

James McAllister – CV

PhD Researcher – Mathematical Neuroscience

Website: <https://jajmcallister.github.io/>

Intelligent Systems Research Centre, Magee College

☎ 07742576089

✉ mcallister-j23@ulster.ac.uk

🐙 GitHub Profile

🌐 LinkedIn Profile



EDUCATION

PhD, Mathematical & Computational Neuroscience <i>Intelligent Systems Research Centre, Magee College, University of Ulster</i> Analysis & modelling of network structure, function, & heterosynaptic plasticity	<i>2023 – present</i>
MRes (Masters of Research), Queen's University, Belfast <i>Distinction</i>	<i>2022–2023</i>
PGCE (Mathematics), Queen's University, Belfast <i>GTCNI Star Award and E. Fulton Prize for Mathematics</i>	<i>2018–2019</i>
MA (Dubl) Mathematics, Trinity College Dublin <i>First Class Honours with Gold Medal</i>	<i>2014–2018</i>

EXPERIENCE

Visiting Researcher: University of Bristol <i>Applied Mathematics, Intelligent Systems Research Lab</i>	<i>February 2024 – present</i>
Postgraduate Teaching Assistant: University of Ulster <i>Mathematics and algorithms modules</i>	<i>September 2023 – present</i>
Teacher of Mathematics: Wellington College Belfast <i>Mathematics, Further Mathematics, and Physics</i>	<i>2019–2022</i>

RESEARCH PROJECTS AND PUBLICATIONS

Heterosynaptic plasticity rules induce small-world network topologies <i>Poster: International Conference of Mathematical Neuroscience, Dublin</i>	<i>Due June 2024</i>
Brain connectome connectivity-inspired reservoir networks <i>Possible Poster: Neural Computation Conference, Sheffield</i>	<i>Due July 2024</i>
Graph-theory perspectives on network structure in reservoir computing <i>Ongoing research collaboration with University of Bristol</i>	<i>2024</i>
Mathematical modelling of synaptic maturation & circuit formation <i>Ongoing research collaboration with University of Bristol</i>	<i>2024</i>
The capacity and accuracy of a triple-well Hopfield model <i>Research Project & Presentation: Intelligent Systems Research Centre</i>	<i>October 2023</i>
A discrete attractor model of decision making <i>Research Project & Presentation: Using dynamical systems to model decision-making processes</i>	<i>July 2023</i>
The topology of autistic heterogeneity <i>Research Project: Using topological data analysis to examine autism neuropsychological data</i>	<i>2023</i>
The impact of formative assessment on student attitudes to mathematics <i>Research Project: A synthesis of the literature</i>	<i>2023</i>

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>	

TALKS, PRESENTATIONS, AND SEMINARS

Network structure in reservoir computing & brain connectomes	May 2024
<i>Seminar: Intelligent Systems Research Centre</i>	
Simplicial Hopfield networks	May 2024
<i>Seminar: Intelligent Systems Research Centre COIN Club</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 AND AWARDS

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, 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): Python-based modelling course	
British Sign Language Level 1	

REFEREES

References available on request.