

Md. Mehedi Hasan Shuvo

AI Engineer · LLM & RAG Systems · Computer Vision · IEEE Researcher
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PROFESSIONAL SUMMARY

AI Engineer with strong hands-on experience in **LLM-powered applications, Retrieval-Augmented Generation (RAG), multi-agent systems, and AI automation**. Currently interning at Infinoz engineering production-grade n8n workflows and Supabase-backed RAG pipelines. Built and deployed **20+ end-to-end AI systems** spanning intelligent agents, Computer Vision APIs, and automated ML pipelines. Authored **7 peer-reviewed IEEE publications** at CORE-ranked and international venues; active **IEEE Conference Reviewer**. Proficient in Python, LangChain, LangGraph, CrewAI, OpenAI/Gemini/Groq APIs, FastAPI, and vector databases. Final-year BSc CSE at AIUB (CGPA **3.75/4.00**, Expected 2026).

TECHNICAL SKILLS

LLM & GenAI: LangChain, LangGraph, CrewAI, LlamaIndex, OpenAI API (GPT-4o/4/3.5), Gemini API, Groq, Anthropic API, Ollama, Prompt Engineering, Tool/Function Calling, ReAct Agents, Multi-Agent Orchestration

RAG & Vector Search: RAG Pipeline Design, Hybrid Search, Semantic Re-ranking, Chunking Strategies, Embedding Pipelines, Context-Aware Retrieval, Multi-Tenant RAG

Vector Databases: ChromaDB, Pinecone, Milvus, FAISS, MongoDB Atlas Vector Search, pgvector / Supabase

ML & Deep Learning: PyTorch, TensorFlow, Keras, Scikit-learn, XGBoost, LightGBM, HuggingFace Transformers, BERT Fine-tuning, Transfer Learning, AutoML, SMOTE, Cross-Validation

Computer Vision: YOLOv11, YOLOv12, EfficientNet, CNN, Vision Transformer (ViT), OpenCV, Object Detection, Image Classification, Medical Imaging, Egocentric Vision

NLP: BERT / Transformer Fine-tuning, Sentiment Analysis, NER, Text Classification, Summarisation, Semantic Search, Word2Vec, GloVe, Multilingual / Bangla NLP

AI Automation: n8n Workflow Engineering, API Orchestration, Low-Code AI Pipelines, Automated Document Intelligence, Multi-Service Integration

Deployment & Backend: FastAPI, Docker, Docker Compose, Redis (Cache-Aside), Azure Container Apps, REST APIs, Git, GitHub, Streamlit, Jupyter

Databases: PostgreSQL, Supabase, MySQL, SQLite, MongoDB, ChromaDB

Languages: Python (Primary), JavaScript, C#, Java, R, C++, HTML5, LaTeX

EXPERIENCE

AI Automation Intern

Mar 2026 – Present

Infinoz.com — n8n · Supabase · pgvector · LLM Agents · PostgreSQL

Remote, Bangladesh

- Designed and deployed multi-domain n8n AI chatbot workflows (e-commerce, university, service verticals) with intent routing, confidence-based fallback, Bangla/Banglish language handling, and OpenAI/Gemini API integration.
- Engineered multi-tenant RAG pipelines using Supabase + pgvector as the vector store layer, enabling hybrid semantic search and accurate domain-specific retrieval across isolated client knowledge bases.
- Delivered full automation tasks end-to-end LLM prompt engineering, workflow architecture, debugging, and production deployment across diverse client use cases in a fast-paced internship environment.

Independent AI Engineer & Researcher

Jan 2024 – Present

LLMs · RAG · Computer Vision · Multi-Agent · ML Pipelines

Dhaka, Bangladesh

- Built and deployed 20+ production-grade AI projects LangChain/LangGraph agents, RAG chatbots, YOLO-based CV APIs, XGBoost classifiers, FastAPI microservices each taken from problem definition to a tested, working deliverable.
- Published **7 peer-reviewed IEEE papers** at AICCSA 2025 (CORE-ranked), ECCE 2025, RAAICON 2025, ICCIT 2025, and FET 2026 covering CV, Medical AI, Driver Behavior AI, and Network Threat Detection.
- Serving as **IEEE Conference Reviewer** for IEEE 3ICT 2025 & IEEE FET 2026 evaluating manuscripts in deep learning, intelligent systems, and applied AI against IEEE publication standards.

Senior Tutor & Coaching Centre Co-Manager

2019 – Present

Mathematics, Physics, Chemistry, Computer Science O Level, A Level, SSC, HSC

Dhaka, Bangladesh

- Co-managed a centre with **500+ enrolled students** for 6+ years; recognised as a **5-Star Rated Tutor** on CareTutors platform.

SELECTED PROJECTS

NirovaAI — Early Disease Detection | [nirovaai.app](#) | [GitHub](#) · FastAPI · RAG · LLaMA 3 · Gemini Vision · MongoDB Atlas · XGBoost · React · Azure

- Deployed a production full-stack AI health platform at **nirovaai.app** on Azure Container Apps integrating XGBoost disease & dengue classifiers, Gemini Vision API for skin lesion analysis and lab report OCR, and a **RAG medical chatbot** (Groq LLaMA 3 + MongoDB Atlas Vector Search) for context-grounded clinical Q&A.
- React 18/Vite frontend + FastAPI backend, containerised with Docker and deployed end-to-end on Azure; capstone project serving real users in Bangladesh.

Multi-Tool LangChain/LangGraph Agent — Bangladesh Data

LangChain · LangGraph · OpenAI API · SQLite · Web Search · Tool-Calling

- Architected a stateful LangGraph agent that autonomously routes queries to a local SQLite database, live web search, or both with dynamic SQL generation via LangChain tool-calling, persistent multi-turn memory, and structured output formatting tailored to Bangladesh-specific data.

LLM Article Analysis & Automation Pipeline

n8n · FastAPI · OpenAI API · Streamlit · Google Sheets · Gmail

- Built a zero-touch enterprise document intelligence workflow: Streamlit upload → FastAPI ingestion → n8n orchestration → LLM structured extraction → auto-push to Google Sheets & Gmail five integrated services, fully automated, zero manual steps.

Amar Passport AI Agent

CrewAI · LangChain · Groq · Llama 4 · Multi-Agent · Bilingual Output

- Designed a four-agent CrewAI system: Agent 1 verifies eligibility, Agent 2 calculates 2026 government fees, Agent 3 generates a personalised document checklist, Agent 4 assembles a full bilingual English/Bangla report powered by Groq-hosted Llama 4 for open-source low-latency inference.

Bangladeshi Taka Note Detection API

YOLOv11 · FastAPI · Docker · Redis · PyTorch · REST API

- Trained custom YOLOv11 on 1,490 annotated real-world images achieving **97.16% mAP@0.5** across all 11 Bangladeshi currency denominations; wrapped as a production FastAPI microservice with Docker Compose and Redis cache-aside for low-latency concurrent inference.

BERT Fine-Tuning for QA & NLP Benchmarking

BERT · HuggingFace · PyTorch · SQuAD v1.1 · IMDB

- Fine-tuned bert-base-uncased on SQuAD v1.1 achieving **71.15% Exact Match** and **80.97% F1**; benchmarked TF-IDF, Word2Vec, BERT Embeddings, and fine-tuned BERT on 50K IMDB reviews full accuracy-vs-compute trade-off analysis across classical and transformer NLP approaches.

Customer Churn Prediction — IBM Telco

XGBoost · Scikit-learn · SMOTE · Pandas · NumPy

- End-to-end ML pipeline on 7,043 records: EDA, feature engineering, SMOTE class balancing, stratified cross-validation; Random Forest achieved **~80% accuracy** and **0.84 ROC-AUC** best across LR, KNN, Decision Tree, RF.

IEEE PUBLICATIONS (7 PAPERS — 5 PUBLISHED, 2 ACCEPTED)

- [1] "Deep Learning Based Real-Time Hand Detection Using First-Person Egocentric Perspectives," *IEEE/ACS AICCSA 2025 (CORE Ranked)*. DOI: 10.1109/AICCSA66935.2025.11315447
- [2] "A Deep Learning-Based Framework for Accurate Detection and Classification of On-Road Vehicles Using Improved YOLOv11," *IEEE ECCE 2025*. DOI: 10.1109/ECCE64574.2025.11013964
- [3] "DBNet: Automated Driver Behavior Analysis for Road Safety Using Vision-Based Systems," *IEEE RAAICON 2025 (First Author)*.
- [4] "TOM-YOLO: Tomato Leaf Disease Detection Using Enhanced YOLOv12 Framework," *IEEE RAAICON 2025*.
- [5] "An Enhanced YOLOv11 Framework for Automatic Lumbar Spine Level Detection," *IEEE ICCIT 2025*.
- [6] "Proactive AI and ML Strategies for Network Threat Detection with Adaptive Explainable Intelligence," *IEEE FET 2026 (Accepted)*.
- [7] "MS-YOLO: An Enhanced Real-Time Recyclable Waste Detection and Classification Framework," *IEEE FET 2026 (Accepted)*.

EDUCATION

American International University–Bangladesh (AIUB)

2026 (Expected)

B.Sc. Computer Science & Engineering (Major: Information Systems) CGPA: **3.75 / 4.00**

Dhaka, Bangladesh

Key Courses: Artificial Intelligence, Machine Learning, Computer Vision & Pattern Recognition, NLP, Data Warehousing & Mining, Software Engineering, Database Systems, Algorithms

Govt. Keshab Chandra College, Jhenaidah

2020

Higher Secondary Certificate (HSC) — Science GPA: **5.00 / 5.00**

CERTIFICATIONS & MEMBERSHIPS

- **AI Engineering Bootcamp — Batch 3** — Ostad (2025) Overall Score: **98.3%** | Quiz: 99.4% | Assignment: 96.7% | Attendance: 100% (**Top Scorer**)
- **IEEE Student Member & IEEE Computer Society Member** — IEEE (2023)
- **IEEE Conference Reviewer** — IEEE 3ICT 2025 & IEEE FET 2026 (2025–Present)
- **IT Essentials** — Cisco Networking Academy (2022)
- **Certified 5-Star Rated Tutor** — CareTutors Platform (2025)

REFERENCES

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