

Amiya Chowdhury

AI/ML Engineer • Deep Learning & Systems Software • MLOps & Performance Engineering (M.Tech CSE, NIT Rourkela)
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Professional Summary

AI/ML engineer with 2+ years of production backend and full-SDLC experience, now building deep learning systems in PyTorch (ApneaGuard AI – healthcare 1D-CNN with SHAP/Captum explainability), ML ensembles for time-series forecasting (NeuroQuant M.Tech thesis – XGBoost, BiLSTM-Attention, Temporal Fusion Transformer, HMM-GARCH), and a C/C++ systems portfolio at the ML–hardware boundary (edge inference runtime, Linux performance profiler, NUMA-aware lock-free allocator). Strong in Python, C, C++, PyTorch, Linux, Docker, and GitHub Actions CI/CD. Open to AI/ML Engineer, ML Systems Engineer, Deep Learning Engineer, and Performance Engineering roles.

Technical Skills

- **Languages:** Python, C++, SQL, JavaScript, TypeScript, Solidity
- **Machine Learning & Deep Learning:** PyTorch, scikit-learn, XGBoost, LightGBM, 1D-CNN, LSTM, BiLSTM-Attention, Transformer / Attention architectures, Temporal Fusion Transformer (TFT), HMM-GARCH regime detection, Feature Engineering, Time-Series Forecasting, Biomedical Signal Processing (ECG, SpO2, HRV), Walk-Forward & Subject-Level Cross-Validation, Model Evaluation (PR-AUC, F1), Data Leakage Prevention, pandas, NumPy, SciPy
- **GenAI, Explainable AI & MLOps:** Claude API, Structured LLM Outputs, Prompt Engineering, Tool-Use / Function Calling, SHAP, Captum, Model Interpretability, Reproducible Pipelines, Docker, Docker Compose, GitHub Actions CI/CD, Pytest, Git
- **Systems & Performance:** Data Structures & Algorithms, Linux Systems Programming, Multithreading, Lock-Free & NUMA-Aware Memory Management, Performance Profiling, Edge Inference Runtimes, Heterogeneous Compute, Bash Scripting
- **Backend, Data & Cloud:** FastAPI, Node.js, Express.js, REST APIs, Microservices, Webhooks, OAuth 2.0, PostgreSQL, SQLAlchemy, Alembic, MongoDB, Supabase, Row-Level Security, AWS & Azure Fundamentals (AWS Cloud Practitioner in progress)
- **Blockchain (Prior Domain):** Ethereum, Solana, Polygon, TON, Solidity Smart Contracts, Web3.js, Ethers.js

Key Projects

ApneaGuard AI – Deep Learning Platform for Sleep Apnea Detection & AHI Severity Scoring *Solo Research Project*
Python, PyTorch, XGBoost, FastAPI, PostgreSQL, SQLAlchemy, Docker, GitHub Actions CI/CD, SHAP, Captum, Pytest

- End-to-end deep learning pipeline processing ECG and SpO2 signals (filtering, normalization, HRV feature engineering) feeding a 1D-CNN in PyTorch (PR-AUC 0.69, F1 0.62) benchmarked against an XGBoost baseline (PR-AUC 0.61) for automated apnea-event detection
- Subject-level cross-validation with a dedicated regression test guarding against patient-level data leakage; served via FastAPI + PostgreSQL with SHAP/Captum attributions, GitHub Actions CI/CD, and Docker Compose for reproducible deployment

NeuroQuant – ML-Driven Market Intelligence Platform

M.Tech Thesis, In Progress

Next.js, FastAPI, PostgreSQL/TimescaleDB, XGBoost, LightGBM, BiLSTM-Attention, TFT, HMM-GARCH, SHAP

- Full-stack ML platform for NSE/BSE markets combining a multi-model ensemble (gradient boosting, BiLSTM-Attention, Temporal Fusion Transformer, HMM-GARCH regime detection) with SHAP explainability, walk-forward validation, and a hard leakage-detection rule flagging any model above 75% directional accuracy for audit

Systems Programming Portfolio (C/C++) – ML–Hardware Boundary

Ongoing

C, C++, Linux, POSIX Threads, Perf, Systems Design

- Portfolio of low-level systems projects targeting ML workloads on modern hardware: **EdgeCortex** (edge inference runtime for on-device ML), **PulseIR** (Linux performance profiler), **HyperAlloc** (NUMA-aware lock-free memory allocator), **HeteroCore** (heterogeneous compute runtime), **SchedIQ** (AI-assisted userspace scheduler)

RingBack AI – Claude-Powered Autonomous Booking SaaS (Live in Production)

Next.js 16, TypeScript, Claude API, Twilio, Supabase, Google Calendar API, Stripe, Razorpay – Full-stack GenAI SaaS using Claude API with a structured marker protocol (PROPOSE_SLOTS / BOOK_SLOT / NEEDS_HUMAN) to hold SMS conversations and trigger real bookings against live Google Calendar; Postgres Row-Level Security multi-tenancy and dual Stripe/Razorpay billing rails.

Professional Experience

Senior Blockchain Developer

Jan 2024 – Jul 2025

Webskitters Technology Solutions Pvt. Ltd.

Kolkata, India

- Shipped 3 production systems across the full SDLC (design, testing, CI/CD deployment) on Solana, TON, and Polygon with Node.js/Express.js backend services and REST APIs – backend, data-pipeline, and testing skills directly transferable to ML serving infrastructure
- Built POLPICK, a decentralized web app on Polygon serving **15K+ users** with **\$750K+ in transaction volume**, with automated settlement logic and SQL-backed data storage
- Delivered a DEX, staking module, and DAO governance system for JACKCOIN; cut infrastructure costs by 35% via code-level optimization; defined testing standards and reviewed PRs for 2 junior developers

Blockchain Developer

Aug 2022 – Dec 2023

Code Partner Blockchain Solutions

Kolkata, India

- Built and deployed backend services and smart contracts on Ethereum-compatible networks; operated Linux server infrastructure with 99.8% measured uptime; designed a Git-triggered CI/CD pipeline that cut deployment time by 60%

Research & Publications

Machine Learning for Directional Prediction of NIFTY50 Equities – IEEE-format paper on 20 NIFTY50 stocks over 13+ years with LSTM and Attention-LSTM models, walk-forward validation, and macro-F1 evaluation; prepared for conference submission

Education

M.Tech in Computer Science & Engineering, NIT Rourkela

Aug 2025 – Present

Coursework: Advanced Algorithms, Software Testing, Machine Learning, Distributed Systems, Advanced Computer Networks, Quantum Computing

B.Tech in Information Technology (CGPA 8.2/10), Govt. College of Engineering & Textile Technology, Serampore 2018 – 2022

Certifications: AWS Cloud Practitioner (in progress) • **Interests:** Applied ML, Deep Learning, Edge & On-Device Inference, MLOps, LLM Systems, Explainable AI • **Languages:** English, Hindi, Bengali