Matthew Fehrsen

Full-Stack Engineer · Python · TypeScript · Dart/Flutter

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Full-stack engineer and the founder and CTO of Penng, a screen-free health wearable. I build across the whole product: the Flutter app and its native iOS and Android code, the Python backend, the web dashboards, the AI features and the infrastructure they run on. Coding since my first computer science course in 2018.

WHAT I CAN DO

- **Mobile apps.** iOS and Android apps in Flutter with native Swift and Kotlin: offline-first storage (Drift, SQLite), background sync, Apple Health and Health Connect, Bluetooth LE devices, Live Activities, store releases and profiling.
- **AI agents and pipelines.** Tool-calling agents with typed, streamed outputs, a second model checking actions before they run, RAG and long-term memory on pgvector, MCP servers, and vision pipelines with fallback chains. Models and prompts are chosen with evals, not by feel.
- **Backend and APIs.** FastAPI and PostgreSQL: schema design and migrations, OAuth 2.1, idempotent webhooks, partner APIs with a sandbox, and billing across Apple, Google (RevenueCat) and PayFast in one entitlement ledger.
- **Web apps.** Next.js and React on a FastAPI backend: role-based portals, builders and dashboards, with privacy rules enforced on the server.
- **Health data and algorithms.** Personal baselines, recovery, sleep and strain scores, and activity detection from heart rate, tuned and checked against reference devices.
- **Security.** Threat modelling and audits, secrets management with rotation (AWS SSM), supply-chain checks in CI (Gitleaks, pinned Actions, dependency and static scans), access control, webhook signature checks, rate limits and keeping personal data out of logs.
- **Monitoring.** Privacy-first product analytics, error and release tracking, cron check-ins and alarms.
- **Cloud and incidents.** AWS (Elastic Beanstalk, RDS, S3, CloudFront, SSM, Lambda) and Cloudflare. Debug production incidents to the root cause and repair data safely.
- **CI/CD.** GitHub Actions, merge queues, test-impact selection, self-hosted runners and mobile release builds. I use AI coding agents for speed, with independent review and passing tests on every change.

LANGUAGES

Python	Daily, production	FastAPI, SQLAlchemy and Alembic on PostgreSQL, PydanticAI agents, pytest.
Dart / Flutter	Daily, production	Penng's iOS and Android app: Riverpod, Drift (SQLite), background sync.
TypeScript	Daily, production	Next.js and React web apps, Cloudflare Workers with D1.
SQL	Daily, production	PostgreSQL schema design and migrations, pgvector, SQLite on the phone.
Swift	Production	Native iOS Bluetooth code and SDK bridges, Live Activities.
Kotlin	Production	Android Bluetooth: connection recovery, bonding, CompanionDeviceManager.
PHP	Production	Cape Media's internal platform on MySQL.
Java, C, C++	Coursework	Spring Boot 3 / Java 17 with JPA and JUnit (team), data structures, C++ OOP.
Verilog, MIPS	Coursework	FPGA register files, state machines and a 32-bit MIPS datapath.

FRAMEWORKS AND TOOLS

Frameworks	FastAPI, Flutter, Riverpod, Next.js, React, PydanticAI, FastMCP, Flask, Spring Boot
Cloud & ops	AWS, Cloudflare, Firebase, Docker, Linux, GitHub Actions, Codemagic, Sentry
AI	Claude, GPT and Gemini APIs, MCP, pgvector, evals, LiteRT-LM, llama.cpp, MediaPipe, Whisper

EXPERIENCE

Penng — Dec 2024 – present

Founder & CTO

- Penng is a screen-free health band with iOS, Android and web apps. I lead engineering and took it from idea (Dec 2024) to the App Store and Google Play (Aug 2025); most of the work above was done here.
- Also built a remote MCP server so members can connect Claude or ChatGPT to their data, Bluetooth code for a band with no protocol documentation (worked out from the vendor's Android app), and a support inbox that brings WhatsApp, Instagram, Messenger and email into one place with AI-drafted replies.

Cape Media Corporation

2023 – present

Head of AI Integration · print and digital publisher

- Built an AI video-ad generator for advertiser campaigns, an internal AI assistant for staff, and a tool that turns written articles into two-voice audio interviews (Python, Flask, PHP, MySQL, ElevenLabs).
- Built a social publisher that drafts posts with AI for approval, and worked on the email system, events pipeline and admin dashboards. Ran Meta ad and cold-email campaigns.

ShipWithCode

2026 – present

Founder · side project

- Builds and hosts websites for small businesses: a Python pipeline qualifies leads from Google Maps data, and demo sites are generated and served from a Cloudflare Worker with D1. Replies are sorted by an LLM locked to a fixed schema, which protects against prompt injection.

Earlier

Ultra Leads (2024) · Starlit Solution (Apr 2023 – Aug 2025)

Built Ultra Leads, a pay-per-lead web platform where contractors buy tokens to unlock job leads. Ran Starlit Solution, a social media marketing agency.

EDUCATION

University of Arizona

B.S. Software Engineering (online, part-time), expected Dec 2027 · GPA 3.5 · 35 courses completed, 5 in progress

- **DevSecOps (SFWE 402).** Team-built a Spring Boot 3 / Java 17 finance app with a GitLab CI pipeline (build, test, deploy), dependency scanning, SonarQube static analysis and Docker images.
- **Software assurance (SFWE 401).** Threat-modelled a Flask and TypeScript app (STRIDE, DREAD, MITRE ATT&CK), ran Bandit, Semgrep, Pylint and ESLint, and fixed three vulnerabilities, re-running each tool to confirm.
- **Computer architecture (ECE 274A, ECE 369A).** Verilog on Basys3 FPGAs: register files, state machines and a datapath with controller, all with testbenches; a 32-bit MIPS datapath now being pipelined (team, in progress).
- **Industrial control (SFWE 411).** Brewery fermenter controller in OpenPLC ladder logic with a ScadaBR operator interface over Modbus TCP (team, in progress).
- **Software engineering.** Requirements analysis and test (SFWE 301, in progress), software development lifecycle (SFWE 101), object-oriented modelling in UML (SIE 277), data structures and algorithms in Java (CSC 355), C++ OOP (ECE 201), C (ECE 175).
- **Security and information science.** Cyber operations (CYBV 385), disruptive technologies (ESOC 318, in progress), ESOC 210, engineering ethics (ECE 311, in progress).
- **Maths and science.** Calculus I to III and vector calculus (MATH 122, 129, 223), differential equations (MATH 254), discrete mathematics (MATH 243), engineering probability and statistics (SIE 305); physics (PHYS 141, 143, 241); chemistry (CHEM 141, 142, 145).