

Kaysarul Anas

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📍 Canada — Open to relocate to Ottawa

Backend Developer · TypeScript, Python & REST APIs · Event-Driven Systems · PostgreSQL & AWS

Objective

M.Sc. graduate in Computational Sciences with a track record of shipping production APIs and event-driven systems. Built a TypeScript SaaS with a Cloudflare Worker API, Firebase, and a GitHub Actions pipeline that polls an external source, processes events, and notifies users in real time. Drawn to event-driven and pub/sub architectures, and eager to contribute to the APIs powering Solace PubSub+.

Experience

Research Assistant | Nexirion / Laurentian University May 2025 – Present

Supervisor: *Dr. Sk. Md. Mizanur Rahman*

- Built and deployed a Python pipeline for a multi-agent RAG system over a 3.54M-record dataset: data preparation, hybrid search index, LLM-backed detection service, and evaluation.
- Ran a 4-bit quantized 7B LLM on a single 16GB GPU with a defense layer adding under 5ms per query.
- Our RAG-IDS paper on securing retrieval-augmented intrusion detection was accepted to **IEEE CIC 2026**.

Undergraduate Research Assistant | TNR Lab, North South University, Dhaka, Bangladesh 2022 – 2023

Supervisor / Reference: *Dr. Tanzilur Rahman*

- Continued research on AI-driven projects, machine learning, and deep learning applications.
- Contributed to data preprocessing, model training, and evaluation workflows in medical image analysis.

Technical Skills

Backend:	TypeScript, Python, Django / Django REST, FastAPI, Flask, Node.js, REST APIs, JWT / OAuth authentication, OOP
Databases:	PostgreSQL, MySQL, MongoDB (NoSQL), Firestore, query optimization & indexing
Cloud & Tools:	AWS (EC2, S3), Cloudflare Workers, Docker, Nginx, Gunicorn, GitHub Actions (CI/CD), event-driven architecture (pub/sub, async pipelines), Git/GitHub, Linux, Postman
Frontend & AI:	React, TypeScript, JavaScript (ES6+), Next.js, Tailwind CSS, shadcn/ui; LLM APIs (OpenAI), RAG pipelines, LangChain

Projects

Canadian PRLedger | Built & Launched · Full-Stack TypeScript SaaS · Live Express 🌐 canadianprledger.com
Entry PR Tracker

- Built and launched a free, privacy-first Canadian PR tracking app (32 accounts as of Oct 2026): CEC hours tracker with eligibility-date estimate, CRS / FSW / OINP calculators, document checklist, readiness dashboard, and a live Express Entry draws feed. Full stack in **TypeScript** (TanStack Start, Cloudflare Workers, Firebase).
- **Event-driven pipeline:** a scheduled GitHub Actions job polls the IRCC draws feed on a trigger, processes new events, persists them to Firestore, and fans out email notifications to opted-in users via Resend — an async pub/sub pattern running entirely serverless.
- **Frontend:** 42 file-based routes in React 19 and TypeScript (TanStack Start, Vite, Tailwind CSS v4, shadcn/ui, Recharts); all scoring runs in the browser from versioned config; documents upload directly to the user's Google Drive, never touching the servers.

Northern Shift Guard | Architected & Built · AI Shift-Start Screening for Mining Safety 🏠 🌐 Live Demo

2nd Place Overall & Best Use of Nemotron, Cursor Hackathon Sudbury 2026, Laurentian University

- Built the full stack solo within the hackathon window (React/Vite, FastAPI, TiDB Cloud) and shipped it as one Docker container with a Render blueprint.
- GPT-4o vision detects PPE and fatigue cues, a rules engine checks results against **Ontario Reg 854** per work zone, and **NVIDIA Nemotron** writes plain-language supervisor actions; every scan is saved as an audit record.



3rd Place Overall, CU Hacking 2026, Carleton University, Ottawa (team project)

- Conceived the project and created its initial frontend design and backend pipeline; the team then built on it.
- Runs on a Raspberry Pi: polls temperature sensors and forecasts biomass with logistic growth models.
- As a team, added embedded AI: a small model trained to run on the Pi and detect color changes on-device.

JobTrackerr | Designed & Built · Full-Stack SaaS Application



[Frontend Preview](#)

- Built a job-application tracking SaaS with a Django REST API, React front end, and PostgreSQL, with JWT and Google OAuth authentication. Live frontend preview available; backend is being migrated to new hosting.
- Deployed on AWS EC2 with Nginx and Gunicorn and automated releases through CI/CD; tuned queries and indexing to cut API response times by 30%.

Education

Laurentian University, Sudbury, ON | M.Sc. in Computational Sciences

Sept 2023 – Apr 2025

- CGPA 9.10 / 10.00; Mabel Jean and Bob Lye Memorial Award for Academic Excellence (\$2,000).

North South University, Dhaka, Bangladesh | B.Sc. in Computer Science & Engineering

Jan 2018 – Aug 2022

- CGPA 3.40 / 4.00; Innovation Challenge Season 11, Top 10 of 80 teams.

Publications

- **Defending Retrieval-Augmented Intrusion Detection Against Knowledge Poisoning and Prompt Injection**

Kaysarul Anas Apurba, Md. Hasibul Hasan, Mahedee Zaman Moon, Sk. Md. Mizanur Rahman, Atsuo Inomata
12th IEEE Intl. Conf. on Collaboration and Internet Computing (IEEE CIC 2026) – accepted.

[\[Preprint\]](#) [\[Code\]](#)

- Built a defended multi-agent RAG intrusion detection system and evaluated it under knowledge poisoning and prompt injection on CIC-UNSW-NB15. Found that retrieving several documents largely neutralizes prompt injection and that demoting suspicious documents beats deleting them.

- **SciRet: Reranker Choice, Evidence Depth, and Evaluation Validity in Scientific RAG at Scale**

Kaysarul Anas Apurba, Md. Hasibul Hasan, Shafaet Hasan, Rofiqul Alam Shehab

ACL Rolling Review (ARR), October 2026 cycle – under review.

[\[Preprint\]](#)

- Evaluated retrieval, reranking, and full-text evidence for scientific RAG on CORD-19 and four BEIR sets with human-audited LLM relevance judgments. Found that pseudo-labels fail to separate systems and that the best reranker depends on the benchmark.

- **MalariAI: A Label-Resilient Decoupled Framework for Annotation-Agnostic Cell Segmentation and Explainable Stage Classification in Dense Malaria Blood Smears**

Kaysarul Anas Apurba, Md. Hasibul Hasan, Mohammed Ali, Tanzilur Rahman

Array (Elsevier) – under review; preprint on arXiv (2607.00385).

[\[Preprint\]](#) [\[Code\]](#) [\[Demo\]](#)

- Built a two-stage pipeline of annotation-agnostic watershed segmentation and EfficientNet-B0 stage classification with Grad-CAM++, and benchmarked it against Faster R-CNN, YOLOv8s, and U-Net on BBBC041 and MP-IDB. Found that end-to-end detectors under-count on partially annotated smears, that a U-Net needs the same watershed splitting to match recall, and that Grad-CAM++ localizes significantly above chance.

- **A Non-Invasive Cloud-Based Migration Strategy for Post-Quantum Cybersecurity in Smart HVAC Systems: Architecture, Implementation, and Empirical Evaluation**

Mahedee Zaman Moon, Kaysarul Anas Apurba, Md. Hasibul Hasan, Sk. Md. Mizanur Rahman

Symmetry (MDPI) – preprint, 2026.

[\[Preprint\]](#)

- Cloud proxy architecture adding NIST post-quantum crypto to legacy HVAC without hardware changes.

- **Accurate Prediction of Pulmonary Fibrosis Progression Using EfficientNet and Quantile Regression: A High Performing Approach**

Rofiqul Alam Shehab, Kaysarul Anas Apurba, Md. Ahsanuzzaman, Tanzilur Rahman

IEEE Region 10 Symposium (TENSYP 2023), Canberra, Australia, 2023.

[\[Paper\]](#) [\[IEEE Xplore\]](#)

- Led the EfficientNet and quantile-regression pipeline for fibrosis progression prediction.