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Karl Bitzer.

AI / full-stack engineer

I build products end to end. I designed, built and shipped DoSumpin' to the App Store on my own, spent four years on interface, verification and delivery work for aerospace software at Tangram Flex, and now work on AI and ML at Booz Allen Hamilton.

EXPERIENCE

AI & ML Engineer II · Booz Allen Hamilton

Oct 2026 – present

- Earned internal badges in Cloud Computing, Agentic AI and Cyber AI.

Founder & Engineer · DoSumpin'

2025 – present

A social app that turns shared interests into real plans. Live on the App Store since November 11, 2026. dosumpin.app

- Designed, built and shipped the whole product as its only engineer: product, design and every layer of the code, from requirements and system design through App Store release.
- Directed AI coding agents against scope and acceptance criteria I wrote, with a multi-agent audit-and-fix loop for quality.
- Built a security-first Postgres backend: deny-by-default row-level security on all 17 tables, plus security-definer RPCs and server-side triggers that enforce access control in the database itself (anti-spoofing, age-gating, abuse-resistant blocking).
- Added 26 automated invariant checks in CI that fail the build when the system drifts from its spec, so fixed bugs stay fixed and AI-written code can't quietly regress.
- Designed event-driven flows with Postgres triggers, Deno edge functions and realtime subscriptions, keeping every client in step with shared state.
- Wrote a native iOS module in Swift (MapKit search, geocoding, live map rendering) and bridged it into React Native where no library exposed those APIs.
- Cut releases to one command: EAS Build and Submit across isolated dev and prod environments, Sentry crash reporting and a guarded release pipeline.

React Native · Expo · TypeScript · Supabase / Postgres · Deno · Swift · Sentry

Software Engineer II · Tangram Flex

Aug 2022 – 2026

- Contributed to requirements, scope and development for the Platform Interface Module API, the interface contract between a flight chassis and aircraft avionics that six independent organizations build against.
- Architected a formal-methods verification and validation process using SMT solvers, checking systems against mathematical specifications and surfacing unsafe states and conflicting requirements at design time instead of as late rework.
- Engineered a RAG-based LLM pipeline that parses large technical documents and generates specification-compliant C code, compressing weeks of manual work into 10 minutes.
- Led and planned a 20-engineer, six-organization integration event that exercised the first full release of the software toolchain, platform and data-link interfaces and a containerized OS, clearing a program milestone.
- Coordinated 25 engineers provisioning flight-ready systems for three test events, all delivered on time.
- Designed the signing, packaging and deployment process for custom Linux chassis and a containerized OS (bootc), making delivery into an air-gapped customer environment repeatable, with no remote access and no second attempt.
- Wrote and maintained 500+ pages of technical documentation in Confluence and Jira, the program's source of truth.
- Drove the team's move to Agile, owned the Jira roadmap for software and hardware deliverables, and mentored junior teammates.
- Won the Henny Penny Data Analytics Hackathon (2022) with a dashboard built from data on 400 commercial fryers that recommends oil-change timing based on safety, oil usage and cooking quality.

Python · C · Linux · bootc · Docker · SMT solvers · Jira · Confluence

Full-Stack Software Intern · TalentNow / Ascendum Solutions

Summers 2020 & 2021

- Two terms with the same 10-person team, which spun off to found TalentNow.
- Shipped FlexTeams, which lets recruiters assemble and hire teams by skill set, owning it front end to back end.

- Built dashboards, search filters and candidate-management workflows, and shipped to production with Docker and Git in Agile sprints.

PostgreSQL · Python · JavaScript / TypeScript · Docker

PROJECTS

PokeWatch 2026

An Apple Watch that acts as a Pokéwalker, bridged to the game over BLE and infrared. In progress.

Price-transparency detector 2026

Catches personalized pricing and dark patterns by running 5 isolated Kernel cloud browsers in parallel, one per shopper persona (locale, device, location), and diffing what each is shown. Deployed as a one-call cloud action from a shared engine that also runs as a CLI.

ESP32 task tracker 2025 – present

A standalone task tracker on an ESP32 running FreeRTOS that keeps a personal task bank and sends scheduled SMS reminders.

Heart-disease risk classification 2024

Compared logistic regression, decision tree, random forest and neural network models that predict heart-disease risk from known health factors, averaging 98% accuracy.

Ownt 2026

Scan, catalogue and trade physical media, starting with console games. In progress.

2048-playing agent 2026

An AI agent that plays 2048 in a live cloud browser through screenshots and keypresses. A time-budgeted expectimax solver (~50 ms a move) was validated offline with tests and a simulator before any billable run.

Aircraft detection 2024

A custom network on EfficientNetB3 that classifies 73 aircraft types at 98% accuracy, trained on Kaggle image sets with Pandas and TensorFlow. A local GUI classifies any uploaded photo.

Facial emotion classification 2024 · MIT

Built and compared eight custom CNNs that classify human facial emotions for the MIT Professional Education data-science program, then delivered full technical documentation and presented the findings.

SKILLS

LANGUAGES	TypeScript / JavaScript · Python · Swift · C · Java · SQL
AI & AGENTS	LLM integration · RAG and code-generation pipelines · agentic workflows · Claude API · Claude Code · MCP · model evaluation · browser automation · TensorFlow · computer vision
MOBILE & WEB	React Native · Expo · React · Node.js · Zustand · REST API design · realtime services · accessibility
DATA & BACKEND	PostgreSQL · Supabase · row-level security · Deno edge functions · schema design and migrations · Elasticsearch · SQLite · Pandas
SYSTEMS	Requirements decomposition and traceability · interface and API contract design · verification and validation · formal methods (SMT solvers) · test planning and acceptance criteria · Cameo
DELIVERY	Docker · Linux · CI/CD and release pipelines · EAS Build and Submit · Sentry · Git · air-gapped delivery · Agile (Scrum / Kanban) · Jira · Confluence
EMBEDDED	ESP32 · FreeRTOS · embedded Linux · MQTT · TLS

EDUCATION

B.S., Computer Engineering · University of Dayton May 2022 · GPA 3.7

- Coursework: Artificial Neural Networks, Internet of Things, Computer Architecture, Human-Focused Design.
- Capstone team captain, twice: a custom Darknet computer-vision model for maritime search and rescue, and a motivational smart scale with a companion app that nudges people toward their health goals.
- Co-Director of the UD Summer Appalachia Program (2022): oversaw every service program the group ran and advocated for the community's needs to university mentors and leadership.

CERTIFICATIONS & TRAINING

- MIT Professional Education: Data Science Using AI/ML (2024)
- Anthropic: Introduction to Model Context Protocol · Building with the Claude API · Claude Code · AI Fluency: Framework & Foundations