Yifei(Jimmy) Zhang

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EDUCATION

Ph.D. in Computer Science, Emory University	Aug 2022 – May 2027 (expected)
M.S. in Data Science, Columbia University	Sep 2020 – Feb 2022
Master of Engineering Management, Duke University	Aug 2019 – May 2020
B.E. in Engineering Mechanics, Dalian University of Technology	Sep 2015 – Jun 2019

RESEARCH INTERESTS

Explainable AI, explanation-guided learning, natural language processing, knowledge distillation, multimodal large language model, time series analysis, optimization

PUBLICATIONS

[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

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 an 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.

B-mode Ultrasound Medical Report Generation via Vision-language Model.

Supervisor: Prof. Fenglong Ma, College of Information Sciences and Technology, Penn State University　　*Sep 2021 – May 2022*

- Developed an automated B-mode Ultrasound pregnancy medical report representation learning framework which utilizing ResNet-50 for image visual feature encoding and a pre-trained BERT for medical report templates of each pregnancy phase.
- Deployed a hierarchical long short-term memory (LSTM) with a co-attention mechanism as a decoder. This decodes reports using both image visual features and retrieved template language features.

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 financial reports on 10-K form.
- 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

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