Monisha Gopalan

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

As an enthusiastic AI Scientist Intern at a startup focusing on AI for finance, I bring a strong academic background with double masters in STEM, majoring in physics, and diverse interdisciplinary research experience. I specialize in Portfolio Optimization and have a solid grasp of fundamental finance principles and statistics. My skill set includes advanced programming in Deep Learning Techniques, Monte Carlo Simulations, and Numerical Methods.

SKILLS

Programming	- Python (advanced) – *NumPy, Pandas, PyTorch, SciPy, Matplotlib, Seaborn, Scikit-learn* - R – *Quantmod, jrvFinance, fOptions, PortfolioAnalytics, PerformanceAnalytics* - SQL - MATLAB (basic) - C (basic)
Certifications	1. Quantitative Finance with R – Udemy – July 2023. 2. Introduction to Portfolio Construction and Analysis with Python – Coursera – April 2023. 3. Data Analysis with Python – freeCodeCamp - March 2023.
IT Skills	- AWS Sagemaker - Git -PyCharm - Linux Terminal - LaTeX -Microsoft Office – Word, Excel, PowerPoint
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

WORK EXPERIENCE

03.2023 - 01.2024

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

Deep Learning of Portfolio Optimization

- analysed large-scale time-series datasets on AWS and developed a deep learning model with LSTM using PyTorch Lightning to directly optimise portfolio Sharpe ratio.
- currently engaged in pioneering research to develop a novel architecture, incorporating Hopfield layers and Transformers by positional encoding time-series data, while contributing to a scikit library.
- visualised portfolio results by comparing weight allocations with benchmark portfolios, in addition to equity curve analysis and portfolio metrics.

11.2022 - 03.2023

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

Real Space Renormalization Group Techniques for lattice systems.

- 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.*

Phase-Field Modelling of Eutectoid Transformation in Ternary systems.

- developed a C program that utilizes numerical methods to solve a one-dimensional sharp interface model with a Stefan boundary condition.
- analysed the variation of the growth constant by solving the model for 10 different supersaturation values.

11.2017 - 05.2018

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

Triple point fermions in Full-Heusler compounds using first principle calculations.

- enhanced proficiency in Linux operating systems and command-line interfaces.
- utilized Cray supercomputer clusters and software packages: VASP, WannierTools, Phonopy to compute energy band diagrams and check stability of compounds.
- identified 7 new compounds with triple point fermions.
- presented progress updates every week in the lab group meetings.

EDUCATION

10.2019 - 07.2023

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

Grade: 87%

- *Models of Theoretical Physics, Statistical mechanics, Stochastic Calculus, Bayesian Inference, Markov chain Monte Carlo simulation methods.*
- *Neural networks, Deep learning – Supervised Learning, Unsupervised Learning, Deep Reinforcement Learning.*

08.2018 - 07.2019

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

Grade: 71%

- *Modelling and simulation using Python – Numerical Methods, Molecular and Monte Carlo Methods.*

08.2014 - 05.2018

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

Grade: 70%

- **(Minor: Mathematics)** *Real Analysis, Linear Algebra, Multivariable Calculus, Probability and Statistics, Group theory, Topology.*
- *Algorithms, Data structures and Programming using C; Scientific Computing and Numerical methods using MATLAB.*