MD SHAWMOON AZAD

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PROFILE SUMMARY

I am a researcher in Quantum-Secure Systems and XAI, focusing on hybrid quantum–classical frameworks in Cybersecurity and eXplainable AI in Healthcare. **My Research Interest(s):**

(I) **NIST-Aligned Hybrid Quantum–Classical Cryptography**   (II) **Post Quantum Communication Protocols**
(III) **Efficient QML for Constrained Hardware**   (IV) **Translational Quantum × AI Applications**

EDUCATION

Cleveland State University (CSU)   **Aug 2025 – Present**
Ph.D. in Engineering - Computer Science   Cleveland, OH
Research Theme: Hybrid Quantum-Classical Frameworks for Cybersecurity

North South University (NSU)   **Jan 2019 – Jun 2023**
B.Sc. in Computer Science and Engineering   Dhaka, BD
Distinction: *manga cum laude*
CGPA: 3.74/4.00 ($\approx 93.5\%$ marks)

EXPERIENCE

Graduate Research Assistant   **Aug 2025 – Present**
Intelligent Secure Cyber-Systems and Applications Research Lab, CSU   Cleveland, OH.

- Currently, working on designing and implementing Hybrid Post Quantum TLS for Quantum Safe Cloud.
- Investigating hybrid authentication mechanisms and key exchange optimization to enhance confidentiality, integrity, and downgrade resistance in modern transport protocols.
- Contributing to the development of resilient, scalable, and quantum-ready Internet security standards aligned with emerging post-quantum migration strategies.

Quantum Research Assistant   **(1 year 9 month) Oct 2023 – Jul 2025**
NSU Optics-Quantum & AI lab, NSU   Dhaka, BD.

- Developed secure hybrid Quantum-Classical security protocols using QKD (BB84, B92, E91, W-state) and classical cryptography for imperfect communication channels.
- Completed QKD integrated **4** research projects (**3 Q1 publication, Cumulative Impact: 14.9**)
- Co-supervised undergraduate quantum computing projects.
- Supported research proposal writing for Google Research Grant 2025 and World Bank HEAT Project.
- Delivered **3** NSU CTRGC grant-funded research projects;

AI Research Assistant   **(1 year) Jan 2024 – Jan 2025**
Dept. of Electrical and Computer Engineering, NSU   Dhaka, BD

- Designed data collection pipelines while maintaining ethical data guidelines.
- Built AI framework predicting consumer behavior (91% accuracy) using TPB + ML models.
- Developed mental health analysis tool (99.14% accuracy) with NLP and explainable AI features.
- Fine-tuned BERT-based LLMs, engineered prompts on Gen AI, and applied ensemble + statistical ML techniques.
- Published **2 Q1 journal** papers as 1st author, Total Impact: 8.2; Led **1** NSU CTRGC grant-funded research project.

Teaching Assistant   **(2 years) Jun 2022 – Jun 2024**
Dept. of Electrical and Computer Engineering, NSU   Dhaka, BD

- **Operating Systems** (CSE323): Covered OS structures, process and memory management, and security.
- **Programming Language I** (CSE115): Focused on C programming fundamentals.
- Mentored over **400** students across **25** sections; developed assessments and review materials.

PEER-REVIEWED JOURNAL PUBLICATIONS

1. **"Quantum Secure Image Transmission: A Chaos-Assisted Quantum Key Distribution Approach Using Entanglement."** *IET Quantum Communication*, 6(1), e70016. https://doi.org/10.1049/qtc2.70016
   Equal Contribution 1st Author • Q2 Scopus Indexed • Impact Factor: 3.3

2. **"Multi-layered Security System: Integrating Quantum Key Distribution with Classical Cryptography to Enhance Steganographic Security."** *Alexandria Engineering Journal*, 121, 167–182. https://doi.org/10.1016/j.aej.2025.02.056
   2nd Co-author • Q1 Scopus Indexed • Impact Factor: 6.2

3. **"QSAC: Quantum-assisted Secure Audio Communication using Quantum Entanglement, Audio Steganography, and Classical Encryption."** *Engineering Science and Technology*, 70, 102167.
   https://doi.org/10.1016/j.jestch.2025.102167
   Co-Supervised • Q1 Scopus Indexed • Impact Factor: 5.4

4. **"SAD: Self-assessment of Depression for Bangladeshi University Students Using Machine Learning and NLP."**
   Array, 100372. https://doi.org/10.1016/j.array.2024.100372
   1st Author • Q1 Scopus Indexed • Impact Factor: 4.5

5. **"Predictive Modeling of Consumer Purchase Behavior on Social Media: Integrating the Theory of Planned Behavior and Machine Learning for Actionable Insights."** *PLOS ONE*, 18(12), e0296336.
   https://doi.org/10.1371/journal.pone.0296336
   1st Author • Q1 Scopus Indexed • Impact Factor: 3.7

6. **"Explainable AI for Predicting Problematic Internet Use Among Bangladeshi University Students: The Role of Loneliness, Low Self-Esteem, and Psychological Distress."** *Under Review in PLOS ONE.*
   Co-Supervised • Q1-Submission • Under Review

7. **"Enhancing Cloud Storage Security with Quantum Key Distribution and Post-Quantum Cryptography Using Custom Proxy Re-Encryption."** *Under Review in Quantum Information Processing.*
   Co-Supervised • Q1-Submission • Under Review

PROJECTS

- **Undergraduate Thesis:** Towards Accurate AI-Driven ItihashQA: Developed Bangladeshi history-focused QA system using RAG & LLMs (92% accuracy, mitigated hallucinations). [Paper Link] Spring 2023
- **Undergraduate Capstone Project Showcase:** A Secure Image Transmission Scheme Using Chaotic System and Quantum Entanglement.[Poster Link] Spring 2023

SELECTED CERTIFICATIONS

- **Quantum Mechanics & Quantum Computing:** Theory, COMSOL simulation, and IBM QISKIT learning.
  [Certificate Link]

SKILLS

- **Quantum Tools:** QISKIT, TensorFlow Quantum, NumPy.
- **Programming Languages** : Python, C/C++.
- **Machine Learning Tools**: PyTorch, Scikit-learn.
- **DevOps**: GitHub, Trello.
- **Writing Tools**: Latex and Office Suits
- **Language**: English (Professional), Bangla (Native).

HONORS & AWARDS

- *Magna Cum Laude*, awarded by North South University. Dec 2024
- **Top 10** (of 104 teams), Innovation Challenge 13, NSU ACM. Spring 2023
- **50% Merit-Based Scholarship** for Academic Excellence. Spring 2020 – Fall 2022
- **NSU CTRGC Grant** funding across four research projects. Oct 2023 – Present