, Feilong Tang, Yu Tian, Zhongxing Xu, **Zihong Luo**, Yalin Zheng, Yanda Meng
- Project: <u>Project Link</u>

ARIF: An Adaptive Attention-Based Cross-Modal Representation Integration Framework 2024
- Accepted by International Conference on Artificial Neural Networks(**ICANN2024**)
- Author List: Chengzhi Liu*, **Zihong Luo***, Yifei Bi*, Zile Huang, Dong Shu, Jiheng Hou, Hongchen Wang, Kaiyu Liang
- PDF: <u>arXiv:2306.16950</u>

MTSA-SNN: A Multi-modal Time Series Analysis Model Based on Spiking Neural Network 2024
- Accepted by International Conference on Pattern Recognition (**ICPR2024**) Paper ID: 978
- Author List: Chengzhi Liu*, **Zihong Luo***, Zheng Tao, Yitao Xu, Zile Huang
- PDF: <u>arXiv:2402.05423</u>

MC-DBN: A Deep Belief Network-Based Model for Modality Completion 2024
- Accepted by International Conference on Pattern Recognition (**ICPR2024**) Paper ID: 982
- Author List: **Zihong Luo***, Chengzhi Liu*, Zheng Tao, Heke Xin, Yitao Xu
- PDF: <u>arXiv:2402.09782</u>

Interpretable machine learning models for detecting peripheral neuropathy and lower extremity arterial disease in diabetics: an analysis of critical shared and unique risk factors 2024
- Accepted by BMC Medical Informatics and Decision Making
- Author List: Ya Wu, Danmeng Dong, Lijie Zhu, **Zihong Luo**, Yang Liu, Xiaoyun Xie
- PDF: <u>https://link.springer.com/article/10.1186/s12911-024-02595-z</u>

Technical Skills

Languages
- Python, Java, C++, Latex

Developer Tools
- Pytorch, Jupyter, Matplotlib, sklearns

Operating Systems
- Windows, Linux

Awards
- Participated in the Biology Olympiad 2022, won the Provincial First and National Second Prizes