Joe Tochka

Boston, MA joe@joet.cc joet.cc LinkedIn GitHub

Summary

Senior full-stack software engineer with experience in healthcare applications, workflow automation, and data visualization. Built AI systems at RAND to search large document collections and support research workflows, alongside independent work on interactive visualizations and data exploration tools. Led and mentored engineering teams at NGP VAN and Philips / Medumo.

Professional Experience

Senior Applications Developer, AI · RAND Corporation *2025 – 2026*

- Designed and deployed production agentic systems: agent loop design, tool use, memory, and orchestration for multi-step reasoning.
- Converted research notebooks into tested production services: restructured code, added automated tests and evaluations, and iterated with researchers on quality.
- Built an LLM evaluation framework: accuracy, relevance, and hallucination tracking with adversarial cases.
- Built production RAG and GraphRAG pipelines: chunking, embeddings, retrieval optimization, and re-ranking across millions of pages; optimized database performance and increased data ingestion throughput 10x.
- Engineered full-stack systems (Python/FastAPI, React) with observability dashboards and LLM cost monitoring, deployed via Docker and CI/CD on Azure.
- Introduced agentic coding tools (Claude Code, Codex) to the department and onboarded the team.

Principal Engineer · Independent Consultant *2023 – 2024*

- Shipped production LLM applications using Claude and OpenAI APIs for document processing, search, and conversational interfaces; validated prototypes directly with clients.
- Delivered solo end-to-end products: distributed Python backends, real-time analytics pipelines, and cloud deployment on AWS/Azure with monitoring and observability.

Senior Software Engineer, Team Lead · Philips / Medumo *2018 – 2022*

- Built healthcare software at Medumo through its acquisition by Philips; owned distributed systems serving healthcare providers under HIPAA requirements.
- Scaled prototypes into production messaging services and front-end tools; improved database performance and data throughput with SQL stored procedures.
- Modernized a legacy monolith into microservices on Azure: reduced latency by 90%, improved throughput and reliability; infrastructure as code with secrets in Azure Key Vault.
- Established CI/CD pipelines and testing frameworks that became team standard. Mentored engineers and led architectural review.

Senior Software Engineer, Team Lead · NGP VAN *2012 – 2018*

- Owned parts of the field-organizing platform and helped build the fundraising platform: applications processing tens of millions of records under strict security requirements for sensitive voter data.
- Led an engineering team, ran agile planning and mentored engineers.
- Built authentication, authorization, and input-validation systems protecting customer data from abuse and unauthorized access.
- Modernized a legacy platform with TypeScript, component architecture, and state management; partnered with the Data Team to optimize SQL queries.

Software Engineer · Boston Technologies *2010 – 2011*

- Built real-time low-latency data pipelines and dashboards for financial trading: live analytics, monitoring, and alerting on production systems.

Software Engineering Co-op · Kollmorgen Electro-Optical *2008 – 2009*

- Built a testing framework for embedded real-time systems (C/C++) on DoD submarine contracts.

Skills

- **Frontend:** TypeScript, JavaScript, React, Next.js, Redux, UI/UX design, Data visualization, D3.js
- **Backend:** Python, FastAPI, Node.js, REST APIs, Microservices, Real-time pipelines, Automated testing (Jest, Puppeteer)
- **Data:** PostgreSQL, MongoDB, Elasticsearch, Neo4j, SQL query optimization, Stored procedures
- **Cloud & delivery:** Azure, AWS, Docker, Terraform, CI/CD, Monitoring & observability
- **AI & automation:** Claude/OpenAI APIs, Multimodal AI (text, vision, voice), Agents & tool use, RAG/GraphRAG, Embeddings, LLM evaluation, Claude Code, Codex, Workflow automation
- **Security:** JWT authentication, Authorization, Input validation, HIPAA systems
- **3D & graphics:** Three.js, Unity (C#), Blender (Python, MCP), Procedural generation, Geospatial data, Canvas, SVG

Education

B.S. Electrical Engineering, Minor in Engineering Management · University of Massachusetts Amherst · 2009