

Yifan Yu

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EDUCATION

University of Illinois Urbana-Champaign, Urbana IL

08/2024 - 05/2029

Doctor of Philosophy | Computer Science

Georgia Institute of Technology, Atlanta GA

08/2020 - 05/2024

Bachelor of Science | Computer Science

Honors: Faculty Honor, Presidential Undergraduate Research Award

PUBLICATION

LoftQ: LoRA-Fine-Tuning-Aware Quantization for Large Language Models

Yixiao Li*, **Yifan Yu***, Chen Liang, Pengcheng He, Nikos Karampatziakis, Weizhu Chen, Tuo Zhao

*Accepted by International Conference on Learning Representations (ICLR), 2024, **Oral Presentation***

LoSparse: Structured Compression of Large Language Models based on Low-Rank and Sparse Approximations

Yixiao Li*, **Yifan Yu***, Qingru Zhang, Chen Liang, Pengcheng He, Weizhu Chen, Tuo Zhao

Accepted by International Conference on Machine Learning (ICML), 2023

RESEARCH

Research Assistant at AISys Lab.

08/2024 – Present

- Worked on efficient serving of LLM facing large volume of requests advised by Prof. Fan Lai
- Implemented experiments with vLLM and LMCache backend to reduce the TTFT of the requests on Phi-3 series and Mistral-series models
- Implemented a system prototype that can significantly improve the quality and throughput of LLMs on various datasets leveraging the in-context learning ability of LLMs; supported Huggingface, vLLM, and Gemini API requests backends

Research Assistant at FLASH (Foundations of Learning Systems for Alchemy)

10/2021 – 05/2024

- Worked on improving the efficiencies of large language models with Prof. Tuo Zhao.
- Combined the pruning methods and low rank decomposition as presented in LoSparse paper; implemented the codes and conducted the experiments with Huggingface and PyTorch; further incorporated our method with knowledge distillation and embedded our method with CoFi pruning method; achieved results that match or surpass the state-of-the-art performance on GLUE benchmarks.
- Proposed and implemented an alternative optimization method to minimize the quantization error as presented in the LoftQ paper; surpassed QLoRA on different precisions and showed a large edge over QLoRA on low-precision settings on various benchmarks (GLUE, XSum, WikiText, etc.) using DeBERTa, BART, LLAMA-2

WORK EXPERIENCE

Student Researcher in Systems Research@Google

05/2024 – 07/2024

- Worked in efficient systems for serving LLM facing millions of requests leveraging the abundance of users' queries.
- Implemented experiments on millions of real users' requests using Huggingface and vLLM backends; observed significant quality and throughput improvements on Alpaca, Open Orca, and LMSys-chat.

Intern Data Scientist in The Home Depot

05/2022 – 07/2022

- Worked in the online search team with DSI-based retrieval model as the first undergraduate ever in the team.
- Implemented DSI with PyTorch and HuggingFace; proposed an encoding method based on Pecos clustering for the DSI indexing process; improved over 15 percent recall rate over baseline, matching the current production search performance.

Black Swan Research Intern in Shepherd Ventures

07/2023 – 09/2023

- Researched how to effectively prevent the impact of black swan events through Kmeans and MVO.
- Improved the protection rate by over 5 percent by improving the initialization method of Kmeans process.

SKILLS

Programming: Python (Tensorflow2, Pytorch), Java, C, HTML, CSS, JavaScript, SQL, MATLAB, Mathematica

Related course: GenAI system, Text mining for LLM, Machine Learning, Deep learning, Natural language Processing, Computer Organization and Programming, Systems and Networks, Design & Analysis of Algorithms