Monit Sharma

$$\frac{1}{\sqrt{2}}(|\text{Quantum Physics}\rangle + |\text{Machine Learning}\rangle)$$

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Education

Indian Institute of Science Education and Research (IISERM)

Mohali, India
Aug 2017 - Jun 2022

Integrated Bachelor of Science-Masters of Science **Major-Physics, Minor Data Science**

- Thesis Title : Identifying Quantum Chromodynamics Phase Transition using Quantum Machine Learning

This thesis explored the variational quantum algorithm, and quantum convolutional neural networks to classify and make predictions regarding the QCD phase transitions, and make the quantum convolutional circuits which is similar to that of the convolutional layer in classical CNN. The proposed architecture is showing improvement.

Research and Work Experience

TATA Consultancy Services (TCS)

Remote
Oct 2021 - Mar 2022

- Project Title : Quantum Computing in Logistics and Industry problems

This internship focused on solving various logistics, supply chain and finance related problems, like the last-mile delivery problem, the portfolio optimization problems using the available quantum algorithms and quantum hardware, Worked on IBM's Qiskit work flow, D-Wave's Ocean SDK and Amazon bracket.

Indian Institute of Science Education and Research (IISERM)

Mohali, India
Mar 2021 - Jun 2021

- Project Title : Machine Learning and its application in High-Energy Physics

  This project explored on the use of Machine Learning in the field of High Energy Physics. Machine learning is an important applied research area in particle physics. I worked on numerous projects that connected and motivated these areas of research and development. Projects including searching for rare-decay and Higgs classification. The codes are available here.

- Project Title : Quantum Computing and Quantum Machine Learning

Mohali, India
Mar 2021 - Jun 2021

  This project explored the regime of Quantum computing and quantum algorithms and worked on a paper demonstrating the Quantum speed-up, working on various projects related to Quantum computing. Explored various algorithms including the Grover's search, the Shor's algorithm and the HHL algorithm.

CERN

Remote
May 2020 - Jun 2020

- Project Title : Understanding the basics of Quantum Computing and Quantum GANs

This project focused on learning the fundamentals of Quantum Computing and Quantum Algorithms, while doing some projects and basic algorithms on the Qiskit framework. The codes are available on my GitHub.

Achievements

Exams Qualified

- 2022 **Graduate Aptitude Test in Engineering, PHYSICS**
- 2021 **Common Admission Test, Calls from thirteen IIMs including IIML, IIMK, CAP calls**

Quantum Computing Work

- 2021 **Qiskit Summer School on Quantum Machine Learning, IBM**
- 2021 **QSilver Diploma on Quantum Computing and Programming, QWorld**
- 2021 **QBronze Diploma on Quantum Computing and Programming, QWorld**
- 2021 **The EigenSolvers Quantum Hackathon**, Certificate of Recoginition, **EigenSolvers**
- 2021 **The EigenSolvers Quantum Hackathon**, Certificate of Excellence, **EigenSolvers**

Maths and Machine Learning

- 2020 **Deep Learning and its applications, BML Munjal University**
- 2020 **Welcome to Game Theory , Coursera**
- 2020 **Mathematical Thinking in Computer Science, Coursera**
- 2020 **Introduction to Graph Theory, Coursera**
- 2020 **Number Theory and Cryptography , Coursera**
- 2020 **Mathematics for Machine Learning: Linear Algebra , Coursera**

2020 **Welcome to Game Theory ,** Coursera
2020 **Mathematical Thinking in Computer Science,** Coursera
2020 **Introduction to Graph Theory,** Coursera
2020 **Number Theory and Cryptography ,** Coursera
2020 **Mathematics for Machine Learning: Linear Algebra ,** Coursera
2020 **Combinatorics and Probability ,** Coursera
2020 **Introduction to Discrete Mathematics for Computer Science ,** Coursera

Programming

2020 **Programming for Everybody (Getting Started with Python),** Coursera
2020 **Introduction to Data Science in Python,** Coursera
2020 **C for Everyone: Programming Fundamentals,** Coursera
2020 **Delivery Problem** , Coursera
2020 **Image Data Augmentation with Keras ,** Coursera
2020 **Technical Support Fundamentals ,** Coursera
2020 **International Cyber Conflicts ,** Coursera

Misc.

2020 **Understanding Research Methods ,** Coursera
2020 **Introduction to Psychology ,** Coursera
2020 **The Science of Well-Being,** Coursera
2020 **Moralities of Everyday Life ,** Coursera
2020 **Creative Thinking: Techniques and Tools for Success ,** Coursera
2020 **The Fundamentals of Digital Marketing ,** Google

Skills

Programming Languages :	Python, C/C++, Java, JavaScript, CSS, HTML, MATLAB, Mathematica, LaTeX
Quantum Programming Frameworks :	Qiskit, Cirq, TensorFlow Quantum, PennyLane, QuTiP, AWS Bracket, DWAVE
Programming Frameworks :	TensorFlow, Keras, PyTorch, OpenCV, Scikit-learn, Scikit-image
Software | Microcontrollers :	Quantum ESPRESSO, SolidWorks | Arduino, STM32 Nucleo