Matthew Marshall

Software Engineering Leader

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Passionate and detail-oriented software engineering leader with extensive experience in distributed systems, cloud-native architectures, and finance. Skilled in designing and optimizing high-performance systems, leading engineering teams, and delivering critical enterprise solutions. Proven track record in leading complex technical initiatives, implementing scalable architectures, and driving operational efficiency in fast-paced environments. References available upon request.

Experience

SAVVI Financial, LLC — Apr 2025 – Present

Lead Software Engineer — Waltham, MA

- Architect and principal author of aion (~6,200 of 6,450 commits), a declarative, multi-tenant application platform where AI agents are first-class participants under machine-checked contracts, together with the build and deploy substrate it runs on.
- Mechanized the normative specification in Lean 4: a 57-RFC suite reduced to a seven-proposition kernel, with 1,400+ machine-checked theorems across 570 modules covering permission algebra, bitemporal CRDT convergence, safe schema migration, and typed-expression soundness. Proofs run as Bazel test targets, so a spec regression fails CI like any other test.
- Built a Kubernetes-native coding-agent fleet: a Go/kubebuilder operator reconciling Agent, AgentTask, AgentChannel, and HumanPrompt custom resources into resumable, S3-checkpointed runner Jobs, coordinated over NATS JetStream with an MCP tool surface, human-in-the-loop resume, and durable spawn/handoff/merge lineage.

FundGuard, Inc. — Apr 2024 – Feb 2025

Lead Software Engineer — Dedham, MA

- Led the development of a microservices-based portfolio benchmarking engine using gRPC and Protobuf, supporting arbitrarily complex composite index calculations, real-time FX conversion, and flexible fund performance comparisons.
- Developed real-time and scheduled exception controls for money market funds using Kafka, enabling users to configure custom compliance alerts pertaining to cash transactions and expense yield impacts across funds and share classes.
- Designed and implemented the NAV Impact Report, giving users visibility into the effect of accounting events on fund yield and NAV over time with a versioned history.

Lotic Labs, Inc. — Apr 2016 – Apr 2024

Co-founder — Boston, MA

- Directed NSF-funded R&D as PI for two grants (1722276 and 1927042) focused on using symbolic AI and optimization to address climate-based financial risk management. Managed personnel, budgets, timelines, and reporting requirements.
- Designed internal knowledge base of financial and hydrologic data using Apache Jena, crafted ontologies in OWL-DL and demonstrated advanced SPARQL query evaluation capabilities.
- Automated feature engineering using PyData tools to derive descriptive models of customer financial sensitivity to climate.

Education

Massachusetts Institute of Technology — 2010

B.S., Electrical Engineering & Computer Science

Skills

Python Java C# JavaScript/TypeScript Rust Go Lean 4 Kafka NATS Spark Beam Dask BigQuery Pandas TensorFlow PyTorch Scikit-learn Transformers LoRA/PEFT Ollama LangChain MCP Spring Spring Boot Django Flask gRPC Protobuf REST GraphQL RDF/SPARQL Pydantic Zod JSON Schema AWS GCP Azure Docker Kubernetes kubebuilder ArgoCD PostgreSQL Redis Cassandra MongoDB QGIS GDAL/OGR Mapbox Earth Engine Git Maven Bazel Azure DevOps GitHub GitLab Jira