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| **Zhizheng Zhao**  School of Physics,  Peking University, Beijing 100871, P. R. China  Tel: 86-18810773205 | E-mail: [zhizhengzhao@outlook.com](mailto:zhizhengzhao@outlook.com)  **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. |
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**EDUCATIONAL BACKGROUND**

**Peking University** Beijing, China09/2022 – present

* + ***Major in Physics*:**  Grade: **83.4**/100.0

(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**](https://sziqa.ac.cn/) Visiting Student

**HOBBIES**

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