

# Zhizheng Zhao

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## EDUCATIONAL BACKGROUND

<b>Peking University</b> • <i>Major in Physics</i>	Beijing, China	09/2022 – present Grade: <b>3.503/4.0</b>
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## REASEARCH INTEREST

- **Reinforcement Learning**
- **AI4s**
- **AI Agent**

## REASEARCH EXPERIENCES

<b>Optimizing crystal structure prediction tasks.</b> (Collaborator: Prof. Shengchao Liu, The Chinese University of Hong Kong)	06/2025–present
<ul style="list-style-type: none"><li>• Develop an equivalence judgment component based on geometric information, aiming to improve the previous crystal structure prediction task, which only memorizes the absolute positions of each atom in the crystal, rather than the physical laws.</li><li>• <b>Progress:</b> Under study.</li></ul>	
<b>Reinforcement learning on Hybrid SSM-Transformer model.</b> (Collaborator: Prof. Minjia Zhang, University of Illinois at Urbana-Champaign)	03/2025–present
<ul style="list-style-type: none"><li>• Apply reinforcement learning algorithms to hybrid models with lower computational complexity than Transformer.</li><li>• Improve the inefficiency problem of all advantages in the group being 0 when the sampling abundance is limited in the GRPO algorithm.</li><li>• <b>Progress:</b> Parer in preparation.</li></ul>	
<b>Research on Chain-of-Thought Reasoning for Advanced Image Generation.</b> (Collaborator: Dr. Renrui Zhang, The Chinese University of Hong Kong)	09/2024–01/2025
<ul style="list-style-type: none"><li>• Conducted research on applying Chain-of-Thought (CoT) reasoning to autoregressive image generation, focusing on test-time computation and Direct Preference Optimization (DPO).</li><li>• Proposed and implemented the Potential Assessment Reward Model (PARM), which adaptively evaluates each generation step by integrating existing reward models.</li><li>• Enhanced the Show-o model, achieving a +24% improvement on GenEval and surpassing Stable Diffusion 3 by +15%.</li><li>• <b>Progress:</b> Accepted by CVPR 2025. (<a href="https://openaccess.thecvf.com/content/CVPR2025/papers/Zhang_Lets_Verify_and_Reinforce_Image_Generation_Step_by_Step_CVPR_2025_paper.pdf">https://openaccess.thecvf.com/content/CVPR2025/papers/Zhang_Lets_Verify_and_Reinforce_Image_Generation_Step_by_Step_CVPR_2025_paper.pdf</a>)</li></ul>	
<b>Development and data analysis of resistive plate counter.</b> (Collaborator: Prof. Qite Li, Peking University)	03/2025–present
<ul style="list-style-type: none"><li>• Detector Development.</li><li>• Developed and optimized signal processing algorithms to enhance the accuracy and precision of detector data analysis.</li><li>• Using reinforcement learning to replace traditional algorithms, reduce the signals required for particle determination, and increase detection efficiency and accuracy.</li><li>• <b>Process:</b> Under study</li></ul>	

## PROFESSIONAL SKILLS

Programming and Software:	Python / MATLAB / Mathematica / CERN ROOT / LATEX
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## EXPERIENCE

Shenzhen International Quantum Academy	Visiting Student
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## HOBBIES

Anime  
Computer Games