




GYANATEET DUTTA

Quantum Computing & Machine Learning Researcher

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 LinkedIn |  GitHub: Ryukijano |  Portfolio

EDUCATION

Master of Science (MSc) - Computer Science & Artificial Intelligence

University of Leeds, UK | 2023 – 2024

Specialization: Quantum Computing, Machine Learning, Computer Graphics, GPU Computing

Bachelor of Technology (B.Tech) - Electronics and Computer Science

Kalinga Institute of Industrial Technology (KIIT), India | 2019 – 2023 | **Grade: 8.61/10** (First Class with Distinction)

QUANTUM COMPUTING EXPERIENCE

Quantum Machine Learning Research | University of Leeds | 2023 - Present

- **Hybrid Quantum-Classical Architectures:** Developed novel quantum machine learning systems using Qiskit integrated with PyTorch and TensorFlow
- **Quantum Variational Autoencoders (QVAE):** Implemented and trained QVAE on MNIST dataset
- **Quantum Neural Networks:** Created QNNs for classification tasks, successfully applied to IRIS dataset
- **Quantum Continuous Thought Machines:** Pioneered hybrid quantum-classical recurrent neural networks

Quantum Algorithm Implementation | Personal Research | 2022 - Present

- **Shor's Algorithm:** Comprehensive implementation for integer factorization on Quantum Rings backend
 - **Quantum Teleportation:** Demonstrated quantum state transfer protocols with high fidelity
 - **Bernstein-Vazirani Algorithm:** Efficient implementation for hidden bitstring learning
 - **Quantum Error Correction:** Surface code implementation using Stim framework
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PROFESSIONAL EXPERIENCE

Research Intern | University of Leeds | Mar 2025 - Sep 2025

- Developing computer vision methods for real-time surgical phase detection using Vision Transformers and DINOv2

Research and Development Scientist | *Science Museum Group* | Nov 2023 - Present

- Leading 3D reconstruction using Structure-from-Motion, Neural Radiance Fields, and VR integration for cultural heritage preservation

AWS AI & ML Scholar | *Amazon Web Services* | Jul 2022 - Jun 2023

- Developed reinforcement learning models using PPO, achieved top 15% performance in AWS Summit competition
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QUANTUM ACHIEVEMENTS

- 🏆 **1st Place Winner** - as "Quantum Bits" team | *Yale Quantum * 2025 *Quantum Rings* Challenge |
 - 🎓 **IBM Quantum Challenge 2024** - Completed all notebooks with distinction
 - 🎯 **Future Leaders in Quantum Hackathon 2025** - Selected participant
 - 🏆 **UK Quantum Hackathon 2025** - Selected by National Quantum Computing Centre
 - 📚 **IBM Quantum Summer School 2024** - Advanced quantum algorithms
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QUANTUM SKILLS

Quantum Frameworks

- **Qiskit** (Expert): Circuit design, quantum machine learning, error mitigation
- **PennyLane** (Expert): Differentiable quantum programming, variational algorithms
- **Torch Quantum** (Advanced): PyTorch-based quantum neural networks
- **CuQuantum** (Intermediate): GPU-accelerated quantum circuit simulation

Quantum Algorithms

- Variational Quantum Algorithms (VQE, QAOA)
 - Quantum Machine Learning (QNNs, quantum kernels)
 - Quantum Error Correction (Surface codes, syndrome decoding)
 - Quantum Cryptography protocols
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TECHNICAL SKILLS

Languages: Python (Expert), C++, JAX, JavaScript, CUDA C++

ML/AI: PyTorch, TensorFlow, Transformers, Diffusion Models, Computer Vision

Tools: Git, Docker, Linux, AWS, Google Cloud Platform (TPUs)

Graphics: Neural Rendering (NeRF), 3D Reconstruction, VR/XR, Photogrammetry

KEY PROJECTS

Quantum Continuous Thought Machine | 2024

- Hybrid quantum-classical recurrent architecture with quantum memory slots and synchronization layers
- Applications: MNIST classification, CartPole reinforcement learning, maze solving

8th Place - JAX Diffusers Event | *Hugging Face & Google Cloud* | 2023

- Developed ControlNet for anime-realism art generation using JAX and TPU v4
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PUBLICATIONS

1. "Solving The Travelling Salesmen Problem using HNN and HNN-SA algorithms"

arXiv:2202.13746 | 2022

2. "Improved Pothole Detection Using YOLOv7 and ESRGAN"

arXiv:2401.08588 | 2024

RESEARCH INTERESTS

- Hybrid Quantum-Classical Machine Learning architectures
- Quantum Error Correction for fault-tolerant computation
- Quantum Optimization algorithms and applications
- Near-Term Quantum Applications for practical quantum advantage