

Natnael Yohanes Abdisa Software Engineer

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EDUCATION

Addis Ababa University (Top 10 Universities in Africa)

Addis Ababa, Ethiopia

Bachelor of Software Engineering, GPA: 3.93/4.00

2023 - 2027

- **Relevant Courses:** Linear Algebra, Calculus, Object-Oriented Design, Database Systems, Operating Systems, Machine Learning, Probability and Statistics, Computer Networking, Distributed Systems, Analysis Of Algorithms

A2SV - Africa to Silicon Valley (Google-backed)

Addis Ababa, Ethiopia

Data Structures & Algorithms, Backend Development in Go

Jan 2025 - Nov 2025

- A2SV-trained engineer with strong DSA foundation (Solved 800+ problems on [Leetcode/Codeforces](#) focusing on graph theory, dynamic programming), hands-on [Go backend development using Clean Architecture](#), and real-world project solving.

TECHNICAL SKILLS

| | |
|----------------------------------|---|
| Programming Languages: | Python, Go (Golang), Java, C++, Bash, TypeScript, Kotlin |
| Backend: | Node.js, Express.js, NestJS, Go/Gin, gRPC, GraphQL |
| Databases: | PostgreSQL, MongoDB, MySQL, Neo4j, Redis |
| DevOps & Cloud: | AWS (EC2, S3), Azure, GCP, Docker, Kubernetes, Nginx, Prometheus, Grafana |
| Optimization & AI/ML: | MCP, TensorFlow, NumPy, LangChain, Linear Programming, GLOP |
| Tools: | Git, Jenkins, Linux/Unix, Jira, Jest, HuggingFace, Colab |

PROFESSIONAL EXPERIENCE

iCog Labs (AGI Research)

Addis Ababa, Ethiopia

AI Researcher / Optimization & Machine Learning

March 2025 - September 2025

- Optimized the **MeTTa-Moses genetic algorithm** by implementing **LRU caching strategy** for mutual information calculation, slashing runtime from 2 minutes to 34sec (**4x speedup**)
- Built **neural network library** from scratch using NumPy, implementing backpropagation and **gradient descent**.
- Engineered real-time distributed content filtration system for 1000+ posts with Redis caching, two-tier LLM architecture (Ollama/Groq), reducing API costs by 80% and maintaining sub-500ms response times.

Kyoto Creative

Remote, India

Backend and DevOps Engineer

January 2025 - February 2025

- Architected a scalable job-matching platform using microservices on GCP; deployed with Docker and Kubernetes for container orchestration.
- Enhanced system fault tolerance and reliability to **95%** by debugging WebSocket concurrency issues and implementing graceful shutdown procedures for Go backend services.
- Optimized PostgreSQL database schemas and indexing strategies, reducing average query execution time by **40%** under simulated high-load conditions.

Google Developer Group (GDG) — AAU

Addis Ababa, Ethiopia

Technical Mentor

February 2024 - June 2024

- Led academic study groups for 48+ undergraduates, teaching fundamental concepts in **computational complexity**, recursion, and memory management in Python and C++.
- Led a **team of 7 developers** to build internal university tools, establishing code review standards and CI/CD pipelines that increased deployment frequency by 2x.

KEY PROJECTS

Graph-Based Image Segmentation | [GitHub](#) / Python, NumPy, scikit-image

September 2025

- Implemented the (**Felzenszwalb & Huttenlocher**) Image segmentation algorithm, modeling pixels as a graph and optimizing region merging using a Disjoint-Set (Union-Find) data structure.
- Achieved near-linear **$O(n \log n)$** computational complexity, enabling real-time processing of high-resolution images by minimizing edge weight operations.
- Applied **optimization mathematics** to define adaptive thresholding functions, dynamically balancing segment granularity based on local intensity variance.

Semantic Search & QA Platform | [GitHub](#) / FastAPI, Langchain, Streamlit, Scikit-learn

January 2025

- Built a **Retrieval-Augmented Generation (RAG)** pipeline using Vector Embeddings (Cosine Similarity) to query large-scale document datasets with high precision.
- Integrated **Model Context Protocol (MCP)** to decouple data sources from the LLM reasoning layer, allowing the system to dynamically attach new document context servers without code refactoring.
- Designed a scalable API architecture using **FastAPI**, handling concurrent user sessions with asynchronous request processing.

Medical Scheduler Platform | [Mobile](#) / [Web](#) / NestJS, TypeScript, Flutter, React.js

March 2025

- Engineered a cross-platform medical appointment system with Flutter (mobile) and React.js (web), enabling seamless patient-doctor scheduling.
- Developed a fault-tolerant backend using **NestJS**, implementing **Redis** for distributed session management and caching to handle varying traffic spikes.
- Secured API endpoints with Role-Based Access Control (RBAC), ensuring data integrity and compliance with privacy standards.

ACHIEVEMENTS & LEADERSHIP

- **Google Developer's Group Hackathon Winner** – Won 15,000 ETB for innovative [library management solution](#)
- **TenX Data Analytics Certification:** Achieved with **Great Distinction**. Mastered the data science lifecycle, including data preprocessing, exploratory data analysis (EDA), and visualization techniques.
- **Python Programming Instructor** – Teaching Python, Calculus for 500+ students (2.5K+ community members)
- **Open Source Contributor** – Contributing to [MeTTa-Moses](#) (evolutionary algorithm), [MeTTaLog](#) (functional programming language), [Sugar Labs](#) (educational platform), and [OpenELIS Global](#) (lab management system)

CERTIFICATIONS

[Microsoft Azure Fundamentals \(AZ-900\)](#) | [Google IT Automation with Python](#) | [Supervised Machine Learning](#) | [Blockchain HashGraph Developer](#) | [Evangadi Tech MERN Stack Certified](#)