Asish Kumar Mandoi

Associate Software Engineer, Citrix Systems
Bachelor of Technology in Electrical Engineering
Indian Institute of Technology Kanpur

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Experiences

Jul '23 – Jul '25 **Associate Software Engineer, Cloud Software Group**

Core Networking Team, NetScaler Business Unit, Bengaluru, India

- Contributed to 200+ new customer adoptions in a quarter by working on two most high-visibility projects: Citrix Secure Private Access (SPA) and F5-to-NetScaler Config Converter during 2023-24
- Developed key features for SPA on Linux platforms recording a 17x user growth within a year
- Created an LLM-based tool equipped with latest intelligent prompt optimizers (DSPy) to generate NetScaler policy configurations from natural language prompts, as part of an AI Hackathon
- Carried out security upgrades to NetScaler's monitoring protocol by incorporating SNMPv3 along with the support for latest authentication (SHA256+) and privacy (AES192+) standards
- Among top 20% employees to be awarded rating – 1 as a recognition of valuable contributions by employees throughout the year 2023-24

Dec '21 – Apr '23 **Research Associate, QResearch Project, QWorld**

QWorld, GitHub *Optimizing Logistics using Quantum Algorithms, Mentor: Dr. Paweł Gora*

- Received citations in an IEEE publication on a Graph Coarsening approach, for carrying out simulations with hybrid quantum-classical techniques to solve optimization problems in logistics
- Benchmarked 5 solvers of the Vehicle Routing Problem (VRP) against theoretical predictions by performing simulations for 550+ VRP instances on the D-Wave quantum annealers
- Devised a new efficient solver for VRP with higher performance compared to all existing solvers
- Co-mentored several interns in designing QUBO formulations for VRP for a duration of 6 months
- Presented our work on Quantum Annealing based VRP formulations at two international IT conferences – Warsaw IT Days 2022 and Data Science Summit 2022

Jan '23 – Mar '23 **Quantum Computing Analyst Intern, Unisys India**

Enterprise Computing Solutions Research & Innovation Team

- Made valuable contributions to the development of a proof of concept-based prototype to tackle large-scale Vehicle Routing, working in direct collaboration with the D-Wave team
- Evaluated the commercial viability of the model by achieving near optimal solutions for datasets with over 1000 nodes in under 5 mins of runtime

May '22 – Jul '22 **Software Engineer Intern, Citrix Systems**

DevOps and Automation Services Team, Bengaluru, India

- Created an infrastructure integrated with Grafeas, a software auditing service, for CI/CD of major internal applications across Citrix, including workflows with Kubernetes deployed via Helm Charts
- Facilitated active monitoring of the Grafeas API by creating a dashboard and an alert system on Slack based on reports collected from the pipeline logs using Splunk

Presentations

Nov '22 **A. Mandoi**, "*Quantum Annealing methods for solving the Vehicle Routing Problem.*" Talk presented at **Data Science Summit 2022**, Warsaw, Poland.

Apr '22 S. Borah, **A. Mandoi**, A. Verma, "*Heuristic QUBO Formulations for solving the Vehicle Routing Problem using Quantum Annealing.*" Talk presented at the 13th **Warsaw IT Days 2022**, Warsaw, Poland.

Selected Projects

Dec '22 – Jun '23 **Hopfield Neural Networks for Combinatorial Optimization**

Report *Thesis Project, Advisor: Prof. Shubham Sahay*

- Gained insight into properties of nonvolatile memory-based annealing-inspired computing accelerators for combinatorial optimization capable of near-optimal accuracy and performance
- Achieved near-optimal solutions to 800+ node optimization problems by implementing Hopfield Neural Networks and applying various stochastic and weight annealing techniques
- Demonstrated a qualitative similarity in the annealing processes and behaviour of neural networks operating close to the critical condition

Mar '23 – Apr '23 **Quantum Logic Gate between a Solid State Quantum Bit and a Photon**
Report *Advisor: Prof. Shilpi Gupta, EE698Y (Quantum Optics)*
- Demonstrated controlled-NOT gate behavior in a Quantum Dot (QD)-cavity system subjected to pump-probe lasers by solving the Lindblad Master Equation to obtain cavity reflection coefficient
- Reproduced the reflection spectrum by simulating a theoretical model of the QD-cavity system
- Presented project outcomes to the class, explaining the process, key ideas, and the conclusion

Mar '22 – Apr '22 **Quantum Algorithms for Semidefinite Programming and its Applications**
Report *Advisor: Prof. Ketan Rajawat, EE609A (Convex Optimization in SP-COM)*
- Studied Arora and Kale's classical algorithm based on Multiplicative Weights Update method for solving Semidefinite Programs (SDPs)
- Compared the classical complexity and lower bounds with that of the quantum extension of SDP solvers and subsequent speed-ups
- Investigated practical applications of quantum algorithms for solving SDPs like Quantum Error Recovery and Shadow Tomography

May '21 – Jul '21 **IITK-Coin**
GitHub, Doc *A centralised pseudo-currency system | Programming Club, IIT Kanpur*
- Developed a microservices-based pseudo-currency application for 3000+ institute-wide users
- Built a scalable backend component using Golang, processing upto 300 concurrent transactions per second through optimized caching via Redis and a SQLite database with WAL journal mode
- Implemented a muliti-layered security architecture including Bcrypt-based password hashing+salting, JWT-based user authorization, and OTP-based confirmation system for transaction verification

Achievements & Honours

Programming Achievements

Nov '22 **HAQS, qBraid**
Won the qBraid Open Challenge and among the top 3 contenders in the QML Challenge

Aug '22 **Quantum Excellence, Qiskit Global Summer School 2022, IBM**
Badge Among 1200 worldwide to complete the 2 week long Qiskit Global Summer School program with intensive hands-on labs focused on quantum simulations using NISQ hardware

Nov '21, Jun '22 **IBM Quantum Challenges**
Badges Among 1000 worldwide to complete challenges of *fall 2021* and *spring 2022* by solving problems in areas of finance, fermionic chemistry, machine learning and optimization

Scholastic Achievements

Jun '19 All India Rank 3592 in JEE-Advanced out of 220,000+ shortlisted candidates

Apr '19 All India Rank 7480 in JEE-Main out of 0.9 million+ candidates

May '18 National Top 300 to be selected for Indian National Chemistry Olympiad, HBCSE

Dec '17, May '18 All India Rank 322 in KVPY out of 50,000+ candidates and awarded KVPY Fellowship by Govt. of India, and IISc Bangalore

Education

Jul '19 – Jul '23 **Bachelor of Technology in Electrical Engineering**, *CPI: 7.5/10.0*
Minor in Quantum Physics
Indian Institute of Technology Kanpur, India

May '19 **Grade XII (CBSE Board)**, *Cumulative Percentage: 93.8%*
MBS Public School, Bhubaneswar, India

Jun '17 **Grade X (CBSE Board)**, *CGPA: 10.0/10.0*
DAV Public School, Bhubaneswar, India

Technical Skills

Languages C, C++, Python, Go, MATLAB, JavaScript
Web Node.js, HTML, CSS, PHP, MySQL, SQLite, Redis
Frameworks QuTiP, TensorFlow, Qiskit, Ocean, DSPy (prompt optimizer for AI models)
Utilities/Tools Git, Docker, Kubernetes, Jenkins, Splunk, LaTeX, Linux shell utilities

Relevant Coursework

Quantum Computing, Quantum Optics, Semiconductor Devices, Computer Networks, Data Structures and Algorithms, Convex Optimization in Signal Processing & Communication, Introduction to Machine Learning, Probability and Statistics