Monisha Gopalan

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Date of Birth	29 December 1996	**Nationality**	Indian
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SUMMARY

Data Scientist with dual master's degrees in STEM and a solid foundation in physics, specializing in portfolio optimization, machine learning, and quantitative finance. Proficient in Python and data analysis, seeking to apply my expertise in AI, Data Science or Quantitative Analysis roles to solve complex, real-world problems and contribute to impactful research.

SKILLS

Programming	- Python (advanced) – *NumPy, Pandas, PyTorch, SciPy, Matplotlib, Seaborn, Scikit-learn* - SQL, MATLAB, R, C (basic).
IT Skills	- AWS Sagemaker - Git - VS Code - Linux Terminal - LaTeX
Certifications	1. *Quant Bootcamp* – ARPM - July 2024. 2. *Quantitative Finance with R* – Udemy – July 2023. 3. *Introduction to Portfolio Construction and Analysis with Python* – Coursera – April 2023. 4. *Data Analysis with Python* – freeCodeCamp - March 2023.
Soft skills	- Problem solving - Thinking Differently - Analysis - Communication skills - Planning - Teamwork
Languages	- English (C2) – Fluent spoken and written. *TOEFL iBT: 106/120* - Italian – Basic spoken and written. - German – Basic; willing to improve.

WORK EXPERIENCE

04.2024 - NOW

Visual Data Scientist | *ARPM – Advanced Risk and Portfolio Management, Italy.*

- Contributing to the ARPM e-platform by writing Python code to implement case studies in quantitative finance and advanced data science concepts, such as optimal transport, and creating visualizations to enhance teaching material.
- Completed the mathematically rigorous ARPM Quant Bootcamp and Data Science Foundations course as part of professional training.

03.2023 - 03.2024

AI Scientist - Intern | *Ipazia, Milan, Italy.*

- Analysed large-scale time-series datasets and implemented LSTM and Transformer models for optimizing portfolios, using PyTorch Lightning and AWS SageMaker.
- Engaged in pioneering research to develop a novel architecture, incorporating Hopfield layers for portfolio optimisation, contributing to a peer-reviewed publication.
- Explored emerging areas like extreme multilabel classification and conformal prediction for uncertainty quantification.

11.2022 - 03.2023

Master's Thesis Student | *University of Padova, Italy.*

- Conducted extensive study of 4 real-space renormalization group methods applied to Ising and Potts models on lattices.
- Implemented Monte Carlo method for renormalization group using the efficient Wulff cluster sampling algorithm.

11.2018 - 07.2019

Master's Thesis Student | *Indian Institute of Science, Bengaluru.*

- Developed a C program for phase-field modelling of eutectoid transformation in ternary systems, analysing growth constants with Stefan boundary conditions.

11.2017 - 05.2018

Bachelor's Thesis Student | *Indian Institute of Science, Bengaluru.*

- Conducted computational modelling of Full-Heusler compounds, identifying 7 new materials with topological properties using Cray clusters.

PUBLICATION

11.2024

Hopfield Networks for Asset Allocation

ICAIF '24: Proceedings of the 5th ACM International Conference on AI in Finance

https://doi.org/10.1145/3677052.3698605

EDUCATION

10.2019 - 07.2023

Master's degree in Physics | *University of Padova, Italy.*

08.2018 - 07.2019

Master of Science in Materials Science | *Indian Institute of Science, Bengaluru*

08.2014 - 05.2018

Bachelor of Science (Research) in Materials Science | *Indian Institute of Science*

PROJECTS

12.2023 - 01.2024

Corporate Credit Rating Forecast using Machine Learning Methods

https://monishagopalan.github.io/projects/credit-rating/

- Implemented machine learning models, including XGBoost and RandomForest, to predict corporate credit ratings from historical financial data.
- Applied techniques such as SMOTE to address class imbalance in datasets, and hyperparameter optimisation to improve the classification models.
- Gained proficiency in financial ratios and understand a company's fiscal strength.

02.2024 - 03.2024

Extreme Multilabel Classification and Conformal Risk Control

- Explored challenges in Extreme Multilabel Classification (XML) and developed python implementation of relevant metrics such as precision@k, discounted cumulative gain @k and propensity scored losses.
- Applied conformal risk control techniques in the multilabel classification scenario, particularly in the context of assigning candidates to job profiles, aiming to quantify uncertainties and enhance decision-making processes.