OLUWASEUN OLUSHOLA

Applied Mathematics PhD Researcher | Mathematical Modelling | Scientific Computing | Data Analysis
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PROFESSIONAL PROFILE

Applied Mathematics PhD researcher at the University of Birmingham specialising in mathematical modelling, dynamical systems and scientific computing. Experienced in developing and analysing nonlinear differential-equation models, numerical simulation, stability and bifurcation analysis, and translating complex quantitative problems into tractable computational investigations. Technical experience includes MATLAB, Maple, Python and SQL, with additional experience in data analysis and machine learning.

TECHNICAL SKILLS

Mathematical Modelling: Ordinary and delay differential equations, dynamical systems, population modelling, nonlinear systems, stability analysis, bifurcation analysis, parameter analysis

Scientific Computing: MATLAB, Maple, DDE-BIFTOOL, numerical simulation, numerical continuation, computational model development and validation

Data & Programming: Python, SQL, pandas, Jupyter Notebook, data cleaning and manipulation, exploratory data analysis, data visualisation

Machine Learning: Support vector machines, decision trees, k-nearest neighbours, model evaluation and performance comparison

Professional: Quantitative problem-solving, technical communication, research, stakeholder engagement, project delivery, documentation and presentation

TECHNICAL & RESEARCH EXPERIENCE

PhD Researcher in Applied Mathematics – University of Birmingham **2025–Present**

Research: *Population dynamics for a Daphnia biofiltration technology* | 125th Anniversary Scholarship

- Develop nonlinear, stage-structured ordinary and delay differential equation models of biological population dynamics for water-treatment applications
- Apply steady-state, stability, eigenvalue and bifurcation analysis to investigate changes in system behaviour across operating conditions
- Implement numerical simulations and continuation methods in MATLAB and DDE-BIFTOOL to analyse equilibria, stability and oscillatory dynamics.
- Use Maple for symbolic derivation and analysis of characteristic equations and stability conditions, validating analytical findings against numerical results
- Independently manage the analytical and computational research workflow, from model formulation and verification through to technical documentation and communication of results

ENTREPRENEURIAL & LEADERSHIP EXPERIENCE

Co-Founder – Akron Realty **2026-Present**

- Co-founded a technology-enabled real-estate platform, helping take the business from concept and stakeholder research through to pilot launch
- Shape product and operational priorities using feedback from renters, buyers, landlords, property owners, agents and other stakeholders
- Coordinate work across a multidisciplinary team spanning technology, content, operations and customer-facing activities, balancing user needs, commercial priorities and delivery requirements

PROFESSIONAL EXPERIENCE

Education Support Administrator – University of Birmingham **Jul 2022 – Sept 2023**

- Handled 30+ daily enquiries from students, staff and external organisations while maintaining accuracy and service standards.
- Performed systematic validation and completeness checks across records, reducing avoidable errors by approximately 5%
- Used 5+ University systems and liaised with 20+ stakeholders to collate information, resolve discrepancies, produce reports and meet operational deadlines

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

- Deliver undergraduate mathematics tutorials and problem-solving sessions, communicating complex concepts to students with different levels of technical understanding
- Guide students through analytical problem-solving while developing independent mathematical reasoning and confidence

DATA SCIENCE & MACHINE LEARNING

IBM Data Science Professional Certificate **Jun 2023**

- Built and evaluated machine-learning models in Python, including support vector machines, decision trees and k-nearest neighbours, using real-world datasets.
- Wrote SQL queries using joins, views and transactions to create and interrogate relational databases
- Cleaned, analysed and visualised data using pandas and Jupyter Notebook, developing reproducible workflows and communicating results through dashboards

SELECTED ACHIEVEMENTS & LEADERSHIP

- **Invited Keynote Speaker**, Black Heroes of Mathematics 2026, ICMS Edinburgh
- **Shortlisted**, University of Birmingham Digital Scholarship Award, 2026
- **Selected Research Presentations:** Beyond Boundaries: PhD Research for Climate and Sustainability Solutions and British Applied Mathematics Colloquium, 2026