Md. Yeasir Arafat

Software & AI Engineer | Flutter · Machine Learning · AI Automation

yeasir.cse.dev@gmail.com +880 1783-181525 Dhaka, Bangladesh
github.com/Art3MasA005 in/md-yeasir-arafat codewithyeasir.vercel.app



PROFILE

Final-semester Computer Science & Engineering student who builds cross-platform mobile applications and the machine learning that runs behind them. Shipped a calibrated clinical risk model (AUC 0.810, ECE 0.020) served from a FastAPI backend into a bilingual Flutter client with 226 automated tests; an on-device plant-disease classifier evaluated on a held-out field set rather than lab images; and a multi-agent LLM automation system routing intent across messaging, email and calendar APIs. Most recently built a research platform for network intrusion detection under drift and unseen attacks, evaluated over 339 chronological replay runs on three public datasets; a paper on the method is under review. Also built a bilingual English/Bangla document-retrieval system that answers with page-level citations and refuses when the source does not support an answer. Comfortable owning a feature end to end — from dataset audit to the screen the user actually taps. Open to remote roles worldwide.

TECHNICAL SKILLS

Languages	Dart, Python, Java, C, C++, Bash, Assembly
App Development	Flutter, BLoC, Riverpod, GetX, Drift/SQLite, responsive and bilingual UI
ML & DL	PyTorch, TensorFlow, TensorFlow Lite, ONNX, scikit-learn, LightGBM, NumPy, pandas, Matplotlib; custom datasets, leakage auditing, probability calibration, INT8 quantization, Grad-CAM
LLM & Automation	RAG, hybrid retrieval (pgvector, BM25, reranking), LangChain, n8n multi-agent workflows, intent routing, tool-calling; Claude, OpenAI, Gemini, Groq, Grok, OpenRouter
Backend & APIs	FastAPI, REST, GraphQL, WebSockets, webhooks, SSE streaming, alembic migrations, row-level security
Databases	PostgreSQL, pgvector, Supabase, Firebase, SQLite, MySQL
Tools	Git, GitHub, Android Studio, VS Code, Postman, Linux
Core Theory	Linear Algebra, Probability & Statistics, Algorithms, Data Structures, Operating Systems

PROJECTS

SentinelAI — Intrusion Detection Under Drift and Unseen Attacks September 2026 – October 2026

Python · FastAPI · scikit-learn · LightGBM · PyTorch · Flutter github.com/Art3MasA005/sentinelai

- Built a research platform for the conditions intrusion detectors actually meet: traffic drifts, attack classes appear that did not exist at training time, and analysts label only a small, **late** fraction of flows. It replays CIC-IDS2017, CSE-CIC-IDS2018 and UNSW-NB15 **in time order** on a fixed, delayed label budget.
- Designed an open-world adaptation method: flows far from every known class are flagged *unknown* rather than forced into a wrong label, labels are spent on novel and diverse traffic, and a retrained model is deployed only after it passes a **hold-out check** — otherwise it is rejected or rolled back.
- Compared it with **eight methods**, including re-implementations of published baselines, over **339 runs** (3 datasets × 5 seeds, config hash and dataset SHA-256 stored per run).
- Shipped a FastAPI backend with replay workers and a Flutter Windows desktop app — 11 pages, light and dark themes, and a one-click installer that starts and stops its own backend. **94 backend and 11 Flutter tests**; the method is described in a conference paper now under review (see Research & Publications).

Sora — Bilingual Agentic AI Assistant for PC and Phone October 2026

Python · FastAPI · PyTorch · LLM Agents · pgvector · Flutter · Whisper github.com/Art3MasA005/sora-assistant

- **Agentic AI**: an LLM agent with **60 tools** chains its own tool calls to finish a request — drives the PC's browser (click, fill, download), works in VS Code (edit, run, commit) and hands coding jobs to Claude Code.
- **Automation**: routines run on their own — on a schedule, a new email, a phone notification, low battery, a device going online or a web page changing — and report back by voice. Controls the PC (apps, windows, files, Wi-Fi) and the phone (calls, SMS, alarms); shows WhatsApp and Messenger notifications on the PC and replies by voice.
- Spoken to in **Bangla, English or a mix** with a **"Hey Sora"** wake word; one Flutter app for Android and Windows; Gmail, Calendar and Drive; risky steps wait for **approval**. **221 backend tests**.

Ledgerly — Small Business Ledger for Bangladesh November 2025 – September 2026

Flutter · Riverpod · Drift/SQLite · Firebase Auth, Firestore & Cloud Functions

- Built an **offline-first** credit ledger for small shops: customer and supplier balances, cash reconciliation, invoices, stock and analytics in Bangla and English. Every entry is written to local SQLite first; the cloud is a backup, never a dependency. The current version, v2.0.1 (September 2026), is being prepared for Google Play.
- Found that a single-document Firestore backup **silently stops uploading** once a real shop's ledger passes the 1 MiB document cap; redesigned it as gzip-compressed JSON split into sub-1 MB parts, with photos chunked the same way.
- Made multi-device restore safe: a failed cloud read is never treated as "no backup" (an empty ledger would overwrite the real one), each backup carries an id so one phone cannot overwrite another's newer data, and restores are fenced off from auto-backup.

Bulletin — Bilingual Document Retrieval for Universities August 2026

FastAPI · PostgreSQL/pgvector · Flutter · RAG

- Built a bilingual English/Bangla retrieval system over university documents — academic calendars, exam routines, fee schedules — answering in either language with **page-level citations**, and refusing when the documents do not support an answer.
- Named the failure the project targets: an English query and a Bangla chunk share **zero tokens**, so the lexical arm of hybrid search returns empty and retrieval silently collapses to dense alone. Implemented two mitigations — a shared cross-lingual embedding space and query translation — to be measured against each other.
- Verified that premise before writing a single chunk: **100% top-1** rank accuracy over 20 domain sentence pairs, matched-vs-mismatched cosine margin **+0.386**.
- Measured the hybrid arm rather than assuming it — dense owns prose (MRR 0.98), lexical owns course codes (0.94), and only the fusion never loses a document. On a 62-question gold set: **15/15 unanswerable questions refused, zero invented facts**, eight stopped by a retrieval score floor before any LLM call.
- Enforced correctness structurally rather than by convention: the audience filter runs *inside* the SQL before vector search, since post-filtering leaks a document's existence through the not-found path, and chat attachments carry no embedding column so one student's routine can never be retrieved for another. **363 backend and 35 Flutter tests**.

Crop Doctor BD — On-Device Plant Disease Detection April 2026 – May 2026

Python · TensorFlow Lite · Flutter

- Built an offline classifier for rice, potato, tomato and corn across **18 classes**, running entirely on-device with no network at inference.
- Rejected the field's standard evaluation: rather than reporting accuracy on a random split of lab images, held out a **separate field test set** and report the lab-to-field gap as the headline result.
- Grouped near-duplicates by perceptual hash and assert leakage-freedom in tests; added `not_a_leaf` and `other_plant` classes with an abstain threshold so unknown input is refused rather than confidently misdiagnosed.
- Exported **INT8 TFLite** builds benchmarked for size and latency; produced Grad-CAM overlays for failure cases as well as successes.

DiaVision — Diabetes Risk Screening January 2026 – March 2026

Python · FastAPI · PostgreSQL · Flutter · ONNX

- Built an eleven-question, no-blood-test screening tool returning a **calibrated** risk range in English and Bangla: **AUC-ROC 0.810**, **85.1% sensitivity / 66.9% specificity** at the shipped threshold, **expected calibration error 0.020**.
- **Rejected a 0.94 AUC model.** A leakage audit showed the three features that lifted the headline from 0.806 to 0.9365 made it **0.18 AUC worse** on people who had never been screened — precisely the target user. Shipped the honest model instead.
- Established that waist circumference beat sample volume: 5,843 NHANES rows (89% with waist) outperformed 437,000 pooled rows (1.2%) — **66.9% vs 52.9% specificity** at 85% sensitivity.
- Engineered the full stack: FastAPI + PostgreSQL with alembic migrations and row-level security, a 19-screen Flutter client in two languages and two themes, and **143 backend tests, 55 widget tests and 28 screen goldens**.
- Froze the feature contract in `feature_spec.json` before writing the database schema against it, so a leakage finding during training cost hours instead of a rewrite.

Luna — Multi-Agent Personal AI Assistant September 2025 – December 2025

n8n · Python · Flutter · OpenRouter · Gmail API

- Designed an agent-based assistant taking input from Telegram, WhatsApp, Messenger and web chat, normalising every payload into one schema, then routing by intent to a specialist agent.
- Implemented a **hybrid orchestrator** — keyword matching for unambiguous requests, an LLM router prompt emitting structured `intent` and `confidence` for the rest.

- Built specialist agents for email (send, label, draft, urgency scoring), contacts (schema-strict, phone-normalised), voice (transcribe then re-enter the text pipeline), prompt enhancement and image generation.
- Applied **cost-aware model routing** — frontier models for reasoning, smaller models for structured extraction — with chat memory under TTL retention.
- Instrumented every agent to log `requestId, intent, agent, status, error, executionTime`; validated across unit, integration, system, acceptance, performance, security and regression testing.
- Undergraduate capstone (Integrated Design Project II), supervised by Ms. Fatema Tuj Johora.

RESEARCH & PUBLICATIONS

NOVA: Novelty-aware, Open-world, Validated Adaptation for Network Intrusion Detection under Delayed and Scarce Labels Under review, 2026

Conference paper · Concept Drift · Open-Set Recognition · Active Learning

- Proposed an adaptation loop for unseen attacks under a small, **delayed** label budget: k-NN rejection recalibrated per class, a novelty-weighted query, and a **hold-out check** before each update or rollback.
- Against **eight methods**, matched the strongest baseline on open-world macro-F1 on both CIC datasets while flagging **significantly fewer benign flows on every dataset** (2.8% vs 4.5% on CIC-IDS2017).

Anatomy-Aware Supervision for Critical Organ Segmentation with Transformer-Based Networks Spring 2026 – Present

Python · PyTorch · Pyramid Vision Transformer · Medical Imaging

- Building a **Pyramid Vision Transformer (PVT)** based medical image segmentation framework, trained and evaluated on the **Synapse** multi-organ dataset.
- Investigating **anatomy-aware supervision** — using anatomical structure as a training signal rather than scoring every voxel independently — to improve segmentation accuracy and boundary quality on critical abdominal organs.
- Implemented the complete preprocessing, training and evaluation pipeline.
- Undergraduate thesis, supervised by Riad Hassan.

EDUCATION

B.Sc. in Computer Science and Engineering 2022 – 2026 (final semester)

Green University of Bangladesh

Relevant coursework: Object-Oriented Programming, Data Structures, Algorithms, Operating Systems, Computer Architecture, Microprocessor & Microcontroller, Computer Networking, Data Communication, Cyber Security, Machine Learning, Data Mining, Artificial Intelligence, Integrated System Design, Database Systems.

Higher Secondary Certificate (Science) 2020

Rajshahi Court College

CERTIFICATIONS

Ostad	Flutter App Development · Flutter & AI-Driven App Development · AI Agent Development Bootcamp
VibeAcademy	AI Automation & Agentic Workflows with n8n
HP LIFE	Data Science & Analytics
Wadhwani	Job Ready: Employability Skills (75 h, 97%)

ADDITIONAL

Languages	Bangla (native), English (fluent), Hindi (fluent)
Availability	Immediately

PERSONAL INFORMATION

Location	Dhaka, Bangladesh
Nationality	Bangladeshi
Student ID	222002024, Green University of Bangladesh

Public version — academic results and personal details are omitted. **Request the complete CV**.