

# Haoran Xu

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## Education

**Tsinghua University** Sep.2022-Jul.2026(expected)

### Bachelor of Science in Electrical Engineering

Overall GPA: 3.7/4.0

**Relevant Courses:** Principle of Circuits(A-), Digital Electronics(A-), Fundamentals of Analog Electronics(B+), Power Electronics(B+), Fundamentals of Computer Program Design(A+), Introduction to Complex Analysis (A+), Operational Research (A), Introduction of Energy and Information(A-), Forecasting Technology in Power Systems(A)

**Awards:** Comprehensive Excellence Scholarship (Tsinghua Friends - Siyuan Electric Scholarship), Comprehensive Excellence Scholarship (Tsinghua Friends - Toyota Scholarship), Outstanding Volunteer and Public Service Scholarship

## Publications & Manuscripts

- [ICML 2026] Fang, Y., Xu, H., Han, J., Ding, S., Wang, Y., Wang, Y., & Wang, X. (2025). "BioArc: Discovering Optimal Neural Architectures for Biological Foundation Models."

## Research Interests

- **Energy Storage Systems:** Physics-based modeling, state estimation (SOC/SOH), and optimal control of batteries.
- **Sustainable Transportation:** Developing advanced BMS and thermal management systems for electrified vehicles.
- **Grid Integration:** Leveraging energy storage to bridge the gap between transportation sectors and renewable power grids.

## Research Experiences & Select Projects

**Concurrency Debugging AI Agent (Ongoing)** Jun.2025-Present

*Advisor: Tianyi Zhang & Yongle Zhang, Assistant Professors, Purdue University*

- Developed a curated dataset of concurrency issues in distributed systems, creating a taxonomy for races, deadlocks, and ordering violations
- Designed an LLM-orchestrated workflow that hierarchically localizes bugs at the file, class, and line levels and proposes repair suggestions
- Created an "Action Knowledge Base" to function as a safety guardrail for the LLM agent, addressing issues with flawed or unsafe sequential action planning

**Neural Architecture Search for Single-Cell Foundation Models (Ongoing)** Jul.2025-Present

*Advisor: Xuan Wang, Assistant Professor, Virginia Tech*

- Investigating the optimal neural architectures for building foundation models on single-cell sequencing data.
- Utilizing NNI with PyTorch Lightning to explore CNN, LSTM, Mamba, Hyena, and Transformer across multiple tasks
- Developed the "BioArc Agent," a multi-agent LLM that consistently outperforms standard predictors in recommending optimal architectures for novel tasks

## Skills

- **Programming Language:** C, C++, Python, Java, Fortran, Shell
- **Software & Tools:** Mathematica, Matlab, Vivado, LTSpice, PyTorch Lightning

## Leadership & Activities

- Vice Minister, Academic Affairs Department, Tsinghua University Student Union
- Vice Minister, Technical Department, Innovation Association of the Department of Electrical Engineering, Tsinghua University
- Five-Star Tsinghua Volunteer (500+ accumulated service hours)