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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, and I am interested in high-energy physics and artificial intelligence. I have previously collaborated with Dr. Renrui Zhang from the Chinese University of Hong Kong to study image generation based on thought chain reasoning and its related computational models. I am currently conducting research related to reinforcement learning under the guidance of Assistant Professor Minjia Zhang from the University of Illinois at Urbana-Champaign. In addition to my work in artificial intelligence, I am also passionate about physics, especially in areas related to theoretical and experimental 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:**
* Introduction to Earthquakes (98),
* Introduction to Atmospheric Sciences (97),
* **Thermodynamics** (90),
* **Data Structures and Algorithms(89),**
* **Optics(89),**
* Fundamentals of Modern Electronic Circuits and Experiments(88),
* **Fluid Mechanics**(85),

**REASEARCH INTEREST**

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

**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:** Accepted by CVPR 2025.

**Added time differentiation to GRPO's reward value** 03/2025–present

(Collaborator: Prof. Minjia Zhang, *University of Illinois at Urbana-Champaign*)

* At present, the effect is improved by 10% compared with the GPRO method. The stability problem is still being solved, and the effect in the large parameter model is still being tested.
* **Progress:** Under study.

**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**