

Xingyu Zhu

PH.D. STUDENT · PRINCETON UNIVERSITY

✉ xingyu.zhu@princeton.edu | 🏠 ultimatejupiter.github.io

Education

Princeton University

PH.D. IN COMPUTER SCIENCE

Princeton, NJ

2023 -

- Advisor: Prof. Sanjeev Arora

Duke University

BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE

Durham, NC

2018 - 2022

- GPA: 3.972 / 4.0, Magna Cum Laude
- Undergraduate Research Advisor: Prof. Rong Ge

Research Interests

- I am broadly interested in **Theoretical Machine Learning** and **Language Modeling**. Recently I am interested in studying modern large language models and their optimization through a theoretical lens. I have also worked on optimization dynamics for deep neural nets (edge of stability, Hessians of neural nets) and computational economics (briefly).

Publications and Preprints

(* : Equal Contribution.)

Xingyu Zhu*, Abhishek Panigrahi*, and Sanjeev Arora. “On the Power of Context-Enhanced Learning in LLMs.” (ICML 2025). (Spotlight: top 2.6%)

Zeyu Shen, Zhiyi Wang, Xingyu Zhu, Brandon Fain, and Kamesh Munagala. “Fairness in the assignment problem with uncertain priorities.” (AAMAS, 2023).

Xingyu Zhu*, Zixuan Wang*, Xiang Wang, Mo Zhou, and Rong Ge. “Understanding Edge-of-Stability Training Dynamics with a Minimalist Example.” (ICLR 2023).

Yikai Wu*, **Xingyu Zhu***, Chenwei Wu, Annie Wang, and Rong Ge. “Dissecting hessian: Understanding common structure of hessian in neural networks.” (Preprint, 2020).

Talks

March. 27, 2025. *On the Power of Context-Enhanced Learning in LLMs*. Princeton PLI

May 24, 2023. *Understanding Edge-of-Stability Training Dynamics with a Minimalist Example*. ELLIS

Awards, Fellowships

- 2023 **Gordon Y.S. Wu Fellowship**, Princeton University
- 2023 **Elected to Phi Beta Kappa**, Duke University
- 2023 **Alex Vasilos Memorial Award**, Duke University
- 2022 **Graduation with Highest Distinction**, Duke University

Teaching

Spring 2025	Neural Networks, Theory and Practices (COS485) Head TA: PSET & Exam Design, OH, Grading	<i>Princeton University</i> <i>Instructor: Sebastian Seung</i>
Fall 2024	Introduction to Machine Learning (COS324) TA: PSET & Exam Design, Precept, OH	<i>Princeton University</i> <i>Instructor: Jia Deng, Adji Dieng</i>
Fall 2022	Discrete Math for Computer Science(CS230) TA: Recitation, Office Hours, Grading	<i>Duke University</i> <i>Instructor: Bruce Donald</i>
Fall 2022	Design and Analysis of Algorithms (CS330) TA: Recitation, Grading	<i>Duke University</i> <i>Instructor: Debmalya Panigrahi</i>
Spring 2022	Design and Analysis of Algorithms (CS330) TA: Office Hours, Grading	<i>Duke University</i> <i>Instructor: Rong Ge</i>