

Todd Hughes

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Summary of Qualifications

- **Senior Quantitative Software Engineer** and **Enterprise Architect** with **20+ years** of commercial and enterprise application development experience creating secure, stable, mission-critical solutions
- Extensive experience in **finance**, banking, and FinTech, delivering solutions for commercial and investments banks, with focus on Fixed Income, asset-backed securities (RMBS), ETFs (Exchange Traded Funds), Equities, and Indexes
- 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
- Proficient in **full software development lifecycle** (SDLC) and **full-stack** development using **agile** methodologies—from analysis and design to implementation, testing, deployment (CI/CD), and documentation—both technical and end-user
- Experience in **distributed, scalable, n-tier architectures** using object-oriented design (OOD) principles, with implementations including server-, client-, and API-based applications (desktop, web, mobile)
- Skilled Database Administrator (DBA) and **data architect** with 20+ years strong relational database (RDBMS) and NoSQL data modelling, design, programming, tuning, and administration experience

Technical Profile

- **Languages/Standards:** C# (20+ yrs), Python (6+ yrs), Objective-C, JavaScript (20+ yrs), TypeScript, SQL, HTML, CSS
- **Databases/Warehouses:** PostgreSQL, Microsoft SQL Server, Elasticsearch/OpenSearch, Snowflake
- **Frameworks/Libraries:** TensorFlow/Keras, scikit-learn, NumPy, Pandas, .NET Core, FastAPI, React, Angular, jQuery
- **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 Engineer / Manager (London Stock Exchange Group (LSEG))

May 2016 – Present

- **Led** code reviews and trained team on coding and architectural best practices. **Mentored** junior developers and performed interviews with prospective hires. Advised **cross-functional** teams on optimal cloud architecture and resource selection to align with performance and cost goals. **Trained** quants and data scientists on performance and optimization strategies.
- Created **ML feature engineering** pipeline for Prepayment Risk Model. Used historical Fixed Income MBS agency data to calculate complex probability distributions for model input parameters. Leveraged **Python** and PySpark within AWS Step Functions, Glue Jobs, and Lambdas for robust ETL process, while using Snowflake data warehouses for storage and analysis.
- Engineered anomaly detection workflow using **machine learning** (ML) and **AI** to audit and monitor historical RMBS data quality. Used time series and multivariate statistical analysis, along with an unsupervised learning algorithm, to detect outliers in high-dimensional, evolving big data. Leveraged Python with scikit-learn to optimize model fitting and parameter tuning.
- Designed and developed **cloud-based API** to deliver ETF, Equity, and Index analytics and historical data to Wealth Management Platform. Utilized C# .NET, combined with test-driven development (**TDD**) principles. Deployed to AWS Lambda serverless environment and backed by OpenSearch to facilitate scalability, high performance, and availability.

Co-founder, CTO & Senior Architect (Givsee Inc.)

October 2012 – May 2016

- Architected and developed complete **mobile- and web-based** fundraising and payment platform for nonprofit industry. Worked closely with CEO and COO to create strategic direction and develop product roadmap. Performed market and competitor analysis, as well as client interviews, to combine optimal market fit with an exceptional user experience (UX).

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- **Hired and managed** contract developers to create Android-based version of mobile application. Set development objectives and timeline, while ensuring necessary resources to help team reach goals.
- Developed public-facing websites for donors, customers, and employees using ASP.NET MVC with C#.NET. Used jQuery to assist with cross-browser compatibility and to increase responsiveness using asynchronous requests. Created mobile-first, responsive web design and layout using Bootstrap.
- Created **RESTful API** with ASP.NET MVC that allowed for effective mobile application integration using JSON and allowed for secure transmission of payment transactional data. Integrated online transaction processing (OLTP) with application tier using Authorize.Net CIM and AIM APIs to facilitate payments and provide secure, atomic transactions.
- Developed native iOS/iPhone app using **Objective-C** to consume API. Worked closely with Chief Design Officer to implement UI requirements and created custom UI controls to uniquely enhance product design.
- Designed and implemented backend using Microsoft SQL Server, along with indexed views and stored procedures. Integrated Elasticsearch using NEST to improve real-time, full-text search (FTS) capabilities. Performed entire server, database, IIS, and SSL administration and configuration for websites and API.

Senior Software Engineer & Consultant (Verray Corporation)

March 2010 – October 2012

- Created publishing and distribution platform to launch the first online magazine dedicated to International Emergency Medicine using C# and MySQL. Created public API to facilitate integration with partner websites.
- Designed and developed job recruiting platform for industry-leading journal. Integrated API into existing, Joomla-based website using jQuery and JSON. Created **eCommerce** shopping cart using C# and ASP.NET for online purchasing of ads.
- Created native iOS photography app using Objective-C within Xcode. Managed entire App Store approval process to deliver a globally-sold product.
- Tuned SQL Server **T-SQL** stored procedures, user-defined functions, and triggers for high-speed, high-volume **prescription dispensing system** to increase performance and remove deadlocks. Created SQL Agent Jobs with C# **CLR** stored procedures to automate remote pharmaceutical drug database updates through FTP.

Senior Developer (Sharp BancSystems, Inc.)

May 2002 – March 2010

- Developed business-critical **multi-tier**, distributed check scanning system to facilitate cash letter exchange between the **Federal Reserve**, image exchange vendors, and banks using C# and Remoting. Updated **Remote Deposit Capture** (RDC) application that enabled branches and customers to scan, proof, and balance items.
- Designed and implemented the **Check Image** data warehouse application that fully automated item exchange and settlement between the core accounting and imaging systems. Generated and exchanged data in the financial industry-standard ANSI **x9.37** format and the Federal Reserve Common Output Format (COF).
- Created bank statement application to generate reports based on the **OFX** (Open Financial Exchange) format and substitute checks/IRDs (Image Replacement Documents) based on the x9.90 specification. Utilized a **Service-Oriented Architecture** (SOA) with C# Web Services to provide statements to online banking systems.
- Designed, created, and maintained mission-critical **relational databases** for all client banks and branches. Developed horizontally **partitioned** databases for performance and scalability. Served as SQL Server **Database Administrator (DBA)** to develop maintenance routines and disaster recovery plans.

Additional Experience

Co-founder and Technical Advisor (FinRatio)

March 2024 – September 2025

- Served in advisory and technical role to Founder to deliver AI-powered predictive and generative financial performance solutions to banks and companies. Advised on strategic implementation of cutting-edge technologies.

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- Developed **Agentic AI** solution to evaluate performance metrics of financial statements and KPIs. Utilized LlamaIndex framework for multi-agent orchestration with multimodal **RAG** (Retrieval-Augmented Generation) to extend foundational LLMs with context-aware, dynamic knowledge. Leveraged Arize Phoenix for LLM tracing, monitoring, and observability.
- Created low-latency API using FastAPI with TensorFlow/Keras to serve **ML inference endpoint** for financial predictions. Simplified deployment with **containerization** using Docker, AWS Lambdas, and Amazon Elastic Container Registry.

Head of Digital Business Development (Emergency Physicians International)

May 2012 – February 2018

- Served in an advisory role to the Founder and Publisher to assist in digital business development strategies to increase revenue. Advised on technical and software solutions regarding long-term enterprise architecture.

CTO/Advisory Board (Best Fashion Friend)

June 2013 – July 2015

- Served in an advisory role to CEO to set strategic and long-range plans regarding technology. Acted as a liaison between management team and offshore developers to streamline development efforts and clarify goals.

Education & 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