

PENGHUI YANG

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📄 PERSONAL INFORMATION

Age: 21 **Ethnicity:** Tujia

Political Status: Party Member

Research Interests: Deep Learning, Multimodal LLM, Smart Energy & Smart Cities

🎓 EDUCATION

Tsinghua University, Building Environment and Energy Engineering 2022 – Present

GPA: 3.77 **Rank:** 1/16

Key Courses with Grades:

- **Mathematical Foundations:** Linear Algebra (A), Calculus A(1) (A-), Introduction to Complex Analysis (A), Partial Differential Equations (A), Probability and Statistics (A+)
- **Professional Courses :** Fluid Mechanics and Pipe Network Analysis (A), Engineering Thermodynamics (A+), Building Environment Science (A-), Fundamentals of Heat Transfer (A-)

Honors:

- Tsinghua University Comprehensive Excellence Scholarship (Top 10%), 2022-2023
- Tsinghua University Comprehensive Excellence Scholarship (Top 10%), 2023-2024
- Second Prize in Tsinghua University Artificial General Intelligence Competition, 2025
- National Scholarship, 2025

Skills:

- Programming Languages: Proficient in Python; Familiar with C/C++
- Data & Algorithms: Self-learned data structures and algorithms; Familiar with machine learning and deep learning
- Language & Communication: Fluent in English (CET-6: 565); Strong technical writing and presentation skills

🧑‍🔬 RESEARCH EXPERIENCE

Academic Advancement Program 2024.09-2025.05

Research on RAG Generative Model Based on Architectural Database

- Objective: Optimize generative AI models for architecture by integrating Retrieval-Augmented Generation (RAG) techniques with architectural knowledge databases, enabling multimodal outputs and professional design solutions.
- Role: Technical Lead. Constructed architectural knowledge databases via data extraction and vectorization; Coordinated large model deployment. We have updated our Cleanroom-RAG project code on GitHub.

Summer Research Assistant 2024.08

Building Energy Consumption Prediction Based on Deep Learning

- Objective: Predict short-term cooling load for HVAC systems in large public buildings using historical chiller data.
- Role: Project Lead. Preprocessed raw data, applied feature engineering (CV-RFE), and implemented a Transformer model to achieve 80% accuracy in 3-day load forecasting.

Student Research Training (SRT) 2023.12-2024.07

Accelerated Algorithm for Building Cluster Shadow Calculation Using Sky Grid

- Objective: Optimize traditional hourly shadow computation by simplifying solar trajectory analysis via hemispherical sky grid clustering.
- Role: Project Lead. Evaluated accuracy of the new algorithm; Applied K-means clustering to reduce computation time by more than 90% while maintaining <2% annual average error.