

Aric Camarata

AI Research Engineer

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PROFESSIONAL SUMMARY

Applied AI engineer focused on retrieval and multi-model systems. I build production retrieval-augmented generation pipelines that combine lexical and semantic search with cross-encoder reranking, and design evaluation harnesses to measure quality rather than guess at it.

Twenty years of systems engineering underneath the research: the work ships, runs under real load, and respects data-sovereignty constraints through local inference. Background spans Apple, AT&T, U.S. Treasury, and a decade of principal-level engineering at Unity.

CORE COMPETENCIES

Applied AI Research, Retrieval-Augmented Generation, Hybrid Retrieval, Cross-Encoder Reranking, BGE-M3, Reciprocal Rank Fusion, Embeddings, Vector Search, Multi-Model Routing, Evaluation, Agent Memory, AI/ML, LLM, RAG, Vector Database, pgvector, tsvector, Agent Orchestration, Claude API, OpenAI API, MLX-LM, Qwen3, Hugging Face, MCP, Prompt Engineering, Fine-tuning, Go, TypeScript, Rust, Python, PHP, RAG pipelines, BGE-M3 reranking, RRF fusion, Ollama, Gemini API, PostgreSQL, Redis, Elasticsearch, Hadoop, HBase, Cassandra, GraphQL, Hasura Federation, REST, gRPC, Docker, Nginx, Hetzner VPS, Vercel, Cloudflare, Linux, Next.js (App Router), React, Tailwind CSS

PROFESSIONAL EXPERIENCE

Principal AI Engineer — Unity

Jan 2024 — Present

Fairfax, VA (Remote)

- Designed and built a hybrid retrieval pipeline combining PostgreSQL tsvector full-text search, pgvector approximate nearest neighbor, Reciprocal Rank Fusion, and BGE-M3 cross-encoder reranking — measurably higher recall and precision than either lexical or dense retrieval alone.
- Built a classifier-driven multi-model router across Claude, GPT, and local Qwen3 / MLX-LM models, validated against a 95th-percentile evaluation task set; held quality steady while cutting inference cost roughly 60 percent versus a single-frontier-model baseline.
- Researched and implemented persistent agent memory: summary pyramids (turn / day / week / month) with embeddings and an ltree topic taxonomy, enabling year-old conversation recall and cross-session context.
- Built privacy-first inference: local models handle PII-bearing operations; frontier models are gated by a redaction and secret-detection pipeline, preserving full data sovereignty for regulated workloads.

Principal Software Architect — Unity

Jan 2014 — Jan 2024

Remote

- Founded and led Unity Platforms for a decade, delivering principal-level software architecture to Credit Karma, Walmart Labs, Cigna, Cambium Networks, Progress Software, and CMD.
- Architected Unity Sites — a multi-tenant Next.js (App Router) platform serving Flock, Veterans, FlockTV, and FlockNAS brands from a single codebase; hostname-based middleware with per-tenant feature flags, Hasura RLS, and JWT custom claims enforcing zero cross-tenant data leakage at the schema level.
- Designed distributed event-driven systems on AWS Lambda, DynamoDB, GraphQL Federation, Kafka, and SNS/SQS for financial services and healthcare clients.
- Built nSelf from an internal 200-line deployment script into a full Go CLI deployed across enterprise clients — groundwork for the AI-native platform built from 2024 onward.

Senior Developer — United States Institute of Peace

Apr 2013 — Dec 2013

Washington, DC

- Developed and hardened web applications in C# / .NET / ASP.NET for a federal peace-building institution.
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Led application security hardening — defense-in-depth access controls, credential-stuffing mitigation, and secure session management aligned to federal security standards.

- Delivered full SDLC on compressed government timelines in a zero-tolerance security environment.

Senior Developer — Double Prime

Feb 2013 — Apr 2013

Remote

- Built API-first, headless content architecture using decoupled Drupal — an early implementation of platform patterns that have since become industry standard for high-scale editorial systems.
- Integrated Akamai CDN and Alfresco content management into high-traffic global editorial platforms; developed Perl-based data transformation pipelines for large-volume content migration.

Lead Developer / Architect — Northrop Grumman

Jul 2011 — Feb 2013

McLean, VA

- Architected a real-time big-data pipeline (Hadoop, Hive, HBase, Cassandra) for the U.S. Treasury security operations center — the kind of large-scale data infrastructure that underpins modern ML systems.
- Held active TS clearance (since expired); led a team of 6+ engineers and introduced TDD and CI/CD practices at national-security scale.

Senior Developer — College Board

Apr 2011 — Jul 2011

Reston, VA

- Delivered front-end and application development on the Big Future college search platform (tier-1 national traffic).
- Built feature components on Spring MVC + GWT stack with JSP/JSTL templating.

Senior Developer — Able Engineering

Jan 2011 — Apr 2011

Phoenix, AZ

- Built employee evaluation platform on Spring MVC — form workflows, scoring logic, and admin reporting.
- Delivered full feature set from requirements to deployment on compressed timeline.

Senior Developer — Capgemini

Oct 2010 — Jan 2011

Phoenix, AZ

- Built internal IT management tools on Zend Framework: ticketing system, helpdesk portal, system monitoring dashboard, and on-call rotation tool.
- Worked alongside enterprise consulting team serving large telecom and insurance clients.

Senior Developer — Pearson Education

Jul 2010 — Oct 2010

Chandler, AZ

- Delivered CMS integrations (Drupal, WordPress, Joomla, Mura) for educational publishing platforms.
- Built Genesys/Avaya call-center tooling for customer support operations.

Software Developer — Apple Inc.

Oct 2007 — Jul 2010

Chandler, AZ

- Built and maintained internal enterprise portal and knowledge base systems on Drupal and the LAMP stack, serving engineering and support teams across Apple divisions.
- Developed tools used daily by thousands of internal users — built to the reliability and maintainability standards of Apple's internal engineering culture.

Software Developer — AT&T

Apr 2006 — Oct 2007

Phoenix, AZ

- Led consolidation of call center support tooling as part of the AT&T / SBC AFSS merger initiative — unified NOC, Engineering, and Customer Support teams onto a single AJAX-based platform.
- Early experience with large-scale systems integration, observability tooling, and reliability engineering in a 24/7 enterprise telecom environment.

Manager — Roxbury Group

Feb 2004 — Mar 2006

Fairfax, VA

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Combined branch management and software development for a regional IT services firm — technical leadership alongside operational responsibility from the start of my career.

- Deployed and administered Windows Server networks for SMB clients; built custom inventory tracking and rental management software (C, TCL, PHP) that replaced manual processes and reduced reconciliation time significantly.

19D Cavalry Scout — U.S. Army

Mar 2001 — Feb 2004

Virginia

- Served as 19D Combat Cavalry Scout, U.S. Army.
- Service period included September 11, 2001 and the early post-9/11 operational period.
- Foundational experience in mission-critical decision-making, operational discipline, and leading under pressure.

EDUCATION

Bachelor of Science, Management Information Systems — Belltown University

Jan 2008 — Dec 2011

PA

Full Curriculum — 10 Certifications

freeCodeCamp

Computer Science & Mathematics — Full Library

MIT OpenCourseWare