

Mahbub Alam, PhD

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About me

I hold a **PhD in Mathematics** with postdoctoral experience, specializing in probability theory, stochastic processes, and statistical modeling. I have worked on Python-based machine learning models and model validation for **credit risk assessment, predicting breast cancer, and image-based classification** (computer vision), using logistic regression, random forest, and k-NN algorithms. Additionally, I have used SQL to extract, clean, and transform large datasets from the MIMIC-IV database. Looking forward to applying my analytical background, coding skills, and detail-oriented mindset to drive real-world impact as a Quant or Data Scientist.

Skills

Analytical and Mathematical skills

- Developed supervised ML models for assessing credit risk, predicting breast cancer and image-based classification (computer vision); experience in exploratory data analysis, visualization (3 years)
- Advanced expertise in Probability Theory, Stochastic Processes, Mathematical Modeling, and Classical Statistics (Hypothesis Testing, Bayesian Methods, Regression) (10 years)

Programming

- *Python*: pandas, Scikit-learn, Keras/TensorFlow, Matplotlib, NumPy, Statsmodels, SciPy; OOP; experience in GCP (7 years)
- *R, SQL (1 year), Git, Shell (6 years)*; comfortable working in Linux-based environments

Soft skills

- Problem solving, Fast learner, Communication, Teamwork, Leadership, Growth Mindset
- Languages: English (fluent), Swedish (60 hp – Uppsala University)

Courses

- Applied Deep Learning, *Uppsala University*
- Machine Learning for Trading with GCP
- Python and Statistics for Financial Analysis
- Machine Learning Specialization (*by Andrew Ng*)
- Financial Engineering and Risk Management

Work Experience

Postdoctoral researcher, Uppsala University, Sweden Jan 2022 – Dec 2024

- Stochastic analysis, modeling large datasets, central limit theorem, Brownian motion.
- Studied and implemented machine learning methods using Keras, Scikit-learn.
- Planned, organized and led projects.

PhD Candidate, TIFR, Mumbai, India 2016 – 2021

- Conducted research on applications of statistics and probability in number theory.
- Performed numerical experiments using NumPy, Pandas, SciPy, Matplotlib.
- Published research in top journals, presented at international conferences.

Projects [\(GitHub link\)](#)

Selected projects demonstrating the application of analytics, machine learning and SQL in real-world data scenarios.

Machine Learning/AI projects ([GitHub link](#))

- **Credit_Risk_Analysis**: End-to-end framework implementing IFRS 9 and Basel; calibrated PD, LGD modeling; EAD, ECL estimates
- **BreastCancerPredictAI**: Binary classification for tumor diagnosis, complete ML pipeline with hyperparameter tuning
- **Computer_Vision_in_Agriculture**: Automated produce classification with k-Nearest Neighbors; evaluating model robustness
- **AI_plays_TicTacToe**: AI agent using minimax algorithm and magic square for efficient win detection; interactive play on Jupyter

Data modeling in data warehousing

- Designed and optimized complex SQL queries to extract, clean, and transform large-scale clinical data from the [MIMIC-IV Clinical Database](#).

Solving [Advent of Code](#) and LeetCode problems

- Sharpening algorithmic problem-solving skills through Advent of Code programming challenges.

Education

PhD in mathematics , TIFR Mumbai	2016 – 2021
• Statistical analysis of lattices, central limit theorems, Brownian motion	
Master's in Mathematics , Indian Statistical Institute, Kolkata	2014 – 2016
• Advanced mathematics, Statistics	