

# Shovon Sharma

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## Technical Skills

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**Languages:** C/C++, Python, Go, Bash, JavaScript, Solidity

**Databases:** MySQL, PostgreSQL, SQLite, Oracle SQL, ChromaDB

**Frameworks/Tools:** PyTorch, JAX/Flax, FastAPI, Docker, Git, Linux, Blockchain, Hugging Face, Unislot AI

## Projects

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### DMoEBERT – Sparse Mixture-of-Experts for NLI (Thesis)

- Designed a scalable **sparse Mixture-of-Experts encoder-only model** for Natural Language Inference.
- Trained 23M and 45M parameter models from scratch under resource limits.
- Achieved **84% precision on SNLI**, outperforming BERT-base (LoRA PEFT) with **13.5x fewer FLOPs** and **5.3x lower memory**.

### Stable Diffusion from Scratch

- Implemented a full **Denoising Diffusion Probabilistic Model (DDPM)** in PyTorch.
- Built **attention-enhanced U-Net** and **Variational Autoencoder (VAE)** for latent-space compression.
- Optimized training using a two-stage approach for stability and low memory use.

### Course Finder – AI-Powered Recommendation System

- Built recommendation engine using **Sentence Transformers + ChromaDB**.
- Integrated FastAPI backend, Streamlit UI, and Dockerized deployment.
- Designed a **multi-factor ranking system** (similarity, rating, difficulty).

### Sharma's Drive – Decentralized File Storage Platform

- Developed a **blockchain-based file sharing** (e.g., audio, image, video, zip) platform using Solidity smart contracts.
- Integrated Node.js backend and React frontend for secure upload and retrieval.

### Task Management API (FastAPI + PostgreSQL)

- Designed RESTful API with full CRUD functionality.
- Built using FastAPI, PostgreSQL, and Docker for containerized deployment.

### Chomp Chase – AI Maze Race Game

- Generated random mazes via **DFS with backtracking**.
- Implemented AI opponent using the **A\* pathfinding algorithm**.

## Education

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### B.Sc. in Computer Science and Engineering

2020–2025

Khulna University of Engineering & Technology (KUET)

### Higher Secondary Certificate (HSC)

2017–2019

Govt. M.M. City College, Khulna — *Board Merit Position: 23*

## Technical Writing

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- Contributor on Medium — write technical deep-dives on AI, systems, and programming.

### Notable Articles:

- The No-Nonsense Guide to Attention, LinearAttention, GPU Memory & FlashAttention : Math to Code 
- Understanding Vision Transformers from First Principles : Theory & Code 
- The Math Behind Stable Diffusion 
- Let's Take a SQL Adventure: From Theory to LeetCode 
- Let's Explore Go: From Hello World to Data Structures 
- Let me teach u Bash : From 'hello world' to User Management 