Rochisha Agarwal

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EDUCATION

Indian Institute of Technology (IIT), Roorkee
Integrated Masters in Physics

Roorkee, India
2018–2023

EXPERIENCE

Vector Institute, Toronto
Undergraduate Research

Toronto, Canada
November 2020 - Present

- Working with Prof. Juan Carrasquilla to solve combinatorial optimization problems using VCA Algorithm. A very new and optimistic Quantum Inspired Algorithm that uses Recurrent Neural Network to imitate simulated annealing model and provides severe advantages over the latter.

Colorado School of Mines
Undergraduate Research

Colorado, United States
November 2020 - Present

- Working in Carr group to understand many-body systems using complexity analysis.

Middlesex University, London
Undergraduate Research

London, UK
Summer 2020

- Worked on Quantum Computing Algorithms for Finance with Prof. Nagarajan, which involved initially a literature survey of all the available algorithms in the Finance domain on Portfolio optimization.
- Created an algorithm for 'Stock Picking' with PennyLane and Qiskit single-handedly from scratch using Variational Quantum Eigensolver (VQE).

Cloobot Techlabs
Data Science Intern

Chennai, India
Summer 2020

- Worked on a Machine Learning Project, for identifying keywords in the set of mails using NLP and the CRF model.
- Single-handedly created automated reports in Python for the product Resource Productivity Management.

IIT Roorkee
Undergraduate Research

Roorkee, India
July 2020- August 2020

- Worked with Prof. Sugata Gangopadhyay to build a course for Quantum Computing for non Physics students.
- Wrote chapters 'Introduction to Qubits', 'Measurement of Qubits', and 'Single Qubit Gates' for the course on LaTeX with integrated visualizations and code.

Qiskit Global Summer School
Attendee

Virtual
July 2020

- The school focused on teaching broad range of topics- Grover's Search, Shor's Algorithms, Transmon Qubits, Quantum Chemistry and their implementation.
- Completed the final project that involved simulating LiH molecule using VQE.

Skills

- **Languages:** Python, C++, MATLAB, Javascript (Vue, React, Angular)
- **Packages:** Django, Pandas, Scikit-learn, Qiskit, Pennylane, Cirq, LaTeX
- **Relevant Courses:** Quantum Mechanics, Quantum Computing, Linear Algebra, Data Structures and Algorithms, Ordinary Differential Equation, Analog and Digital Electronics, Machine Learning (online)
- **Utilities:** Git, Linux Shell

Projects

Quantum Machine Learning Textbook

Unitary Fund

- Creating Quantum Machine Learning textbook (an open-source textbook) with integrated visualization. The project is funded by Unitary Fund and have received USD 4000 for the same.

Achievements

- Was selected as Qiskit Advocate by IBMQ.   2020–Present
- Elligible for INSPIRE scholarship   2019

Volunteer Experience and Leadership

- Quantum Computing Group, IIT Roorkee — Core Member   2020 –Present
  In charge of regular discussions related to Quantum Computing of basics as well as advanced topics.
- Qiskit Challenge India (Quantum Machine Learning) — Mentor   September 2020
  Mentored 500+ participants on the challenge for creating a Variational Quantum Classifier to classify 0 and 1 digit.
- Watch out! IIT Roorkee — Editor   2018 –Present
  Worked on several editorials and news pieces in this official student media body. Inform the student populous of the campus about the happenings through articles and videos.
- NSS, IIT Roorkee — Event Manager   2018–2019
  Organized Blood Donation Camp and National Social Summit under National Service Scheme.
- TEDxIITRoorkee — Manager   Fall 2019
  Promoted and managed an event which saw the participation of 250 people and six eminent speakers.