

MD RAKIB HASAN

A dedicated graduate in Soil, Water, and Environment from the University of Dhaka, equipped with over 2 years of strong foundation in quantitative and qualitative interdisciplinary research. Expertise includes 3.5 years of experience in data science, having data-driven insights and abilities in rigorous analysis to strategic decision-making. Diligent and performance driven, seeking opportunities to apply and enhance extensive problem-solving potential in research and organizational impact.



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Areas of Expertise

RESEARCH METHODOLOGIES

Quantitative Research & Analysis
Qualitative Analytics & Fieldwork
Disaster Risk Assessment & Monitoring
Environmental Health Risk Assessment
Water Quality Assess & Documentation
Public Health Hazards Monitoring
Climate Adaptation Workflow

DATA ANALYSIS & MODELING

Data Analysis (Python, R, SQL)
Statistical & Predictive Modeling
Machine Learning (TensorFlow, Keras)
Remote Sensing (Google Earth Engine)
Real-Time Monitoring (QGIS+Python)
GIS Mapping (ArcGIS, QGIS)

PROJECT MANAGEMENT

Research Project Coordination
Monitoring & Evaluation (M&E)
NGO/INGO Program Coordination
Grant & Research Proposal Reporting
Participatory Research Fieldwork
Communication & Presentation
Stakeholder Collaboration

DATA VISUALIZATION & DATABASE

Python, R (Matplotlib, Seaborn, ggPlot)
Dashboarding/Plot (Tableau, PowerBI)
Database (SQLite, PostgreSQL, MySQL)
Cloud Storage (AWS, GCP, Azure)

Certification / Training



- Google IT Support Professional
- Google IT Automation With Python
- Google Cloud: Cloud Architect
- Mathematics for Machine Learning
- Architecting Google Compute Engine
- DataOps with Apache Iceberg using Spark, Nessie, and Dremio

Extracurricular Activities

Secretary (Technical), **Geo-Biome Club**
University of Dhaka

Participant, **Stanford University**
Code In Place 2024

Runnersup in Dhaka Division
BCB Young Tigers Cricket (2017)

Educational Qualification

University of Dhaka; B.Sc in Soil, Water & Environment Jan 2020- Feb 2025

CGPA: 3.62/4.00;
Research Project: Health Risk Assessment from Heavy Metals in Dried Fish of Dhaka.

Higher Secondary Certificate (HSC) Graduated in 2019

Letter Grade: A (Science), Government Bangla College

Secondary School Certificate (SSC) Graduated in 2017

Letter Grade: A+ (Science), Lalmatia Housing Society School & College

Professional Experience

Stanford University; Code In Place 2025

Section Leader March 2025 - May 2025

- Led the class of 9 international students to teach CS106A/B program of Stanford University Syllabus. Provided detailed feedback and grading on assignments and exams.
- Collaborating with Dr. Chris Piech & Dr. Mehran Sahami to enhance course materials.

Atomic Energy Center; Bangladesh Atomic Energy Commission

Research Assistant Mar 2024 - Nov 2024

- Developed and deployed deep learning models using TensorFlow and Scikit-Learn for water quality forecasting, enhancing environmental monitoring of the Turag, Buriganga, Shitalakshya, Dhaleshwari, and Balu rivers.
- Analyzed water pollution dynamics and documented findings in 7+ study, contributing to 10+ journal articles.

University of Dhaka; Department of Soil, Water And Environment

Research Assistant Mar 2023 - Nov 2024

- Led 15+ analytical chemistry and deep learning projects to assess the impact of soil, sediment, and water quality on human health, analyzing over 500 samples across the Gangetic Delta.
- Used 5+ mathematical and statistical approaches to improve soil organic carbon (SOC) model accuracy by 15%. Contributed to 7+ peer-reviewed journal articles.

Publications

Journal of Next Research, Elsevier (Under review)



Hasan, M. R., Rahman, A., Zubyer, S., & Jolly, D. Y. N. Comparative analysis of water quality forecasting of enhanced CNN, RNN, LSTM, GRU-based multivariate and univariate deep learning architectures for the urban Turag River.

Journal of Biological Science, University of Dhaka (Under review)



Uddin, M. J., Hasan, M. R., Arabi, F. Z., & Ali, A. Z. Spatial soil variability and carbon dynamics in the Moribund Delta of the Ganges of Bangladesh.

Journal of Environmental Geochemistry and Health, Elsevier



Rahman, A., Hasan, M. R., Zubyer, S., Jolly, Y. N., & Akter, S. Heavy metals and health risk assessment of Buriganga, Shityalakshya, Balu, Turag, Dhaleshwari river sediments and water around Dhaka.

Journal of Environmental Science Ecosystem, Elsevier



Hasan, M. R., Arabi, F. Z., Uddin, M. J., & Mohiuddin, A. S. M. The potential soil organic carbon stocks in Sundarbans tidal mangrove forest ecosystem of Bangladesh.

Interpersonal Skills

Languages

English (Fluent)
Bengali (Native)
Hindi (Fluent)

Communication Skills

Expert in communication with senior leadership and decision making teams.

Programming (4Y)

Python R
SQL Bash

Database (3Y)

PostgreSQL MongoDB
MySQL SQLite

Data Handling (4Y)

Pandas Numpy
A. Spark Excel

Dashboarding / Plotting (3Y)

PowerBI Tableau
DataStudio Superset
Seaborn Matplotlib

Machine Learning (3Y)

Scikit-Learn TensorFlow
PyTorch Spark MLlib

Operating Platform (3Y)

Linux Win Server
Unix

App Development (1Y)

Django Flask

Project

Water Quality Modeling Using Enhanced CNN, RNN, LSTM, GRU of Turag

- Analyzed Turag River water and developed a novel method for modeling dissolved oxygen (DO) and biological oxygen demand (BOD) using stacked CNN, RNN, LSTM, and GRU models, in collaboration with Atomic Energy Center.
- Deep learning models outperformed machine learning models, improving accuracy by 3.88%, reducing errors by 7.41%, and increasing reliability by 95.56%.

Ground Water Arsenic Pollution Modeling Using Ensemble Techniques

- Analyzed groundwater from 909 wells to assess Arsenic pollution and developed a novel ensemble technique using multi-scalar data fusion (soil, climatic, anthropogenic, satellite imagery) for prediction.
- The approach is expected to improve prediction accuracy by 5-10% compared to traditional deep learning models. The project was collaborated with Dr. Anwar Zahid* from the Institute of Water Modeling, BWDB on the project.

Heavy Metal Contamination and Health Risk Assessment in Dhaka's Rivers

- Led a team to analyze seasonal heavy metal concentrations (Cr, Ni, Cu, As, Cd, Pb) in water/sediments across 5 Dhaka rivers (Buriganga, Shitalakshya, Balu, Turag, Dhaleshwari) under supervision of Dr Yeasmin Nahar Jolly*.
- Identified Pb and Cu as primary pollutants, with winter concentrations exceeding WHO/USEPA limits by up to 300% due to reduced runoff.
- Quantified ecological and health risks using advanced indices (Igeo, PLI) and Monte Carlo simulations, revealing moderate-to-high carcinogenic risks from Pb/As via ingestion/dermal exposure.

Soil Organic Carbon Dynamics Of Ganges Basin Delta By Deep Learning

- Collected Soil Samples from Sundarbans, Moribund, Mature & Active Delta of Ganges Basin of Bangladesh, analyzed physico-chemical characteristics under the supervision of Dr Md Jashim Uddin*.
- The soil organic carbon analyzed from the lab was then mapped with satellite-imageries and historical weather data of 32 years and feed into Ensemble Deep Learning Model to predict soil organic carbon sequestration.
- The inter-relationship of variables was analyzed and findings are being compiled into a manuscript.

All Other projects can be found on [Github](#)

References

Dr. Md. Akhter Hossain Khan Vice Chancellor

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Dr. ASM Mohiuddin Chairman

Department of Soil Water And Environment
University of Dhaka
asm.mohiuddin@du.ac.bd

Dr. Yeasmin Nahar Jolly Chief Scientific Officer

Atomic Energy Center
jolly_tipu@yahoo.com