RAIYAN RAHMAN

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RESEARCH INTERESTS

My interests are broadly in the realm of **Quantum Networks** and **Quantum Cryptography**. I am focusing on hybrid quantum communication systems, which uses methods from both continuous and discrete variable quantum architectures.

EDUCATION

North South University (NSU) *(Sep 2019 - Jun 2023)*
B.S. in Computer Science and Engineering
GPA: 3.79/4.0

WORK EXPERIENCE

Research Assistant April 2025 - June 2025
Supervisors: Dr. Abul Kalam Al Azad, and Dr. Nabeel Mohammed NSU

· We are focusing on computational modeling of small, interconnected networks of neurons, known as motifs, to understand how neural networks function. Using electro-physiological models to simulate the behavior of individual neurons within these motifs, we are specifically looking at bursting spiking patterns. By analyzing these small networks, we aim to gain insights into the fundamental building blocks of larger, more complex neural systems. We are working towards developing deep neural models, which in turn can clearly predict the burst/spiking patterns.

Research Assistant Feb 2024 - March 2025
Supervisors: Dr. Abul Kalam Al Azad, and Dr. Sifat Momen NSU

· We worked on the behavioral research of e-commerce customer preferences, focusing on the Theory of Planned Behavior (TPB). The research concentrated on examining consumer attitudes and social norms that influenced online purchases in Bangladesh, with the objective of providing practical insights for business strategy.

TEACHING EXPERIENCE

Instructor Feb 2024 - Dec 2024
Mahdys Research Academy Remote

· I am tasked with teaching introductory quantum computation, cryptography, schemes such as (BB84, B92, E91) and their applications using Qiskit, along with basic machine learning concepts and their practical applications using Scikit-learn. Under the supervision of Dr. Mahdy Rahman Chowdhury, the teams are now conducting research on post quantum cryptography and time series data modeling.

Teaching Assistant June 2022 - Sep 2022
Subject: MAT361(Statistics) NSU

· I supported students with course-related inquiries, assisted faculties in preparing and managing course materials and assessments, and helped proctor examinations alongside faculty to ensure academic integrity.

PUBLICATIONS

1. **Raiyan Rahman**, Md Shawmoon Azad, Mohammed Rakibul Hasan, Syed Emad Uddin Shubha, M.R.C.Mahdy(2023). Enhancing the security of image transmission in Quantum era: A Chaos-Assisted QKD Approach using entanglement. [Under review][ArXiv]

2. Shawmoon Azad, Shadman Sakib Khan, Rezwan Hossain, **Raiyan Rahman**, Sifat Momen, *"Predictive Modeling of Consumer Purchase Behavior on Social Media: Integrating Theory of Planned Behavior and Machine Learning for Actionable Insights."* **PLoS ONE (Q1)** [**I.F.: 3.752**] [Link] [Github].

3. **Raiyan Rahman**, Abul Kalam al Azad, Sifat Momen. "MGFormer: A Lightweight Multi-Granular Transformer for Subject-Independent Alzheimer's Classification". [Under review]

PROJECTS

1. **ItihashQA**: An Open Source Conversational Question Answering System applied in the context of Bangladeshi History. This was the first ever Retrieval Augmented Generation model based on Bangladeshi data. [Github]

ACHIEVEMENTS

Magna Cum Laude, awarded by NSU	*2024*
Top 10 among 104 teams at Innovation Challenge(IC) organized by NSU ACM.	*Spring 2023*

SKILLS

Quantum Tools	Qiskit, Strawberryfields
Programming Languages	Python, C++
Machine Learning Tools	PyTorch, Sklearn
Web-dev Tools	Django, React