

# Rezwan Ahmed

DEVELOPER OF NATIONAL SPATIAL DATA INFRASTRUCTURE (NSDI) · GIS AND REMOTE SENSING EXPERT

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## Summary

I am a Consultant (GIS Programmer) at the Roads and Highways Department, and the developer of the National Spatial Data Infrastructure. I hold a degree in Geography and Environment from the University of Dhaka and Masters degree in Computer Science from Jahangirnagar University. With more than five years of experience, I have worked with organizations such as the World Bank, UN, JICA, Survey of Bangladesh and the Bangladesh Forest Department. As a Python programmer, open-source contributor, and WebGIS developer, My areas of interest include Remote Sensing, GIS, Climate Change, Earth Observation using Satellites, and Machine Learning.

## Work Experience

### Roads and Highways Department

Dhaka, Bangladesh

CONSULTANT (GIS PROGRAMMER)

Dec. 2024 - Present

- Developed GIS Portal of Roads and Highways Department.
- Wrote program to integrate Google Street View into the existing GIS Portal of Roads and Highways Department.
- Implemented Vector Tiling System for basemap that can render maps 37% faster without lagging.
- Designed and developed chainage and distance calculation matrix of RHD.
- Created an automated diagram generation program for viewing road structure of every road of RHD.
- Integrated latest high resolution satellite imagery basemaps with the RHD GIS Portal.
- Created a data synchronization pipeline of entire GIS database of RHD.

### The World Bank

Dhaka, Bangladesh

TECHNICAL CONSULTANT

Jul. 2024 - Nov. 2024

- Provided technical expertise in geospatial analysis and land suitability assessments for photovoltaic installations..
- Collaborated with stakeholders to integrate solar energy potential with zoning regulations and environmental considerations.
- Applied advanced GIS methodologies and programmed QGIS Plugin to identify optimal solar panel locations across Bangladesh.
- Assisted in the creation of interactive, user-friendly mapping tools to support energy policy decision-making.
- Conducted multiple training and workshop for the stakeholders.

### Survey of Bangladesh (National Mapping Agency)

Dhaka, Bangladesh

CONSULTANT (GIS EXPERT)

Jun. 2022 - Jun. 2024

- Developed National Spatial Data Infrastructure (NSDI) for Survey of Bangladesh, Ministry of Defence.
- Wrote multiple project proposals and DPP. Raised 5 million BDT for SoB from the Ministry of Defence.
- Integrated custom built map engine that performs 67% faster than the previous system.
- Collaborated with 43 different government organizations to build a common platform for data sharing.
- Created Routing and Navigation System, 3D models and Flood Simulation System for Bangladesh.
- Redesigned WMS/WMTS/WFS API and implemented CDN services for lower latency.
- Trained more than 100 government employees on operation, development and implementation of NSDI.
- Engineered automation of basemap tile creation system through WMS API that minimized basemap creation time from several weeks down to instant.

### Bangladesh Forest Department

Dhaka, Bangladesh

APP DEVELOPER

Feb. 2022 - May. 2022

- Developed a mobile app for plant species identification in Bangladesh using CNN-based image recognition.
- Integrated a plant species database enabling offline and real-time identification in remote forested areas.
- Optimized app performance by fine-tuning the CNN model to enhance accuracy in distinguishing similar plant species.
- Enhanced user experience with a simple, intuitive interface for plant identification by both forest staff and the public.

### All South Corporation

Dhaka, Bangladesh

GIS ENGINEER (REMOTE)

Mar. 2022 - Mar. 2023

- Developed a web-based Real Estate Management System using Open-Source QGIS System.
- Automated data collection and processing workflows using Python and GDAL for improved efficiency.
- Implemented advanced GIS tools, including split, merge, update attribute, vertex correction, etc., into the WebGIS Platform.
- Performed base machine deployment of ArcGIS Enterprise.
- ✦ Created automated backup and recovery scripts for GIS databases to ensure data security and integrity.

### Department of Meteorology, University of Dhaka

Dhaka, Bangladesh

GIS TECH.

Sep. 2021 - Feb. 2022

- Worked in a project funded by World Bank focusing on Disaster Risk and Climate Resilience.
- Manually identified and digitized 5000+ vulnerable communities in Bangladesh.
- Managed geodatabase of identified vulnerable communities.
- Performed geospatial analysis on the physical accessibility of cyclone shelters in Bangladesh.
- Wrote research paper on the accessibility of cyclone shelters in the vulnerable communities of Bangladesh.

## Skills

<b>Programming</b>	Python, JavaScript, Earth Engine, Node, PostgreSQL, PostGIS, NodeJS, GeoNode
<b>GIS and RS</b>	QGIS, ArcGIS Enterprise, ArcGIS Pro, ArcGIS Desktop, ERDAS IMAGINE, Pix4D Mapper, GDAL, QField, NetCDF, LiDAR Technology
<b>Data Analysis</b>	Numpy, Pandas, Matplotlib, Geopandas, Tableau
<b>Web Development</b>	Django, Django REST Framework, React, NextJS, FastAPI, Bootstrap, Tailwind, CSS, HTML5
<b>DevOps</b>	Git, Github Actions, Linux, Windows Server 2022, Docker, AWS EC2, Cloudflare, Nginx, Selenium
<b>Others</b>	LaTeX, Adobe Illustrator, Adobe Photoshop, Microsoft Office, Kobo Toolbox

## Education

<b>Jahangirnagar University</b>	<i>Dhaka, Bangladesh</i>
MASTER OF SCIENCE (MSc) IN COMPUTER SCIENCE	<i>Jan. 2024 - Jan. 2025</i>
• <b>Courseworks:</b> Data Structures and Algorithms, Software Engineering and Advanced Database Management Systems, Artificial Intelligence and Machine Learning, Digital Image Processing, Artificial Neural Networks.	
<b>University of Dhaka</b>	<i>Dhaka, Bangladesh</i>
BACHELOR OF SCIENCE (BSc) IN GEOGRAPHY & ENVIRONMENT	<i>Feb. 2018 - Dec. 2021</i>
• <b>Minor</b> in Geology, Soil, Water & Environment and Botany	
• <b>Courseworks:</b> GIS, Remote Sensing, Physical Geography, Climatology, Statistics, Environmental Analysis	

## Awards & Achievements

2024	<b>General Scholarship</b> , Faculty of Earth and Environmental Sciences, University of Dhaka
2024	<b>Research Fellow</b> , University Grants Commission of Bangladesh
2023	<b>National Science and Technology Fellowship</b> , Ministry of Science and Technology
2022	<b>Champion</b> , Poster Presentation, National Environment Olympiad
2022	<b>1st Runner-up</b> , Poster presentation, World Environment Day 2022
2021	<b>Academic Excellence</b> , Commonwealth of Learning Scholarship

## Publications

	<b>Ahmed, R.</b> , Hossain, R. B., Ferdous, Z., Sharmin, T., Refat, A., & Moni, U. H. (2025). Spatiotemporal Analysis of Urban Expansion and Its Impact on Agricultural Land Degradation and Vegetation Health in Narayanganj District, Bangladesh. <i>Acadlore Trans. Geosci.</i> , 3(4), 197-209. <a href="https://doi.org/10.56578/atg030402">https://doi.org/10.56578/atg030402</a>
2025	<b>Ahmed, R.</b> , Ahmed, A., Ferdous, Z., Kabir, M. H., Rahman, O., & Ryhan, M. A. (2025). Assessment of Physical Accessibility to Cyclone Shelters in the Exposed Coastal Area of Bangladesh by using Geospatial Approach. <i>The Dhaka University Journal of Earth and Environmental Sciences</i> , 13(2), 63–75. <a href="https://doi.org/10.3329/dujees.v13i2.79455">https://doi.org/10.3329/dujees.v13i2.79455</a>
	<b>Ahmed, R.</b> , Jarin, N.Z., Rahman, O. (2024). Spatiotemporal Dynamics of Flood Exposure in Bangladesh: A GIS and Remote Sensing Based Approach. In: Biswas, B., Ghute, B.B. (eds) <i>Flood Risk Management. Springer Natural Hazards</i> . Springer, Singapore. <a href="https://doi.org/10.1007/978-981-97-2688-2_1">https://doi.org/10.1007/978-981-97-2688-2_1</a>
2024	<b>Ahmed, R.</b> , Sium, S. M., & Fazlul Haq, K. Md. (2023). A geospatial analysis on river dynamics in upper active Brahmaputra-Jamuna floodplain region, Bangladesh. <i>International Journal of Business, Social and Scientific Research</i> , 11(2), 15–22. <a href="https://doi.org/10.55706/ijbssr11204">https://doi.org/10.55706/ijbssr11204</a>
2023	<b>Ahmed, R.</b> , & Hoque, M. A. (2023). GIS-Based Assessment of Land Suitability for Rubber Cultivation in Chittagong District, Bangladesh. In <i>BIO Web of Conferences</i> (Vol. 80, p. 02007). EDP Sciences. <a href="https://doi.org/10.1051/bioconf/20238002007">https://doi.org/10.1051/bioconf/20238002007</a>

## Projects

<b>Maplibre Google Streetview</b>	<i>Project Link</i>
TECHNOLOGIES USED: JAVASCRIPT, MAPLIBRE, GOOGLE STREETVIEW API, HTML, CSS	
• Developed a project to integrate Google Street View into maps.	
• Fully open sourced it under MIT license which is currently used by more than 1000 users.	
<b>SoB Navigate</b>	<i>Project Link</i>
TECHNOLOGIES USED: JAVASCRIPT, MAPBOX, MAPBOX ROUTING API, HTML, CSS	
• A website that can find the most optimal way to go from any point to a destination.	
• Supports geocoding and reverse geocoding system for address lookup.	

## Coordinate Transformer

[Project Link](#)

TECHNOLOGIES USED: PYTHON, STREAMLIT

- Small yet powerful software built with Python that can batch transform from one coordinate projection system to any other system.
- Currently supports 11,000+ coordinate projection system as mentioned in EPSG database.

## Drought Monitor

[Project Link](#)

TECHNOLOGIES USED: PYTHON, MATPLOTLIB, GEOPANDAS, JUPYTER NOTEBOOK, GIT, GITHUB

- Monitored and visualized the spread of drought across the USA in 2021.

## Padma Riverbank Erosion

[Project Link](#)

TECHNOLOGIES USED: JAVASCRIPT, GOOGLE EARTH ENGINE, PYTHON

- Detected the riverbank erosion in the Padma River from 1989 to 2021.
- Visualized the change in river course and location of Padma Bridge.

## Open Source Contributions

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2021 **Kepler GL, Uber**, Fixed errors in codebase and updated the documentation.

[Website](#)

2022 **Ridge Map**, Fixed a runtime error that was causing the python module to crash.

[Github Project](#)