Qiao Sun

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EDUCATION

2024.09-Present **Massachusetts Institute of Technology** **Undergraduate**

- Double major in Mathematics and AI (Expected Graduation Year: 2028), GPA: 4.00/4.00

2023.09-2024.07 **Tsinghua University** **Pre-college**

- Institute for Interdisciplinary Information Sciences, GPA: 4.00/4.00

RESEARCH EXPERIENCE

2024.09-Present **Undergraduate Research** **Professor: Kaiming He**

- Work as a UROP student at Prof. He' s computer vision group, with Zhicheng Jiang & Hanhong Zhao
- Topic: Generative models, mainly on image generation (Diffusion models, Flow Matching, etc.)
- Develop on **Google Compute Platform** using **TPUs** and **JAX**

Previous work: [2502.13129] Is Noise Conditioning Necessary for Denoising Generative Models?

- Challenge common wisdom and revisit the necessity of noise conditioning in Diffusion & Flow Matching
- Reimplement 8 denoising generative models on different datasets and test their performance w/o noise conditioning
- Develop a new model **uEDM**, achieving comparable FID score with SOTA diffusion model in noise-unconditional setting
- Theoretical analysis that matches experiment results, ablations on stochasticity, three more alternative architectures, etc.
- Pave the way for new chances for classic methods such as energy-based models by connecting them to diffusion models

CERTIFICATES AND HONORS

2024	2nd place in 2024 Putnam Mathematical Competition
2023	Gold Medal & 11th Place in 2023 International Mathematics Olympiad
2022	Gold Medal & 1st Place with Perfect Score in 2022 Chinese Mathematics Olympiad
2022&2023&2024	Excellent Award in Alibaba Global Mathematics Competition, Top 70 out of 50,000+ participants

SKILLS

- Programming skills: Prominent in C and python; expert in **PyTorch** and **JAX**
- Language: English (fluent), Mandarin (native)

COURSES AND GRADES

Semester	Course Title	Grade	Gradepoint
2023-Fall	Calculus A (1)	A-	4.0
At Tsinghua	Linear Algebra	A+	4.0
University	Introduction to Computer Science	A	4.0
	Algorithm Design	A	4.0
	Introduction to Programming in C/C++	A+	4.0
	Situation and Policy (1)	P	4.0
2024-Spring	General Physics (1)	A	4.0
At Tsinghua	Theory of Computation	A+	4.0
University	Introduction to Computer Systems	A	4.0
	Mathematics for Computer Science and Artificial Intelligence	A+	4.0
	Introduction to Large Language Model Applications	A	4.0
2024-Fall	Machine Learning (Grad version)	P	N/A
At MIT	Algebraic Topology I	P	N/A
	Quantum Computation	P	N/A
	Intro to Solid-State Chemistry	P	N/A
	Intro to CS Prog in Python	P	N/A
	Introductory Biology	P	N/A
	Physics II	P	N/A
	Calculus II	P	N/A