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Md Nakir Ahmed

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Summary

Geospatial expert specializing in remote sensing, data analysis, and machine learning, proficient in Python, R, ArcGIS Pro, and UAV data collection. Experienced in leading research projects and applying innovative GIS solutions for real-world challenges.

Education

PhD in Geospatial Information Sciences **Present**

Department of Geospatial Information Sciences, The University of Texas at Dallas, Richardson,

TX, USA.

Dissertation: Advancing Deep Learning Techniques for Cassava Detection Using Unmanned Aerial Systems and Model Optimization.

MS in Social Data Analytics and Research **December 2025**

School of Economic, Political and Policy Sciences, The University of Texas at Dallas, USA.

M.S. in Environmental Sciences **December 2019**

Department of Environmental Sciences, Jahangirnagar University, Dhaka, Bangladesh.

Thesis: Elemental analysis of Dhaleshwari river sediment around the tannery industries, Savar, Dhaka.

B.Sc. in Environmental Sciences **December 2017**

Department of Environmental Sciences, Jahangirnagar University, Dhaka, Bangladesh.

Project: Land use and land cover change detection of Subarnachar Upazila of Noakhali district, Bangladesh using remote sensing and GIS techniques.

Employment

Teaching Associate | The University of Texas at Dallas, TX **May 2023 – Present**

Courses: The Global Environment, Special Topics in Geospatial Information Science - Drone and Remote Sensing.

Developed and delivered course content, facilitating discussions and hands-on labs, improving student engagement and understanding of complex geospatial concepts. Evaluated over 50 students, achieving positive feedback on teaching effectiveness.

Teaching Assistant | The University of Texas at Dallas, TX **August 2022 –May 2023**

Courses: Remote Sensing Fundamentals, The Global Environment, Global Change and Its Challenges.

Assisted in course delivery and graded assignments, providing timely feedback, which increased class performance and students' understanding of advanced geospatial analysis techniques.

Research Assistant | The University of Texas at Dallas, TX **August 2021 - July 2022**

Conducted research on remote sensing applications, analyzing large geospatial datasets. Assisted in sorting collected data and creating a data repository for drone imagery.

Research Consultant | CEGIS, Bangladesh **May 2020 -May 2021**

The National Land Cover Map was developed using SPOT satellite images and georeferenced land plots with RTK GPS. Created digital GIS maps, integrated data into a Geodatabase for online access, and provided insights to guide policy recommendations for sustainable land management.

Data Enumerator | Bangladesh Bureau of Statistics, Bangladesh **January 2020 - April 2020**

Collected and processed household data through surveys, contributing to the successful completion of a national census project.

Research Interests

- Crop identification using UAV data.
- Object detection and pattern recognition algorithms.
- Machine learning and deep learning in Remote Sensing.

Achievements

- Pioneer Student Research Grant 2024-2025
- Second Place in GIS Day 2022 Awarded by Geospatial Information Sciences Program, UTD
- Received National Science and Technology (NST) Fellowship award for M.S. Thesis. in 2018.

Skills

- Python
- R Programming
- ArcGIS
- ArcGIS Online
- Experience Builder
- Survey123

Professional Membership

- American Association of Geographers
- Gamma Theta Upsilon honor society

Projects

Drone Data Collection for High-Resolution Mapping in Guyana (2023-2024)

Led a team in planning and executing drone missions to collect high-resolution imagery in Guyana, coordinating with local communities. The data supports my dissertation and contributes to a regional image repository.

Change Detection Using Landsat Images

Designed a Python-based tool to detect and visualize vegetation changes over time using Landsat imagery. Implemented NDVI calculations and change maps with user-friendly features like temporal sliders and location selection.

Spatial Interpolation of Precipitation Data in Bangladesh

Compared and evaluated spatial interpolation methods (IDW, Kriging, Spline, and Global Polynomial) using the CRU TS dataset for predicting precipitation in Bangladesh, with cross-validation and RMSE analysis.

Prediction of Health Insurance Coverage Using Machine Learning

Built a machine learning model to predict health insurance coverage in the Dallas-Fort Worth area based on socioeconomic factors, with interactive visualizations to analyze factor influence and model performance.

Home Price Prediction Using Linear Regression

Created a linear regression model to predict home prices in Texas using socioeconomic and housing variables, enhancing accuracy with geographically weighted regression (GWR).

Wind Speed Forecasting Application

Developed a web application for wind speed forecasting using ArcGIS Maps SDK for JavaScript, featuring time sliders, search, and compass widgets for a user-friendly interface.

Regression Analysis of Grocery Store Density in Dallas

Modeled grocery store density in Dallas using spatial regression and kernel density estimates, refining the model for an R-squared of 0.74.

Regional Cluster Analysis in Texas

Performed a spatially constrained cluster analysis of Texas counties, identifying five regional clusters based on socio-economic, political, and demographic variables for regional planning insights.