

Thomas Walker

Houston, Texas

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🌐 <https://thomaswalker1.github.io/>

EDUCATION

Doctor of Philosophy in Electrical and Computer Engineering

January 2025 - Present

Department of Electrical and Computer Engineering, Rice University

- Supervisor: Professor Richard Baraniuk
- Grade: 4.0 GPA

BSc Mathematics

September 2021 - June 2024

Department of Mathematics, Imperial College London

- Grade: First Class Honours (89%)

INDUSTRY AND RESEARCH EXPERIENCES

Research Assistant

September 2024 - December 2024

Imperial College London - Dr Anthea Monod

- Developing the use of tropical geometry to represent and investigate the properties of neural networks. Leading to the second authorship of *Tropical Expressivity of Neural Networks*.

Student Researcher

June 2024 - September 2024

Helmholtz Munich - AIDOS Lab - Professor Bastian Rieck

- Understanding how transformer models represent concepts in their latent representations. Leading to the first authorship of *Concept Boundary Vectors*.

Student Researcher

July - September 2023

Imperial College London - Safe Artificial Intelligence Lab - Professor Alessio Lomuscio

- Investigating neural network generalization with a focus on PAC learning theory. Leading to the first authorship *Tightening the Evaluation of PAC Bounds using Formal Verification Results*.

Data Consultant

June - September 2022

BAE Digital Intelligence

- Investigating project operations and developing strategies to improve resource utilization. Tasks involved working with database infrastructure (SQL, Java), AWS and developing a data dashboard in Python (Dash, Selenium).

SELECTED PAPERS

GrokAlign: Geometric Characterisation and Acceleration of Grokking

July 2025

ICML 2025 - High Dimensional Learning Workshop

Tropical Expressivity of Neural Networks

October 2024

ArXiv Preprint

AWARDS

IBM Prize For Excellence in Pure Mathematics

August 2024

Department of Mathematics, Imperial College London

- Awarded to a final year student of Mathematics in recognition of high academic achievement and excellence in Pure Mathematics.

Dean's List for Academic Excellence

August 2022/3/4

Department of Mathematics, Imperial College London

- Awarded to students in the top 10% of the year cohort for overall academic performance.

FUNDING

Graduate Fellowship

January 2025 - Present

Rice University - Department of Electrical and Computer Engineering

Undergraduate Research Project Funding

July - August 2023

Imperial College London - Department of Mathematics and Department of Computer Science

OTHER EXPERIENCES

Reprogramming AI Models Hackathon

November 2024

Apart Research

- Studying how feature steering influences the faithfulness and quality of chain-of-thought reasoning in large language models. Leading to the co-authorship of *Encouraging Chain-of-Thought Reasoning*.

Website Administrator

December 2021 - June 2024

Imperial Wiki Society

- Working on a student-led initiative to develop an online platform to host supplementary material for modules taught at the university. Focusing on managing the project and developing resources for the mathematics modules.

Mathematics Tutor

October 2021 - July 2022

My Tutor

- Planning and delivering online lessons on a weekly basis, as well as conducting reports on a student's progress to deliver back to their parents and teachers.

ARTICLES

The Prime Minister's Mathematical Propositions

July 2023

Imperial College London - Faculty of Natural Sciences Blog Post

TECHNICAL SKILLS AND INTERESTS

Spoken Languages (Fluent): English, Italian

Programming Languages: Python, Julia, Latex, Markdown

Miscellaneous Qualifications : Royal Life Saving Society National Pool Lifeguarding Qualification, Bronze Duke of Edinburgh

Extracurricular Activities: Tough Mudder 2021, Hyde Park Relay 2022, Rome Marathon 2024, Brecon Beacons Ultra Marathon 2025