

James McAllister – CV

PhD Researcher – Mathematical Neuroscience

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🐙 [GitHub Profile](#)

🌐 [LinkedIn Profile](#)

EDUCATION

PhD, Mathematics & Computational Neuroscience, Magee College 2023 – present

Intelligent Systems Research Centre, Magee College, University of Ulster

Mathematical & computational spectral graph theory-based analysis & modelling of heterosynaptic plasticity

MRes (Masters of Research), Queen's University, Belfast 2022–2023

Distinction

PGCE (Mathematics), Queen's University, Belfast 2018–2019

GTCNI Star Award and E. Fulton Prize for Mathematics

MA (Dubl) Mathematics, Trinity College Dublin 2014–2018

First Class Honours with Gold Medal

EXPERIENCE

Visiting Researcher: University of Bristol February 2024 – present

Mathematics, Computing, and Neuroscience, Intelligent Systems Research Lab

Postgraduate Teaching Assistant: University of Ulster September 2023 – present

Mathematics and algorithms modules

Teacher of Mathematics: Wellington College Belfast 2019–2022

Mathematics, Further Mathematics, and Physics

RESEARCH PROJECTS, PUBLICATIONS, AND PRESENTATIONS

Graph-theory perspectives on network structure in reservoir computing 2024

Ongoing research collaboration with University of Bristol

Heterosynaptic plasticity rules induce small-world network topologies Due June 2024

Poster: International Conference of Mathematical Neuroscience, Dublin

Mathematical modelling of synaptic maturation dynamics 2024

Ongoing research collaboration with University of Bristol

Connectome-inspired multi-task reservoirs Due July 2024

Poster: Neural Computation Conference, Sheffield

The capacity and accuracy of a triple-well Hopfield model 2023

Research Project & Presentation: Intelligent Systems Research Centre

A discrete attractor model of decision making 2023

Research Project & Presentation: Using dynamical systems to model decision-making processes

The topology of autistic heterogeneity 2022/23

Research Project: Using topological data analysis to examine autism neuropsychological data

The impact of formative assessment on student attitudes to mathematics 2023

Research Project: A synthesis of the literature

A multilevel analysis of high-stakes examination results in mathematics	2021
<i>Cantley, I., & McAllister, J. https://doi.org/10.1007/s11199-021-01234-5</i>	
<i>Cambridge University: Talk at British Society for Research into Learning Mathematics (BSRLM)</i>	2020
Trigonometric series and the emergence of transfinite set theory	2018
<i>Final Year Research Dissertation & Poster. First class (distinction). Trinity College Dublin</i>	
Complex numbers in mathematics education	2018
<i>Mathematics Education Research Project. First class (distinction). Trinity College Dublin</i>	

SKILLS AND INTERESTS

Languages: English, German, French, British Sign Language

Programming Languages: Python, Julia, MATLAB, SPSS

Other Developer Tools: LaTeX, Microsoft, Google Suite

Areas of Interest: Graph & network theory, mathematical modelling of synaptic plasticity, applications of topology & topological data analysis, functional analysis, assessment theory

ACHIEVEMENTS

Gold Medal, Trinity College Dublin	2018
Naughton Foundation Scholarship	2014–2018
Exhibition Award, Trinity College Dublin	2014
Trinity College Dublin Sizarship	2014–2018
Trinity College Dublin First Class Prize	2015, 2016, 2017
E. Fulton Prize for Mathematics (PGCE), QUB	2019
GTCNI Star Award	2019

COURSES AND TRAINING

Deep Learning Neuromatch Academy Summer School

Computational Neuroscience Autumn School, Intelligent Systems Research Centre, Ulster University

Computational Neuroscience Neuromatch Academy Summer School

INCF (International Neuroinformatics Coordinating Facility): Mathematical & Computational Modelling of Neuronal Plasticity - Python-based modelling course

British Sign Language Level 1

REFEREES

References available on request.