David (Dongshen) Wu

+44 7529 185494 | dongshen.wu@outlook.com | https://www.linkedin.com/in/dongshen-wu | London, UK

EDUCATION

Imperial College London
MSc in Mathematics   *Oct 2022 – Jun 2026*
- **Honours**: Year 1 – 81.97, Year 2 – 80.56, Dean's List in both years (top 10% in cohort), on track to First Class.
- **Relevant Modules**: Statistical Modelling, Probability Theory, Machine Learning, Stochastic Simulation, Maths Finance
- **Individual Research**: Studied and presented a Morse-theoretic proof of the Poincaré duality and its applications.
- **Group Research**: Used fixed point method and Physics-Informed Neural Networks to solve non-linear PDE on n-Torus.

Winchester College
Secondary Education - A-Levels   *Sep 2020 – Jun 2022*
- **Honours**: 4A*, Top 10% in STEP II and III, Richardson Prize for being top 1 in Maths in high school, House Prefect.
- **Competitions**: British Mathematics Olympiads – Distinction, British Physics Olympiads – Top Gold (top 50 nationally)
- **Extended Project**: A*, used Python to explore data analysis and predictive modelling techniques, including chaos in dynamical systems (Lorenz), stochastic processes (Monte Carlo), and machine learning (multivariate regression).

RESEARCH EXPERIENCE

Tokyo Institute of Technology
Research Intern (IROP) – Prof Takafumi Kanamori   *Jul 2024 – Sept 2024*
- Selected as one of 2 out of 500 year 2 & 3 students to participate in this fully funded research exchange on deep learning.
- Worked on test-time uncertainty estimation for pre-trained neural networks in the lazy regime, secured 2nd author.
- Developed a state-of-the-art Out-of-distribution detector using PyTorch after proposing a bound on linear perturbations.

Imperial College London
Research Intern (UROP) – Dr Michael Mayer   *Jul 2023 – Aug 2023*
- Examined the effects of heating on Poiseuille flow between superhydrophobic channels by Laplace equations modelling.
- Computed the analytical result in Python in 2 ways, using numerical methods and Physics-Informed Neural Networks.

PROFESSIONAL EXPERIENCE

Offshore Renewable Energy (ORE) Catapult
Assistant in Applied Research   *Sept 2024 – Oct 2024*
- Developed independently a Retrieval-Augmented Generation (RAG) framework using Langchain for custom pdf queries.
- Improving the model accuracy with optimisation techniques, including re-rank, hybrid search, and metadata filtering.
- Increasing the Operation and Maintenance efficiency while preparing data for future machine learning workflows.

Imperial College Mathematics Society
External Vice President   *Aug 2023 – Jun 2024*
- Maintained productive relationships with existing sponsors while successfully attracting 2 new sponsors that year.
- Organised our career fair from start to finish, including planning, sending over 50 invitations, and promoting the event.
- Led a large society with over 1,000 members, administrated negotiation, signing and invoicing with sponsors.

Optiver x Imperial Trading Academy
Top Performer   *Oct 2023 – Nov 2023*
- Gained a deeper understanding of concepts in option theory, including Greeks, Black-Scholes, and Implied volatility.
- Developed an effective market-neutral quoting strategy that provides liquidity to the derived futures and options market.
- Worked in pairs to implement, test, and optimise the algorithm on Optibook, which performed in the top 10% at the end.

SKILLS & INTERESTS

- **Computer:** Proficient in Python, LaTeX. Familiar with MATLAB, R, Julia, Linux, JavaScript, Microsoft Office, Notion.
- **Hobbies:** Routinely practise cycling, golf, triathlon. Occasionally go ski, surf, photography, live music (drum set), poker.
- **Languages:** Bilingual in English and Mandarin. Proficient in Cantonese. Currently studying a business French course.
- **Python Packages**: Experience with PyTorch, TensorFlow, Langchain, OpenAI, LlamaIndex, NumPy, Pandas.