Md Rahatul Ashakin

Last updated: November 15, 2025

Queens, New York, USA

ashakin.rahatul@gmail.com · Website · Google Scholar · GitHub · LinkedIn · https://orcid.org/0009-0000-4892-8420

Research Focus

Reliable AI through optimization and privacy. I use hybrid classical and quantum methods such as QAOA in Qiskit to improve model selection and robustness, and apply privacy preserving techniques for secure data sharing in health and finance across cloud and edge systems.

Education

M.S., Information Technology (Track: Data Management & Analytics)   *Oct 2022–Mar 2024*
GPA: 4.00/4.00, Washington University of Science and Technology, Alexandria, Virginia

B.S., Computer Science and Engineering, North South University, Dhaka, Bangladesh   *Sep 2013–Aug 2018*

Professional Experience

Associate Researcher, Merrimack College, North Andover, Massachusetts   *Sep 2024–Present*

- Designed and evaluated 5+ cancer-model experiments (GNNs/transformers) on multi-omics (TCGA-BRCA, MIMIC), delivering **+6 pts AUROC (0.94 vs 0.88)** and **+8% F1-score** vs. classical PCA baselines.
- Built 3+ hybrid quantum–classical prototypes in Qiskit (QAOA/VQE) for classification & optimization, improving model precision by **+36 pts (78% vs 42%)** in target prioritization and accuracy by **+11 pts (89% vs 78%)** in FinBERT HPO.
- Produced 11+ literature reviews and 45+ figures/tables for publications; co-authored 9+ manuscripts (conference, journal, book chapter) and introduced LaTeX/Zotero templates that cut drafting/review cycles by 30%.

Data Analyst (Contract), Next Tech USA LLC, Jamaica, New York   *May 2025–Present*

- Ingested, cleaned, and documented 15+ large healthcare datasets (50M+ rows), building EDA/feature pipelines that reduced data defects by 30% and shortened analysis cycle time by 5 hrs/week.
- Developed and validated 3 ML models for patient-outcome prediction and workflow optimization, improving AUC by +8 pts and reducing false alerts by 15%; shipped 2 models to staging.
- Built 10+ stakeholder dashboards (Power BI/Tableau) with 25+ KPIs, driving adoption across 4 teams and cutting report prep time from 8 hrs to 30 mins per week via automated refresh and role-based views.

Data Science Intern, Tekurai Inc., San Antonio, Texas   *May 2024–April 2025*

- Built transformer and CNN pipelines for clinical text and audio, analyzed clinician and patient interactions for decision support.
- Processed 500k+ healthcare records with Python and produced interactive Power BI dashboards for operations and care insights.
- Prototyped **privacy-aware** blockchain workflows for secure data exchange in drug discovery across multiple institutions.

Program Manager, ShopUp, Dhaka, Bangladesh   *Feb 2022–Sep 2022*

- Led B2C/B2B analytics (forecasting, KPI reporting, Tableau/Power BI dashboards); partnered with operations/product to define KPI taxonomy and automate SQL/ETL pipelines for executive reporting.

Project Manager, Icon Information Systems Ltd., Dhaka, Bangladesh   *Jun 2020–Feb 2022*

- Directed cross-team reporting, SQL data workflows, and agile ceremonies (sprints, risk tracking); produced project plans, stakeholder updates, and UAT/release checklists to ensure on-time, auditable deliveries.

Assistant Project Manager, Millennium Information Solution Ltd., Dhaka, Bangladesh   *Nov 2018–May 2020*

- Supported delivery of HRIS and financial systems with user acceptance testing, reliability checks, and transaction safety reviews for regulated stakeholders.

Publications & Scholarly Contributions (Selected)

Book Chapter (forthcoming)

- **Ashakin, M. R.** (2026). Chapter 5: *Current Tools and Techniques of Artificial Intelligence in Healthcare.* In D. Roosan (Ed.), *Quantum Computing in Medicine: Transforming Drug Discovery, Protein Folding, and Genomics Research through Artificial Intelligence Integration*. Elsevier. ISBN: 978-0-443-34193-9.

Conference Papers

- Roosan, D., **Ashakin, M. R.**, Khan, R., Khan, H.M., Khou, T., Carnasciali, M.I., Haider, M. R. (2025). *Variational Quantum Circuits for Molecular Classification Using Graph Neural Network.* In: IEEE International Conference on Quantum Communications, Networking, and Computing (QCNC 2025).

- Roosan, D., **Ashakin, M. R.**, Khou, T. (2025). *Adaptive Multimodal Artificial Intelligence with Liquid Neural Network for Edge Computing-Based Augmented Reality*. In: IEAI 2025, IOS Press, *Advances in Transdisciplinary Engineering*.
- Roosan, D., Khan, R., **Ashakin, M. R.**, Khou, T., Nirzhor, S., Haider, M. R. (2025). *Quantum Variational Transformer Model for Enhanced Cancer Classification*. In: IEAI 2025, IOS Press, *Advances in Transdisciplinary Engineering*
- Roosan, D., Khou, T., Pham, B., Li, Y., **Ashakin, M. R.**, Khan, H.M., Khan, R., Haider, M. R. *Quantum AI Enhanced Blockchain Security for Drug Discovery*. In: Proceedings of ICIAI 2025, Springer LNEE.

Journals

- **Ashakin, M. R.**, Stuetzle, C., Khan, R., Nirzhor, S., Roosan, D. *Quantum Annealing of Financial Sentiment Analysis by Optimizing Large Language Model Hyperparameters.* Under review at Financial Innovation (SpringerOpen). *Resources:* Code: GitHub repository (Manuscript available upon request).
- Roosan, D., **Ashakin, M. R.**, Khan, R., Karim, M. *A Blockchain-Enabled Deep Learning Framework for Secure Omics Data Sharing and Attack Detection*, Nov 2025, Journal of Cybersecurity, Digital Forensics and Jurisprudence.
- **Ashakin, M. R.**, Hossain, B., Ifty, S.M.H. *Enhancing Digital Signal Processing: Obstacles and Advancements in FPGA and ASIC Hardware Implementations*, 2024, Pathfinder of Research.
- **Ashakin, M. R.**, Bhuyian, M. R., Hosain M. R., Deya, R.S., Hasan, S.E. *Transforming to Smart Healthcare: AI Innovations for Improving Affordability, Efficiency, and Accessibility*, 2024, Pathfinder of Research.

Academic Service

Teaching Assistant, Merrimack College (Prof. Don Roosan)

- **DSE 4900 (Capstone)** – Fall 2024; Fall 2025: Mentored teams from proposal to final presentation; coordinated labs and weekly clinics; supervised projects/theses end-to-end (scoping, curation, modeling, reporting); instituted reproducible practice (clean repos, env pinning, MLflow) and rigorous evaluation (ablations, error analysis, calibration, leakage/imbalance).
- **DSE 4116/6116 Quantum Machine Learning** – Fall 2025: Designed and delivered Qiskit labs (VQE, QAOA, QSVM/QNN) with classical baselines; mentored hybrid classical–quantum workflows and parameter sweeps; enforced reproducibility (clean repos, env pinning, MLflow) and fair-comparison protocols.
- **DSE 3010 (ML for DS)** – Fall 2024: Taught model selection and diagnostics; standardized repos/environments and MLflow tracking with diagnostic checks (ablations, error analysis, leakage/imbalance).

Skills

Trustworthy ML & Stats: Transformers · GNNs · multimodal fusion · robust training · calibration & uncertainty · ablations/error analysis

Quantum & Optimization: Qiskit · VQE/QAOA · hybrid C–Q workflows · QUBO/Ising mappings · quantum-guided HPO

Data Eng & Reproducibility: SQL · ETL · schema design · MLflow/W&B · env pinning · unit tests · CI/CD (Actions) · DVC

Visualization & Writing: Matplotlib · dashboards · LaTeX/Overleaf · figure/table design

Privacy & Cryptography: HE (CKKS/BGV; OpenFHE/SEAL) · differential privacy · secure aggregation · PQC (KEMs/signatures; liboqs) · threat modeling

Clinical NLP & Speech: HF fine-tuning · sequence labeling · ASR preprocessing · sentiment · topic modeling

Programming & Platforms: Python (PyTorch, scikit-learn, NumPy, Pandas) · Git/Linux · Jupyter · Docker (basic) · GPUs · cloud · edge/IoT

Domains: Computational genomics · clinical decision support · financial sentiment

Selected Research Projects (open-source)

- **IBD-Quantum-ESM**. Quantum-informed *IBD* modeling pipeline (classical+quantum optimization; Qiskit QSVC/QuantumKernel + ESM mapping). *Resources:* Links: Webpage · GitHub · Source/CLI · **Key Results & Reproducibility:** IBDMDB—F1_macro 0.797; ROC–AUC 0.927 (5-fold CV); CLI: `ingest-omics` → `train-omics` → `report`.
- **Quantum Optimization Sandbox**. Scaffold to *repurpose* ML experiments with QAOA/VQE vs. classical baselines. *Resources:* Links: GitHub · README · Notebooks · Scripts · **Key Results:** PDB 4DVF docking top-10, best donepezil −8.2 **kcal/mol.**
- **FinBERT_Quantum_Optimization**. FinBERT fine-tuning with quantum optimization (QAOA/VQE) for financial sentiment. *Resources:* Links: GitHub · README · Notebooks · Environment · **Key Results:** Accuracy +11 points (78% → 89%) vs. classical FinBERT.

Honors & Awards

- **Presidential List**, Master of Science in Information Technology, Washington University of Science and Technology, Alexandria, VA