Bocheng David Zhang

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Education

University of Illinois Urbana-Champaign (UIUC) *Expected Graduation: May 2028*
Bachelor of Science in Computer Science & Physics

- GPA: 4.0/4.0.
- Relevant Coursework: Algorithms, Machine Learning, Computational Physics, Quantum Computing.
- Member of the International Collegiate Programming Contest (ICPC) team.

Experience

Undergraduate Researcher, ULab *Aug 2025 – Present*
University of Illinois Urbana-Champaign *Urbana, IL*

- Investigating emergent communication protocols in multi-agent systems to enhance collaborative problem-solving, under the guidance of Prof. Jiaxuan You.

Collaborator, Math Reasoning Team *May 2025 – Present*
NVIDIA *Remote*

- Engineered robust data processing pipelines to validate and structure large-scale mathematical text data for reasoning research, ensuring data integrity and quality for model training.
- Developed over 250 complex algorithmic problems and solutions, contributing to a high-quality dataset used by NVIDIA's core research teams.

Software Engineering Research Intern *Aug 2022 – May 2024*
Illinois Institute of Technology *Remote*

- Contributed production-level Python code to the open-source **QMCPy** library, implementing numerical integration methods used in quantitative finance and scientific computing.
- Accelerated core library functions by designing and implementing a novel median-of-means sampling method, outperforming previous benchmarks on Keister functions.

Projects

Special Relativity Graphics Library | Python Visualization Tool

- Developed an object-oriented Python library to model and create visualizations for complex special relativity kinematics, including time dilation and length contraction.

Publications

GTAlign: Game-Theoretic Alignment of LLM Assistants for Mutual Welfare *2025*
Submitted to ICLR 2026

- Proposed a game-theoretic framework modeling user-AI interaction as a cooperative game to align LLM assistants with user preferences for mutual welfare.

The Challenge of Teaching Reasoning to LLMs Without RL or Distillation *2025*
Presented at AI4Math@ICML 2025

- Explored minimal fine-tuning approaches for inducing chain-of-thought reasoning in base language models. Selected as a reviewer for the workshop.

Median of Means Sampling for the Keister Function *2025*
Submitted to International Monte Carlo Conference 2026

- Investigated the performance of median-of-means sampling for computing the Keister function integral, demonstrating improved robustness.

Awards & Honors

Heidelberg Laureate Forum: Selected Young Researcher – *2025*
MCM/ICM Meritorious Winner (top 8%) *2023*