

# Ziming Zhao

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## EDUCATION

University of Michigan, Ann Arbor, USA	01/2021-01/2023
MS in Information Science, School of Information   GPA: 3.9/4.0	
Shanghai Jiao Tong University, Shanghai, China	09/2017-08/2021
BS in Electronic and Computer Engineering   GPA: 3.55/4.0	

## RESEARCH INTERESTS

Graph Learning (Heterogeneous Graph & Hypergraph), Causal Inference, AIOps, Microservices System

## PUBLICATION

Liu, Y., **Zhao, Z. (co-first author)**, *et al.* *Exploiting Spatial-temporal Data for Sleep Stage Classification via Hypergraph Learning*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2024

## WORKING EXPERIENCE

**Machine Learning Engineer, Alipay, Alibaba**, Hangzhou, China 02/2023-Present  
**AIOps System Development**

- Built up the AIOps system focusing on root cause analysis for microservices in payment scenarios;
- Developed the anomaly detection model for runtime log data of the microservices with meta-learning and text auto-encoder technique;
- Developed multi-modal root cause analysis model based on Causal Discovery and customized Random Walk algorithm, which achieved a 95% Top-3 accuracy;
- Developed a microservice monitor platform to support customizing log patterns & trace topologies for real-time vulnerability scanning;
- Enhanced the online DevOps ticket service system with the Large Language Model and the Retrieval Augmented Generation technique, which reduced the average ticket solution time cost from 55min to 32min.

## RESEARCH EXPERIENCE

**Exploiting Spatial-Temporal Data for Sleep Stage Classification via Hypergraph Learning** 09/2023

- Proposed an adaptive hypergraph-learning framework (STHL), including dynamic hyperedge construction, hyperedge embedding update, and multi-head attentive node embedding update;
- Designed a learning process to simultaneously generate spatial and temporal hyperedges in order to learn from spatiotemporal data;
- Conducted a general comparison with latest STGCN models on sleep-stage classification tasks via ISRUC-S3 dataset, resulting in a performance gain of 3.7% in accuracy compared with state-of-the-art models;
- Completed the paper as the first author, which has been accepted by ICASSP 2024.

**Towards Practical Root Cause Analysis in Large-scale Microservice Systems via Causal Attention Graph** 06/2023

- Proposed a novel causal attention graph network for root cause analysis (CG-RCA) with the following components: the generation of causal direction graphs, GAT-based causal weight generation on multi-modal microservice data, root cause inference with customized PageRank;
- Evaluated CG-RCA through A/B testing in the System Integration Test environment of Alipay and the open-source GAIA dataset, improving Top-1 accuracy by 9.3%, Top-3 accuracy by 6.2;
- The paper will be submitted to ICSOC 2024 and the preprint version is now available.

## COMPETITION EXPERIENCE

**Metaprogramming Framework for Machine Learning Tasks** 12/2021

**Winner of Microsoft Student Hackathon**

- Developed a Graphics UI-based machine learning framework, which can be used to complete tasks from data preprocessing to model training by just dragging and dropping modules on frontend;
- Added a CRF-LSTM segmentation model that can be applied to both Chinese and English corpora;
- Added CBOW, Skip-Gram, negative-sampling, and GloVe modules that can train word2vec based on the segmentation results of this model;
- Applied the Multiple word vector training results to the analogy task for performance comparison and visualization.

## TECHNICAL SKILLS

Machine Learning Framework: Pytorch  
Programming Languages: Java, Python, C, C++, Matlab