

# JIAXIN GUO

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## Education

<b>Tsinghua University (THU)</b> Beijing, China	Sep.2021 – Jun.2026 (expected)
<b>Swiss Federal Institute of Technology in Lausanne (EPFL)</b> Lausanne, Switzerland	Feb.2024 – Jul.2024

- Bachelor of Science in Mathematics and Physics + Measurement Control Technology and Instruments
- GPA: 3.9/4.0
- **Core Courses:** Advanced Topics in Linear Algebra (A), Convex Optimization (A), Data Structure (A-)

- Exchange Major: Computer Science
- GPA: 5.82/6.0
- **Core Courses:** Advanced probability and applications (A), Optimization for machine learning (A), Learning theory (A-)

## Research Interest

My research interests lie in the broad area of large language models, including foundation modeling, reward modeling and reasoning, and reinforcement learning. I focus on reasoning-centric alignment and exploring the upper limits of model reasoning capabilities, and aim to develop principled, reasoning-aware learning strategies that advance the depth, reliability, and robustness of model reasoning for real-world deployment.

## Publications

- **Jiaxin Guo\***, Zewen Chi\*, Li Dong\*, Qingxiu Dong, Xun Wu, Shaohan Huang, Furu Wei, "Reward Reasoning Model", *NeurIPS 2025, Poster*.
- Yuezhou Hu\*, **Jiaxin Guo\***, Xinyu Feng, Tuo Zhao, "AdaSPEC: Selective Knowledge Distillation for Efficient Speculative Decoders", *NeurIPS 2025, Spotlight (Top 3.5%)*.
- Yihao Li\*, Hanle Zheng\*, **Jiaxin Guo**, Lei Deng, "Decoupling the Contributions of Spatio-Temporal Coding: From ANNs to SNNs", *Neurips Workshop 2024*.

## Research Experience

<b>Diffusion Language Model</b> <i>Research Intern at MSRA, Beijing</i> <i>Advisor: Li Dong, Principal Researcher</i>	Jun.2025 – Present
<ul style="list-style-type: none"><li>• Designed Uniform-State Diffusion Language Model for fast text generation with self-correction.</li><li>• Pretrained diffusion language model initialized from an autoregressive model, accelerating training and ensuring stable, single-stage optimization without multi-stage pipelines.</li><li>• Developed block-based architecture to speed up inference while preserving generation quality.</li><li>• Achieved next-token prediction accuracy comparable to autoregressive models, demonstrating competitive performance with efficient sampling.</li></ul>	

<b>Reward Reasoning Model</b> <i>Research Intern at MSRA, Beijing</i> <i>Advisor: Li Dong, Principal Researcher</i>	Feb.2025 – May 2025
<ul style="list-style-type: none"><li>• Built Reward Reasoning Models (RRMs), a novel reward model paradigm that performs deliberate chain-of-thought reasoning before predicting final rewards.</li><li>• Implemented reinforcement learning framework to enable RRMs' reasoning to self-evolve without relying on supervised reasoning traces.</li><li>• Leveraged adaptive test-time computation to selectively engage reasoning for complex queries, boosting reward accuracy while maintaining efficiency.</li></ul>	

- Achieved state-of-the-art performance across diverse reward modeling benchmarks, demonstrating effectiveness of reasoning-enhanced reward inference.
- Applied RRM in both RLHF and test-time RL settings, achieving stable alignment gains across multiple domains while **avoiding reward hacking** common in traditional scalar reward models.
- Published as **Poster** at NeurIPS 2025 (co-first author).

### **Energy-Based Diffusion Reasoning Model**

Oct.2024 – Feb.2025

*Research Intern at MSRA, Beijing*

*Advisor: Li Dong, Principal Researcher*

- Designed energy-based diffusion framework in limited-token setting that used score matching to model energy functions for reasoning tasks.
- Developed Recursive Denoising Langevin Sampling method to scale solution accuracy with number of Langevin steps and recursion depth, enhancing scalability to complex problems.
- Achieved SOTA on Sudoku that reached **95.6% accuracy**, displaying effectiveness of energy-based iterative reasoning in discrete-space tasks.

### **Selective Knowledge Distillation for Efficient Speculative Decoders**

Jul.2024 – Feb.2025

*Research Assistant at H. Milton Stewart School of Industrial and Systems Engineering, Gatech*

*Advisor: Tuo Zhao, Associate Professor*

- Examined speculative decoding for LLM inference acceleration to craft **lightweight, plug-and-play** selective knowledge distillation methods that enhance draft-target model alignment.
- Applied **AdaSPEC**, a novel knowledge distillation (KD) method integrating selective token filtering to optimize draft model alignment with target model by focusing on simpler tokens.
- Designed and implemented reference model to filter out tokens difficult to fit, significantly improving KD process and refining draft model's alignment with target model.
- Conducted performance evaluation across diverse tasks and model configurations of up to 32B, achieving state-of-the-art acceptance rates and **up to 3.3x inference speed-up**.
- Attained up to **8.9% faster generation** and **7.45% higher token throughput** when integrated with advanced SD methods like Eagle, ensuring **practicality for real-world industrial deployment**.
- Published as **Spotlight (Top 3.5%)** at NeurIPS 2025 (co-first author).

### **Brain-inspired Intelligence Model**

Jun.2022 – Feb.2024

*Research Assistant at Center for Brain Inspired Computing Research, THU*

*Advisor: Lei Deng, Associate Professor*

- Investigated emergence of functional communities in Spiking Neural Networks (SNNs), extending findings from Artificial Neural Networks where neurons form specialized clusters for different tasks.
- Applied extended modularity metric for negative links to detect structural communities in SNNs trained on specifically designed memory tasks.
- Functionally clustered neurons based on firing variance across task stages.
- Identified distinct functional communities in SNNs that align with modularity-based clusters, demonstrating task-specific selectivity and functional specialization in brain-inspired networks.

### **Awards and Honors**

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|---|-------------|
| • First prize in Chinese High School Mathematics League                 | 2018 - 2021 |
| • Academic Excellence Scholarship, Comprehensive Excellence Scholarship | 2022        |

### **Skills & Others**

**Languages:** Chinese (native); English (fluent-TOEFL: 108; GRE: 328)

**Computer:** Fluent in C++, Python, MATLAB; basic understanding of Julia.

**Math:** Proficiency in convex analysis and optimization algorithms