

# Monisha Gopalan



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## SUMMARY

With a passion for solving complex problems and a background marked by dual master's degrees in STEM, including a strong foundation in physics, I stand equipped with diverse interdisciplinary research experiences. My recent role as an AI Scientist at a dynamic startup, where I delved into Portfolio Optimization, solidified my expertise in the domains of Finance, Deep Learning, and Statistics. I am currently seeking opportunities to apply my combination of academic rigor and practical experience in positions as an **AI/Data Scientist** or **Quantitative Analyst**.

## SKILLS

<b>Programming</b>	- Python (advanced) – NumPy, Pandas, PyTorch, SciPy, Matplotlib, Seaborn, Scikit-learn - SQL, MATLAB, R, C (basic)		
<b>IT Skills</b>	- AWS Sagemaker - Linux Terminal	- Git - LaTeX	- VS Code
<b>Soft skills</b>	- Problem solving - Communication skills	- Thinking Differently - Planning	- Analysis - Teamwork

## WORK EXPERIENCE

- 03.2023 - 03.2024 **AI Scientist - Intern** | *Ipazia, Milan, Italy.*
- Analysed large-scale time-series datasets and implemented LSTM model for optimizing portfolios, using **PyTorch Lightning** and **AWS SageMaker**.
  - Engaged in pioneering research to develop a novel architecture, incorporating Hopfield layers for portfolio optimisation, and contributed to manuscript development.
  - 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.*
- 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	<b>Bachelor's Thesis Student</b>   <i>Indian Institute of Science, Bengaluru.</i> <b>Triple point fermions in Full-Heusler compounds using first principle calculations.</b> <ul style="list-style-type: none"> <li>Enhanced proficiency in Linux operating systems and command-line interfaces.</li> <li>Utilized Cray supercomputer clusters and software packages: VASP, WannierTools, Phonopy to compute energy band diagrams and check stability of compounds.</li> <li>Identified 7 new compounds with triple point fermions.</li> <li>Presented progress updates every week in the lab group meetings.</li> </ul>
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## EDUCATION

10.2019 - 07.2023	<b>Master's degree in Physics</b>   <i>University of Padova, Italy.</i>
08.2018 - 07.2019	<b>Master of Science in Materials Science</b>   <i>Indian Institute of Science, Bengaluru</i>
08.2014 - 05.2018	<b>Bachelor of Science (Research) in Materials Science</b>   <i>Indian Institute of Science</i>

## PROJECTS

12.2023 - 01.2024	<b>Corporate Credit Rating Forecast using Machine Learning Methods</b> <a href="https://monishagopalan.github.io/projects/credit-rating/">https://monishagopalan.github.io/projects/credit-rating/</a> <ul style="list-style-type: none"> <li>Implemented machine learning models, including XGBoost and RandomForest, to predict corporate credit ratings from historical financial data.</li> <li>Applied techniques such as SMOTE to address class imbalance in datasets, and hyperparameter optimisation to improve the classification models.</li> <li>Gained proficiency in financial ratios and understand a company's fiscal strength.</li> </ul>
02.2024 - 03.2024	<b>Extreme Multilabel Classification and Conformal Risk Control</b> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>