

# RAIYAN RAHMAN

Google Scholar  $\diamond$  Website  $\diamond$  LinkedIn

Email: rrahman@ncsu.edu

## 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. Previously, I worked on biomedical signal processing, analyzing neural dynamics to find patterns in brain activity.

## 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*

NSU

- We used computational models of neuronal motifs to study burst and spike dynamics through electrophysiological simulations. Insights from these small networks informed the development of deep neural models for predicting complex neural activity patterns.

**Research Assistant**

Feb 2024 - March 2025

*Supervisors: Dr. Abul Kalam Al Azad, and Dr. Sifat Momen*

NSU

- We conducted behavioral research on e-commerce customer preferences using the Theory of Planned Behavior (TPB). The study examined consumer attitudes and social norms influencing online purchases in Bangladesh to inform business strategy.

## TEACHING EXPERIENCE

---

**Instructor**

Feb 2024 - Dec 2024

*Mahdy Research Academy*

Remote

- I was tasked with teaching introductory quantum computation, cryptography, protocols such as BB84, B92, E91 and their applications using Qiskit, along with basic machine learning concepts and their practical applications in signal processing. Under the supervision of Dr. Mahdy Rahman Chowdhury, the teams are now conducting research on post quantum cryptography and biomedical signal processing.

**Teaching Assistant**

Summer 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

---

In reverse chronological order

### Published/Accepted

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.*” [Pre-print]
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].

### Under Review

1. **Raiyan Rahman**, Abul Kalam al Azad, Sifat Momen (2025), “*MGFormer: A Lightweight Multi-Granular Transformer for Subject-Independent Alzheimer’s Classification*”. [Under review at **Biomedical Signal Processing and Control** [**I.F 4.9**]]
2. Kazi Abrar Shafin, Md Maruf Imtiaz, Rabbi Al Nahiyen, **Raiyan Rahman**, M. R. C. Mahdy, “*Mapping the Mind at Rest: Machine-Learning Identification of Alzheimer’s and Frontotemporal Dementia through EEG Microstate Parameters*”. [Under review at **Array** [**I.F 2.7**]]

## 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 Bengali 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

---

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

## REFEREES

---

- **Dr. Mahdy Rahman Chowdhury**, Associate Professor,  
Department of Computer Science and Engineering, North South University,  
Email: mahdy.chowdhury@northsouth.edu
- **Dr. Abul Kalam Al Azad**, Associate Professor,  
Department of Mathematics and Physics, North South University,  
Email: abul.azad03@northsouth.edu
- **Dr. Sifat Momen**, Associate Professor,  
Department of Computer Science and Engineering, North South University,  
Email: sifat.momen@northsouth.edu