

# Yifei(Jimmy) Zhang

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## EDUCATION

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<b>Ph.D. in Computer Science, Emory University</b>	Aug 2022 – May 2026 (expected)
<b>M.S. in Data Science, Columbia University</b>	Sep 2020 – Feb 2022
<b>Master of Engineering Management, Duke University</b>	Aug 2019 – May 2020
<b>B.E. in Engineering Mechanics, Dalian University of Technology</b>	Sep 2015 – Jun 2019

## RESEARCH INTERESTS

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**Explainable AI, Explanation-Guided Learning, Large Language Models Distillation, Multimodal Large Language Models, Generative AI, Medical Imaging**

## PUBLICATIONS

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- [IJCAI 2024] **Yifei Zhang**, Bo Pan, Siyi Gu, Guangji Bai, Meikang Qiu, Xiaofeng Yang, and Liang Zhao. *Visual Attention-Prompted Prediction and Learning*. International Joint Conference on Artificial Intelligence.
- [ICCV 2023] **Yifei Zhang**, Siyi Gu, Yuyang Gao, Bo Pan, Xiaofeng Yang, and Liang Zhao. *MAGI: Multi-Annotated Explanation-Guided Learning*. The 36th International Conference on Computer Vision.
- [KDD 2023] Siyi Gu\*, **Yifei Zhang\***, Yuyang Gao, Xiaofeng Yang and Liang Zhao. *ESSA: Explanation Iterative Supervision via Saliency-guided Data Augmentation*. The 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining.

## RESEARCH EXPERIENCE

### Explanation-Guided Large Language Models Efficient Distillation

Supervisor: Prof. Liang Zhao, Department of Computer Science, Emory University

Sep 2023 – Feb 2024

- Developed the ELAD framework, achieving efficient knowledge distillation from large language models (LLM) to smaller models through active learning, balancing annotation costs and model performance.
- Introduced a sample selection method based on generative explanations, which accurately identifies and prioritizes samples with high uncertainty in active learning, significantly enhancing the efficiency of knowledge distillation.
- Proposed a customized explanation correction technique, enabling the teacher LLM to specifically detect and correct reasoning errors in student models, improving the quality and reliability of distillation.

### Enhance Image Recognition Performance via Multi-Annotated Explanation Supervision.

Supervisor: Prof. Liang Zhao, Department of Computer Science, Emory University

Oct 2022 – Mar 2023

- Developed an innovative framework for explanation supervision trained in a multi-task manner, leveraging class labels and integrating multiple explanation annotations, dynamically weighted for each annotator for optimal results.
- Introduced a new generative model designed to fill in missing annotations, utilizing variational inference that adapts to the individual characteristics of each annotator during annotation generation.
- Proposed a unique alignment mechanism integrated into the generative model to learn the alignment between annotations and annotators during training, transforming the inference challenge into a linear sum assignment problem.

### Improve model predictability through Explanation-guided Supervision and Data Augmentation.

Supervisor: Prof. Liang Zhao, Department of Computer Science, Emory University

Aug 2022 – Feb 2023

- Introduced a novel framework that combines explanation supervision with adversarial-trained data augmentation, enabling enhanced image data augmentation through a synergized iterative interplay.
- Developed a unique “annotation-to-image” generator with dual decoders, capturing distinct foreground and background patterns, facilitating realistic image generation with a “1-to-many” mapping from annotations.
- Leveraged a novel algorithm for alternating training of data augmenter and classifier over multiple iterations, eliminating error back-propagation and ensuring abundant data for explanation supervision.

## WORK EXPERIENCE

### Data Science Intern

PIMCO, New York, NY, US

Sep 2021 – Dec 2021

- Utilized Python libraries such as BeautifulSoup, re, and nltk for data cleaning and sentence extraction from 10-K financial reports forms.
- Employed a pre-trained finBERT model to extract language features for sentences, utilized K-means clustering to sample sentences of high uncertainty from different regions based on extracted features, and applied active fine-tuning to reduce the need for manual labeling.

### Quantitative Analyst Intern

Guotai Junan Securities, Beijing, China

May 2019 – Aug 2019

- Analyzed 30 years of China’s quarterly GDP using time-series decomposition techniques like STL and SEATS, while correlating GDP trends with major economic events.
- Designed an LSTM network with Keras to predict the Shanghai Composite Index, fine-tuning parameters for optimal performance, and achieved a 43% reduction in MAE compared to the ARIMA model.

## SKILLS

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Proficient in **programming languages** including **Python, C/C++, MATLAB, Java, Shell**;  
Fluent in **deep learning** frameworks such as **Pytorch, Tensorflow**;