

# Binyam Mamo

AI/ML and Backend Engineer

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Computer Engineering student at the University of Dubai on a full scholarship, building applied AI and computer vision tools, backend systems and full-stack web apps for clinics, classrooms and small businesses.

## 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

- Built a test harness to benchmark local language models on real smart home devices, graded on device state.
- Raised task success from Home Assistant's own 47.3% to 77.3% on held-out tasks, with no false actions.
- Integrated an AI ask bar into a smart lab digital twin, so live room sensors answer plain language by voice or text.
- Built a prototype student mobile app with a digital ID card 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.

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, every claim cited.

*38 guidelines and 13,536 passages, embedded and searched with pgvector.*

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

**Yakal Education** | Full-stack yakal.me

Tutoring and college counselling, with Stripe checkout and Zoom lessons.

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

**UD Students** | React Native, NFC

NFC-enabled student ID on the phone, verified by tapping a reader.

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

## PROJECTS

**Clix Tools** | Tool calling bindev.me/p/clixa-tools

63 clinical calculators an assistant runs by tool call rather than arithmetic.

*Ported without changing a result, checked against 6,653 recorded cases.*

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 visually impaired users.

*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.

*87% time on target after training the policy in Webots.*

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 and lip sync to your voice.

*MediaPipe drives head pose, blinks, gaze and mouth through a Verlet physics rig.*

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

SignSpeak | Gesture recognition

Learn American Sign Language with your webcam as the marker.

Hand tracking and classification both run in the browser, with no server.

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

SignVerse | Pose synthesis

Translates English text into American Sign Language, rendered as a signing figure.

89% of words in everyday sentences map to a real sign, up from 42%.

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

Respiratory Sound Classifier | Audio classification

Tells asthma, COPD, pneumonia and healthy lungs apart from a cough.

87% on held-out clips across five classes, from a 68 thousand parameter network.

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

Manim Video Generator | MCP server

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

Exposed as an MCP server, so an assistant can render animations as a tool.

Tech: Python, Gemini, Manim, MCP, Streamlit

HealthVault | Encryption, blockchain

Patient-controlled health records, encrypted in the browser.

A doctor receives a record's key only after their visit is on the blockchain.

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

UAE Companies | Scraping

A scraped directory of UAE employers for students, mapped on OpenStreetMap.

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

[bindev.me/p/signspeak](#)

[bindev.me/p/manim-generator](#)

[bindev.me/p/healthvault](#)

[bindev.me/p/uae-companies](#)

SKILLS

|           |                                                                                             |
|-----------|---------------------------------------------------------------------------------------------|
| Languages | TypeScript, JavaScript, Python, Bash, C++, Java                                             |
| Backend   | Node.js, Express, NestJS, FastAPI, Flask, Laravel, Socket.IO                                |
| 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      | Wails (Go), React Native, Flutter, Chrome extensions, VS Code extensions, Raycast, Electron |
| Tooling   | 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 picked as one of the top 5 in the program.

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.