

Sheikh Rahat Mahmud

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Experience

Software Development Engineer (Part-Time)

Jan 2026 – Present

CalcHVAC (Remote, New York)

3D Building-Energy-Model Tool

- Built an IDF/OSM model generator with gbXML extraction inside a scope-preview modal, feeding downstream EnergyPlus/OpenStudio building-energy simulations.
- Engineered bidirectional selection sync between the Three.js 3D viewer and React dropdown selectors across 8+ reactive stores, enabling click-to-select in 3D with consistent state; fixed flickering and selection-reset bugs on camera orbit.
- Added a 3D filter-highlight system rendering filtered surfaces with a distinct material, plus export edit/delete support for surfaces/zones/spaces with unit tests for round-trip gbXML edits.

Intern, Bangladesh Satellite Company Limited (BSCL)

Nov 2025 – Dec 2025

Automated retrieval & reporting with Python; processed 40,000+ records from Excel datasets.

Dhaka

Open Source Developer – KhorchaPati

Sep 2025 – Present

Collaboration with [Shahad Ishraq](#)

Remote

- Authored `shared-ai` package – a LangChain.js ReAct agent with 14 tools across Category/Expense/Budget/Summary domains wrapping WatermelonDB services; dual-provider support (Claude/Gemini), zod-validated schemas, timezone-safe date parsing, 53 parameterized tests.
- Shipped an AI Assistant chat UI in the Electron app with persistent connection/chat state across tab switches; configured webpack for LangChain compatibility (`node`: scheme handling, Node.js polyfill fallbacks, ESM dynamic imports).
- Designed `BudgetService` (20 methods, period-based tracking, 80%/100% alerts, 56+ tests) and `RecurringExpenseService` (5 frequencies, month-end edge cases); delivered shared Sidebar/expense UI and an OKLCH theme redesign across React Native and Electron.

SWE Intern, Academic & Admission Pathshala

Jun 2025 – Aug 2025

Developed 2 core pages (homepage, dashboard) in React for an EdTech platform.

Dhaka

Projects

Digital Store – RAG & Agentic AI | *LangChain, Node.js, bKash API* | [GitHub](#)

Mar 2026 – Present

- Built a RAG pipeline and agentic AI workflows for a full-stack e-commerce platform; integrated bKash Tokenized Checkout with token-based authentication and idempotent transactions.

Knowledge Distillation on DNABERT-2 | *PyTorch, Transformers* | [Preprint](#)

Jan 2026 – Apr 2026

- Compressed DNABERT-2 (117M parameters) into a 26M-parameter student model, retaining 93.31% accuracy (vs. 96.71% teacher) with a 4.5× inference speedup.

IEEE Video & Image Processing (VIP) Cup | *YOLOv8/v11, TransNetV2*

Jul 2025

- Evaluated YOLOv8, YOLOv11, and TransNetV2 on a 2 GB+ dataset, achieving 90%+ accuracy in shot-boundary detection, improving over the 85% baseline.

Thesis: Automated Bilateral Full-Femur Segmentation & Morphometric Analysis from Multi-Resolution Clinical QCT Using Transfer Learning & a Transformer Network

Apr 2025 – Present

- Trained 3D-UNet, UNet, Swin-UNet & UNETR on 22 GB+ DICOM data; 97%+ accuracy. *Supervisor: Dr. Mahmuda Naznin.*
- Designed volumetric preprocessing, a Dice + cross-entropy loss, and morphological postprocessing for memory-constrained, class-imbalanced 3D volumes.

Career Studio | *React, FastAPI, CI/CD, Azure VM* | [GitHub](#)

Jan 2025 – Jul 2025

- Deployed an AI-powered CV builder (React + FastAPI) on an Azure VM with CI/CD for build, test & release.

Education

Bangladesh University of Engineering & Technology (BUET)

Dhaka, Bangladesh

B.Sc. in Computer Science and Engineering, CGPA: 3.11 / 4.00 (L-4 T-1 GPA: 3.32)

Expected Jun 2026

Technical Skills

Languages: Python, C++, SQL, TypeScript, JavaScript

ML / DL: PyTorch, CNN, Transformers, 3D-UNet, UNETR, Swin-UNet, DNABERT-2, YOLOv8/v11, Knowledge Distillation

LLM / Agentic AI: LangChain, LangGraph, RAG, Agentic AI

Tools & Frameworks: FastAPI, React, Docker, Git, CI/CD, Linux, PostgreSQL

Achievements: [CUET Datathon '25 Finalist](#) · [Solvio AI Hackathon R2](#) · [CUET AI Hackathon '25](#) (Bengali ASR) · [BSCL Internship Cert.](#)