Zhizheng Zhao

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Peking University, Beijing, China, 100871

EDUCATION

Peking University Expected 07/2026
School of Physics

- Overall GPA: **83.7**/100
- Research interests: ***Reinforcement Learning, Computer Vision, AI for Science, Optimization, Operations Research, Control System***
- Programming languages: Python, Git, LaTeX, CERN ROOT
- Awards and Honors：

Alishan Scholarship	*8/261 recipients*	09/2025
Outstanding Research Award	*30/261 recipients*	09/2025
National Endeavor Scholarship		09/2025

ACADEMIC VISITS

Shenzhen International Quantum Academy 01/2025 – 02/2025

PUBLICATIONS

- **Let's Verify and Reinforce Image Generation Step by Step** **CVPR 2025**

RESEARCH EXPERIENCE

Resistive Plate Counter Development and Data Analysis 03/2024 – 07/2024
with Prof. Qite Li (Peking University)

- Assembled and commissioned Resistive Plate Counter detector.
- Developed signal processing and feature extraction pipelines for particle identification (PID).

Chain-of-Thought Reasoning for Advanced Image Generation 09/2024 – 01/2025
with Dr. Renrui Zhang (CUHK)

- Applied CoT to autoregressive image generation with test-time compute and DPO (Direct Preference Optimization).
- Proposed Potential Assessment Reward Model to score intermediate steps by integrating existing reward models.
- Enhanced Show-o, achieving +24% on GenEval and +15% vs. Stable Diffusion 3, **accepted by CVPR 2025.**

Reward and Policy Distribution Optimization in GRPO 03/2025 – 07/2025
with Prof. Minjia Zhang (UIUC)

- Analyzed limitations in GRPO reinforcement learning framework, identifying key issues in reward assignment and sparse-signal exploration.
- Designed and implemented multiple strategies to improve credit assignment and sampling-reward alignment, including token-level advantage modeling, negative advantage, and dense ground-truth rewards.

Improving Crystal Structure Prediction via Niggli Reduction 07/2025 – 09/2025
with Prof. Shengchao Liu (CUHK)

- Discovered a fundamental limitation in conventional crystal structure prediction models: they fail to recognize physically equivalent structures across different lattice representations.
- Introduced Niggli reduction to align predictions with canonical representations, designing a differentiable Proxy Loss to enable effective model training.

SELECTED COURSE PROJECT

Neural Network Solver for Complex Electric Field Distributions 12/2024
Course: Physics and Artificial Intelligence, supervised by Prof. Yanqing Ma

- Implemented a neural network with physics-informed loss functions (boundary conditions + PDE residuals) to approximate solutions of electric field distributions.

EXTRACURRICULAR ACTIVITIES

- Peking University Cooking Society — Core Member 09/2022 – present
- Dormitory Committee — Member 02/2023 – present
- Peking University Youth Astronomy Society — Member 09/2023 – present