GYANATEET DUTTA

Quantum Machine Learning & Scientific Computing Researcher

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AWARDS & RECOGNITION

Grand Prix Prize & 1st Place (Medicine Category) – Bradford Quantum Hackathon 2025
Quantum-Enhanced Genomic Sequence Prediction. Hybrid QD-HMC + Quixer quantum transformer pipeline achieving ~90% accuracy vs. ~80% classical MCMC baseline on NCBI genomic datasets for personalized medicine applications.

 1st Place – Yale Quantum Hackathon 2025 | Generalized Shor's Algorithm for Quantum Rings

 Finalist – City of London Quantum Hackathon 2025 | QCBM for financial time-series modeling

Additional | NQCC Participant 2025 (Rolls-Royce: VQE+SQD) | 8th – JAX Diffusers Global 2023 | AWS Scholar 2022–23 | IBM Qiskit Advocate | NVIDIA CUDA Certified | Hugging Face RL Course Contributor

PROFESSIONAL EXPERIENCE

Research Technician – 3D Medical Image Reconstruction | University of Leeds | Mar 2023–Present
Leading development of 3D reconstruction pipelines for medical imaging applications using Structure-from-Motion (SfM) and Neural Radiance Fields (NeRF). Implemented advanced computer vision algorithms for volumetric reconstruction. Integrated Unreal Engine 5 for interactive medical visualization.

Research Intern – AIMS Group (AI in Medical Systems) | University of Leeds | Mar–Sep 2025
Surgical phase detection with self-supervised learning (DINO, DINOv2, JEPA, Vision Transformers). >90% accuracy on surgical workflow classification.

AWS AI/ML Scholar | Amazon Web Services | Jul 2022–Jun 2023
Deep Racer PPO reinforcement learning. Top 15% global performance.

EDUCATION

MSc Computer Science & AI | University of Leeds | 2023–2024 | Quantum Computing, ML, Computer Graphics, GPU Computing

B.Tech Electronics & CS | KIIT University, India | 2019–2023 | Grade: 8.61/10 (First Class with Distinction)

RESEARCH & PUBLICATIONS

Master's Thesis | Surgical Video Prediction (VAE-Transformer). +2.36 dB PSNR improvement with FP16 mixed-precision training, 22 FPS inference.

Improved Pothole Detection Using YOLOv7 and ESRGAN | arXiv:2401.08588
Novel super-resolution approach combining ESRGAN with YOLOv7 for low-resolution pothole detection. 94.7% precision, 82.6% recall—outperforms previous methods without expensive LIDAR sensors.

Solving The Travelling Salesmen Problem using HNN and HNN-SA Algorithms | arXiv:2202.13746
Comparative study of Hopfield Neural Networks and Simulated Annealing for graph optimization problems.

Quantum ML (Self-Directed) | QVAE · QNNs · Quantum Continuous Thought Machine (QCTM—hybrid recurrent) · Quantum Transformers · Quantum Diffusion Models · Surface Code QEC (Stim)

Physics-Informed Neural Networks | Navier-Stokes, Burgers' equations, nonlinear PDEs. GPU-accelerated CUDA.

TECHNICAL SKILLS

Quantum Computing: Qiskit (Expert) · PennyLane (Expert) · Torch Quantum · lambeq · Quixer · ffsim · Q-CTRL · Cirq · CuQuantum · Stim

Quantum Algorithms: VQE · SQD · QAOA · Shor's · Grover's · GQE · QCBM · QNNs · QVAE · Quantum Transformers · QD-HMC · QMCMC · QEC

Machine Learning: PyTorch · TensorFlow · Transformers · Vision Transformers · Self-Supervised Learning (DINO, DINOv2, JEPA) · Deep Reinforcement Learning (PPO, DQN) · Diffusion Models · LangChain · LangGraph

Computer Vision & Graphics: Structure-from-Motion (SfM) · Neural Radiance Fields (NeRF) · YOLO · ESRGAN · Physics-Informed Neural Networks (PINNs) · 3D Reconstruction · Unreal Engine 5

Programming: Python (Expert) · C++ · JAX · CUDA · JavaScript

HPC & Scientific Computing: CUDA (Certified) · GPU Computing · Mixed-Precision Training (FP16) · Distributed Training · TPUs · AWS · NumPy · SciPy · SymPy · FVM · PDE Solvers

Tools & Platforms: Git · Docker · Linux · Slurm · Jupyter

COMMUNITY & LEADERSHIP

Co-Founder Quantum Buddies (Leeds) · GDSC Organizer (Leeds) · Hugging Face RL Course Contributor · XR Society Member