Xudong Wu

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Education

- **University of Edinburgh** **Edinburgh, UK**
  BSc (Honours) in Mathematics and Statistics *September 2023 – Present*
  - First Class, GPA: 3.93, Average score: 77/100.
- **Dalian University of Technology (Project 985 and 211)** **Dalian, China**
  BSc in Information and Computing Science *September 2021 – June 2023*
  - Rank: 10/195, GPA: 3.91, Average score: 89/100.

Honors and Scholarships

- **Dalian University of Technology** **September 2022 – June 2023**
  - First-Class Scholarship, which is for rank 5% students
  - Elite Student
  - Excellent League Secretary
  - International Study Scholarship
- **Dalian University of Technology** **September 2021 – June 2022**
  - Second-Class Scholarship, which is for rank 20% students
  - Elite Student

Research Experiences

- **Master-Level Dissertation: A Comparison of Simulation-Based Inference Algorithms** **ED,UK**
  Advisor: Prof. Amanda Lenzi *Expected Completion: May 2025*
  - Implemented simulation-based inference techniques to address bottlenecks in stochastic model analysis.
  - Conducted simulations to identify parameter sets matching observations without likelihood calculations.
  - Compared performance of simulation-based inference algorithms in various scientific contexts.
  - Enhanced understanding and application of likelihood-free inference methods in real-world scenarios.
- **Summer Research at UC, Irvine** **CA,USA**
  Advisor: Prof. Chen Li *June 2024*
  - Enabled Texera, a machine learning-based data analysis workflow platform, to output html reports.
  - Developed the Storyteller AI to automatically generate workflow data, analyze results, make comments.
  - Enhanced data cleaning, data analysis, and visualization.
  - Imporved the overall efficiency and functionality of the platform.

Course Projects

- **Applied Statistics** **ED, UK**
  Advanced Statistical Analysis of U.S. Presidential Election Data
  - Conducted an extensive linear regression analysis to examine correlations between electoral data from different years, uncovering significant voting patterns and trends.
  - Employed sophisticated outlier detection methods to identify and mitigate the impact of influential data points, thereby refining the overall model accuracy.
  - Reconstructed and optimized the regression model, enhancing its explanatory power and robustness through advanced statistical techniques.

- **Statistical Computing** **ED, UK**
  Advanced Statistical Modeling and Bayesian Inference
  - Developed and implemented sophisticated linear models to estimate 3D printer material usage, employing both classical and Bayesian statistical methods to enhance predictive accuracy and reliability.
  - Applied Bayesian inference techniques, incorporating prior distributions and Monte Carlo integration to refine model parameters, thereby improving the robustness of predictions in a high-uncertainty context.
  - Conducted comprehensive cross-validation and predictive performance assessments, ensuring model validity and identifying the most effective statistical approaches for real-world data applications.
- **Honours Differential Equations** **ED,UK**
  Effectiveness of Antibiotic and Anti-Virulence Drug Treatments
  - Developed a mathematical model utilizing systems of linear ODEs to simulate the dynamics of bacterial infection and the efficacy of antibiotic and anti-virulence drug treatments, achieving a predictive accuracy of 95% for drug efficacy.
  - Employed Fourier series analysis and Laplace transforms to predict the periodic behavior of treatment effectiveness and bacterial resistance, enabling the identification of potential breakthrough treatments with a 30% higher success rate.

Technical Skills

- **Programming Languages:** Python | R | C++ | SQL | Scalar | MATLAB
- **Software:** LaTeX, Git, Microsoft Office Suite
- **Languages:** English (Fluent), IELTS 7
  Mandarin (Native)

Mathematics and Programming Background

Foundational Mathematics Courses: Mathematical Analysis 1 | Mathematical Analysis 2 | Mathematical Analysis 3 | Geometry 1 | Geometry 2 | Higher Algebra 1| Higher Algebra 2 | Number Theory | Probability and Mathematical Statistics | Honours Differential Equations | Financial Mathematics | Numerical Ordinary Differential Equations and Applications | Applied Statistics | Statistic Methodology

Master Level Mathematics Courses: Honours Differential Equations | Honours Complex Variables | Honours Analysis(including Measure Theory) | Abstract Algebra | Real Variable Function Theory | Complex Function Theory (including L^p space)| Mathematical Modeling and Literature Search | Stochastic Modelling

Programming Courses: Python Programming Design | C++ Programming | Statistical Computing

Key Academic Scores

- **University of Edinburgh** **September 2023 – June 2024**
  - **Numerical Ordinary Differential Equations and Applications**: Score: 98/100 - Focused on numerical methods for ODEs, with applications in physics and epidemiology using Python. Emphasised consistency, stability, and convergence of methods.
  - **Honours Complex Variables**: Score: 85/100 - An advanced honour lecture, covered holomorphic functions, and conformal mappings. Included rigorous study of integration and differentiation of complex functions.
  - **Financial Mathematics**: Score: 82/100 - Introduced financial markets, derivative instruments, and no-arbitrage pricing. Included stochastic analysis, Ito calculus, and the Black-Scholes model.
- **Dalian University of Technology** **September 2021 – June 2023**
  - **Mathematical Modeling and Literature Search**: Score: 96/100 - Demonstrated strong capabilities in mathematical problem-solving and research methodologies.
  - **Ordinary Differential Equation**: Score: 99/100 - Achieved near-perfect score, showcasing analytical proficiency in differential equations.