

EDUCATION

Kansas State University

PhD in Applied Mathematics

Friends of Mathematics Award in Research - Top graduating student

Nanyang Technological University

Bachelor of Science (Honours with Distinction) in Mathematical Sciences (Pure Mathematics)

President Research Scholar - Awarded to top-performing students for the Undergraduate Research

Manhattan, KS, USA

May 2027

2026-2027

Singapore

June 2022

2019-2021

INDUSTRIAL/ WORK EXPERIENCE

Project Officer, Nanyang Technological University

Summer 2022

- Worked with Dr. Andrew James Kricker to develop a numerically-stable, large-scale sparse eigenvalue numerical scheme to compute virtual homological spectral radii using Fox differential calculus. Computationally verified an open problem involving a lower bound conjecture, stemming from Geometric Topology, for a small class of surfaces.

Machine Learning Intern, Institute for Infocomm Research, A*Star, Singapore

Fall 2021

- Worked on predictive maintenance for cranes to determine the Remaining Useful Life (RUL) of components using multivariate regression on sensor data to forecast failures before they occur. Gained exposure to IoT communication protocols (like MQTT) used in real-time industrial sensor systems.

ACADEMIC EXPERIENCE

Graduate Research Assistant, Kansas State University

Fall 2022 - Current

- Designed a VAE scheme to solve the inverse problem of retrieving the structure of several polyhalomethane isomers from simulated Coulomb explosion imaging data, achieving ~ 0.1 a.u. per-atom error (5% of the typical bond lengths), with $R^2 > 0.98$, across different isomers. (*J. Chem. Phys.* **164**, 244304, 2026)
- Architected an unsupervised deep learning numerical scheme utilizing TensorFlow with a spectral-based model-informed loss function, derived using asymptotic and Fourier analysis. Reduced the original computational cost from $O(N^6)$ to $O(MN^3 \log N)$, with good accuracy of 25% relative error despite 10% noise. ([arXiv:2609.33062](https://arxiv.org/abs/2609.33062)).
- Proved the decay rate of Fourier coefficients of Green tensors and designed an unsupervised physics-informed deep learning algorithm with a coupled optimization process capitalizing this, to recover unknown parameters from data without phase information. ([arXiv:2609.33070](https://arxiv.org/abs/2609.33070)).

Graduate Teaching Assistant, Kansas State University

Fall 2022 - Current

- Led and taught how to use Python for numerical linear algebra and differential equations in MATH 551: Applied Matrix Theory and 340: Elementary Differential Equations, with an average teaching evaluation of 4.73/5.0.
- Won the Center for the Integration of Undergraduate, Graduate and Postdoctoral Research Graduate Scholarship for mentoring undergraduate students in research. Topic: *Active manipulation of Helmholtz scalar fields using physics-informed neural networks*.

Undergraduate Research Assistant, Nanyang Technological University

Academic Year 2020-2022

- Implemented an eigenvalue numerical scheme to test a conjectured relation between the virtual homological spectral radius of finite type covers of a surface and the hyperbolic volume of the mapping torus with respect to a pseudo-Anosov mapping class (Thesis).

PROJECTS

OpenAI's AI Agent Security - Multi-Step Tool Attacks Kaggle Competition

Summer 2026

- Implemented various deterministic red-teaming multi-step attack search algorithms (including a probe-based template race algorithm, a Go-Explore and Rainbow-teaming-style attack search algorithms) that drives tool-using LLM agents (GPT-OSS 20B, Gemma 4 26B-A4B) across safety guardrails into unsafe tool calls (data exfiltration, destructive writing).

TECHNICAL SKILLS & PROFESSIONAL ACTIVITIES

- *Programming Languages*: Python, MATLAB, LaTeX.
- *Agentic tooling*: Claude Code
- *Cloud & DevOps*: GitHub, Docker.
- *Libraries & Framework*: PyTorch, scikit-learn, pandas, Numpy, HuggingFace, TransformerLENs
- *Coursework*: An Introduction to Statistical Learning, Mathematics of Deep Learning, AI and Mathematics, Deep Learning, Pattern Recognition & Machine Learning, Functional Analysis, PDEs.
- *Certifications*: BlueDot AGI Strategy course, BlueDot Technical AI Safety course
- *Competitive Programming*: Codeforces (Specialist Rank)
- *Service*: Reviewer for NeurIPS2026 Interpretability for Discovery workshop
- *Reading Groups*: BlueDot AI Safety Evals Paper Reading Club, BlueDot Cyber × AI Reading Group