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_____ Areas of Interest

Quantum Information and Computation, Quantum Cryptography, Machine Learning, Experimental Quantum Optics, Theoretical Physics

_____ Skills

- **Quantum Simulation** — Quantum Algorithms (VQE, QPE, LCU), MBQC model of computation, Circuit model to MBQC model conversion.
  Continuous-Variable Cluster State Quantum Computation, gaussian states and gates, homodyne detection simulations

- **Experimental Quantum Optics** — Quantum key Distribution, Beam profiling, alignment, Spectral analysis and Doppler-free spectroscopy, detuning, Programming and automation of Lab tasks, data acquisition, post-processing and data analysis.

- **Quantum Information & Cryptography** — Classical client private remote state preparation, Blind quantum computation and application development, Quantum homomorphic encryption principle and implementation, Lattice cryptography, trapdoor instances LWE and SIS instances.

- **Programming & Dev** — Python, Fast Api, Matlab, CAD modelling

_____ Education

Year	Degree/Examination	Institution/Board	CGPA/ Percentage
2022	MSc Physics	Indian Institute of Technology, Roorkee	7.658/10
2020	B.Tech (Information Technology)	JSS Academy of Technical Education, Noida	7.46/10
2015	Intermediate (Class XII)	Tulsi Vidya Niketan, Varanasi	92.80%

_____ Experiences

June 2022 - Nov 2023   Team lead Blind Quantum Computing (BQC) team at Qulabs Software Pvt. Ltd.
> Surveyed and implemented Measurement based model of quantum computation simulation.
> Surveyed and developed trapdoor oracle based classical client remote state preparation protocol.
> Researched Lattice cryptography, quantum homomorphic encryption.
> Contribution in development of classical client delegated blind quantum computation service and applications using all the above with an aim for a toolkit to provide private delegated quantum computation for a fully classical client.
> Contribution in development of table-top experimental simulation of continuous-variable cluster state quantum computation.
> Also, occasionally, develop automation toolkits for quantum memory lab experiments and analysis.

Nov 2021 - May 2022   Internship in Blind Quantum Computing (BQC) team at Qulabs Software Pvt. Ltd.
> Surveyed Measurement based model of quantum computation simulation.
> Surveyed and produced reports in MBQC and Blind quantum computing (BQC) schemes.
> Learned backend coding for testing for quantum circuits.

May 2021 - May 2022   Msc. project "Quantum Computing of Atomic Nuclei" at IIT Roorkee
> Researched and studied Jordan Wigner and Gray Code representation of Deuteron Hamiltonian.
> Learned Quantum computation and simulation techniques and algorithms.
> Implemented algorithms like variational quantum eigensolver and quantum phase estimation to find the ground state of Deuteron.
> Modified quantum phase estimation algorithm to perform quantum adiabatic type evolution to reach

ground state of a system from an arbitrary state close to ground state.
> Published and presented two conference papers.

July 2020   B.Tech project "Disaster Management System using IoT" at JSS Academy of Technical Education
- Sept 2020   **> Studied and learned Arduino IDE and IoT based programming.**
           > Studied different sensors like temperature and humidity sensor, water level sensor, water flow sensor, etc. and its working.
           > Developed flood detection sensor system that monitors 4 features of flood and alerts and updates in case of possible flood.

Publications

1. Gupta, A., et al.: An efficient and secure quantum blind signature-based electronic cash transaction scheme. IET Quant. Comm. 1–13 (2024). https://doi.org/10.1049/qtc2.12109
2. Gupta, A., Singh, N., Singh, A., Abhishek, P. S., & Arumugam, P. (2022). Quantum adiabatic optimization for nuclear ground state. In Proceedings of the DAE Symp. on Nucl. Phys (Vol. 66, p. 86), https://inspirehep.net/files/09d4a2e25cfb89670b7c6b01e2eef62a .
3. Gupta, Aman, Pooja Siwach, and P. Arumugam. "Exploring algorithms for quantum computing of atomic nuclei." *Proceedings of the DAE Symp. on Nucl. Phys*. Vol. 65. 2021, http://sympnp.org/proceedings/65/A52.pdf.

Achievements
- Presented a paper titled "Quantum adiabatic optimization for nuclear ground state", at 66th DAE-BRNS Symposium
- Qiskit Advocate at IBM Quantum.
- Presented a paper titled, "Exploring algorithms for quantum computing of atomic nuclei", at 65th DAE-BRNS Symposium on Nuclear Physics, 2021
- Certification of Appreciation for Presenting Disaster Management Project at ICCSEMS-2020 Conference

Other Skills
> Team Work as a team lead in BQC team.
> Leadership and Event Management
> Public Speaking