Oluwaseun Olushola

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EDUCATION

PhD in Applied Mathematics – University of Birmingham, UK **2025-Present**

Research: *Population dynamics for a Daphnia biofiltration technology*
Supervisors: Dr Alexandra Tzella and Professor Sara Jabbari
Funding: 125th Anniversary Scholarship

Developing mathematical models using delay differential equations and dynamical systems to investigate the population dynamics underlying Daphnia-based water filtration. Research focuses on steady-state behaviour, stability and bifurcation analysis, with the broader aim of understanding how mathematical modelling can improve the reliability of biofiltration technologies.

MSc in Applied Mathematics – University of Birmingham **2023-2025**
BSc in Mathematics – University of Birmingham **2019-2022**

SELECTED PRESENTATIONS AND TALKS

Black Heroes of Mathematics 2026 (BHoM26), ICMS, Edinburgh **Oct 2026**
Invited Keynote Speaker

Invited to deliver a keynote presentation on my doctoral research in applied mathematics and my wider journey in mathematics, including the use of mathematical modelling in Daphnia-based biofiltration.

Beyond Boundaries: PhD Research for Climate and Sustainability Solutions, University of Birmingham **Sept 2026**
Oral Presentation

Presented my doctoral research on Daphnia-based biofiltration under the theme “Approaches, Solutions and Technologies for Climate Action: Adaptation.”, highlighting the role of mathematics in sustainable wastewater treatment.

University Doctoral School Showcase, University of Birmingham **Jun 2026**
Research Presentation

Presented doctoral research on Daphnia population dynamics and biofiltration to a broad academic audience.

British Applied Mathematics Colloquium (BAMC), University of East Anglia **Apr 2026**
Poster Presentation

Presented a research poster on the mathematical modelling of Daphnia population dynamics and its application to biofiltration technologies

TEACHING AND MENTORING

Postgraduate Teaching Assistant (Mathematics) – University of Birmingham **2025-Present**

- Support undergraduate mathematics teaching through tutorials, problem classes and small-group sessions
- Explain mathematical concepts, guide students through problem-solving approaches and respond to questions at different levels of understanding
- Provide feedback on students' work and support the development of mathematical reasoning, confidence and independent study skills

Levelling Up Maths Tutor/Mentor – University of Birmingham **Mar – Jun 2022**

- Delivered online mathematics tutorials and mentoring to Year 12 STEM students, adapting explanations and approaches to students' individual levels of understanding
- Supported A-Level mathematics study and provided guidance on university progression and UCAS applications

Mathematics and English Tutor – Splat Tuition, Birmingham and Online **2022-Present**

- Deliver Maths and English tuition to learners with differing abilities and learning needs, adapting teaching to support individual progress
- Assess understanding, identify gaps and misconceptions, and strengthen subject knowledge, problem solving and confidence
- Encourage active participation and independent learning through questioning, discussion and guided problem-solving

Bishop Challoner Teaching Internship **Jun-July 2021**

- Planned and supported classroom teaching, using student-performance data to inform assessment and identify areas requiring additional support
- Conducted classroom-based research and proposed interventions to improve attainment and learning outcomes

PUBLIC ENGAGEMENT AND OUTREACH

Selected Engagements

PhD Pathways Panel, University of Birmingham Dec 2025
Panel speaker discussing doctoral study, academic progression and the PhD experience with prospective and current students.

Selected Writing and Features

"A Classroom Full of Curiosity" – University of Birmingham PGR Development Blog
Article reflecting on mathematics outreach and engagement with school students.

"Work/life balance: looking after ourselves so we can do our best work" – University of Birmingham
Contributed a piece on wellbeing and maintaining balance during doctoral study.

"From Nigeria to Brum: a Black mathematician's journey" – University of Birmingham
Featured profile reflecting on my educational and mathematical journey

TECHNICAL SKILLS

Mathematical modelling and analysis: Delay differential equations; nonlinear dynamical systems; mathematical biology; population dynamics; steady-state and stability analysis; characteristic equations; eigenvalue analysis; transcritical and Hopf bifurcation analysis.

Numerical and computational methods: Numerical simulation; numerical bifurcation analysis; parameter continuation; characteristic-root computation; time-series and periodic-solution analysis.

Scientific computing: MATLAB; dde23; DDE-BIFTOOL; Maple; symbolic and numerical equation solving; scientific visualisation.

ADDITIONAL TRAINING

IBM Data Science Professional Certificate **Jun 2023**
Python; pandas; SQL; Jupyter Notebook; Beautiful Soup; Plotly; data cleaning and EDA; SVMs; decision trees; k-nearest neighbours; model evaluation; relational databases; dashboards and web scraping.