

# James McAllister – CV

**PhD Researcher** – Intelligent Systems Research Centre, Ulster University  
Computational Neuroscience, Neural Dynamics, Machine Learning  
*Associate Member of the Institute of Mathematics & Applications*

✉ Email  
🌐 LinkedIn  
🌐 Webpage  
🐙 GitHub

## EDUCATION

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<b>PhD Theoretical &amp; Computational Neuroscience</b>	2023–2026
Intelligent Systems Research Centre, Ulster University Visiting PhD Researcher at University of Bristol, Neural Dynamics Group (2024)	
<b>Associate Fellowship of Higher Education Authority (AFHEA)</b>	2024–2025
Doctoral College, Ulster University	
<b>Masters of Research (MRes)</b>	2022–2023
Queen’s University Belfast, Distinction	
<b>PGCE (Mathematics)</b>	2018–2019
Queen’s University Belfast, GTCNI Star Award and E. Fulton Prize for Mathematics	
<b>MA (Dubl) Mathematics</b>	2014–2018
Trinity College Dublin, First Class Honours with Gold Medal	

## EXPERIENCE

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<b>Delivering Lectures in Mathematics Modules</b>	2024 – present
Linear Algebra, Differential Equations, Statistics	
<b>Co-Supervision of Final Year Undergraduate Projects</b>	2024 – present
Computer science, machine learning, neuroscience, applied maths	
<b>Visiting Researcher: University of Bristol</b>	2024
Neural Dynamics Group, School of Engineering Mathematics	
<b>Postgraduate Teaching Assistant</b>	2023 – present
Undergraduate and postgraduate tutorials in mathematics, algorithms, and data science	
<b>Teacher of Mathematics: Wellington College Belfast</b>	2019–2022
Mathematics, Further Mathematics, and Physics	

## RESEARCH

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<b>Linking structure &amp; function in Recurrent Neural Networks</b>	2024 – present
Ongoing PhD research in collaboration with Universities of Cambridge & Bristol	
<b>Mathematical modelling of synaptic maturation &amp; circuit formation</b>	2024 – present
Ongoing research collaboration with University of Bristol	
<b>Topological and simplicial features in reservoir computing networks</b>	2024
Paper: McAllister, et al., UKCI, <a href="https://doi.org/10.1007/978-3-031-78857-4_5">https://doi.org/10.1007/978-3-031-78857-4_5</a>	
<b>The capacity and accuracy of a triple-well Hopfield model</b>	2023
Research Project & Presentation: Intelligent Systems Research Centre	
<b>A discrete attractor model of decision making</b>	2023
Research Project & Presentation: Using dynamical systems to model decision-making processes	
<b>A review &amp; statistical analysis of the effect of formative assessment in mathematics</b>	2023
Research Project & Dissertation, Distinction, Queen’s University Belfast	
<b>A multilevel analysis of high-stakes examination results in mathematics</b>	2021
Paper: Cantley, I., & McAllister, J. <a href="https://doi.org/10.1007/s11199-021-01234-5">https://doi.org/10.1007/s11199-021-01234-5</a>	
Cambridge University: Talk at British Society for Research into Learning Mathematics (BSRLM)	2020
<b>Trigonometric series and the emergence of transfinite set theory</b>	2018
Final Year Research Dissertation & Poster. First class (distinction). Trinity College Dublin	

## TALKS, POSTERS, AND SEMINARS

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Invited talk: <i>Recent Trends in Rough Analysis &amp; Dynamical Systems: Theory and Practice</i>	July 2025
Poster: <i>UK Neural Computation, Imperial College, London</i>	July 2025
Seminar: <i>Ignite Sessions, Intelligent Systems Research Centre</i>	June 2025
Invited talk: <i>Cambridge University, CBL Lab, <a href="https://talks.cam.ac.uk/talk/index/232441">https://talks.cam.ac.uk/talk/index/232441</a></i>	June 2025
Poster: <i>Festival of Research, Ulster University</i>	June 2025
Poster: <i>CoSyNe, Montreal &amp; Mont-Tremblant, <a href="https://doi.org/10.5281/zenodo.15350011">https://doi.org/10.5281/zenodo.15350011</a></i>	March 2025
Talk: <i>Intelligent Systems Research Centre, COIN Club</i>	Feb 2025
Talk: <i>Workshop UK Computational Intelligence, UKCI 2024</i>	Sep 2024
Talk: <i>Computational Neuroscience, Neurotechnology &amp; NeuroAI Summer School</i>	Aug 2024
Poster: <i>UK Neural Computation, Sheffield, <a href="https://doi.org/10.5281/zenodo.13303677">https://doi.org/10.5281/zenodo.13303677</a></i>	July 2024
Poster: <i>Int. Conf. Mathematical Neuroscience, Dublin, <a href="https://doi.org/10.5281/zenodo.13303384">https://doi.org/10.5281/zenodo.13303384</a></i>	June 2024
Seminar: <i>Intelligent Systems Research Centre</i>	May 2024
Talk: <i>Intelligent Systems Research Centre, COIN Club</i>	May 2024

## SKILLS AND INTERESTS

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**Languages:** English, German, French, British Sign Language

**Programming Languages:** Julia (main), Python, MATLAB, R, SPSS

**Other Developer Tools:** High Performance Computing, L<sup>A</sup>T<sub>E</sub>X, Microsoft, Google Suite

**Areas of Interest:** Theoretical neuroscience, Network theory & dynamics, Mathematical modelling, Applications of topology, Functional analysis, Mathematics of Machine Learning, Assessment theory

## ACHIEVEMENTS AND AWARDS

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Best Poster Prize, PhD Festival of Research, Ulster University	June 2025
Travel Grant, Computational and Systems Neuroscience (CoSyNe)	March 2025
Best Student Paper Award, UK Computational Intelligence, Belfast	Sep 2024
Visiting Scholarship, University of Bristol	Feb 2024
E. Fulton Prize for Mathematics, QUB	Sep 2019
GTCNI Star Award, PGCE, QUB	July 2019
Gold Medal, Trinity College Dublin	Nov 2018
Trinity College Dublin First Class Prize	2015, 2016, 2017
Naughton Foundation Scholarship	2014–2018
Exhibition Award, Trinity College Dublin	Sep 2014
Trinity College Dublin Sizarship	2014–2018

## COURSES AND TRAINING

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Hausdorff Mathematics Centre, Statistical mechanics of spin glasses, neural networks & learning	2025
Associate Fellow of the Higher Education Authority (AFHEA), First Steps to Teaching	2024–25
Computational Neuroscience Autumn School, Intelligent Systems Research Centre, UU	2023, 2024
Computational Neuroscience Neuromatch Academy Summer School	2023
INCF (International Neuroinformatics Coordinating Facility): Python-based modelling course	2023
British Sign Language Level 1	2019

## REFEREES

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References available on request.