

Thomas Walker

Rice University - Electrical and Computer Engineering

✉ thomas.mattia.walker@hotmail.co.uk

🔗 <https://thomaswalker1.github.io/>

EDUCATION

Doctor of Philosophy in Electrical and Computer Engineering

January 2025 - Present

Rice University

- Supervised by Professor Richard Baraniuk, focusing on machine learning.

BSc Mathematics

September 2021 - June 2024

Imperial College London

- First Class Honours: 89% Final Grade

A-levels

September 2019 - June 2021

Reading School

- Mathematics: A*, Further Mathematics: A*, Physics: A*, Extended Project Qualification: A*

EXPERIENCE

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.

Student Researcher

June 2024 - September 2024

Helmholtz Munich - AIDOS Lab - Professor Bastian Rieck

- Understanding how transformer models represent concepts in their latent representations.

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. Refined the evaluation of PAC bounds using testing certificates on regions of the input space.

Student Researcher

September - October 2022

Imperial College London - Dr Dean Bodenham

- Investigating how programming languages (Python, R, C++) generate pseudo-random numbers. Developing a repository of functions to align pseudo-random number generators across languages.

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).

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.

SELECTED PAPERS

GrokAlign: Geometric Characterisation and Acceleration of Grokking

July 2025

ICML 2025 - HiDL Workshop

Tropical Expressivity of Neural Networks

October 2024

ArXiv Preprint

AWARDS

IBM Prize For Excellence In Pure Mathematics

August 2024

Imperial College London Department of Mathematics

- 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

Imperial College London Department of Mathematics

- Awarded to students to the top 10% in the year group 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

ARTICLES

The Prime Minister's Mathematical Propositions

July 2023

Imperial College London - Faculty of Natural Sciences Blog Post

WORKSHOPS

AI Alignment - BlueDot Impact

October 2024 - February 2025

– A 12-week online course, covering a range of technical AI alignment research agendas. Involving an 8-week learning phase followed by a 4-week project phase.

Human Aligned AI Summer School - Centre for Theoretical Study at Charles University

July 2024

– Four intensive days of talks, workshops, and discussions covering the latest trends in AI alignment research and broader framings of AI alignment research.

X-Risk - Global Challenges Project

May 2023

– A workshop on investigating approaches taken to AI safety research.

AI Safety Fundamentals - Imperial Effective Altruism Society

October - December 2022

– Comprised of eight group discussion sessions on the literature surrounding the concerns of powerful AI systems and the research on AI safety.

VOLUNTEERING

Treasurer

October 2021 - July 2022

Imperial College London - Linstead Halls

Dog Fosterer

May 2020 - August 2022

Royal Society for the Prevention of Cruelty to Animals (RSPCA), The Responsible Dog Rescue

TECHNICAL SKILLS AND INTERESTS

Spoken Languages (Fluent): English, Italian

Programming Languages (Intermediate): 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