

# S M Mahidur Rahman

Computer Science Graduate | AI/ML Researcher | [mahidursakib.github.io/Portfolio](https://mahidursakib.github.io/Portfolio)

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## EDUCATION

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<b>B.Sc. in Computer Science</b> , BRAC University	2022 – 2026
• GPA: 3.14/4.00	
<b>Higher Secondary School Certificate (Science)</b> , BAF Shaheen College Dhaka	2019 – 2020
• GPA: 5.00/5.00	
<b>Secondary School Certificate (Science)</b> , Uttara High School & College	2017 – 2018
• GPA: 5.00/5.00	

## SKILLS

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**Programming Languages:** Python, C, JavaScript

**ML/DL Frameworks:** PyTorch, TensorFlow, scikit-learn, CNNs, Regression Modeling, Multimodal Learning, Attention Mechanisms, Ensemble Methods, Explainable AI

**Computer Vision/Image Processing:** U-Net, Attention U-Net, Grad-CAM, SHAP, OpenCV, PIL

**Libraries:** NumPy, Pandas, Matplotlib

**Tools:** Git, LaTeX, MongoDB Atlas, Postman, Google Colab, Hugging Face

**Web Development:** Node.js, React.js, Express.js, MySQL, MongoDB, TailwindCSS, HTML

**Soft Skills:** Mentoring, Team Collaboration, Problem Solving, Time Management

**Language Proficiency:** Bangla (Native), English (Professional)

## RESEARCH & PROJECTS

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### Multimodal Deep Learning for Predicting Mechanical Ventilation Duration (Undergraduate Thesis)

- \* Developed a multimodal predictive system combining chest X-ray images and structured clinical data.
- \* Implemented CNN-based models (ResNet-18, DenseNet-121) and ensemble learning methods with attention-based fusion.
- \* Evaluated model performance using regression and correlation metrics with explainability analysis (Grad-CAM, SHAP).

### BRAC University Indoor Games Club – Web Management System

- \* Developed a full-stack web application to manage club members, events, feedback, and payments with secure user and admin workflows.
- \* Tools & Technologies: PHP, MySQL, HTML, CSS, JavaScript.

### Employee Management and Payroll System

- \* Built a role-based employee and payroll management system with separate admin and employee dashboards and secure backend services.
- \* Tools & Technologies: MERN Stack (MongoDB, Express.js, React, Node.js), JWT authentication, RESTful APIs.

### **CampusOrbit – All-in-One Student Engagement System**

- \* Designed and developed a MERN-based student engagement platform to centralize campus events, club activities, and student participation workflows.
- \* Implemented event interaction features including RSVP management, attendee tracking, automated notifications, and sponsorship request handling for organizers and club officers.
- \* Tools & Technologies: MERN Stack, RESTful architecture, role-based access control, modular system design.

### **Non-Deterministic Generative Modeling using $\beta$ -Variational Autoencoders**

- \* Developed a  $\beta$ -Variational Autoencoder (VAE) for unsupervised data generation, modeling latent uncertainty and comparing stochastic behavior against a deterministic Autoencoder baseline.
- \* Tools & Technologies: PyTorch, MNIST dataset, CNN-based encoder-decoder architecture, reconstruction MSE, uncertainty visualization using multi-sample outputs and variance analysis.

### **Enhanced Weather Forecast Classification**

- \* Developed a machine learning–based classification system to predict weather types using structured meteorological data with systematic preprocessing and feature analysis.
- \* Tools & Technologies: Python, scikit-learn, Pandas, NumPy; trained and compared Logistic Regression, KNN, Decision Tree and Random Forest models.

### **Attention-Enhanced U-Net for Joint Image Segmentation and Classification**

- \* Developed a deep learning pipeline for joint image segmentation and classification using U-Net and Attention U-Net architectures with an integrated classifier head.
- \* Tools & Technologies: PyTorch, Attention U-Net, CNNs; evaluated using mIoU, Dice coefficient, pixel accuracy, and classification metrics with qualitative mask visualization.

### **GuardianBot – Obstacle Avoiding, Rain Detecting, and Light Sensing Robot**

- \* Developed an autonomous Arduino robot that navigates safely by avoiding obstacles, detecting rain to trigger an umbrella mechanism, and halting motion under low-light conditions.
- \* Tools & Technologies: Arduino Uno, Ultrasonic Sensor, Rain Sensor, LDR, DC motors, Servo motors, L293D motor driver.

## **CERTIFICATIONS**

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### **App Development**

**2023**

- \* Completed structured app development training as an extra-curricular activity.