James McAllister – CV

PhD Researcher – Mathematical Neuroscience
Website: https://jajmcallister.github.io/
Intelligent Systems Research Centre

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GitHub Profile
LinkedIn Profile

Education

- **Ulster University, Intelligent Systems Research Centre** *2023 – present*
  PhD, Mathematical Neuroscience
- **Queen's University, Belfast** *2022–2023*
  MRes (Research Methods) – 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

- **Ulster University** *September 2023 – present*
  Postgraduate Teaching Assistant Magee Campus
  – Leading tutorials in Mathematics modules for computing, engineering, and artificial intelligence
- **Wellington College** *2019–2022*
  Teacher of Mathematics, Further Mathematics and Physics Belfast

Research Projects, Publications, and Presentations

- Heterosynaptic plasticity rules induce small-world network topologies *Due 2024*
  International Conference of Mathematical Neuroscience
- The capacity and accuracy of a triple well Hopfield model *2023*
  Intelligent Systems Research Centre Computational Neuroscience Autumn School Project
- A discrete attractor model of decision making *2023*
  Using dynamical systems to model decision-making processes – Neuromatch Academy Project
- The topology of autistic heterogeneity *2022/23*
  Research Project
- The impact of formative assessment on student attitudes to mathematics *2022/23*
  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
- Georg Cantor: Trigonometric Series and the Emergence of Transfinite Set Theory *2017/18*
  Final Year Research Dissertation. First class (distinction). Academic poster display
- Complex Numbers in Mathematics Education *2017/18*
  Mathematics Education Research Project. First class (distinction)

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: Mathematical modelling of synaptic plasticity, network theory, applications of topology and geometry, functional analysis, mathematical biology, 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*
- **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): 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.

Referees

Referee 1: Dr Cian O'Donnell, PhD Supervisor, Computational Neuroscience, School of Computing, Engineering & Intelligent Systems, Ulster University. c.odonnell2@ulster.ac.uk

Referee 2: Prof Paschalis Karageorgis, Associate Professor, Pure & Applied Mathematics, School of Mathematics, Trinity College Dublin, karageop@tcd.ie