Mohammed Sakib Hasan

AI/ML Engineer — Computer Vision — NLP — LLM Applications

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PROFESSIONAL SUMMARY

Computer Science undergraduate with two IEEE conference papers and hands-on experience developing RAG pipelines, Agentic AI workflows, and machine learning systems. Proficient in PyTorch, FastAPI, open-source LLMs (LoRA/QLoRA), and vector search with Qdrant. Passionate about translating practical AI research and LLM architectures into efficient, real-world solutions as an AI Engineer.

RESEARCH EXPERIENCE

StrokeGuardian: Hybrid Ensemble ML for Real-Time Brain Stroke Prediction and Clinical Decision Support *2025*
IEEE WIECON-ECE | **First Author** | DOI: 10.1109/WIECON-ECE69386.2025.11526163

- Proposed and evaluated a hybrid ensemble machine learning framework for early-stage, real-time brain stroke risk prediction.
- Implemented clinical decision support features to assist healthcare practitioners with data-driven predictive insights.
- Presented the research paper as the first author at the IEEE WIECON-ECE 2025 conference.

SafeRide: A Real-Time IoT-Based Smart Helmet with Road-Condition Intelligence *2025*
IEEE RAAICON | **First Author** | DOI: 10.1109/RAAICON69033.2025.11502538

- Designed an intelligent IoT-enabled smart helmet system integrating real-time telemetry and road-condition monitoring.
- Developed proactive accident prevention and alert mechanisms to improve rider safety and situational awareness.
- Presented the research paper as the lead author at the IEEE RAAICON 2025 conference.

TECHNICAL SKILLS

Programming: Python, C, C++, Java, Dart, SQL
Web Development: HTML5, CSS, JavaScript
ML & Deep Learning: PyTorch, TensorFlow, Keras, Scikit-learn, CNN, RNN, LSTM, GRU
Computer Vision: OpenCV , YOLO, Object Detection, Image Classification, Face Recognition
NLP & LLMs: Huggingface , Transformers,LLM Fine-tuning (LoRA, QLoRA), Open-Source LLMs, Prompt Engineering
Generative & Agentic AI: Agentic AI Workflows, RAG, LangChain, Embeddings, Semantic Search
Databases & Frameworks: Qdrant, ChromaDB, FastAPI, Flask, Streamlit, Docker, Git

PROJECTS

AI-Powered Intelligent Brochure Generator *2026* | GitHub
Python | *Groq LLM* | *Hugging Face* | *Streamlit* | *BeautifulSoup* | *Playwright* | *ReportLab*

- Built an autonomous pipeline scraping websites via BeautifulSoup/Playwright and extracting structured brand intelligence using Groq-hosted LLMs.
- Synthesized generative marketing imagery with Hugging Face and automated dynamic multi-page PDF generation via ReportLab in a Streamlit UI.

Mentora : An-AI-Based-Mental-Health-Self-Awareness *2026* | GitHub
Next.js 15 | *TypeScript* | *FastAPI* | *Hugging Face* | *RAG* | *PostgreSQL* | *Redis* | *Docker*

- Developed a full-stack NLP system classifying multi-class emotional sentiment across 100+ languages using pre-trained transformer models.
- Optimized model inference pipelines utilizing ONNX Runtime and built high-performance asynchronous REST APIs with FastAPI and Pydantic.
- Designed an interactive Next.js 15 frontend featuring JWT authentication, historical analytics dashboards, and exportable reports (PDF/CSV).
- Scaled data persistence using PostgreSQL with SQLAlchemy/Alembic migrations, Redis caching, and Dockerized multi-service deployment.

AI-Driven Hospital Flow & Bed Management Digital Twin *2026* | GitHub

React.js | FastAPI | SimPy | Scikit-Learn | HTML5 Canvas | Tailwind CSS | SQLite/PostgreSQL

- Built an event-driven 3D hospital digital twin using SimPy and Scikit-Learn to simulate patient triage, forecast arrival surges, and optimize ICU/ward bed occupancy.
- Developed a High-DPI isometric HTML5 Canvas visualizer rendering real-time telemetry, 45-bed occupancy states, and dynamic patient pathfinding trajectories.

Multimodal Human Emotion Recognition AI *2025* | GitHub

Python | PyTorch | OpenCV | Librosa | Transformers | NLP | Multimodal Deep Learning

- Developed a multimodal emotion recognition pipeline classifying six affective states by fusing facial expression CV features and acoustic speech signals.
- Integrated transformer-based NLP models for textual sentiment analysis, improving multi-class classification robustness over single-modality baselines.

CareSync — AI-Powered Family Health Coordination App *2025* | GitHub

Flutter | Firebase | Gemini API | Mobile Development

- Built an offline-first cross-platform healthcare app using Flutter and Firebase, featuring multi-profile synchronization and secure cloud storage.
- Integrated Google Gemini API to deliver contextual health advice, smart medication reminders, and appointment scheduling workflows.

CSE Study Room — Collaborative Academic Platform *2024* | Live Demo

JavaScript | Node.js / Python | WebSockets | WebRTC | SQL

- Architected a collaborative web platform for CSE students featuring real-time group chat, video conferencing, and resource sharing.
- Designed interactive quiz modules, personal progress tracking dashboards, and automated academic roadmaps.
- Implemented secure authentication and session management for peer-to-peer study sessions.

Smart IoT & Embedded Systems Projects *2022 – 2023*

Hardware | Arduino Uno | Microcontrollers | Sensors (LDR, MQ) | Embedded C

- **Dual-Axis Solar Tracking System (2023):** Engineered an automated solar alignment mechanism using LDR light sensors and Arduino Uno to maximize photovoltaic energy capture efficiency over static setups.
- **Smart Bike Alcohol Detection Safety Robot (2022):** Prototyped an alcohol-sensing vehicle lockout system using MQ sensors and microcontrollers to prevent intoxicated driving and trigger alerts.

EDUCATION

Bachelor of Science in Computer Science and Engineering *Expected Graduation: 2027*

Patuakhali Science and Technology University **CGPA: 3.56**

EXTRA-CURRICULAR ACTIVITIES

Assistant General Secretary (Academic Research & Higher Studies) *2026 – Present*

CSE Club, Patuakhali Science and Technology University

- Lead research discussion forums, study groups, and guidance sessions for students aspiring toward academic research and higher studies.
- Assist students in research methodology, paper writing, collaborative coding, and project debugging.

Campus Ambassador *2021 – 2022*

Apar's Classroom | Remote

- Promoted STEM education initiatives, organized virtual outreach campaigns, and drove student engagement across campus.

Affiliate Partner *2022 – 2023*

10 Minute School | Remote

- Spearheaded digital outreach to connect students with quality online technical and academic skill courses.

Academic Document Specialist / Typist *2020 – 2021*

Academic and Admission Pathshala | Remote

- Formatted, digitized, and cataloged academic assessments, test materials, and institutional documentation.