

# Ivelina Mladenova

ivelina.p.mladenova@gmail.com   GitHub Page

## Education

---

**PhD in Mathematical Sciences**, Queen Mary University of London, UK Oct 2022 – (exp. 2026)

- **Research focus:** Physics-Informed Neural Networks (PINNs) for high-dimensional parametric parabolic PDEs with applications in finance – particularly in option pricing.
- **Tools:** PyTorch, TensorFlow/Keras, DeepXDE, JAX; Queen Mary HPC cluster - Apocrita.
- **Teaching Assistant** for the following modules:
  - **IT Classes:** Probability and Statistics I (Lab); Statistical Modeling I, Introduction to Computer Programming (Python), Financial Data Analytics, Introduction to Machine Learning, Numerical Computing with C and C++.
  - **Tutorials:** Probability & Statistics, Applied Calculus, Introduction to Analysis with Calculus.
- **Leadership & Outreach:**
  - Elected **Postgraduate Research Representative** (2022 – present). This includes leading initiatives to foster a supportive PhD community, including weekly peer wellbeing sessions and social events. Liaise with academic staff to raise student concerns in quarterly meetings. Oversee the upkeep of shared office spaces, ensuring a safe and well-equipped environment for postgraduate researchers.
  - Led a team of PhD and undergraduate students in a **History of Mathematics** project at QMUL, producing a report on the mathematical development of probability theory, more specifically on the *Law of Large Numbers* and *Central Limit Theorem*. Integrated mathematical rigour, Python code (for the "Applications" section is on my GitHub), and historical insight, highlighting diverse global contributions and modern applications in Monte Carlo methods, Stochastic processes, and Machine learning.
  - Engaged in outreach activities including **undergraduate research seminars**, the “*Mathematician Like Me*” campaign, and mentoring Year 12 students (ages 16 – 17) in a peer-led research project on perceptions of who can become a mathematician and how to attract more diverse talent into the field.
  - Provided one-on-one support to postgraduate researchers from Geography, Biology, and Psychology departments, as part of a **Statistics and Data Science Clinic** – advising on statistical analysis, hypothesis testing, and modelling techniques for their research data.

**MSc in Applied Statistics**, Imperial College London, UK (*Merit*) Oct 2021 – Sep 2022

- **Elected Modules:** Advanced Simulation, Deep Learning, Machine Learning, Statistical Finance, Stochastic Processes.
- **Thesis:** Applied a graph-based time series model to nowcast Bank of England interest rate decisions using high-dimensional macroeconomic data, in collaboration with HSBC. Benchmarked performance against a dynamic factor model (DFM).

**BSc in Mathematics with Statistics**, University of Surrey, UK (*1st Class*) Oct 2017 – Sep 2021

- **Thesis:** Developed a numerical estimation framework using the Expectation-Maximisation (EM) algorithm for parameter inference in a discrete-time self-exciting Hawkes process.
- **Leadership:** Treasurer of MathSoc and Team Surrey Volleyball Club (Year 2).

**AAT Level 3 Diploma in Accounting**, StepForward Apprenticeship, UK (*Merit*) Sep 2016 – Sep 2017

## Professional Experience

---

**Intern**, Blue Raven AI, Singapore Oct 2025 – April 2026

- Financial data analytics.

**Machine Learning Intern**, Earth-i, UK Jun 2021 – Aug 2021

- Built unsupervised learning pipeline using Variational Autoencoders (TensorFlow) for SAR satellite imagery.
- Achieved 67% accuracy in identifying copper smelter activity across temporal image data.

**Part-time Data Science Instructor**, University of Surrey Dec 2020 – Apr 2021

- Delivered Python tutorials on "Pattern Recognition and Machine Learning" to over 20 undergraduate students.

**Placement Year Data Analyst**, Sainsbury's Tech, London, UK Jul 2019 – Jul 2020

- Automated Entry Price Point analysis using Python (Pandas, NumPy, Scikit-learn).
- Developed sentiment analysis dashboards in MicroStrategy using customer feedback data.

**Accounts Payable Assistant (Part-time)**, Pai Skincare, London, UK Jul 2018 – Oct 2018

- Developed a payment plan system to streamline supplier payments and maintain up-to-date financial records.

**Finance Analyst**, Make Shift, London, UK Sep 2016 – Sep 2017

- Created a dynamic Discounted Cash Flow model to evaluate real estate investments in Excel.
- Produced and presented monthly MI reports including P&L, cash flow statements, and balance sheets.

## Technical Skills

---

**Languages & Libraries:** Python (NumPy, Pandas, Matplotlib, PyTorch, TensorFlow, Scikit-learn, JAX), SQL.

**ML/DL:** Deep learning (PINNs, DeepONets, CNNs, RNNs, VAEs, Transformers).

**Probabilistic models:** Gaussian Mixture Models, Naive Bayes, Hidden Markov Models, Latent Dirichlet Allocation (LDA), Gaussian Processes;

**Bayesian methods:** Sequential Monte Carlo, MCMC (Metropolis-Hastings, Gibbs).

**Classical ML:** Supervised (regression, classification), Unsupervised (clustering, PCA), Kernel methods, Ensemble models.

## Personal Interests

---

**Endurance and strength sports:** marathon running, weightlifting, volleyball, rowing, table tennis, and yoga.

Passionate about Economics, Psychology, and Global History; some reads include *Nexus*, *Sapiens*, *Thinking, Fast and Slow*, *Why Nations Fail*, *Chip War*, and *The World in 2050*, *Vulture Capitalism*, *The (Mis)Behaviour of Markets*, and other.