MD RAKIB HASAN

Graduated from University of Dhaka, equipped with over 2 years of strong foundation in quantitative and qualitative interdisciplinary research, additional 3.5 years of expertise in data science, having abilities in rigorous statistical analysis to scientific decision-making. Performance driven, seeking opportunities to apply and enhance problem-solving potential in research and organizational impact.

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Areas of Expertise

RESEARCH METHODOLOGIES
Quantitative Research & Analysis
Qualitative Analytics & Fieldwork
Climate Adaptation Workflow

RISK MONITORING & EVALUATION
Disaster Risk Assessment & Monitoring
Environmental Health Risk Assessment
Water Quality Assess & Documentation
Public Health Hazards Monitoring

PROJECT MANAGEMENT
Monitoring & Evaluation (M&E)
NGO/INGO Program Coordination
Stakeholder Collaboration

DATA ANALYSIS & MODELING
Data Analysis (Python, R, SQL)
Statistical & Predictive Modeling
Machine Learning (TensorFlow, Keras)
Remote Sensing (Google Earth Engine)
GIS Mapping (ArcGIS, QGIS)

WRITING & REPORTING
Grant & Research Proposal Reporting
Participatory Research Fieldwork
Communication & Presentation

DATA VISUALIZATION & DATABASE
Python, R (Matplotlib, Seaborn, ggPlot)
Dashboarding/Plot (Tableau, PowerBI)
Database (SQLite, PostgreSQL, MySQL)

Certification / Training 🔗

⚜Certified Peer Reviewer Elsevier
⚜Mathematics for Machine Learning
⚜Google IT Support Professional
⚜Google IT Automation With Python
⚜Google Cloud: Cloud Architect
⚜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)

Work 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 2022 - 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.

Educational Qualifications

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

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 MLib

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 techniqueusing 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

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Atomic Energy Center
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