



IRTAZ IRFAN

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EDUCATION

East Delta University Jan 2022 – Dec 2025
Bachelor of Science in Computer Science and Engineering (Major in AI) Chittagong, Bangladesh

- **Academic Focus:** Deep Learning, Computer Vision, High-Performance Systems
- **Honors & Recognition:** Dean's List Award for Academic Merit | **CGPA:** 2.83 / 4.00

CDA Public College Jan 2019 – Jan 2020
Higher Secondary Certificate (HSC) – Science **GPA: 5.00 / 5.00**

Chittagong Ideal High School Jan 2016 – Dec 2017
Secondary School Certificate (SSC) – Science **GPA: 4.67 / 5.00**

PUBLICATIONS & CONFERENCE PRESENTATIONS

1. **Irtaz Irfan [First Author]**, Golam Moktader Daiyan, “Low-Light Image Enhancement using U-Net based Generative Adversarial Network with Dual Attention Mechanism.” *International Conference on Emerging Frontiers in Advanced Sciences and Technologies (EFAST 2026)*, June 2026. **[Presented]**
★ **Honors: Best Speaker Award** (Technical Session Presentation).
2. Tanjid Alam Dhrubo, **Irtaz Irfan [Co-Author]**, “Unpaired Handwriting Style Transfer for Bangla Script using CycleGAN with Structural Continuity Loss.” *International Conference on Emerging Frontiers in Advanced Sciences and Technologies (EFAST 2026)*, June 2026. **[Presented]**

PROFESSIONAL EXPERIENCE

AgriGate Aug 2026 – Present
AI Developer Dhaka, Bangladesh

- Architect and train multimodal deep learning pipelines in PyTorch combining computer vision classifiers and tabular clinical scoring for disease prediction.
- Build high-throughput asynchronous inference APIs using FastAPI and Uvicorn, optimizing data batching to achieve low-latency predictions.
- Implement automated data validation, augmentation, and preprocessing workflows to scale training data quality and diversity across cross-platform environments.

British American Language Academy Oct 2025 – Dec 2025
Student Counselor & Academic IT Operations Chittagong, Bangladesh

- Administered institutional databases, structuring student enrollment records and query retrieval systems.
- Advised prospective scholars on standardized language certifications (IELTS/TOEFL) and international university application prerequisites.

Science Core Coaching Center Jan 2022 – Dec 2025
Science & ICT Instructor Chittagong, Bangladesh

- Mentored cohorts of 15+ senior secondary students in algorithmic problem-solving, structured programming, and Information and Communication Technology (ICT).
- Authored technical worksheets, diagnostic coding assessments, and instructional walkthroughs.

TECHNICAL PROJECTS

PagedInfer — High-Throughput LLM Inference Serving Engine [\[GitHub\]](#)
Technologies: Python, PyTorch, CUDA Memory Management, FastAPI, AsyncIO

- Architected a high-concurrency LLM serving engine implementing **paged KV-cache memory allocation** to eliminate virtual memory fragmentation during multi-token generation.
- Engineered dynamic request scheduling with continuous batching and token preemption, significantly reducing Time-To-First-Token (TTFT) latency.
- Benchmarked an **8.37x serving throughput gain** compared to sequential inference pipelines under heavy concurrent workloads.

VectorCore — High-Dimensional Vector Search Engine

[\[GitHub\]](#)

Technologies: Python, NumPy, HNSW Graph Indexing, Custom Distance Kernels

- Developed an Approximate Nearest Neighbor (ANN) vector retrieval engine from scratch based on **Hierarchical Navigable Small World (HNSW)** graph structures.
- Implemented optimized vector distance kernels (Cosine, Euclidean L_2) with multi-layer heuristic edge pruning.
- Attained **1,876.5 QPS at 0.53 ms average retrieval latency** across 128-dimensional embedding spaces, outperforming linear scan baselines by **2.44x**.

CTG Shield — Real-Time Geospatial Intelligence & Dispatch Engine

[\[GitHub\]](#)

Technologies: FastAPI, WebSockets, PostgreSQL, PostGIS, AsyncIO

- Developed a low-latency geospatial panic response backend executing spatial containment queries via **PostGIS polygon indexing**.
- Built an asynchronous WebSocket fan-out dispatcher streaming emergency SOS telemetry to active responders with **sub-3 ms client ACK latency**.
- Achieved a **15.71 ms spatial query execution time** and **15.42 ms total async broadcast dispatch** across active client connection pools.

MCP-Mesh — Model Context Protocol Agent Gateway

[\[GitHub\]](#)

Technologies: Python, FastAPI, JSON-RPC 2.0, AsyncIO, Pydantic

- Engineered a Model Context Protocol (MCP) gateway federating distributed tool schemas into a unified virtual catalog for autonomous AI agents.
- Implemented asynchronous JSON-RPC routing, dynamic input validation, and execution tracing across concurrent agent tool calls.

TECHNICAL SKILLS

- **Programming Languages:** Python, C, JavaScript, HTML5/CSS3
- **AI & Machine Learning:** PyTorch, TensorFlow, OpenCV, Generative Adversarial Networks (CycleGAN, U-Net), Hugging Face, Scikit-learn
- **Backend & Systems Engineering:** FastAPI, REST APIs, WebSockets, Asynchronous I/O, JSON-RPC 2.0, Distributed Tool Routing
- **Databases & Geospatial:** PostgreSQL, PostGIS, Vector Indexing (HNSW), SQLite
- **Developer Tools & Platforms:** Git, GitHub, VS Code, Linux, Docker, LaTeX, Overleaf, Render
- **Languages:** English (Fluent / Professional Working Proficiency), Bengali (Native)

LEADERSHIP & CO-CURRICULAR ACTIVITIES

- **Humanitarian Outreach (Youth's Voice):** Active core volunteer spearheading community welfare initiatives, including the seasonal *Project Chana-Piaju* food distribution for underprivileged children and families, and raising **108,000+ BDT** in emergency logistics for 200 flood-affected households in Fatikchari (2024).
- **Bangladesh Scouts:** Long-term active scout; completed national-level wilderness survival, expedition, and emergency preparedness training.
- **Competitive Programming & Hackathons:** Competed in national algorithmic coding contests, including NCPC, IUPC, and regional inter-university hackathons.
- **Sports Operations:** Directed organizational management for a 32-team regional football tournament, administering budgets, match schedules, and corporate sponsorships.
- **Professional Development:** Participated in British Council Aptis assessments and specialized leadership and technical communication workshops.

ACADEMIC REFERENCES

Golam Moktader Daiyan

Assistant Professor

School of Science, Engineering, and Technology

East Delta University

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(Undergraduate Thesis Advisor)

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(Academic Reference)