

Binyam Mamo

AI/ML and Backend Engineer

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Computer Engineering student at the University of Dubai on a full scholarship. Builds applied AI and computer vision tools, backend systems and full-stack web apps, with shipped work in health, education and hospitality.

EXPERIENCE

Backend Developer Intern | Horan Technologies Jun 2026 - Sep 2026

- Built the backend of a hotel management system covering reservations, check-in, housekeeping and billing: 97 endpoints across 16 data models, with about 580 automated tests.
- Built a Telegram assistant answering staff questions by text or voice in English and Amharic, with role-based limits.
- Built the guest booking bot and its mini app, including payments and QR confirmations.

Tech: Node.js, Express, PostgreSQL, Docker

Undergraduate Research Assistant | University of Dubai Mar 2026 - Present

- Benchmarked small local language models controlling a real Home Assistant smart home, building the test harness first: tasks graded on actual device state, with a held-out set written before any fix.
- Raised task success from the 47.3% scored by Home Assistant's built-in matcher to 77.3% on held-out tasks, with no false actions.
- Built the smart lab dashboard: a 3D digital twin of the room wired to its sensors, with one ask bar that takes plain language by text or voice.
- Built a prototype student mobile app whose digital ID card is verified over NFC by holding the phone to a reader.

Tech: Python, Ollama, React, React Native

Backend Intern | Kuraztech Jul 2024 - Sep 2024

- Built features for an internship management system and a price comparison platform, working in an existing Laravel codebase.

Tech: Laravel, JavaScript, Bootstrap, Tailwind CSS, GitHub, Trello

CLIENT WORK

Hakim Click | RAG [bindev.me/p/hakim-click](#)

Clinical answers from Ethiopia's national guidelines, with a citation on every claim.

38 guidelines, 8,076 pages and 13,536 indexed passages, and every answer links back to the page.

Tech: Next.js, React, Tailwind CSS, Prisma, PostgreSQL, Python, FastAPI, pgvector, Gemini, Ollama

Yakal Education | Full-stack [yakal.me](#)

Tutoring and college counselling, with a dashboard for every person involved.

Wrote 805 of the 868 commits on the main branch.

Tech: React, Vite, Tailwind CSS, Node.js, Express, PostgreSQL, Recharts, TypeScript, Supabase, Stripe

UD Students | React Native, NFC | University of Dubai

A prototype student app with a digital ID card you can tap on an NFC reader.

The phone acts as the ID card itself: hold it near a reader and the card is verified over NFC.

Tech: React Native, Expo, TypeScript, Tailwind CSS, TanStack Query, Zustand, Gemini

PROJECTS

Clix Tools | Tool calling [bindev.me/p/clixa-tools](#)

63 clinical calculators, cancer staging and an assistant that shows its working.

The model never does the arithmetic: it can only call the 63 real calculators as tools.

Tech: Preact, TypeScript, Vite, Cloudflare Workers, Gemini, PWA, Chrome Extension

VisionAid | Computer vision [bindev.me/p/visionaid](#)

A phone assistant that reads, recognizes and warns for people with low vision.

Reads text, finds objects and warns about traffic on-device. Built for the 19th IEEE Student Day competition.

Tech: Flutter, TensorFlow Lite, YOLO, Google ML Kit, Gemini, Astro, React, Tailwind CSS

Drone Hunter | Reinforcement learning [bindev.me/p/drone-hunter](#)

A simulated drone that finds and chases a moving rover using only its camera.

One sign flip between training and deployment took time on target from almost nothing to 87%.

Tech: Python, Webots, Stable-Baselines3, Gymnasium, NumPy

Avatar Kit | Face tracking

bindev.me/p/avatar-kit

Cartoon avatars in the browser that copy your face, lip sync to your voice and swing their hair.

MediaPipe face tracking drives head pose, blinks, gaze and mouth through a Verlet physics rig, smoothed with One Euro filters.

Tech: PixiJS, MediaPipe, TypeScript, Vite, Tailwind CSS, Vitest, Playwright

SignSpeak | Gesture recognition

bindev.me/p/signspeak

Learn American Sign Language the way a language app teaches words, with your webcam as the marker.

Hand tracking and classification both run in the browser, so a lesson works on a laptop with no server doing the recognition.

Tech: Next.js, React, TypeScript, Tailwind CSS, MediaPipe, TensorFlow.js, Supabase, Framer Motion

Respiratory Sound Classifier | Audio classification

Tells asthma, COPD, pneumonia and healthy lungs apart from short breathing recordings.

Gets 87% of held-out clips right across five classes while training a network of only about 68 thousand parameters.

Tech: Python, PyTorch, TensorFlow Hub, YAMNet, scikit-learn, librosa, Flask

SignVerse | Pose synthesis

English text in, a signing figure out, and an honest account of how far that gets you.

89% of the words in 20 everyday sentences have a real sign, up from 42% at the start, and the remaining 7 are proper nouns that get fingerspelled.

Tech: Python, FastAPI, MediaPipe, pose-format, JavaScript

Manim Video Generator | LLM code generation

bindev.me/p/manim-generator

Describe a math animation in plain language and get a rendered video.

Runs in the browser through a Colab notebook, with no local install.

Tech: Python, Gemini, Manim, MCP, Streamlit

HealthVault | Encryption, blockchain

bindev.me/p/healthvault

Patient-controlled health records, encrypted in the browser with a blockchain for permissions.

A doctor only receives a record's key after their visit has been written to the blockchain.

Tech: React, Vite, TypeScript, Node.js, Solidity, Hardhat, viem, Web Crypto

UAE Companies | Data pipeline

bindev.me/p/uae-companies

A company directory for students job hunting in the UAE, ranked by whether you can actually get there.

Every fact carries a source URL, a retrieval date and a confidence level, and a field with no source stays empty rather than being filled with a guess.

Tech: React, Vite, TypeScript, Tailwind CSS, Leaflet, Firebase, Python

SKILLS

Languages	TypeScript, JavaScript, Python, Bash, C++, Java
Backend and APIs	Node.js, Express, NestJS, FastAPI, Flask, Laravel, REST, GraphQL, Socket.IO, OpenAPI
AI and ML	PyTorch, OpenCV, RAG, Ollama, OpenClaw
Databases	PostgreSQL, MongoDB, MySQL, InfluxDB
Frontend	React, Next.js, Tailwind CSS, Bootstrap, jQuery, Prisma, Zod, TanStack Query, Stripe
Apps and tooling	Wails (Go), React Native, Flutter, Chrome extensions, VS Code extensions, Raycast, Electron, Docker, Linux, Git, GitHub Actions, Hugging Face, Supabase, Render, Firebase, Vercel

CERTIFICATIONS

Software Engineering, Back-End | ALX Africa, Holberton School

Nov 2022 - Aug 2024

12-month program at 70+ hours a week in C, Python and DevOps. Capstone project Funkey was picked as a top 5 project.

EDUCATION

BSc Computer Engineering | University of Dubai

Aug 2023 - May 2027

- GPA 3.99 on a full scholarship awarded for academic excellence, with AI research projects alongside coursework.

BSc Computer Science | Addis Ababa University

Jan 2022 - Aug 2023

- Completed two semesters, finishing the first in the top 5% of the class, then transferred on a full scholarship.