

Zhizheng Zhao

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About

Hi, I am a third-year student at the School of Physics, Peking University, with interests in both high-energy physics and artificial intelligence. I am currently collaborating with Dr. Renrui Zhang from The Chinese University of Hong Kong on research involving Chain-of-Thought reasoning for image generation and related computational models. In addition to my work in AI, I am passionate about physics, particularly in areas related to theoretical and experimental research. I aim to contribute to both academic and industry advancements through my research.

EDUCATIONAL BACKGROUND

Peking University	Beijing, China	09/2022 – present
Grade: 83.4/100.0		
• Major in Physics: (Consistent improvement from 82.1 in the first semester to 89.3 in the most recent semester; semester Grades: 82.1, 83.6, 79.1, 86.5, 89.3)		
• Advanced Courses:		
- Thermodynamics (90),		
- Data Structures and Algorithms(89),		
- Optics(89),		
- Fundamentals of Modern Electronic Circuits and Experiments(88),		
- Fluid Mechanics(85),		
- Introduction to Atmospheric Sciences (97),		
- Introduction to Earthquakes (98)		

REASEARCH INTEREST

- **Chain-of-Thought Reasoning for Enhancing AI Model Performance.**
- **Muon-Driven Dark Matter Detection in High-Energy Physics.**

REASEARCH EXPERIENCES

Research on Chain-of-Thought Reasoning for Advanced Image Generation.	09/2024–01/2025
(Collaborator: Dr. Renrui Zhang, The Chinese University of Hong Kong)	
• Conducted research on applying Chain-of-Thought (CoT) reasoning to autoregressive image generation, focusing on test-time computation and Direct Preference Optimization (DPO).	
• Proposed and implemented the Potential Assessment Reward Model (PARM), which adaptively evaluates each generation step by integrating existing reward models.	
• Enhanced the Show-o model, achieving a +24% improvement on GenEval and surpassing Stable Diffusion 3 by +15%.	
• Progress: Submitted research findings to CVPR 2025, currently under review.	
Research on Muon-Based Dark Matter Detection in High-Energy Physics	05/2024–present
(Supervisor: Prof. Qite Li, Peking University)	
• Conducted research on detecting dark matter using muons, leveraging their penetrating nature.	
• Developed and optimized signal processing algorithms to enhance the accuracy and precision of detector data analysis.	
• Proposed a novel method for improving the sensitivity of dark matter detection, focusing on signal extraction and noise reduction techniques.	
• Progress: Currently preparing a manuscript for publication, with research findings under development.	

PROFESSIONAL SKILLS

Programming and Software:	Python / MATLAB / Mathematica / CERN ROOT / LATEX
Languages:	Currently in preparation

EXPERIENCE

- Shenzhen International Quantum Academy	Visiting Student
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HOBBIES

- **Anime**
- **Computer Games**