

# Mohd Bilal

📍 Aligarh, India    ✉ mohdbilal7644@gmail.com    ☎ 7078 829 803  
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## Education

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- St. Fidelis Senior Secondary School** 2010 - 2022  
*Secondary Education*
- Saiyyid Hamid Senior Secondary School** 2022 - 2024  
*Senior Secondary Education*
- Aligarh Muslim University** Sept 2024 - Present  
*BTech in Civil Engineering*

## Experience

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- Civil Engineering Intern – Construction & Site Engineering** Jan 2025 – Apr 2025  
*Limra Developers, Aligarh*
- Assisted in on-site execution of residential and commercial projects, including RCC works, formwork, and finishing activities. Supported quantity take-offs, BOQ preparation, and material estimation.

## Projects

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### Prediction of Foundation Settlement Using Hybrid FEA–ML Framework

*Tools Used: OptumG2, Pandas, scikit-learn, XGBoost*

- Performed 50+ finite element simulations in OptumG2 to model immediate settlement of strip footings under drained soil conditions, with varying parameters.
- Trained an XGBoost-based ML model for predicting immediate settlement of shallow foundations using FEA-generated data achieving  $R^2 > 0.92$  and mean absolute error  $< 8\%$  in settlement prediction.
- Validated predictions of the model against real field case-history data, demonstrating strong agreement with observed behavior

### AUV Localization and Control System

*Tools Used: PyTorch, OpenCV, IMU Sensors, PID Control*

- Developed an Autonomous Underwater Vehicle (AUV) localization and control system integrating IMU data with control feedback for motion estimation and implemented PID-based depth control for stable underwater navigation.
- Trained and integrated a custom SuperPoint detection model with visual–inertial cues to improve localization and pose estimation under low-visibility underwater conditions.

### GIS-Based Spatial Analysis for Infrastructure Planning

*Tools Used: QGIS, Python, GeoPandas, Rasterio, OpenStreetMap*

- Conducted GIS-based multi-criteria spatial analysis over a study area of 100–200 km<sup>2</sup> to identify optimal zones for infrastructure development.
- Generated weighted suitability maps by integrating terrain slope, soil constraints, land-use restrictions, and proximity to roads, reducing unsuitable land by 40%.

## Skills

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**Languages:** C++, C, Python, JavaScript

**Civil Engineering Tools:** OptumG2, QGIS, ANSYS, AutoCAD, ArcGIS, MS Excel

**Technologies:** Machine Learning, Computer Vision, Finite Element Analysis, TensorFlow, PyTorch, Linux, Git

## Extracurricular Activities

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**Computer Team Member :** MTS Autonomous Underwater Vehicle (AUV) Club

**Member :** Robo Club, Zakir Hussain College of Engineering and Technology