

Rakesh Karmaker

Software Engineer — Full Stack, AI/ML & LLM Developer

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Summary | Analytical, Problem Solver, and result-driven. B.Sc. in CSE graduate with a strong foundation & Skills in full-stack Web & AI Application development(NestJS, NestJS, Express.js, ASP.NET Core), NLP, ML, and Algorithms. Throughout my academic career, I have demonstrated myself to be a versatile, adaptive, and strongly motivated person capable of delivering solution. Passionate about building scalable, secure, and AI-integrated software systems with clean code principles and architecture, bridging theory and real-world impacts.

Technical Skills

Languages	TypeScript, Javascript, C#, C/C++, Python, R, Java	Arch. & Design	MVC, N-Tier, Modular, RESTful, Modular, SOLID, Repository Pattern, DRY, KISS
Frontend	React, NextJS, Bootstrap 5, Tailwind CSS, Figma	ML/NLP	ML Ensemble, Reinforcement, Transformers, CNN, GNN
Backend	NestJS, Node.js, Express.js, ASP.NET, .NET Core	AI Framework	RAG, LangChain, TensorFlow, PyTorch, Hugging Face, Sklearn.
Database	PostgreSQL, MongoDB, Prisma, TypeORM, MySQL, Oracle, MSQQL, Entity Framework	Tools	Git, Postman, Docker, Jira, Visual Studio, Jupyter, Colab etc.

Projects

Full Stack Web Applications |

Tourism Full Stack Web Application

NextJS, NestJS, TypeScript, PostgreSQL

Backend | Frontend | UI Design |

- Architected & implemented RESTful APIs with NestJS and TypeORM for tourism booking and guide management.
- Integrated Gemini API & Google Maps for an AI-aided Tour recommendation chat system. Further working on integrating
- Designed Frontend in Figma and a PostgreSQL database for a modular, scalable Backend architecture.

DCS Club Alliance - Full Stack Web Application

NextJS 16, NestJS, PostgreSQL, SOLID, Repository Pattern, Prisma, PostHog, TypeScript

Documentation | GitHub

[GitHub Link](#)

- Developed & connected the NextJS Frontend and NestJS Backend via RESTful APIs, documented with Swagger API.
- Designed PostgreSQL Prisma schema for modular, scalable Backend with SOLID, DRY, KISS & Repository Pattern for maintainable, secure, and enterprise-grade Backend design.

Event Management using NextJS

NextJS 16, NextJS Backend, MongoDB, ReactBits, PostHog, TypeScript

[GitHub Link](#) | [Live](#)

- Tested and developed Full-stack dev. in NextJS 16 with RESTful APIs
- Integrated PostHog, MongoDB, new experimental cache in NextJS.

Backend Systems & Software Engineering |

Exam Management System Backend

ASP.NET Web API, 3-Tier Architecture, SOLID, Repository Pattern

[GitHub](#)

- Implemented Web API Backend using 3-tier architecture in .NET Framework, maintaining enterprise-grade Backend design.

- Applied the repository pattern with Entity Framework, & ADO.NET with Code First database development approach.
- Designed the admin dashboards, student & exam management in both text and MCQ format, and performance reporting.
- Applied SOLID, DRY, KISS principles for maintainable enterprise-grade Backend design.

EcoCharge Hub – EV Station Management Platform

php Backend, MVC, MySQL, HTML, CSS, JavaScript

 [GitHub](#) |  [Live Demo](#)

- Developed a web-based project designed to facilitate environmental management and supervision tasks.
- Implemented using PHP, HTML, CSS, & Vanilla JavaScript following the MVC Architecture.

Hospital Management System

C#, Win Forms, .NET Framework, MVC, Microsoft SQL

 [GitHub](#)

- Designed & developed a Windows desktop application by using C# and Windows Forms (.NET) with MVC architecture.
- Implemented key modules, including a Dashboard for Doctors, medical staff, Lab Tests, & patient records and appointments management system.
- Designed a responsive and modern UI by implementing a flat, multi-color, fixed-side-bar Dashboard-like UI design.

Tour Planner and Guide - Software Engineering Project

C#, Win Forms, MVC, Microsoft SQL

 [Documentation](#) |  [UI Design](#)

- Architectured key features & concepts in a Software Engineering case study of a Tour Guide & Assistance system.
- Designed the Use Case Diagrams, Class Diagrams, Activity Diagrams, and Architecture Diagrams, and QC tests,
- Furthermore, using Figma, I participated in a group to design a mobile app UI prototype along with Test cases.

Farm Management System - A Pure Database Project

MySQL, Oracle, Draw.io, SQL plus.

 [Documentation](#)

- Responsible for Database Design, Database query, ER Diagram Drawing, & Normalization for a Farm Management system.
- Created and managed databases for storing information on farmers, workers, products, production costs, sales, and profits, as well as performed queries on the designed database on Oracle.

Hotel Management System

Java, JavaFX, file-based storing, error handling

 [GitHub](#)

- A hotel Management system using Java, JavaFX, JavaGUI using Error Handling, File IO, OOP Concepts

Ai & Research Projects

Empirical Study of BERT Variants

Python, HuggingFace Transformers

 [GitHub](#)

- Trained and evaluated BERT, DistilBERT, and ALBERT models on sentiment datasets.
- Achieved 93% F1-score on IMDB sentiment classification.
- Conducted ablation experiments for model compression and efficiency comparison.

Brain Neurological Disease GNN Benchmark

Graph Neural Networks, PyTorch Geometric

 [GitHub](#)

- Benchmarked multiple GNN architectures for classifying neurological disease patterns from brain graph datasets.
- Implemented GraphSAGE, GCN, and GAT pipelines using PyTorch Geometric.

- Performed preprocessing, model evaluation, visualization, and comparative analysis.

MNIST Handwritten Digit Classification

Keras, TensorFlow, CNN



- Built a CNN model for digit recognition using TensorFlow/Keras.
- Trained and evaluated visualization pipeline including confusion matrix and accuracy plots.

Caesarian Data Preprocessing & Analysis

R, Data Wrangling, EDA



- Cleaned, transformed, and normalized Caesarian delivery dataset for ML modeling.
- Applied statistical techniques and exploratory data analysis (EDA) in R.

Milk Quality Analysis

R, EDA, Statistical Modelling



- Performed EDA and statistical modeling for milk quality classification.
- Visualized relationships between chemical properties and output quality labels.

Royal Bengal Tiger Image Feature Extraction

Python, OpenCV, Feature Engineering



- Extracted and engineered visual features from tiger images for ML classification.
- Applied histogram features, edge detection, and image preprocessing.

Experience

Research Assistant, AIUB Research Lab – Empirical Study of BERT Variants

Jan 2025 – June 2025

- Conducted experiments comparing BERT, DistilBERT, and ALBERT on sentiment classification.
- Prepared detailed reports and visualizations using Python (Matplotlib, Seaborn) for presentations.
- Implemented model fine-tuning pipelines and ablation studies to optimize performance.

Web Dev. & Hosting Management – Diamond Mart BD

Jun 2021 – Aug 2024

- Designed and developed a fully functional website on WordPress CMS with plugin tools integration such as Elementor, Astra Pro theme, and Flatsome theme.
- Designed UI and implemented payment integrations with Bkash and Nagad APIs.
- Performed Search Engine Optimization (SEO) tasks using tools like Yoast SEO and manual optimization techniques.

Education

American International University – Bangladesh

Jan 2022 – 2025

B.Sc. in Computer Science & Engineering

CGPA 3.86/4.00

Major: Computational Theory

60% Scholarship, & Dean's List, Academic Award: Magna Cum Laude

Udayan Uchcha Madhyamik Bidyalaya

Jun 2018 – Jun 2020

Higher Secondary Certificate

GPA 5.00 / 5.00

Dhaka Collegiate School, Dhaka

Jan 2010 – April 2018

Secondary Secondary Certificate

GPA 5.00 / 5.00

Awards

- Dean's List / Dean's Honorable Mention, Department of Computer Science, FST, AIUB
- Magna Cum Laude (Academic Award)
- 60% Tuition Scholarship (Academic Merit)

Certifications

- Meta Front-End Developer Professional (Coursera) [!\[\]\(a22ba4e13c745edbf29e51af246c4c12_img.jpg\)](#)
- React Basics – Meta (Coursera) [!\[\]\(33b18af9a4b997eb52666cfeb3c44157_img.jpg\)](#)
- Programming with JavaScript – Meta (Coursera) [!\[\]\(262b158440b847a82f89a14cab8644ec_img.jpg\)](#)
- HTML5, CSS3 & Bootstrap 4 – Bohubrihi [!\[\]\(f51929fecf7b0dc947ac13f4c4835e8f_img.jpg\)](#)
- NLP Specialization – DeepLearning.AI [!\[\]\(dfbf0e54bcca114319aa65c906feb8d0_img.jpg\)](#)
- Machine Learning A-Z: AI, Python & R – Udemy [!\[\]\(64792950f1b7ee883a860b5f0af110c3_img.jpg\)](#)

Extracurricular Activities

- Basic CF Contest & Problem solving [!\[\]\(633dd45d48d71eb51a85c6dd83ee51e9_img.jpg\)](#) [View Profile](#)
- Event Coordinator, Dhaka Collegiate Alumni Association
- General Member, AIUB Research & Development Club (AIUB R&DC)
- General Secretary, Biggyan Park (Science Organization)

Soft Skills

- Problem Solving & Analytical Thinking
- Leadership & Team Coordination
- Communication & Documentation
- Adaptability & Time Management
- Requirements Analysis & System Thinking

Language Skills

- Bangla — Native
- English — Professional Working Proficiency (IELTS September 2025)
- Hindi — Conversational

References

- **Dr. Debajyoti Karmaker**
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- **Dr. Md. Abdullah-Al-Jubair**
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