

# Kaalkidan Sahele, DPhil

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## Education

**University of Oxford (DPhil)** Field of Study: GNNs, AI, Data Knowledge, Temporal Graphs  
2025 - Present (Grad. 2028/29) Funded by Department of Computer Science & Black Academic Futures programme (BAF)  
*Supervised by Prof. Ian Horrocks & Prof. Bernado Cuenca Grau*

**Durham University (MEng)** Computer Science First Class Honours  
2021 - 2025

## Research Experience

**Graduate Teaching Assistant | University of Oxford** Oct 2025  
Classes taught include Machine Learning, Concurrent Algorithms and Data Structures, Design and Analysis of Algorithms, Digital Systems

**Advanced Final Research Project (Awarded: First Class) | Durham University** Sep 2023 - Jun 2025  
Project includes deriving novel theoretical results as well as coding and modelling temporal graphs

**MITACS Globalink Research Intern (Quantum Machine Learning) | University of Toronto** Jun 2024 - Sep 2024  
Derived novel pulse functions for quantum circuits to improve quantum machine learning pipeline  
Co-authored paper titled “Parameterised Encoder Circuits and Efficient Circuit Growth for QML”  
Achieved comparable fidelity results of generalised rotation gates to Adam optimiser  
Contributed to poster presentation for 10<sup>th</sup> International Conference on Quantum Information and Quantum Control (CQIQC-X)  
Presented “Quantum Machine Learning” talk at Quantum Tea Seminar Series

**Lab Demonstrator | Durham University** Sep 2023 - May 2025  
Taught theory of computation, algorithms & complexity, data structures, linear algebra, calculus

**Research Shadowing | Durham University** Jun 2023  
Shadowed Professor George Mertzios in his ongoing research projects with his current PhD students  
Projects include Labelling Strategies on Periodic Temporal Graphs

**Paper Reviewer | Durham University, University of Toronto**  
Non-PC member reviewer for papers in 3<sup>rd</sup> Symposium on Algorithmic Foundations of Dynamic Networks (SAND 2024)  
Non-PC member reviewer for paper in 42<sup>nd</sup> International Symposium on Theoretical Aspects of Computer Science (STACS 2025)  
Non-PC member reviewer for papers in IEEE International Conference on Quantum Computing and Engineering (QCE2024)  
Regularly attend ACiD (Algorithmic Complexity in Durham) Seminar series  
Regularly attended Toronto Quantum Information Seminar

## Leadership & Other Work Experience

**GitHub Campus Expert | GitHub** Nov 2024 - Present  
Workshop Lead: GitHub & IDEs, Machine Learning  
Lead tech communities

**President | Durham University Computing Society** Jun 2024 - Jun 2025  
Lead executive team & society, including overseeing all 5 subdivisions (Computing Society, Durham University Women in Tech/ DurHack/ DurHack: Next Gen/ Durham SIAM & IMA Chapter/ Robotics)

**Co-founder & Lead | DUWiT Hacks (Durham University Women in Tech)** Dec 2024 - Mar 2025  
Singlehandedly raised £7k sponsorship  
Acted as main point of contact for event logistics, catering, sponsors and partners, prize givers, volunteers, and attendees

**Head of Hacker Experience | DurHack 9** Dec 2023 - Nov 2024  
Increased % of female identifying attendees from 22% in DurHack 8 to 23.6% in DurHack 9  
Pioneered the creation of HackPacks, leading to a submission rate of 133 projects amongst 600 attendees  
Initiated collaboration efforts for first ever UK-US hackathon portal with Hack North Carolina, fostering global hacker community engagement

**IT Officer | St. Aidan’s JCR CIO, Durham University** Jun 2022 - Jul 2023  
Redesigned the website, improving site visitor count by 11%  
Migrated 8000 rows of data from website database from Heroku to AWS via Windows PowerShell  
Streamlined the online Google workspace for the entire JCR executive committee

## Notable Projects & Awards

Awards	Durham Inspired Coleman Scholarship 2021-25 (one recipient per cohort) MITACS Certificate of Completion 2024 Scott Logic Prize (Professor Sue Black resp.) prize for Outstanding Contribution to Durham community (Women in Tech community resp.)
Projects	Uncertainty-Aware Graph Neural Networks for Mechanistic Interpretability and AI Safety Developed an uncertainty-aware Graph Neural Network framework that models neural networks and knowledge graphs as computational graphs to approximate internal activations, quantify epistemic uncertainty, and identify robust or fragile subcircuits using graph-theoretic metrics for improved mechanistic interpretability and safety in high-stake policy and decision systems. CS224W: Machine Learning with Graphs (Stanford) Completed the course independently once all material was made available online