Harshit Garg

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Education

2018–Present	**B.E. Computer Science**. BITS Pilani Pilani Campus, India 8.16 / 10 *(4 semesters)*
2017–2018	**Senior Secondary School, CBSE**. DAV Public School Pushpanjali, Delhi 94.4%

Experience

May'20– Jun'20	**Intern**, UST Global, *Trivandrum*. • Worked with a team of 4 to study "quantum-safe" protocols including liboqs for openssh, openssl, etc., and Hybrid key-exchange in TLS1.3 and prepared a report. • Implemented Quantum Image Encryption for medical imagery in qiskit. Uses NEQR, Image Scrambling, and 2-D logistic sine-map.

Projects

July'20– Present	**Optimal Scheduling for Age of Information**. *Advisor: Prof. Amit Dua, CSIS BITS Pilani* • Developing a model for age of information with soft updates and distortion. • Currently reviewing literature and using Convex optimization (specifically KKT) to find optimal strategy.
Apr'20– May'20	**AFORT - Attack Tree Repository**. *Advisor: Prof. Rajesh Kumar, CSIS BITS Pilani* • Repository of attack trees and attack defense trees. • Developed a website with PythonAnywhere from scratch using Flask, MySQL, Bootstrap, and JS.

Technical Skills

Programming Languages	C/C++, Python, HTML/CSS, Javascript, Assembly (MASM), Verilog, Haskell
Quantum Tools	Qiskit, Q#, PennyLane, Strawberry Fields

Coursework

Computer Science	Data Structures & Algorithms, Object Oriented Programming, Discrete Mathematics, Machine Learning
Electronics	Digital Design, Microprocessor & Interfaces
Physics	Quantum Information & Computation
Mathematics	Linear Algebra, Probability & Statistics, Differential Calculus

Hackathons

Sep'20	**Qiskit India Challenge** A pan-India Quantum Machine Learning challenge using Qiskit. Task was to classify MNIST dataset amongst digits 4 and 9. Worked with a team of 5 and achieved an **efficiency of 77%**. Used EfficientSU2, COBYLA, ZZFeatureMap.

Jun'20   **Q# Coding Contest Summer 2020**   A worldwide competitive coding-esque competition by Microsoft, hosted on codeforces. Involved working with Q# Machine Learning libraries and state manipulation problems.

Certificates and Workshops

Jul'20 –   **Cornerstone Models of Quantum Computing** Selected to attend a 4-week remote workshop organized
Aug'20   by TRIUMF and University of British Columbia alongside 60 other graduate/PhD candidates. Worked with **PennyLane, Strawberry Fields**, D-Wave **Quantum Annealing** systems, and Xanadu's **Quantum Photonics**.

Jul'20   **Qiskit Global Summer School** Attended remote summer school organized by IBM. Learnt about Quantum Error Correction, Variation Quantum Eigensolvers (VQE), and Superconducting qubits. Final project to solve for minimum energy state of LiH molecule using VQEs.

Jul'20   **SPCOM IISc Bangalore** A 4-day remote workshop with talks on Quantum Error Correction, Quantum Networks, and Quantum Algorithms.

Extra-Curricular Activities

Aug'20 –   **Qurator**, Quantum Universal Education.
Present
- Community for creating approachable tutorials/articles on Quantum Computing concepts, and funded by Unitary Fund.
- I work on reviewing and "qurating" the submitted articles

Aug'20 –   **Vice-President**, MATRIX, *Literature and Cinema Society*.
Present
- A community of 30-35 film and literature enthusiasts (and geeks).
- Conducted directed discussions on philosophy, writing, art and current affairs, organised presentations and introductions of books, movies etc.

Dec'19 –   **Member**, Srishtaara, *Makerspace at BITS Pilani*.
Present
- Working with a team of 25 to establish India's first makerspace in a library.
- Responsible for editing videos for the club, and managing projects, amongst various other activities.