RUIHONG ZENG

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Google Scholar Github

Education

- **Sun Yat-sen University** Guangzhou, China
  Supervisor: Prof. Shangsong Liang Sep 2021 – Jun 2024
  Master Student, Artificial Intelligence
  School of Computer Science and Engineering
  GPA: 92.2 / 100.0
- **Shanghai Lixin University of Accounting and Finance** Shanghai, China
  Undergraduate Student, International Economics and Trade Sep 2013 – Jun 2017
  School of International Economics and Trade
  GPA: 76.8 / 100.0

Research Interests

- **Machine Learning on Graphs:**
  - Extending Graph Neural Networks (GNNs) to deal with graph learning tasks on homogeneous and heterogeneous graphs, such as representation learning and node classification.
  - Combining Bayesian graphical models and variational inference methods to enhance graph representation learning.
  - Studying enhanced Graph Neural Networks to improve the factuality and bias detection in sparse media graphs.
- **Large Language Models:**
  - Studying how memory structures and memory retrieval methods affect the performance of LLM-based agents.
  - Exploring the integration of knowledge graphs to enhance RAG and LLMs for improved knowledge-intensive tasks.

Research Projects

- **MGIGNN**: Worked on the effectiveness problem of existing Graph Neural Networks (GNNs) in capturing long-range dependencies within homogeneous and heterogeneous graphs and proposed to leverage memorized global information to enhance GNN performance in both transductive and inductive settings. The outcome of this project has been published in TWEB. Apr–Dec 2022
- **MediaGraphMind**: Worked on the connections and label sparsity problem in media graphs and proposed to leverage memorized global information to enhance the performance of factuality and bias detection. The outcome of this project has been submitted to NAACL 2025 and is currently under review. Apr–Dec 2023
- **On the Structural Memory of LLM Agents**: Worked on investigating the impact of memory structures and retrieval methods on the performance of LLM-based agents. The outcome of this project has been submitted to the ACL Rolling Review (December 2024 cycle). Apr–Dec 2024

Publications

1. **Ruihong Zeng**, Jinyuan Fang, Siwei Liu, Zaiqiao Meng, and Shangsong Liang, Enhancing Graph Neural Networks via Memorized Global Information. ACM Transactions on the Web (**TWEB**), 2024. [*Code*].
2. Muhammad Arslan Manzoor (co-first author), **Ruihong Zeng (co-first author)**, Preslav Nakov, and Shangsong Liang, MediaGraphMind (MGM): Memorizing for Global Understanding of Media Graphs for Factuality and Bias. Under review. [*Code*].
3. **Ruihong Zeng (co-first author)**, Jinyuan Fang (co-first author), Siwei Liu, and Zaiqiao Meng, On the Structural Memory of LLM Agents. Under review. [*Code*].

Research Activities

- **Teaching Assistant:**
  - *Machine Learning and Data Mining*, Sun Yat-sen University Fall 2022
  - Instructor: Prof. Shangsong Liang
- **Research Assistant:**
  - Supervisor: Prof. Zaiqiao Meng, University of Glasgow Apr–Dec 2024
- **External Reviewer:**
  - ACL Rolling Review (December, 2024), ICML 2024, NeurIPS 2024, NeurIPS 2023

Working Experience

- **Data Mining Engineer**
  - Employer: Beijing Xinsight Company. Apr 2017 - Apr 2018
  - Responsibility 1: Built e-commerce user models to analyze shopping trends and user preferences using supervised learning methods, such as logistic regression, random forest, and gradient boosting.
  - Responsibility 2: Performed feature engineering with natural language processing techniques, including Named Entity Recognition (NER), word2vec, and TF-IDF, to analyze user shopping behaviors effectively.
- **AI Algorithm Engineer**
  - Employer: Shenzhen Gowild Technology Company. Apr 2018 - Nov 2019
  - Responsibility 1: Developed speech generation and speech recognition models for interactive chatbots using deep learning methods, such as Tacotron, WaveRNN, CTC, and WFST.
  - Responsibility 2: Implemented user intent classification by leveraging pre-trained models, including BERT and ELMo.
- **Speech Algorithm Engineer**
  - Employer: Shenzhen AKULAKU Company. Nov 2019 - Apr 2021
  - Responsibility 1: Designed speech generation models for Indonesian chatbots.
  - Responsibility 2: Optimized inference performance by rewriting models in C++ and converting them to TensorRT for deployment.

Courses and Skills

- **Selected Courses:**
  - Mathematics: Advanced Mathematics, Linear Algebra, Statistics, Discrete Mathematics
  - Machine Learning: Machine Learning, Artificial Intelligence and Pattern Recognition
  - Programming: Program Design, Java Language, Data Structure and Algorithm
- **Programming languages & machine learning tools:**

  C, C++, Python, Latex, Tensorflow, Pytorch
- **Languages:**

  Mandarin, Cantonese, English (IELTS: 6.5/9.0)