Mehedi Hasan Nipu

lifeasmeher@gmail.com | Mehedi Hasan Nipu | Notmeher | +880 01836602311 | Google Scholar | Portfolio

Education

B.Sc. in Computer Science and Engineering — January 2019 – January 2024
North South University, Dhaka, Bangladesh — **Credits:** 138

Work Experience

DEXIAN (BANGLADESH) LIMITED — **Application Developer** — May 2025 – Present, Dhaka, Bangladesh

- **RFPGen: AI-Powered Government RFP Aggregation & Proposal Generation Platform**
  - Developed a **SAM.gov scraper and multi-portal aggregation pipeline** to automatically discover ServiceNow/ITSM opportunities across US federal and SLED procurement portals, with keyword-based relevance scoring and structured Excel output.
  - Integrated **Azure Document Intelligence** and **GPT-4.1** to analyze RFP documents, extracting structured requirements and enabling natural language Q&A over indexed document sections stored in **Azure SQL**.
  - Developed **Claude Agent SDK-powered agents** for automated company profiling and end-to-end **DOCX/PPTX proposal generation**, tailoring responses to specific RFP requirements using company capability profiles.
  - Built a **unified activity logging and cost analysis dashboard** tracking user interactions, agent invocations, and document operations alongside real-time API spend across **Anthropic Claude** and **Azure OpenAI** models, with per-user breakdowns and full audit trails persisted in Azure SQL.

  Tech Stack: Python 3.12, FastAPI, React 18, TypeScript, LangGraph, Anthropic Claude Opus/Sonnet, Azure OpenAI GPT-4.1, Azure Document Intelligence, Azure SQL, Azure Blob Storage, Selenium, Patchright, Firecrawl
- **SFAGent: AI-Powered Salesforce Agentic Compliance System**
  - Created **Salesforce Apex Classes** to handle **Post and Get operations** seamlessly within Salesforce, allowing for easy interaction with Salesforce data through natural language queries.
  - Developed **Custom Functions** to manage the integration of Apex classes with **authentication tokens**, ensuring secure and efficient API communication.
  - Integrated **Azure AI Foundry Agent** to power the Agentic operations, enabling automated Salesforce workflows based on natural language inputs.
  - Developed a **FastAPI** for both text and **speech-to-text (STT)** functionality, leveraging **Azure OpenAI Whisper** for accurate audio-to-text conversion.
  - Built an intuitive **frontend** for both text and audio input, enabling users to perform Post and Get operations via natural language with an automatic **Agentic flow**.

  Tech Stack: Salesforce Sandbox, Apex Class, Azure AI Foundry, GPT-4.1, Whisper, FastAPI
- **BM Product Accelerator: AI-Powered Full-Stack Application Generator**
  - Developed a **multi-agent orchestration system** using **Claude Agent SDK** that analyzes PRD documents and generates comprehensive implementation plans by discovering and comparing reusable components from **Azure Blob Storage**.
  - Engineered an **automated code generation pipeline** with **BackendBuilderAgent** creating FastAPI applications and **FrontendBuilderAgent** scaffolding React/Vite projects with npm management.
  - Implemented a **skill generation system** that extracts reusable patterns from GitHub repositories or code archives, automatically generating documentation and updating the component library.
  - Built an **interactive CLI** with natural language capabilities, enabling developers to modify and debug projects through conversational AI with automatic port management and session persistence.
  - Architected a **FastAPI backend** with async operations, **Azure Blob Storage** integration, multi-format document parsing (PDF, DOCX, MD), and **Pydantic** validation.

  Tech Stack: Claude Agent SDK, FastAPI, React, Vite, Azure Blob Storage, Pydantic, Multi-Agent Systems, NLP
- **AI-Powered Automated Check Fraud Detection**
  - Developed an **AI-based automated check fraud detection system** using advanced ML techniques; leveraged **Azure Document Intelligence** with the prebuilt **US Bank Check Model** to validate critical check components.
  - Trained a **Siamese Neural Network** for signature matching and categorized checks into **Safe, Suspicious, and Fraud** categories; built a responsive web app for real-time fraud detection.

  Tech Stack: Python, Azure Document Intelligence, Siamese Neural Network, React, Django, TensorFlow **Demo:** Interactive Application Demo
- **GeoViz: Modern Flight-Based Compliance System**
  - Developed a responsive web app for **geographic data visualization and coordinate analysis** with **Next.js, React, and shadcn/ui**; integrated **Leaflet.js maps** for real-time multi-layer tracking of flights and pipelines.
  - Implemented coverage calculation using the **Haversine formula** and designed a **UI/UX system** with Tailwind CSS optimized for desktop, tablet, and mobile.

  Tech Stack: Python, Next.js, React, Leaflet.js, shadcn/ui, Tailwind CSS, GeoJSON, Haversine Formula, Axios, Django

TIME RESEARCH AND INNOVATION LTD **AI/ML Engineer** Dec 2024 – May 2025, Portsmouth, UK

- **GenBot: Advanced RAG-Based Web Chatbot with CrewAI**
  - Developed a pipeline for **vectorizing and storing unstructured data** using **OpenAI embeddings and ChromaDB**; implemented **RAG-based agents** integrating vector databases and external web search APIs for dynamic responses.
  - Designed a **React JS frontend** and evaluated **embedding models with RAGAS** to select the most effective model for retrieval accuracy.

  Tech Stack: Python, OpenAI, ChromaDB, LangChain, React, Google Custom Search API, WebCrawler, Playwright
- **Company Competitor Service Analysis and SWOT AI Agent**
  - Developed an **AI-powered agent system** for analyzing company details, extracting services, identifying top competitors, and performing **comprehensive SWOT analysis** using web scraping and OpenAI GPT models.

  Tech Stack: Python, OpenAI, Streamlit, BeautifulSoup, Pandas, GPT-4, CrewAI
- **LLM Powered Legal Contract Generator**
  - Developed a **Flask-based web app** leveraging **Groq's AI model and LLaMA Vision** for legal contract generation; incorporated **OCR technology** for extracting text from scanned documents and automating section creation, formatting, and legal language refinement.

  Tech Stack: Python, Flask, Groq API, LLaMA Vision, PyMuPDF, OpenCV

Technical Skills

- **Programming Languages:** Python ((NumPy, scikit-learn, Matplotlib, Pandas, Seaborn)
- **Web Development:** HTML5, CSS3, FastAPI, Flask, React JS, Next.js, Streamlit
- **Database:** MySQL, Azure SQL
- **Deep Learning Frameworks:** TensorFlow, Keras, PyTorch
- **LLM Application Frameworks:** LangChain, LangGraph, LangSmith, Ragas, DeepEval, CrewAI, OpenAI, Claude Agent SDK
- **Cloud Services:** Azure OpenAI, Azure AI Foundry, Azure App Service, Azure Blob Storage, Docker, Azure Boards
- **Others:** Vector Database, OpenCV, GitLab, GitHub, GitHub Copilot, Linux, LLM Fine-tuning, Architecture & Data Flow Diagrams, Data Scraping, Data Annotation, Data Analysis, Feature Engineering

Achievements and Awards

Rising Star Award — **DEXIAN (BANGLADESH) LIMITED**, H2 2025 REFLECTION February 2, 2026
Recipient of Rising Star Award for excellence in Agile delivery, results-driven execution, and high performance under pressure.

Publications

Journals

- **Safe and Scalable Collaboration in Multi-Agent LLM Systems: A Comprehensive Review.** *IEEE Transactions on Systems, Man, and Cybernetics: Systems* Link
- "From Pixels to Pathology: The Power of CNNs in Detecting Tuberculosis." *EAI Endorsed Transactions on Pervasive Health and Technology*, Vol. 10, 2024. Link

Conference Proceedings

- "Deep Learning-Based Classification of Rice Varieties for Agricultural Applications." *2024 International Conference on Augmented Reality, Intelligent Systems, and Industrial Automation (ARIIA)*, Manipal, India, 2024, pp. 1-6, doi: 10.1109/ARIIA63345.2024.11051570. Link
- "A Federated and Explainable Machine Learning Framework for Robust Intrusion Detection and Network Security Enhancement in Industrial Internet of Things (IIoT) Environments." *2026 5th International Conference on Electrical, Computer & Telecommunication Engineering (ICECTE)*. Link
- "Enhancing Lung Cancer Detection with Attention Mechanisms and Unified Ensemble Learning: A Hybrid Feature Fusion Approach." *2025 35th International Conference on Computer Theory and Applications (ICCTA)*. Link

Preprints

- "MedBayes-Lite: Bayesian Uncertainty Quantification for Safe Clinical Decision Support." *arXiv preprint arXiv:2511.16625*, 2024. Link

Research Interests

LLM, LLM Agents, Computer Vision, Human-LLM Interaction, AI in Healthcare, Trustworthy AI, Machine Learning Applications, Medical AI, Multi-Agent Systems, NLP