Yixiao HUANG

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EDUCATION

University of California, Berkeley

Ph.D in Computer Science   Advisor: Prof. Somayeh Sojoudi   Sept, 2024 - now

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 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."**. The 39th Annual AAAI Conference on Artificial Intelligence (oral presentation), 2025. [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

<u>TUTORING</u>

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.