

# SHISHEER S KAUSHIK

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## Skills

### Languages

English | Hindi | Kannada

### Programming

Python | C | HTML | Verilog HDL

### Softwares & Frameworks

Scikit-learn | CST Studio | OpenCV |  
Matlab | Network Simulator-2

### Quantum Development Frameworks

Qiskit | Cirq | PennyLane | QuTiP

### Deep Learning Frameworks

Tensorflow | PyTorch

### Soft Skills

Teamwork | Leadership

## Education

### B N M Institute of Technology, Bengaluru, India

Bachelor of Engineering - CGPA: 8.37  
Electronics & Communication Engineering  
July 2018 - 2022

### Alvas Pre-University, India

Class XII (State Board) - Score: 86.5%  
August 2016 - May 2018

### Jain Public School, India

Class X (CBSE AISSE) - CGPA: 9.0  
June 2015 - March 2016

## UG Courses

Calculus and Linear Algebra  
Transform Calculus, Fourier  
Series

Complex Analysis and  
Probability Theory

Engineering Physics and Quantum  
Mechanics

Digital Communication &  
Computer Networks

Digital Signal Processing

## Experience

[view in portfolio](#)

### Qworld Association (QIntern-2023) - Summer Intern

Team Head: Pawel Gora (CEO of Quantum AI Foundation)

July 2023 - Present

- I am working on a project titled Optimizing logistics using quantum computing. This project will be on using VQE and its variants as well as surrogate optimization. I will work with the project team on implementing the code, preparing and running experiments, and analyzing the results.

### QNU Labs Pvt. Ltd. - SparQ Summer Intern

Team Head: Ayyan Chattopadhyay

May 2023 - Present

- I will be collaborating 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. - Junior Researcher

Guide: Raghavendra V (Head of Research, Qkrishi)

February 2023 - Present

- Working 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 - Data Science Internship

Guide: Mayank Arora (CEO and Founder at Elite-Techno)

August 2021 - September 2021

- 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) - Summer Internship

Mentor: Zeki Can Seskir (Doctoral Student at KIT-ITAS, Germany)

July 2021 - August 2021

- 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

[view in portfolio](#)

### Benchmarking and Solving Vehicle routing problems on various Quantum Computing (QPU's) - Optimization

November 2022 - Present

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 benchmark the respective routing algorithm on various available QPU's by testing on several optimization algorithms to observe and compare the best optimal (minimal) cost.

Embedded Systems & VLSI  
Cryptography & Network  
Security  
C and Python Application  
Programming

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## Summer Schools & Workshops

### CirQuiT Summer School on Quantum Computing

RV College of Engineering  
(2021)

### IBM Qiskit Summer School

IBM Quantum (2 Years)

### Quantum Computing

### Workshop

Qworld (2 courses)

### LPS Summer of Quantum

LPS Qubit Collaboratory (2 courses)

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## Online Courses

### Quantum 101: Delft X

Edx - TU Delft University (2 courses)

### Cryptography and Network

### Security

NPTEL (2022)

### Quantum Computing With Qiskit

Udemy (1 course)

### Introduction to Quantum

### Computing

Coursera - St Petersburg State  
University (1 course)

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## Achievements

### IBM Certified Associate Developer- Qiskit v0.2X

Awarded IBM Qiskit Developer badge for demonstrating fundamental knowledge of quantum computing concepts and by being able to express them using Qiskit open source (SDK).

### IBM Quantum Challenge

2021, 2022, 2023

Secured Advance Badge among 2000+ participants across the world and my results stood out in the top 25 contestants.

### QC-Hackathon

September 2015

My project secured 7th place for building a QR-Code Generator using the Bernstein-Vazirani algorithm.

### Excellence in academic award

September 2019

I secured 3<sup>rd</sup> rank in Engineering department during my 1<sup>st</sup> semester.

## Malware detection in Android through Quantum Machine Learning model - *Quantum ML*

January 2023

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 'SecMI' for training, and evaluating machine learning models. And a Hybrid quantum-classical machine learning algorithm VQC for dataset classification.

## Quantum QR-Code Generator - *Quantum Algorithms*

March 2021 - April 2021

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 Steganography using BB84, BBM92 & Ekert91 Protocol - *Quantum Communication*

February 2021

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 - *OpenCv*

Dec 2020 - Jan 2021

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% similarity proportion when tested with two distinct metrics based approaches such as Euclidean distance and Mahalanobis distance.

## Designing Wearable Antenna - *UHB Micro-strip patch antenna*

May 2021 - July 2022

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.

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## Publications

[view publication](#)

### Wearable Antenna For Remote Health Monitoring

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. It is observed that the SAR value, which is an important parameter, is well within FCC standards, indicating that this proposed antenna is feasible to use for Tele-medical applications. The paper is due to be published in IEEE Xplore this year.

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## Extracurricular

[view in portfolio](#)

### Qworld Association Global Workshops - *Academic Mentor*

Qworld is a non-profit global organisation that brings quantum computing researchers & enthusiasts together. As a mentor, I have actively participated in numerous workshops & events by guiding enthusiasts across the globe.

### We Make Devs - *University Lead at Community Classrooms*

Mentoring on a road map track by providing hands-on training in various fields of scientific computing, collaborating with like-minded candidates in a community.

### TYCIA and Valliappa Foundation - *Student Fund-raiser*

Served as the Student fund-raiser & influencer, by finding several donors for the #1000 and you campaign focusing on Tribal Girl child Education.