

Yixiao HUANG

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EDUCATION

University of California, Berkeley

Ph.D in Computer Science Advisor: Prof. Somayeh Sojoudi

Starting from Sept, 2024

City University of Hong Kong

B.E. in Information Engineering CGPA: 3.98 / 4.3 (rank 1/91)

Sept, 2019 – Jun, 2023

Experience (In reverse chronological order)

On the calibration property of pruned language models

Research Assistant

Mar, 2024 -

Supervisor: **Prof. Chen LIU (CityU)**

- A model is well calibrated when the model confidence matches its performance. We conducted extensive experiments on a series of Llama models and evaluated their calibration capabilities.
- In particular, we hypothesize that fine-tuned models tend to be over-confident due to over-parameterization, and this can be solved by model pruning, which can at most reduce the model parameters by 50%.

On the theoretical foundation of self-attention mechanism

Visiting Scholar

July, 2023 - Feb, 2024

Supervisor: **Prof. Samet Oymak (University of Michigan, Ann Arbor)**

- Worked on the generalization property of self-attention where we find a precise mapping between self-attention and context-conditioned Markov Chain and use it to build guarantees for consistency estimation and sample complexity under IID data.
- Investigated the implicit regularization of self-attention on next-token prediction where we prove that optimizing self-attention can discover the strongly connected components of a priority graph induced by the data. This helps us connect the optimal solution of learning a transformer with solving an SVM problem.

PUBLICATIONS

1. Mingchen Li, Xuechen Zhang, Yixiao Huang, and Samet Oymak. “**On the Power of Convolution Augmented Transformer.**”. Preprint, 2024. [pdf]
2. Muhammed Emrullah Ildiz, Yixiao Huang, Yingcong Li, Ankit Singh Rawat, and Samet Oymak. “**From Self-Attention to Markov models: Unveiling the Dynamics of Generative Transformers.**”. The 41st International Conference on Machine Learning (ICML), 2024. [pdf]
3. Xuyang Zhong, Yixiao Huang, Chen Liu, “**Towards Efficient Training and Evaluation of Robust Models against l_0 Bounded Adversarial Perturbations**”. The 41st International Conference on Machine Learning (ICML), 2024. [pdf]
4. Yingcong Li*, Yixiao Huang*, Muhammed Emrullah Ildiz, Ankit Singh Rawat, Samet Oymak, “**Mechanics of Next Token Prediction with Self-Attention**”. The 27th International Conference on Artificial Intelligence and Statistics (AISTATS), 2024. (* equal contribution) [pdf]
5. Yixiao Huang, Xiaoli WU, Rosa H. M. Chan and Pooled Resource Open-Access ALS Clinical Trials Consortium, “**Stratification and Survival Prediction for Amyotrophic Lateral Sclerosis Patients**”. IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), 2022, pp. 1-5, doi: 10.1109/BHI56158.2022.9926946. [pdf]

ACADEMIC EXPERIENCE

Reviewer: AISTATS 2024,2025, ICLR 2025; TMLR

HONORS AND AWARDS

2024 ICML Travel Award

Jun, 2024

The College of Engineering Dean's Scholarships

Maximum of 5 recipients in the College of Engineering every year

Aug, 2022

The 46th International Collegiate Programming Contest - Asia Kunming Regional

Silver Medal (Rank 40th/697)

April, 2022

Chi-Li Pao Foundation Scholarships for Academic Outstanding Students

Maximum of 2 recipients in the College of Engineering every year

Aug, 2021

TUTORING

EE2331 - Data Structures and Algorithms

In-class tutoring

Fall, 2022

- Responsible for assisting in teaching and answering students' questions.

MA1201 - Calculus and Basic Linear Algebra II

After-class tutoring

Fall, 2020

- Served as a tutor in helping 12 students review and consolidate the course content every week.