

# Rezuan Chowdhury Rifat

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## Education

**North South University (NSU)**  
BS in Computer Science & Engineering  
• CGPA: 3.08/4.0

Dhaka, Bangladesh  
Sept 2019 – July 2024

## Research Experience

### Directed Research

February 2024 – July 2024

Supervisor: Dr. Mohammad Abdul Qayum, North South University

- Learned and constructed several quantum algorithms utilizing Qiskit simulation.
- Conducted research on breast cancer detection using Quantum Neural Network.
- Proposed a hybrid classical-quantum machine learning algorithm that outperformed other hybrid classical-quantum algorithms in terms of accuracy and training time.
- Submitted a paper on this work to the *International Conference on Computer and Information Technology (ICCIT)* that is under review.

### Undergrad Thesis

July 2023 – July 2024

Thesis title: *Drug Repurposing for Covid-19 using Graph Neural Network*

Supervisor: Dr. Mohammad Ashrafuzzaman Khan, North South University

- Collected and analyzed data from various relevant sources and studies.
- Built a knowledge graph using a Graph Neural Network and utilized transfer learning to enhance the knowledge graph.
- A multi-layer perceptron was used as a drug ranking model trained on embeddings derived from the knowledge graph.

## Publication

**Breast Cancer Detection using Quantum Neural Network** (Under Review)

September 2024

*Rezuan Chowdhury Rifat*, Md. Tahmid - Ul Islam Tonmoy, Rifa Tasniya Aziz, Mohammad Abdul Qayum

*27<sup>th</sup> International Conference on Computer and Information Technology (ICCIT 2024)*

## Projects

### Improving Chest Radiograph Detection on Imbalanced data

January 2023 - June 2023

- Built a chest radiograph detection system using YOLOv5.
- Preprocessed Data with Weighted boxes fusion and utilized a classwise data balancing technique to handle data imbalance.
- Test time augmentation and ensemble method further improved the system.

### Tooth Segmentation

May 2022 - June 2023

- Designed a root canal monitoring system utilizing the Segment Anything Model (SAM) and YOLOv5.
- Data noise was handled through the BM3D algorithm.
- A classwise data balancing technique was applied to address data imbalance.

### SETI Signal Classification

September 2022 - Jan 2023

- Employed various machine learning techniques and architecture to detect extraterrestrial radio signals.
- Transfer learning on EfficientNet and Transformer models generated better accuracy and lower training time.

## National COVID-19 Vaccine Registration System

June 2021 - September 2021

- Developed a COVID-19 vaccine registration website using Django where users must verify using NID and OTP for security concerns.
- An encryption method was employed to secure the database.

## Technical Skills

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**Programming Languages:** Python, C\C++ , Java, JavaScript, SQL, Kotlin

**Frameworks and libraries:** PyTorch, TensorFlow, Keras, OpenCV, SciKit-learn, NumPy, Pandas, Matplotlib, Django, Qiskit

**Tools & Technologies:** Git, MySQL, MS SQL Server, SQLite, Android SDK, Firebase, Arduino, Microsoft Office,  $\LaTeX$

## Co-Curricular Activities

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### Problem Solving Bootcamp

December 2020 - Jan 2021

*NSU Problem Solvers*, North South University

- Participated in a boot camp focused on data structure and algorithms using C++ .
- Enhanced problem-solving skills by solving hundreds of problems and participating in weekly programming contests.

### ICPC Preliminary Contest

April 2021

North South University

- Participated in the *International Collegiate Programming Contest (ICPC) 2021* preliminary contest, competing with over 1200 teams nationwide.

## Professional Membership

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IEEE Student Member

2020