

# Zhizheng Zhao

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## EDUCATION

<b>Peking University</b> <i>School of Physics</i>	09/2022 – 07/2026
• Overall GPA: <b>83.7/100</b>	
• Research interests: <b>Operations Research, Optimization, Control Systems, Reinforcement Learning</b>	
• Programming languages: Python, MATLAB, CERN ROOT, LaTeX	

## HONORS

• Outstanding Research Award	09/2025
• Alishan Scholarship	09/2025
• National Endeavor Scholarship	09/2025

## PUBLICATIONS

• <a href="#">Let's Verify and Reinforce Image Generation Step by Step.</a>	<b>CVPR 2025 (accepted)</b>
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## RESEARCH EXPERIENCE

<b>Resistive Plate Counter Development and Data Analysis</b> <i>with Prof. Qite Li (Peking University)</i>	03/2024 – 07/2024
• Assembled and commissioned a Resistive Plate Counter detector.	
• Developed and optimized signal processing algorithms to enhance the accuracy and precision of detector data analysis.	
<b>Chain-of-Thought Reasoning for Advanced Image Generation</b> <i>with Dr. Renrui Zhang (CUHK)</i>	
• Applied CoT to autoregressive image generation with test-time compute and DPO (Direct Preference Optimization).	09/2024 – 01/2025
• 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, <b>accepted by CVPR 2025</b> .	

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

<b>Improving Crystal Structure Prediction via Niggli Reduction</b> <i>with Prof. Shengchao Liu (CUHK)</i>	07/2025 – 09/2025
• Identified 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

<b>Neural Network Solver for Complex Electric Field Distributions</b> <i>Course: Physics and Artificial Intelligence, supervised by Prof. Yanqing Ma</i>	01/2025
• Implemented a neural network with physics-informed loss functions (boundary conditions + PDE residuals) to approximate solutions of electric field distributions.	

## ACADEMIC VISITS

<b>Shenzhen International Quantum Academy — Visiting Student</b>	01/2025 – 02/2025
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## 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