

Todd Hughes

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Summary of Qualifications

- Senior Quantitative Software Engineer and Enterprise Architect with 20+ years of development experience creating secure, stable, mission-critical solutions across financial services, banking, FinTech, healthcare, and publishing industries
- Extensive experience in finance, banking, and FinTech, delivering quantitative analytics solutions for investments banks, with focus on Fixed Income, asset-backed securities (RMBS), ETFs (Exchange Traded Funds), Equities, and Indexes
- Experience in distributed, scalable, cloud-native architectures across the full stack: data pipelines, ETL infrastructure, serverless applications, APIs, backend services, and frontend applications (desktop, web, mobile)
- Proficient in full software development lifecycle (SDLC) and full-stack development using agile methodologies—from requirements analysis and system design to implementation, test-driven development (TDD), CI/CD, and documentation.
- Experience in AI and Machine Learning (ML), developing LLM-backed, Agents using multimodal RAG (Retrieval-Augmented Generation) to enrich knowledge base and increase agentic accuracy
- Skilled Database Administrator (DBA) and data architect with 20+ years strong relational database (RDBMS) and NoSQL data modelling, design, programming, performance tuning, and administration experience

Skills / Technical Profile

- Languages/Standards: C# (20+ yrs), Python (6+ yrs), SQL (20+ yrs), Objective-C, JavaScript, TypeScript, HTML, CSS
- Databases/Warehouses: PostgreSQL, Microsoft SQL Server, Elasticsearch/OpenSearch, Snowflake
- Frameworks/Libraries: NumPy, Pandas, .NET Core, FastAPI, React, Angular, jQuery, TensorFlow/Keras, scikit-learn
- Platforms/Containers: Linux, Windows, MacOS/iOS, Amazon Web Services (AWS), Microsoft Azure, Docker
- Engineering: Solutions Architecture, Distributed Systems, Scalability, Technical Writing, Systems Design, Best Practices

Professional Experience

Senior Quantitative Developer & Technical Lead (London Stock Exchange Group (LSEG))

May 2016 – Present

- Led technical team through code reviews and architectural design best practices. Mentored junior developers, conducted technical interviews with candidates, and advised cross-functional teams on cloud architecture optimization to align with cost goals. Trained quants and data scientists on performance and optimization strategies to meet scalability objectives.
- Built data pipeline for Prepayment Risk Model by engineering complex financial calculations, probability distributions, and statistical measures on historical Fixed Income RMBS data, reducing processing time by 65%. Developed ETL infrastructure using Python and PySpark with AWS Step Functions, Glue, and Lambdas, while using Snowflake for data warehousing.
- Engineered anomaly detection workflow to audit and monitor 20TB+ of historical MBS data for quality and to ensure data integrity for downstream quantitative models. Implemented time series and multivariate statistical analysis using machine learning (ML/AI) with Python and unsupervised algorithms in scikit-learn to identify outliers in high-dimensional datasets.
- Designed and developed low-latency, high-performance cloud-based API delivering ETF, Equity, and Index analytics to Wealth Management Platform with sub-50ms response times. Developed in C# .NET using test-driven development (TDD) principles. Deployed serverless infrastructure on AWS Lambda backed by OpenSearch to ensure scalability and availability.

Co-founder & Lead Engineer (FinRatio)

March 2024 – September 2025

- Co-founded AI-powered financial analytics startup and built complete technology platform. Developed generative and predictive AI solutions for financial performance evaluation, KPI analysis, and forecasting for banking and corporate sectors.
- Built production Agentic AI system using Python with LlamaIndex for multi-agent orchestration. Implemented multimodal RAG (Retrieval-Augmented Generation) pipeline extending foundational LLMs with context-aware knowledge graphs for financial statement analysis. Integrated Arize Phoenix for LLM tracing, evaluation, and observability.

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- Created **low-latency**, FastAPI-based ML inference service deploying TensorFlow/Keras models for financial predictions. Architected serverless deployment using Docker, AWS Lambda, and Amazon ECR, delivering sub-100ms response times.

Co-founder & CTO (Givsee Inc.)

October 2012 – May 2016

- Co-founded FinTech startup and led technology development of **mobile/web** fundraising and payment platform serving nonprofit industry. Partnered with CEO/COO on strategic direction, product roadmap, market positioning, and user experience (UX) design based on competitive analysis and client research.
- Architected and built cloud-based, cross-platform solution: native iOS application (Objective-C), mobile-first responsive web applications (ASP.NET MVC, C#, jQuery, Bootstrap), **RESTful API** with JSON integration, and SQL Server database with Elasticsearch for real-time full-text search capabilities—delivering complete platform from zero to production.
- Built secure donation and payment processing infrastructure using Authorize.Net APIs for online transaction processing (OLTP), implementing atomic transactions with **PCI-compliant** data encryption, SSL/TLS transmission, and secure storage.
- Hired** and **managed** contract developers for Android application, setting technical objectives and delivery timelines. Owned all infrastructure including DevOps, CI/CD pipelines, server administration, database architecture, and IIS/SSL configuration.

Senior Software Engineer & Consultant (Verray Corporation)

March 2010 – October 2012

- Designed and developed job recruiting platform for industry-leading online emergency medicine journal. Integrated **RESTful API** into existing, Joomla-based website using jQuery and JSON. Created **eCommerce** shopping cart using C# and ASP.NET for online purchasing and payment processing.
- Created publishing and distribution platform to launch the first online magazine dedicated to International Emergency Medicine using C# and MySQL. Built public API to facilitate integration with partner websites.
- Optimized **SQL Server performance** for high-volume prescription dispensing system. **Tuned** T-SQL stored procedures, user-defined functions, and triggers to increase throughput and eliminate bottlenecks and deadlocks. Automated remote pharmaceutical drug database updates using SQL Agent Jobs with C# CLR stored procedures and FTP integration.

Senior Developer (Sharp BancSystems, Inc.)

May 2002 – March 2010

- Developed distributed check scanning system (Remote Deposit Capture) integrating with the **Federal Reserve**, image exchange vendors, and banking networks using **multi-tier** C# architecture with .NET Remoting, enabling branches and customers to scan, proof, and balance check items remotely and settle using electronic Image Cash Letter exchange.
- Designed and implemented the **Check Image** data warehouse application automating item exchange and reconciliation between the core accounting and imaging systems. Generated financial data in industry-standard ANSI x9.37 format and Federal Reserve Common Output Format for automated processing.
- Built bank statement application generating OFX (Open Financial Exchange) reports and substitute checks/IRDs (Image Replacement Documents) per x9.90 specification. Architected horizontally partitioned SQL Server databases for scalability and served as **DBA** for all client banks and branches developing maintenance routines and disaster recovery plans.

Education, Credentials, & Professional Development

- Southern Methodist University (SMU) – B.A., Magna Cum Laude (Psychology)
- MIT** – Professional Program in **Machine Learning and Artificial Intelligence**
- AWS Certified **Machine Learning** – Specialty (MLS)
- Microsoft Certified: Azure **AI** Fundamentals
- AWS Certified Solutions Architect Associate
- AWS Certified Cloud Practitioner