Shisheer S Kaushik

m23iqt@iitj.ac.in | Portfolio | (+91) 9380193839
github | linkedin

Education

Indian Institute of Technology, Jodhpur (ITTJ) Expected graduation date: Jun. 2025
M.Tech. in Quantum Science and Technology | Link to all courses
Relevant Courses: Machine Learning, Complexity Theory, Quantum Mechanics, Quantum Computation, Quantum Information Science, Algorithms and Data Structures I and II, Software and Data Engineering

B N M Institute of Technology (BNMIT) Graduated date: Jun. 2022
B.Eng. in Electronics and Communication Engineering | Link to all courses ***GPA: 8.37/10***
Relevant Courses: Network Analysis, Computer Architecture, Signals & Systems, Verilog HDL & VLSI Design, Information Theory & Coding, Digital Communication, C++ & Python Application Programming, Network Security, Cellullar & Space Communication

Experience

QNU Labs Pvt. Ltd May. 2023 - July. 2023
Summer Intern Fellow *PHP, JavaScript, SQL Server, HTML, CSS, Bootstrap, Qiskit, Python, Git, GitHub*

- I collaborated closely with a team of seasoned professionals on a project entitled Browser-Based Quantum-Safe VPN PQC Plugin as part of the SparQ Summer Internship.

Qkrishi Quantum Pvt. Ltd Feb. 2023 - April. 2023
Junior Researcher *Qiskit, Python, NetworkX, Dwave-ocean-sdk, Bootstrap, Git, GitHub, Docker, Linux*

- Worked on developing and evaluating a novel quantum optimization algorithm to solve the travelling salesman and vehicle routing problem using phase estimation technique by encoding the given distances between the cities as phases.

Elite Techno Groups Aug. 2021 - Sep. 2021
Data Science Internship *Python, SQL-query, JSON, Docker, Git, GitHub*

- During one month of internship, I implemented an Inventory Management system by transmitting structured data network in JSON format.
- This system was used to keep track of products, perform sales analysis and generate a statement consisting of the purchase history of the company.

Qworld Association (QIntern-2021) Jul. 2021 - Aug. 2021
Summer School Internship *Qiskit, Python, Git, GitHub*

- The project focused mainly on creating a platform for a comprehensive and curated collection of resources aiming to help understand Quantum Computing.
- I was allotted to one respective group under a mentor to work on major computational issues faced during Quantum Application Programming, like “Quantum Error Correction”.
- During the course of my internship, I devised a Quantum Error Detection model based on surface error code, It enhanced my skills and knowledge in this particular field.

Projects

Autism Disease Detection Using Quantum Transfer Learning Techniques Oct. 2023
Quantum ML model *Pennylane, Python, Tensorflow, Torchvision, Keras, Kaggle, Git, GitHub*

- Build a diagnostic model for medical images by employing Convolution Neural Networks (CNNs) and transfer learning techniques.
- Understanding the CNN in terms of Quantum Gates and circuits and Compared the results between Classical CNN and QCNN.

Benchmarking and Solving Vehicle routing problems on various Quantum Computing (QPU’s) Feb. 2023 - April. 2023
Quantum based Optimization project *Qiskit, Python, NetworkX, Dwave-ocean-sdk, Bootstrap, Git, GitHub*

- This ongoing project is a part of my work as a junior researcher at Qkrishi, Gurgaon, India. The objective is to develop a novel optimized quantum algorithm using several methods, like the phase estimation technique to solve the traveling salesman problem and vehicle routing problem.
- And benchmarked the respective routing algorithm on various available QPU’s by testing on several optimization algorithms to observe and compare the best optimal (minimal) cost.

Malware detection in Android through Quantum Machine Learning model Jan. 2023

Quantum ML model *Qiskit, Python, Tensorflow, Torchvision, Keras, Git, GitHub*

- I developed a customized machine learning model to detect malware in the android by analyzing and classifying the behaviour of mobile applications, as malicious or benign.
- It utilizes an open-source framework 'SecML' for training, and evaluating machine learning models. And a Hybrid quantum-classical machine learning algorithm VQC for dataset classification.

Quantum QR-Code Generator Mar. 2021 - April. 2021

Quantum Algorithms based project *Python, Git, GitHub*

- I built a model which generates a QR-code by encoding the quantum state in a two- dimensional array of black and white squares, by utilizing the Bernstein-Vazirani algorithm for searching the secret bit string of an oracle

Quantum secure communication via Stegenography using BB84, BBM92 & Ekert91 Protocol Feb. 2021

Quantum Communication prtocols based project *Qiskit, Python, HTML, Streamlit, Git, GitHub*

- An interactive model, that would enable users to experiment with the encryption and decryption process to transmit secret messages securely, using the Quantum key Distribution methodology, particularly the BB84, BBM92 and Ekert91 protocol.

Celebrity Look-alike classification model Dec. 2020 - Jan.2021

OpenCV project *Python, OpenCV, Tensorflow, Torchvision, Git, GitHub*

- This project is a face-recognition model built using dlib's python library and CNN to identify and classify a celebrity look-alike portrait from the picture being uploaded.
- The model produced 98.38 percent similarly proportion when tested with two distinct metrics based approaches such as Euclidean distance and Mahalanobis distance.

Designing Wearable Antenna May. 2021 - July. 2022

UHB Micro-strip patch antenna *CST Studio, HSS, Origin, JavaScript, LATEX, GitHub*

- The aim of the project is to design and fabricate a very efficient, highly sensitive and low-cost micro-strip patch antenna with an etched customized logo which is tailored to perform the intended application of remotely monitoring the health.

Publication

Wearable Antenna For Remote Health Monitoring Feb. 2023

Published in IEEE-2023

- This article presents the design and fabrication of a wearable, fully flexible and efficient micro-strip patch antenna pasted on both jeans textile and FR4 (lossy) material to operate at f = 2.66 GHz and f=2.3 GHz as a centre frequencies. This work discusses, experimental and numerical results of the antenna designed and fabricated.

Leadership and Volunteering

IBM Qiskit Advocate Jun. 2023 - Ongoing

Open source contributor & mentor

- Guiding a community of 550+ CS students in their professional development, technical skills and interest in tech.
- Orchestrating workshops, coding sessions, and events to enhance skills and encourage continuous learning.

Qworld Association Global Work April. 2021 - Dec. 2022

Academic Mentor & Project contributor

- Guiding a community of 550+ CS students in their professional development, technical skills and interest in tech.
- Orchestrating workshops, coding sessions, and events to enhance skills and encourage continuous learning.

Skills

Languages:

Python, C++, HTML, JavaScript, Qiskit, Pennylane, QuTiP

Technologies & Tools:

Django, Git, Linux, Tensorflow, OpenCv, NS-2, CST Studio, Docker

Achievements:

IBM Certified Associate Developer. IBM Quantum Challenges. QC-Hackathon. Excellence in academics.

Certifications:

Cryptography and Network Security. Quantum 101: Delft X.