Zacharia Hammad

Full Stack Software Engineer

Secure AI Workflows | Knowledge Graphs | Agentic Interfaces | Event-Driven Architecture | Security

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SUMMARY

Full Stack Software Engineer building secure AI workflow systems across Python/FastAPI services, React/TypeScript interfaces, event-driven infrastructure, LLM knowledge graphs, RAG/search, and human-in-the-loop product surfaces. Experience with multi-tenant authorization, audit logging, source-attributed evidence workflows, transactional event delivery, DLQ/replay, and production security hardening.

TECHNICAL SKILLS

Languages: Python, TypeScript, JavaScript, Rust, SQL
Core stack: FastAPI, React 19, Next.js, PostgreSQL, Neo4j, Kafka/Redpanda, Redis
AI systems: Claude, OpenAI APIs, Codex-assisted development, RAG, LightRAG, Graphiti, vector retrieval, knowledge graphs, tool-calling agents, human-in-the-loop workflows
Reliability: transactional outbox, DLQs, replay workflows, idempotent processing, retries, circuit breakers, cross-language event contracts
Security: multi-tenant isolation, Postgres RLS, HMAC event signing, service auth, Cypher-injection hardening, PII redaction, audit logging

PROFESSIONAL EXPERIENCE

Software Engineer | Visionary Solutions | Aug 2025 - Present

- Independently developed a multimodal evidence-processing platform used in enterprise/government-facing customer demos, spanning GPU inference, entity resolution, event-driven delivery, chain-of-custody workflows, and multi-tenant API surfaces.
- Designed graph/RAG infrastructure that became the core intelligence layer for customer-facing AI SaaS workflows, powering entity resolution, temporal modeling, graph search, and graph-backed user context.
- Built an LLM-powered investigation assistant with Next.js, Claude/OpenAI APIs, 40+ tool-calling actions, source-linked evidence workflows, graph analytics, and human-in-the-loop write confirmation.
- Engineered cross-service reliability through signed events, transactional outbox delivery, DLQs, replay workflows, idempotent processing, retries, circuit breakers, and cross-language event contracts.
- Hardened multi-tenant security across services with org-scoped isolation, Postgres RLS, Neo4j tenant keys, service authentication, Cypher-injection fixes, PII redaction, and audit remediation.
- Built React/TypeScript AI product workflows now rolling out to customers, integrating LLM chat, voice agents, Bayesian scoring, event consumers, and graph-backed context.

Unmanned Aerial Systems Engineering Co-op | PECO / Exelon | Sept 2023 - Mar 2024

- Engineered Python automation with Pandas and API integrations, reducing reporting time from two hours to under 30 minutes while improving analytics accuracy.
- Built Power BI dashboards for drone quality KPIs and optimized Python/Excel/Power BI data flows, cutting processing time by 75% and improving data accuracy by 20%.

Engineering Co-op | NAVSEA | Sept 2022 - Mar 2023

- Improved submarine simulation algorithms and sensor modeling while documenting electrical/mechanical workflows for gas-sensor and chamber systems.

Research and Development Co-op | Saint-Gobain | Sept 2021 - Mar 2022

- Led Python/MATLAB analytics and statistical modeling for materials experiments, identifying process improvements and potential 50% cost savings.

PROJECTS

Repotoire | Rust, Code Graphs, Static Analysis

- Built a Rust code-intelligence CLI that models repositories as knowledge graphs to catch duplicate logic, dependency cycles, security issues, and architectural drift; adopted internally at Visionary Solutions as a developer testing tool.

ML Pothole Detection System | Python, YOLO, Raspberry Pi, PostgreSQL

- Built an AI road-defect detection system combining YOLO edge inference, GPS-tagged capture, backend APIs, PostgreSQL, object storage, and a geospatial dashboard; won Drexel Senior Design Championship.

SyncSphere Console | Python, ML Ranking, Event Ingestion

- Built a hackathon-winning ML event recommendation platform using clustering and ranking to personalize HR engagement; won the Wexford Challenge at Philly CodeFest 2025.

EDUCATION

Drexel University | Bachelor of Science in Computer Engineering, Minor in Data Science | GPA: 3.7 | June 2025