

# Natnael Fisseha W.

+251-90-568-7433 | natnaelfisseha16@gmail.com | LinkedIn | GitHub

## EDUCATION

### Addis Ababa Science and Technology University

Bachelor of Science in Software Engineering | CGPA: 3.75 / 4.00

Addis Ababa, Ethiopia

Mar 2022 – Jun 2026

- **Relevant Coursework:** Machine Learning, Artificial Intelligence, Data Structures & Algorithms, Advanced Programming, Operating Systems, Research Methods
- Awards: AASTU Presidential Award; Dean's Award for Academic Excellence; HackAtom Ethiopia 2024 Winner

## EXPERIENCE

### Machine Learning Researcher Intern

iCog Labs

Addis Ababa, Ethiopia

Mar 2024 – Aug 2025

- Researched and implemented Predictive Coding-based neural architectures as alternatives to backpropagation for sequence modeling and large language models.
- Designed energy-based objective functions and latent update mechanisms for biologically inspired, interpretable learning in LLM training pipelines.
- Built modular training and evaluation pipelines using token-level accuracy, BLEU, BERTScore, and custom energy-based metrics.
- Tuned models with Optuna through multi-objective hyperparameter search and pruning strategies across latent dimensions, learning rates, and energy scaling factors.

### Applied AI Engineer

Independent Consultant

Remote

Jan 2025 – Present

- Designed and deployed LLM-powered applications using RAG, embeddings, prompt engineering, and agentic workflows for real-world client use cases across multiple industries.
- Built AI-driven educational systems enabling automated question generation, scoring, personalized recommendations, and parent-generated assessments from Arabic educational content.
- Developed domain-specific RAG assistants including a real estate knowledge system and a voice-based travel planner integrating ElevenLabs, n8n, and Next.js.
- Orchestrated production AI workflows integrating LLM APIs, vector retrieval, webhooks, and third-party services; maintained multiple 5-star client reviews on delivery.

### Backend Engineer

Dynamic Technologies

Addis Ababa, Ethiopia

Jul 2024 – Oct 2024; Re-engaged Jan 2026 – Present

- Led migration of a live gaming platform from external API dependency to in-house data architecture using Hono.js, cutting response latency by approximately 80%.
- Designed optimized database schemas, indexing strategies, and ingestion pipelines to synchronize third-party data sources; delivered the full backend within two weeks.
- Developed microservices for SkillWave, a social learning platform with personalized roadmaps and integrated Chapa payments; containerized with Docker and Kubernetes configs.

### Technical Lead

GDG on Campus AASTU

Addis Ababa, Ethiopia

Dec 2024 – Jun 2026

- Led a technical community of 70+ developers across 7 mentors, establishing engineering standards, mentoring teams, and coordinating capstone sprints across 15 teams.
- Designed structured technical evaluation frameworks and facilitated sessions on AI/ML trends, engineering practices, and collaborative development.

## PROJECTS

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### Codebase Intelligence Q&A

2024 – Present

Python · LangChain · ChromaDB · OpenAI · FastAPI

- Built a production RAG system that ingests entire GitHub repositories via context-aware chunking, embedding generation, and symbol/file-level metadata indexing.
- Engineered hybrid BM25 plus cosine similarity re-ranking with an LLM-based filtering stage, reducing hallucinations on code-level queries by approximately 60% over naive RAG.
- Indexed a 40k-file open-source monorepo in under 4 minutes; achieved p95 query latency below 1.2 s with local Chroma and sub-400 ms with a remote vector store.
- Exposed the system via FastAPI with streaming responses and session-level conversational memory supporting multi-turn interactions over large codebases.

### Parent-Child Educational AI Platform

2024 – Present

Python · OpenAI/Groq · PostgreSQL · Telegram Bot API · Next.js

- Developed AI-powered Telegram and web applications for automated question generation, scoring, personalized learning, and parent-generated assessments from Arabic content.
- Implemented RAG pipelines over educational resources for curriculum-aligned evaluation; designed multi-user async workflows for students, parents, and assessment histories.

### Neuro: B2B Outreach Automation System

2025 – Present

n8n · Groq (LLaMA) · PostgreSQL · Apify · Telegram Bot API

- Designed and deployed a multi-stage outreach automation pipeline integrating Apify scraping, Groq LLM enrichment, and Listmonk for personalized campaign delivery.
- Implemented error recovery and self-healing workflow patterns across interconnected async n8n nodes, with Telegram-based monitoring and alerting for production reliability.

## TECHNICAL SKILLS

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**AI & Machine Learning:** PyTorch, LangChain, RAG Pipelines, Hugging Face, OpenAI API, Groq (LLaMA), Prompt Engineering, Embeddings, FAISS, ChromaDB, BM25, Optuna, BERTScore

**Automation & Agents:** n8n, Agentic Workflows, Webhooks, API Integrations, Make.com, Zapier, Playwright

**Programming:** Python, TypeScript, JavaScript, Node.js

**Backend & Databases:** FastAPI, Hono.js, PostgreSQL, MySQL, MongoDB, Redis, REST APIs, Swagger/OpenAPI

**Infrastructure & DevOps:** Docker, Kubernetes, Git/GitHub, Linux, AWS Fundamentals, SSH, CI/CD

**Research:** Experimental Design, Academic Writing, Literature Review, Model Evaluation

## CERTIFICATIONS

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- **Associate AI Engineer for Developers** – DataCamp: OpenAI APIs, Prompt Engineering, Hugging Face, LangChain, Embeddings, Vector Databases, LLMops, production deployment.
- **Fundamentals of Data Science** – Cisco Networking Academy