

# Monisha Gopalan



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## SUMMARY

As an enthusiastic AI Scientist Intern at an AI startup, I bring a strong academic background with double masters in STEM, majoring in physics, and diverse interdisciplinary research experience. I specialize in Portfolio Optimization in Finance and have a solid grasp of the deep learning methods and statistics. I'm actively pursuing opportunities as an AI/Data Scientist.

## SKILLS

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

## WORK EXPERIENCE

03.2023 - 01.2024	<b>AI Scientist - Intern</b>   <i>Ipazia, Milan, Italy.</i> <b>Deep Learning of Portfolio Optimization</b> <ul style="list-style-type: none"><li>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.</li><li>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.</li><li>visualised portfolio results by comparing weight allocations with benchmark portfolios, in addition to equity curve analysis and portfolio metrics.</li></ul>
11.2022 - 03.2023	<b>Master's Thesis Student</b>   <i>University of Padova, Italy.</i> <b>Real Space Renormalization Group Techniques for lattice systems.</b> <ul style="list-style-type: none"><li>conducted extensive study of 4 real-space renormalization group methods applied to Ising and Potts models on lattices.</li></ul>

- 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

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- 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

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- 12.2023 - 01.2024 **Corporate Credit Rating Forecast using Machine Learning Methods**
  - 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.