

Kevin Ho

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Education

Mississippi State University, Starkville, MS

May 2027

Bachelor of Science, Computer Science

GPA: 4.0

Bachelor of Science, Mathematics

Relevant Courses: Advanced Algorithms and Data Structures, Artificial Intelligence, Deep Learning and Natural Language Processing, Numerical Analysis, Linear Algebra, Functional Analysis, Mathematical Statistics

Experience

Dynamics Across Multiple Networks, Starkville, MS

September 2024 – Present

Undergraduate Research Assistant

- Analyze vulnerabilities and behavior in complex networks like **rumor propagation** and **disease transmission** using **graph theory** and Python-based simulations.
- Contribute to developing a unified framework for improving **system resilience** and **risk mitigation**, with findings presented at conferences.

DRUMS REU Program at NCSU, Raleigh, NC

May 2025 – August 2025

Mathematics Researcher

- Implemented the **Sparse Direct Empirical Interpolation Method (S-DEIM)**, with a **Recurrent Neural Network (RNN)** to reconstruct high-resolution SST fields from sparse data.
- Co-authored a manuscript on the framework's performance and development as a **computationally efficient** model, to be submitted to the *Journal of Geophysical Research: Oceans*.

Medical Diagnosis Software Development, Starkville, MS

July 2024 – May 2025

Undergraduate Research Assistant

- Developed AI-driven brain tumor detection software using **Convolutional Neural Networks (CNNs)** on MRI data, achieving over **95%** precision to assist early diagnosis.
- Collaborated with medical professionals to integrate the software into clinical workflows at **UMMC**, enhancing efficiency in radiology imaging analysis.

Projects

Autonomous Tetris Agent using Deep Reinforcement Learning

Python, PyTorch, NumPy, Gymnasium

- Developed a custom reward function and state representation to train a **deep reinforcement learning** agent on advanced Tetris tactics.
- Optimized the agent's policy to achieve a peak global ranking within the **top 0.001%** (top ~100) out of 9,725,421 players on the competitive server tetr.io.

DiAlignment: LLM Output Modification with Activation Vector Scaling

Python, Flask, Gemini API

- Implemented dynamic scaling of activation vectors to modify LLM outputs, and evaluated model vulnerabilities to **rejection white-box attacks** to benchmark AI alignment.
- Awarded Best Use of Streamlit** and placed **3rd in the AI Alignment Track** at the AI ATL Hackathon.

Quantitative Trading and Portfolio Optimization Engine

C++, STL

- Engineered a from-scratch C++ simulation to implement and backtest automated trading agents based on key financial models, such as **Modern Portfolio Theory (MPT)**.
- Analyzed risk-return trade-offs by simulating portfolio performance across diverse asset allocations (stocks, bonds, commodities), optimizing for the **Sharpe Ratio**.

Extracurriculars

Chess Club, Mississippi State University

President, August 2023 – Present

- Organize weekly meetings and chess events, engaging the campus community in competitive and recreational play.
- Coordinate tournaments with local schools and universities, managing logistics and securing sponsorships that raised funds to support club activities.

ACM Competitive Programming Club, Mississippi State University

Vice President, August 2023 – Present

- 2024 ICPC Southeast Regionals Gold Medalist.**
- Developed and led a structured training curriculum for coding competitions, preparing members for contests like ICPC.

Skills

Programming Languages: Python, C/C++, Java, JavaScript, Matlab, Julia, R

Machine Learning: TensorFlow, PyTorch, NumPy, Hugging Face, Scikit-learn

Database Technologies: SQL, SQLite, MongoDB

Web Development: React, Google Cloud, Flask, Streamlit, Cloudflare, React.js

Software & Tools: Git, JetBrains, Matplotlib, Jupyter, Visual Studio Code