

NAYMUL HOSSAIN

Waterloo, Canada | naymul.xyz | naymulhossain21@gmail.com | [linkedin.com/in/nay](https://www.linkedin.com/in/nay) | github.com/n5hossai | (+1) 289 668 8130

Summary

Software Developer (4+ yrs) specializing in **mathematical optimization** and **applied AI/ML** for airline crew scheduling at Skywise (an Airbus company). Build Mixed Integer Linear Programming and heuristic solvers in C++ on Linux and ship production LLM/RAG tooling in the Optimization, AI & ML Chapter. University of Waterloo mathematics background (Computational Mathematics; Statistics, Computer Science, Combinatorics & Optimization); strengths in algorithm design, ML systems, and evaluation.

Technical Skills

Languages: C++, C#, Python, Perl, SQL, TypeScript, Bash

AI/ML & Optimization: MILP & heuristic solvers (Gurobi/CPLEX, OR-Tools), LLM/RAG, AWS Bedrock, PyTorch, Hugging Face, FAISS, retrieval & evaluation (Ragas)

Cloud & Tooling: AWS (EC2, Lambda, Bedrock), GitLab CI/CD, Docker, JFrog, Nagios, MariaDB, MongoDB, Linux

Experience

Skywise, an Airbus Company

Apr 2023 – Present

Intermediate Software Developer — Optimization, AI & ML Chapter

- Design and ship crew scheduling optimization for PBS (Preferential Bidding System) in C++ on Linux, applying Mixed Integer Linear Programming and heuristic algorithms to plan pilots and cabin crew for **35+ commercial airlines**
- Cut solver runtime by **~15%** and reduced scheduler memory footprint by building an engine simulator and optimizing hot paths with memoization, caching, and efficient data structures guided by profiling
- Instrumented Nagios dashboards and AWS CloudWatch alerting that support **99.97% job reliability** in production, enabling proactive monitoring, faster incident response, and minimal scheduling downtime
- Scaled the service behind multiple load balancers on VMware, with master-slave MariaDB replication for failover, backups, and high availability under peak airline planning load
- Built and operate a production Retrieval-Augmented Generation assistant on AWS EC2 and Bedrock, used by Skywise teams and airline customers to answer PBS and scheduling-algorithm questions at scale
- Mentor junior developers, guide design reviews, and provide estimates and impact analysis, while shipping quarterly across a 20-person team: Perl/MariaDB services, Python/SCons deployments on GitLab CI/CD, and C++ unit tests

Competers Inc.

Aug 2022 – Dec 2022

Software Engineer — Full-Stack

- Built full-stack features across a Node.js/Angular/Express stack and migrated legacy SOAP microservices to REST APIs on .NET, modernizing service integration and simplifying long-term maintenance
- Re-architected microservices into AWS Lambda functions to improve scalability and cut infrastructure cost, and applied Test-Driven Development to raise coverage and reduce defect rates

bKash Limited

May 2019 – Aug 2019

Software Engineering Intern — Backend

- Built secure Django REST APIs with token-based authentication and access controls, protecting user data on a high-volume mobile financial platform serving millions of users
- Integrated a Dialogflow conversational agent through the Facebook Messenger SDK, using AWS ElastiCache to cache session state and frequent responses for low-latency replies

Projects

- **RAG Evaluation Framework** — A retrieval-augmented QA system that answers questions over a document corpus, with an evaluation harness that scores retrieval quality (recall@k, MRR) and answer groundedness, and compares dense vs. hybrid retrieval with rerankers. *Python, FAISS, sentence-transformers, Ragas.*
- **Transformer LLM from Scratch** — A GPT-style language model built from scratch in PyTorch (attention, training loop), tuned for inference with KV-cache and quantization, then served as an MCP tool. *PyTorch, MCP.*

Education & Certifications

University of Waterloo — B.Math, Honours Computational Mathematics

Sep 2017 – Aug 2021

Minors: Statistics, Computer Science, Combinatorics & Optimization

Certifications: AWS Certified Developer – Associate | Supervised Machine Learning (Stanford/DeepLearning.AI)