

DIVYANSHU SINGH

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EDUCATION

Gautam Buddha University

Bachelor of Science with Honors in Physics (GPA: 3.36— 8.0/10 (Absolute))

Aug. 2019 – Aug 2022

Greater Noida, Uttar Pradesh

Kanha Makhan Public School

Physics, Computer Science; Central Board of Secondary Education; 76.8% (384/500)

May 2019 – June 2019

Mathura, Uttar Pradesh

RELEVANT COURSEWORK

- Quantum Mechanics
- Electrodynamics
- Solid State Physics
- Advanced Calculus
- Mathematical Physics
- Linear Algebra
- Discrete Mathematics
- Basics of Programming

RESEARCH

Qiskit Advocate | IBM Quantum([Link](#))

July 2022 - Present

- After successfully passing the IBM Certified Associate Developer - Quantum Computation using Qiskit v0.2X, and many remarkable open-source contributions to Qiskit, I was made a Qiskit Advocate, one of under 200 across over 30 countries.
- This achievement depicts a deep level of understanding with Qiskit including circuits, algorithms, simulators, qubits and noise
- Through my contributions to the Qiskit and the quantum community, I have demonstrated an ability and commitment to educate and influence others by sharing ideas, knowledge and expertise in the field of quantum computing.

Beat the Quantum Machine | Qiskit Hackathon Europe([Link](#))

May - June 2020

- Proposed the implementation of a Quantum Othello game using quantum computing together with classical machine learning techniques to create a (self-improving) computer opponent players can compete against
- Othello is also seen as a Markov Decision Problem in reinforcement learning. In addition, the mixed application of Convolutional Neural Networks result in a better accuracy predicting moves.
- The Quantum opponent creates winning strategies using a Variational Quantum Circuit for Deep Reinforcement Learning. The implementation utilises PyTorch to train a Deep Q-Learning Neural Network with a Quantum Computing based hidden layer.

Variational Quantum Eigensolver | IBM Quantum([Link](#))

August 2020

- Wrote a program to simulate LiH molecule through quantum computer
- Plot a graph to analyze the results and to find how close we are
- Got hands on experience in using different optimizers

EXPERIENCE

Indian Institute of Information Technology, Guwahati

December 2020

Research Intern

Guwahati, Assam

- A month long research internship in which a project proposed by Dr. Babita Jajodia on analysing the results of different Adder circuits by designing adder circuits in many different approaches
- The results are then compared between different IBM quantum computers and the ideal simulators
- Explored ways to design an adder circuit and understand how much efficient quantum computers are in controlling noise errors.

RESEARCH PUBLICATIONS

Experimental Evaluation of Adder Circuits on IBM QX Hardware | Springer([Link](#))

January 2022

- This work experimentally evaluated the performance of quantum adders on various IBM quantum hardware. We have constructed quantum circuits for one-qubit and two-qubit quantum adders using Quantum Information Science Kit (Qiskit). A detailed experimental analysis of accuracy rate of seven IBM devices are reported in this work.

Experimental Evaluation of QFT Adders on IBM QX Hardware | Springer ([Link](#))

April 2022

- In this paper, We have experimentally evaluate the performance of QFT adders on various IBM Quantum Experience (QX) hardware against Quantum Information Science Kit (Qiskit) Simulator

CERTIFICATION / ACHIEVEMENTS

- **IBM Certified Associate Developer - Quantum Computation using Qiskit v0.2X** for Passing certification test of expertise in Quantum Computation using Qiskit conducted by **IBM Quantum**
- **Top** contributor in **Qiskit Textbook** and **Qiskit tutorials**. Made 50+ significant content-related contributions.
- **Mentor** in **Quantum Global Summer School 2021** and **IBM Quantum Challenge Africa** conducted by **IBM Quantum** and **Qiskit Community**
- **Participated** in MIT's **Quantum Computing Hackathon** conducted by **IQISE** and **Massachusetts Institute of Technology**
- **Qiskit hackathon Europe** - Won **Community Choice** award for proposed project(Beat the quantum Machine) after selection in between **Top 20** projects **Participation certificate**
- **Certificate of Appreciation** for Mentoring in the **The Eigensolvers Quantum School** conducted by **Eigensolvers** and **ISTE NIT Calicut**

TECHNICAL SKILLS

Programming Languages: Python,C++,HTML/CSS

Developer Tools: Qiskit, Jupyter notebook, VS code, Docker, Scilab, Maple

Technologies/Frameworks: Linux, GitHub,Git, L^AT_EX