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: 3.93/4.0
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, Hypergraph based Multimodal Learning, Root Cause Analysis, AIOps

PUBLICATION

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

Yi, Z., **Zhao, Z**., et al. Multimodal Fusion via Hypergraph Autoencoder and Contrastive Learning for Emotion Recognition in Conversation, ACM Multimedia (ACM MM), 2024.

WORKING EXPERIENCE

Machine Learning Engineer, **Alipay, Alibaba,** Hangzhou, China   02/2023-04/2024
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

Multimodal Fusion via Hypergraph Autoencoder and Contrastive Learning for Emotion Recognition in Conversation   2024.7

- Proposed the HAUCL framework based on variational hypergraph autoencoder, which adaptively captures the long-distance high-order dependencies between conversational information for the multimodal emotion recognition task (MERC);
- Utilized contrastive learning to mitigate the impact of instability brought by the reparametrized sampling process, enhancing both robustness and performance;
- Validated the effectiveness of the framework on two mainstream MERC datasets, IEMOCAP and MELD. HAUCL achieves a better all-round performance compared with baselines, resulting in a performance gain of 1.29% in accuracy and 1.15 in weighted F-1 score;
- Completed the paper as second author, which has been accepted by ACMMM'2024.

Exploiting Spatial-Temporal Data for Sleep Stage Classification via Hypergraph Learning   2023.12

- 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 first author, which has been accepted by ICASSP'2024.

CHASE: A Causal Heterogeneous Graph based Framework for Root Cause Analysis in Multimodal Microservice Systems 2024.5

- Proposed CHASE to handle data of log, metric and trace under the task of root cause analysis for AIOps systems, in which a multimodal invocation graph is constructed for multimodal feature fusion and instance-level anomaly detection based on heterogeneous message passing;
- Modeled the causality flow of anomalies with the construction of hyperedges on the basis of trace typology. The multivariate causality correlation between a set of instances is further modelled with hypergraph convolution;
- Evaluated CHASE on the System Integration Test environment of Alipay and open-source datasets, which achieves a performance gain of 20% in top-1 accuracy;
- Completed the paper as first author, which has been submitted to IEEE TSC and is currently under review. Preprint version is available on arXiv.

COMPETITION EXPERIENCE

Metaprogramming Framework for Machine Learning Tasks, 2021.12
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