

Melvin Wafula

Senior Backend Engineer, Digital Assets & Digital Health

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Ask my AI assistant at melvin.pentacostai.com. AI agents can read melvin.pentacostai.com/llms.txt or connect to my MCP server at melvin.pentacostai.com/api/mcp.

PROFILE

Backend engineer with four years of professional work on digital assets. I've built lending platforms, NFT marketplaces, a bitcoin on-ramp and an on-chain game, and the lending platform I maintain at Shufl Labs moves over \$10,000 in loans a month. Since 2025 I have also worked in digital health. I'm building a national registry for kidney patients and converting the national kidney guidelines into a WHO SMART Guideline. The two fields overlap more than people expect. Both need records you can audit, systems that recover cleanly when something fails, and shared standards so institutions can exchange data (FHIR in health, open ledgers in finance). That overlap is where I want to work next.

SKILLS

Languages	TypeScript · JavaScript · Python · SQL
Backend	Node.js · Express · REST APIs · PostgreSQL · Redis · Supabase · Firebase / Firestore · Background workers
Digital assets	Algorand (AlgoKit, Algorand Python, PyTeal) · Smart contracts · Reach · x402 payments · USDC settlement · Escrow and LogicSig flows · Lending protocols
Digital health	HL7 FHIR · WHO SMART Guidelines · Digital Adaptation Kits (DAK) · BPMN · ICD-11 / LOINC
Frontend & apps	React · Next.js · Tailwind CSS · Svelte · React Native / Expo · Electron
Cloud & delivery	AWS (EC2, Amplify, Secrets Manager) · Vercel · Fly.io · Google App Engine · Docker · GitHub Actions
Testing	Jest · Playwright · pytest · Integration tests · Architecture reviews
AI tooling	LLM extraction pipelines · Claude Code and agent skills · Multi-agent workflows · Knowledge graphs

EXPERIENCE

Founder & Lead Engineer · PentacostAi 2026 – Present

My own studio. The first product is AlgoCity, a four-player city-trading game on Algorand MainNet in which AI agents can take a seat.

- Wrote the six Algorand Python smart contracts behind the game (game, factory, deeds, rules, treasury and swap pool), the Next.js client, and a keeper worker that runs on Fly.io.
- Built a paid x402 endpoint for the Algorand x402 Global Challenge. A player pays once in USDC and gets a game table. If the table fails to open, the payment never settles, and one payment can't open two tables.
- Every state change goes through a contract that checks it. The database and the UI only display what the chain says.
- Each contract has a written spec and a cost proof measured from real builds. Tests run in pytest, Jest and Playwright.

Blockchain Developer · Shufl Labs Jul 2024 – Present

Backend and smart-contract work for the Shufl NFT marketplace and the Goanna DAO lending platform. I'm an admin of the AI Goanna and Rand Gallery GitHub organisations.

- Reworked the Goanna lending platform, which now handles over \$10,000 in loans a month, and brought its cloud costs down significantly.
- Leading the merge of two old marketplace backends, Shufl (AWS EC2) and RandSwap (App Engine and Firestore), into one Node.js and Express service on PostgreSQL and Redis.
- Each transaction is submitted under a unique key, so a retry can't charge anyone twice. A background reconciler checks stuck transactions against the chain and corrects the records. Three settlement methods (escrow, app call and LogicSig) share one interface, and the service has 300 automated tests.
- I plan the work and AI coding models implement it. I review each module's architecture before it's ported and again afterwards.
- Found an encryption key hardcoded in the old code, with its IV reused. The new service keeps no keys in code and reads secrets from AWS Secrets Manager.
- Built the Mutant vs Zombies staking game and worked on the Shufl marketplace. Both are live on mainnet.

Backend / Blockchain Developer · MulaStack Mar 2024 – Present

A service for buying bitcoin with local currency.

- I work on the backend and the blockchain side of the purchase flow.

Lead Developer · Safariblocks Aug 2022 – Jul 2023

Led development of the Jasiri Protocol on Algorand, a micropayments system meant to free up capital locked in real-world assets and commodities.

- Led the build of the Jasiri browser extension and dApp through to Algorand TestNet.

Blockchain Developer · Reach Platform Apr 2022 – May 2023

Smart contracts in Reach, a language that compiles one program for several blockchains.

- Published a tutorial that deploys the same NFT auction contract to Ethereum and Algorand.

SELECTED PROJECTS

Kenya Renal Registry

2025 – 2026

A national registry for kidney patients, with clinical decision support based on WHO SMART Guidelines. Web (Next.js), mobile (Expo) and desktop (Electron) apps share an AWS Amplify backend. Diagnoses and lab results are coded in ICD-11 and LOINC so they map onto FHIR.

Kidney guidelines to WHO SMART

2026

Turning the Kenya National Kidney Guidelines 2026 into a WHO SMART Digital Adaptation Kit, the structured form a guideline takes before it becomes software. I wrote a 17-part method guide and a tool that traces each WHO rule back to the document it came from. An AI-assisted pipeline pulls decision tables and care pathways out of each chapter for review against the source.

DEFI-P2P github.com/defip2p

2025

Peer-to-peer lending on Algorand, which I built on my own. It runs on AlgoKit contracts, a Next.js frontend and Supabase, and CI deploys the contracts to TestNet. Asset details that rarely change are cached separately from live balances, and requests are queued by priority so the dashboard loads what's on screen first.

Table Banking model

2025

A white paper on the maths behind chamas, community savings-and-credit groups. It sets rules for how much each member can borrow and how profit is shared (30% by savings, 70% by interest paid). I tested the model in Python against one group's real ledger.

Algox402 SDK github.com/BMscis/cointext-algorand-x402

2025

An SDK for paying per request with x402 on Algorand. It covers the buyer, seller and facilitator roles and includes Express middleware with PostgreSQL storage.

EDUCATION

Tourism Management, United States International University

2013 – 2017

ORGANISATIONS AND LANGUAGES

I run the **AI-Goanna**, **RandGallery**, **defip2p** and **SmartSeatTicketing** GitHub organisations and contribute to **Shufl-Labs** and **Algorand-Developer-Retreat**. I write at bmscis.hashnode.dev, and I speak English and Kiswahili.