MD. ASIF UDDIN

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Machine learning researcher and engineer working across medical imaging, vision-language models and causal inference. Comfortable owning a problem end to end, from data curation and architecture design through training under a constrained GPU budget to the inference path that follows. Looking for machine learning engineering or research assistant work.

EDUCATION

MSc, Computer Science and Engineering — BRAC University, Dhaka Fall 2026 —
Thesis proposal accepted: HCGT-PG. Supervisor: Dr. Badhan Das.

BSc, Computer Science and Engineering — BRAC University, Dhaka Fall 2021 – Summer 2026
CGPA 3.30 / 4.00. Thesis: HierarchiRetina, supervised by Rafeed Rahman, deposited in the BRAC University institutional repository. Coursework in machine learning, deep learning, compilers, theory of computation, DBMS, operating systems, algorithms and software engineering.

Higher Secondary Certificate — Uttara High School and College, Dhaka 2020
GPA 5.00 / 5.00. Science.

Secondary School Certificate — Ullapara Merchant Pilot High School, Sirajganj 2018
GPA 4.72 / 5.00. Science.

RESEARCH

HierarchiRetina 2026
Interpretable diabetic retinopathy grading from retinal photographs
Supervisors: Rafeed Rahman, Niloy Farhan, Md. Golam Rabiul Alam. Deposited.

Rank Radii Transfer as Quantiles 2026
Placing unseen species inside the taxonomy, not in flat clusters
Supervisor: Niloy Farhan. In preparation.

Automated Renal Analysis 2026
Automated Renal Measurement, Kidney Stone and Cyst Segmentation, and Radiology Report Generation from Thick-Slice Non-Contrast CT
Supervisor: Niloy Farhan. In preparation.

HCGT-PG 2026
What would happen if you knocked the gene down
Supervisor: Dr. Badhan Das. Proposal accepted.

PAPERS AND MANUSCRIPTS

HierarchiRetina: A Multi-Stage Deep Learning Pipeline for Diabetic Retinopathy Severity Assessment Published 2026
BSc thesis, BRAC University

Rank Radii Transfer as Quantiles: Taxonomic Placement and Sub-Taxonomy Construction for Unseen Species In preparation 2026

Automated Renal Analysis In preparation 2026

TECHNICAL

Languages. Python (primary). C (coursework level).

Deep learning. PyTorch, timm, segmentation_models_pytorch. Mixed-precision training with GradScaler tuning, EMA, test-time augmentation, k-fold CV with resumable per-fold checkpointing, class-imbalance handling (pos_weight, weighted samplers), threshold calibration on validation only, ordinal regression (CORN), mixture-of-experts, cross-attention fusion, attention gates, ASPP, GeM pooling, deep supervision, frozen-backbone transfer, Grad-CAM.

Architectures used hands-on. ConvNeXt V2, Swin UNETR V2, DINOv2/v3, EfficientNet, U-Net, U-Net++, Attention U-Net, SwinHRUNetPP, HSMoE-AUNet, image-text encoders.

Medical imaging. Fundus photography, non-contrast CT, NIfTI and DICOM handling, FOV masking with morphological erosion, CLAHE on the green channel, retinal cropping, patch extraction and stitching, lesion-level connected-component evaluation, de-identification, radiologist report parsing.

Evaluation. QWK, ICC, AUC-ROC, AUC-PR, Dice, IoU, NMI, lesion-level and image-level recall, sensitivity/specificity tradeoff analysis, per-dataset breakdowns, held-out test discipline and leakage assertions.

Causal inference and computational biology. Causal graphs and DAGs, d-separation, interventions, counterfactual reasoning, gene perturbation analysis, gene regulatory network inference, multi-omics integration and biomarker discovery.

Data. pandas, NumPy, Albumentations, OpenCV, Matplotlib, Seaborn, scikit-learn, nbformat.

Backend. FastAPI, REST APIs, SQLAlchemy, JWT auth, Alembic, AWS S3, CloudFront.

MODEL FAMILIARITY. Beyond the architectures I have used hands-on, I regularly study modern vision, multimodal, language, medical imaging and computational biology models. This includes SigLIP 2, EVA-CLIP, SAM 3, nnU-Net, ViT, Qwen, Llama, DeepSeek, Kimi, MedGemma and genomic models such as AlphaGenome and Geneformer. I focus on understanding their architecture, training objective, scaling behavior, benchmarks, limitations and practical use rather than treating familiarity with a model as equivalent to hands-on experience. The model notes I keep are part of this ongoing study.

READING. I love reading books and research papers. My current reading is centered on machine learning, causality and computational biology. Key books include The Book of Why, Causality: Models, Reasoning, and Inference, Causal Inference in Statistics: A Primer, and Elements of Causal Inference: Foundations and Learning Algorithms. The reading is not separate from the research work. It is mainly about understanding what can be inferred from data, where the assumptions enter, and how interventions can provide stronger evidence than observation alone.

Other. Git, Jupyter, LaTeX, lex/yacc, CUDA-level debugging. Trained on an NVIDIA RTX A6000.

ENGINEERING

CSMMS — Campus Student Management and Marketplace System
FastAPI backend: REST API design, filtered and paginated marketplace, S3 and CloudFront image upload, service impact metrics, SQLAlchemy, JWT, Alembic.

Leveraging CNN and Random Forest for Accurate Food Expiry Prediction
AI-driven food expiry prediction model combining CNNs for image analysis with Random Forest and MLP algorithms to evaluate environmental metadata (temperature, humidity, storage duration) and minimize food waste.

Compiler symbol table
Scoped symbol table for a compiler front end using lex and yacc/bison, with cross-platform builds on Linux and macOS.

ADDITIONAL

Languages. Bangla, native. English, full professional proficiency and the medium of instruction throughout secondary and undergraduate study.