

# Zhizheng Zhao

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## EDUCATION

<b>Peking University</b> <i>School of Physics</i>	09/2022 – 07/2026
<ul style="list-style-type: none"><li>Overall GPA: <b>83.7/100</b></li><li>Research interests: <i>Operations Research, Optimization, Control Systems, Reinforcement Learning</i></li><li>Programming languages: Python, MATLAB, CERN ROOT, LaTeX</li></ul>	

## 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>	CVPR 2025 (accepted)
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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
<ul style="list-style-type: none"><li>Assembled and commissioned a Resistive Plate Counter detector.</li><li>Developed and optimized signal processing algorithms to enhance the accuracy and precision of detector data analysis.</li></ul>	
<b>Chain-of-Thought Reasoning for Advanced Image Generation</b> <i>with Dr. Renrui Zhang (CUHK)</i>	09/2024 – 01/2025
<ul style="list-style-type: none"><li>Applied CoT to autoregressive image generation with test-time compute and DPO (Direct Preference Optimization).</li><li>Proposed Potential Assessment Reward Model to score intermediate steps by integrating existing reward models.</li><li>Enhanced Show-o, achieving +24% on GenEval and +15% vs. Stable Diffusion 3, <b>accepted by CVPR 2025</b>.</li></ul>	
<b>Reward and Policy Distribution Optimization in GRPO</b> <i>with Prof. Minjia Zhang (UIUC)</i>	03/2025 – 07/2025
<ul style="list-style-type: none"><li>Analyzed limitations in GRPO reinforcement learning framework, identifying key issues in reward assignment and sparse-signal exploration.</li><li>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.</li></ul>	
<b>Improving Crystal Structure Prediction via Niggli Reduction</b> <i>with Prof. Shengchao Liu (CUHK)</i>	07/2025 – 09/2025
<ul style="list-style-type: none"><li>Identified a fundamental limitation in conventional crystal structure prediction models: they fail to recognize physically equivalent structures across different lattice representations.</li><li>Introduced Niggli reduction to align predictions with canonical representations, designing a differentiable Proxy Loss to enable effective model training.</li></ul>	

## 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
<ul style="list-style-type: none"><li>Implemented a neural network with physics-informed loss functions (boundary conditions + PDE residuals) to approximate solutions of electric field distributions.</li></ul>	

## 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