SERBAN GUTIU

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Education

Imperial College London *London, UK*

MSci — Mathematics – First Class (Current Grade) *Oct. 2020 — Jun. 2024*

- Achieved a first class in all years (1st year: **74.59%**, 2nd year: **72.05%**, 3rd year: **71.64%**, 4th year: **76.36%**)
- Strong performance in **Pure Mathematics** modules (**80.57%** in **Analysis I**, **94.84%** in **Lebesgue Measure and Integration**, **90.85%** in **Groups and Rings**, **80.50%** in **Functional Analysis**, **84.57%** in **Stochastic Calculus**)
- Strong performance in **Probability and Statistics** modules (**75.57%** in **Probability Theory**, **73.00%** in **Statistical Theory**, **72.70%** in **Option Pricing**, **77.00%** in **Mathematics for Machine Learning**)

"Nicolae Balcescu" Highschool *Cluj-Napoca, Romania*

Mathematics and Computer Science *Sep. 2016 — Jun. 2020*

- Engaged in multiple mathematics and physics olympiads and national contests - including one participation at the **Romanian National Mathematics Olympiad** (2017)

Experience

Master's Thesis Project | *Individual Research Project under Dr. Kolyan Ray* *Oct. 2023 — Jun. 2024*

- Extended the existing theory of Gaussian process priors in the Gaussian white noise model, to the case of fractional posteriors
- Analysed the asymptotic behaviour of different posterior distributions to evaluate their efficiency and robustness in high-dimensional settings
- Presented the original findings through a detailed report, discussing how the different regimes of the fractional exponent affected the statistical behaviour of the resulting procedures, for both parameter estimation and uncertainty quantification

Unsupervised learning data science project: clustering, dimensionality reduction, graph-based analysis *Mar. 2023*

- Used PCA (Principal Component Analysis) and NMF (Non-Negative Matrix Factorization) to perform image denoising and reconstruction for MNIST dataset, comparing the results of the two methods
- Worked on a dataset containing measurements of gene expression in different tumour samples, analysing it with graph-based analysis methods and various clustering algorithms (k-means, Gaussian Mixture Models)

Supervised learning data science project: Neural networks and regression *Feb. 2023*

- Employed various regression techniques, such as linear regression, Lasso regression and kNN, on a dataset measuring properties of airfoils
- Implemented and trained a neural network to perform a classification task on the MNIST dataset, achieving **94.3% accuracy**
- Carried out binary classification tasks on a medical dataset characterizing risk of developing diabetes, using various methods, such as random forests and support vector machines

Modular Forms | *Group Research Project under Dr. Alice Pozzi* *May 2022 — Jun. 2022*

- Investigated the applications of modular forms within pure mathematics, with a special emphasis on Geometry and Number Theory, collaborating closely with a group of six students
- Showcased alternative methods for proving famous theorems by using modular forms, including Lagrange's four-square theorem and also several Ramanujan Congruences
- Sustained an oral presentation, supported by a 60-page report, clearly explaining the essential concepts of the research project

Undergraduate Teaching Assistant, Imperial College London *Oct. 2023 — Mar. 2024*

- Ran weekly tutorials for first-year students, with a focus on modules such as Analysis, Linear Algebra, Probability and Statistics
- Prepared problem sheets and solutions covering the standard material, as well as more challenging problems every week
- Received positive feedback from students, with many showing significant improvements in their problem solving skills

Skills

- **Research skills**
- **Problem Solving**
- **Probability**
- **Statistics**
- **Data analysis**
- **Machine learning**
- **Python**
- **LaTeX**
- **Time management**
- **Communication**

Interests

- **Problem Solving** — Developed **problem-solving skills** while competing in numerous maths and physics olympiads and contests for 8 years, obtaining **5** × **Silver** & **Bronze Medals** at national and regional mathematics contests
- **Tutoring** — Helped high school students improve their mathematical skills and achieve better grades, over the last few years
- Dedicated combat sports enthusiast: **Amateur Kickboxing Champion, Romania** (2021) | BUCS (British Universities and Colleges Sport) 2024 **Boxing Champion**, having competed for Imperial College's Boxing team | Brazilian Jiu-Jitsu **blue belt**
- Former football player & Runner-up at the **Romanian Youth National Football Championship** (2019), being a regular starting player for my team
- Passionate Hiker: Conquered More Than **10 Mountain Peaks exceeding 2500m** (Romania) | Dedicated Member of Imperial College's Hiking Society, engaging in regular excursions and social events