

Xiao(Harold) Liu

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RESEARCH INTERESTS

Natural Language Processing

Large Language Model, Extractive Text Summarization, Graph4NLP

Multi Modal Learning

Visual Dialogue System

EDUCATION

University of California, Davis

Ph.D. in Computer Science

– Advisor: Prof. Jiawei Zhang

Davis, USA

2021–present

Southeast University

Bachelor of Engineering in Software Engineering

– Advisor: Prof. Guilin Qi and Beilun Wang

Nanjing, China

2016–2020

University of California, Berkeley

Exchange Student in Computer Science and Psychology

Berkeley, USA

2019–2020

WORK EXPERIENCE

[LinkedIn](#)

Amazon Web Services (AWS), Bedrock

Natural Language Processing Research Internship

New York, USA

06/2024–09/2024

- Developed a **novel training pipeline** that integrates tool-use capabilities into the parametric knowledge of visual language models, enhancing their reasoning abilities without increasing inference latency. **This pipeline significantly improved model performance while maintaining the same inference time.**
- Designed and curated a **large-scale dataset** comprising image operation reasoning steps and corresponding intermediate images. This dataset enabled the model to learn directly from the image operation reasoning process.
- A **research paper** is working in progress.

RoastPic Inc

Co-founder, ML Researcher, Project Manager

Davis, USA

06/2023–09/2023

- Played a role as a **co-founder** in conceptualizing and developing an advanced image processing system tailored for coffee bean analysis, leading to a **\$250K seed investment** from a leading industry partner. **The product is in the beta test phase.**
- Designed and developed the **entire software architecture** using **Amazon AWS, React Native**, and **MongoDB Atlas**, including sophisticated database schema designs. Implemented a comprehensive **CI/CD pipeline** with **GitHub Actions** to streamline development and deployment processes. A Wiki knowledge base was created for developer reference and team collaboration.
- Applied **advanced deep learning techniques** for the detection of defects in green coffee beans, enhancing the precision of quality assessments. The detection model could significantly reduce human effort in the coffee QC process in the future.
- **Led and motivated a dynamic team of 5 developers as PM**, fostering a collaborative environment to drive the successful development and deployment of the product.

Intel

Natural Language Processing Research Internship

Beijing, China

01/2021–06/2021

- Developed and implemented **3 innovative visual-linguistic modality interaction schemas** for a visual dialogue model, leading to **SOTA performance** enhancements.
- Executed comprehensive ablation studies to assess the impact and interoperability of the model’s components, confirming the effectiveness of the proposed methodologies.
- Led the structural revision of the previously rejected research paper, enhancing coherence and logical flow, resulting in **acceptance at the ACL DialDoc2021 Workshop**.

KG Data

Natural Language Processing Developer

Nanjing, China

07/2020–01/2021

- Pioneered the adaptation of the BERT model for the company’s private medical QA dataset during BERT’s initial release period. Led the development of a comprehensive fine-tuning and deployment pipeline for the BERT model, culminating in a significant performance improvement over the existing online QA model. Shared insights and techniques through an internal workshop, fostering knowledge dissemination within the company.
- Developed an innovative text clustering algorithm using Gibbs Sampling for the Dirichlet Multinomial Mixture model. **One patent was submitted** and is currently under review.

PUBLICATIONS

 Google Scholar

- [1] **Liu, Xiao**, X. Xiang, Z.Li, Y.Wang, Z.Li, Z.Liu, W.Zhang, W.Ye, J. Zhang. “A Survey of AI-Generated Video Evaluation”. *arXiv preprint arXiv:2410.19884*.
- [2] **Liu, Xiao**, J. Zhang. “GPTA: Generative Prompt Tuning Assistant for Synergistic Downstream Neural Network Enhancement with LLMs”. *arXiv preprint arXiv:2404.00189*.
- [3] **Liu, Xiao**, J. Lin, and J. Zhang. “Beyond Text: Unveiling Multimodal Proficiency of Large Language Models with MultiAPI Benchmark”. *In the Workshop of Towards Knowledgeable Language Models at The 62nd Annual Meeting of the Association for Computational Linguistics (ACL) 2024*.
- [4] H. Zhang, **Liu, Xiao**, and J. Zhang. “SummIt: Iterative Text Summarization via ChatGPT”. *In Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP) 2023*.
- [5] H. Zhang, **Liu, Xiao**, and J. Zhang. “Extractive Summarization via ChatGPT for Faithful Summary Generation”. *In Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP) 2023*.
- [6] **Liu, Xiao**, H. Zhang and J. Zhang. “DiffuSum: Generation Enhanced Extractive Summarization with Diffusion”. *In Proceedings of the Association for Computational Linguistics (ACL) 2023*.
- [7] H. Zhang, **Liu, Xiao**, and J. Zhang. “Contrastive Hierarchical Discourse Graph for Scientific Document Summarization”. *In The 4th workshop on Computational Approaches to Discourse at the 61st Annual Meeting of the Association for Computational Linguistics (ACL) 2023*.
- [8] H. Zhang, **Liu, Xiao**, J. Zhang. “HEGEL: Hypergraph Transformer for Long Document Summarization”. *In Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP) 2022*.
- [9] L. Yang, F. Meng, **Liu, Xiao**, M. Wu, V. Ying, and J. Xu. “SeqDialN: Sequential Visual Dialog Network in Joint Visual-Linguistic Representation Space”. *In Proceedings of the 1st Workshop on Document-grounded Dialogue and Conversational Question Answering*. Association for Computational Linguistics (ACL DialDoc) 2021.
- [10] N. Ma, **Liu, Xiao**, Y. Gao. “Entity Linking Based on Graph Model and Semantic Representation”. *In International Conference on Knowledge Science, Engineering, and Management 2019*.

OTHER RESEARCH EXPERIENCE

Photometric Assessment of Coffee Color Naming Schema

Davis, USA

Volunteer Researcher at UC Davis Coffee Center and Specialty Coffee Association

06/2022–10/2023

- Supervised by Prof. William Ristenpart. Worked on a novel approach developed for differentiating coffee colors through photometric analysis and regression on near-infrared metrics for Specialty Coffee Association (SCA). A new color naming schema based on the ISCC–NBS System was proposed. A poster was presented at SCA Coffee Expo 2023, currently under SCA review, potentially setting a new industry standard.

Development of Q&A System for Carrier Rocket

Nanjing, China

Undergraduate Researcher at Southeast University

09/2017–02/2018

- Supervised by Prof. Guilin Qi. Worked on a project to help aerospace workers reduce errors in rocket launch by offering similar failure reference cases as well as solutions in the system.

CERTIFICATIONS AND ACHIEVEMENTS

UC Davis Graduate Group in Computer Science (GGCS) Research Fellowship	2023
Coffee Quality Institute Q Arabica Grader	2022
Coursera deeplearning.ai Deep Learning Specialization	2019
Nvidia Image Recognition Course Training	2019
China National Innovation Project Fellowship	2018
Third Prize, Southeast University School History System Development Competition	2017

TEACHING EXPERIENCE

Teaching Assistant at UC Davis, ECS 189G Deep Learning	Winter 2024
Teaching Assistant at UC Davis, ECS 189G Deep Learning	Winter 2023
Teaching Assistant at UC Davis, ECS 189G Deep Learning	Winter 2022
Teaching Assistant at UC Davis, ECS 289G Advanced Deep Learning	Spring 2022

SKILLS

Programming: Python, JavaScript, JAVA

Deep Learning Frameworks: Pytorch, Hugging Face, OpenAI API Kit

Project Management Tools: Lark, Notion, Miro, Figma

Languages: Mandarin (native), English (fluent)