

James McAllister – CV

PhD Researcher – Mathematical Neuroscience

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🐙 [GitHub Profile](#)

🌐 [LinkedIn Profile](#)

EDUCATION

- **Magee College, Intelligent Systems Research Centre, University of Ulster** 2023 – present
PhD, Mathematics and Computational Neuroscience
- **Queen's University, Belfast** 2022–2023
MRes (Masters of Research) – Distinction
- **Queen's University, Belfast** 2018–2019
PGCE (Mathematics) – GTCNI Star Award and E. Fulton Prize for Mathematics
- **Trinity College Dublin** 2014–2018
MA (Dubl) Mathematics – First Class Honours with Gold Medal

EXPERIENCE

- **Visiting Researcher: Mathematics, Computing and Neuroscience** February 2024 – present
University of Bristol, Applied Mathematics, Intelligent Systems Lab
- **Postgraduate Teaching Assistant in mathematics and algorithms modules** 2023 – present
Magee College, University of Ulster
- **Teacher of Mathematics, Further Mathematics, and Physics** 2019–2022
Wellington College Belfast

RESEARCH PROJECTS, PUBLICATIONS, AND PRESENTATIONS

- **Graph-theory perspectives on recurrent neural 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
- **The capacity and accuracy of a triple well Hopfield model** 2023
Research Project: Intelligent Systems Research Centre
- **A discrete attractor model of decision making** 2023
Research Project: 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
A synthesis of the literature
- **Insights from a multilevel analysis of high-stakes examination results in mathematics** 2021
Cantley, I., & McAllister, J. <https://doi.org/10.1007/s11199-021-01234-5>
- **Trigonometric Series and the Emergence of Transfinite Set Theory** 2018
Final Year Research Dissertation & Poster. First class (distinction). Trinity College Dublin
- **Complex Numbers in Mathematics Education** 2018
Mathematics Education Research Project. First class (distinction). Trinity College Dublin

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, TRAINING, AND TALKS

Computational Neuroscience Autumn School (1 week): 10/23, Intelligent Systems Research Centre, Ulster University

Computational Neuroscience Neuromatch Academy Summer School (3 weeks): 07/2023

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

Faculty of Education, Cambridge University. Title: The gender similarities hypothesis: Insights from a multilevel analysis of high-stakes examination results in mathematics, 03/2020, research article and presentation. British Society for Research into Learning Mathematics (BSRLM).

REFEREES

References available on request.