Muhammed Ali Mehmood

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EDUCATION

PhD Mathematics, Imperial College London — Oct. 2022 – Oct. 2025

- **Key themes:** Machine Learning, Partial Differential Equations, Numerical analysis.
- **Five research papers, including:**
  - "*Physics-informed Neural Networks for congestion models*" (in progress), L. Gonon, M.A. Mehmood and E. Zatorska.
  - "*Hard congestion limit of the dissipative Aw-Rascle system with a polynomial offset function*", M.A. Mehmood, Journal of Mathematical Analysis and Applications 533.1 (2024)
  - "*Duality solutions to the hard-congestion model for the dissipative Aw-Rascle system*", N. Chaudhuri, M.A. Mehmood, C. Perrin and E. Zatorska, Communications in Partial Differential Equations (2024)

MSc Pure Mathematics, Imperial College London — Oct. 2021 – Oct. 2022

- **Grade:** First Class Honours (79%) completing modules such as Probability Theory and Formalising Mathematics.

BSc Mathematics, King's College London — Sept. 2018 – Aug. 2021

- **Grade:** First Class Honours (83%) completing modules such as Numerical & Computational Methods with Python, Statistical Inference, Linear Partial Differential Equations, Fundamentals of Probability Theory

QUANT EXPERIENCE

Spring into Quant Finance Participant, G-Research — Apr 2025

- Placed on a highly competitive week-long Quant Finance program hosted by G-Research. The workshop provides a detailed introduction and immersion into the world of quantitative finance and machine learning.

PERSONAL PROJECTS

Using an LLM to classify Math Exam Questions — Jan 2025

- **Context:** every year, over 100 A-Level Maths exam papers are set across exam boards. This makes it incredibly difficult and costly for educators and students to maintain an up-to-date database of exam questions for each topic.
- **My solution:** created a BERT-based multi-label classification model that takes as input a set of A-Level Mathematics question paper, detects and classifies each question. The output is a pdf file for each topic.
- Trained using an independently sourced dataset of A-Level exams over the past ten years.

Neural Network from scratch for detecting diabetes — Oct 2024

- Developed and trained a neural network using only NumPy, which is able to predict whether given individuals have diabetes or not, based on health data such as glucose levels and BMI.
- Used the "Pima Indians Diabetes" dataset for training.

AWARDS

- **Doris-Chen Mobility Award (2024)** - an award of 1000 GBP given to exceptional PhD students in the Mathematics department of Imperial College for the purpose of taking their research abroad.
- **Roth Scholarship (2022)** - awarded a full scholarship to undertake my PhD research at Imperial College.
- **MSc Award (2021)** - awarded the prize for the best MSc Pure Mathematics presentation at Imperial College.

SKILLS

- **Programming:** Python, Lean, C++ (Basic), LaTeX
- **Software:** NumPy, pandas, PyTorch, scikit-learn