

RAJ RAI

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EDUCATION

UNIVERSITY OF MASSACHUSETTS

Bachelor of Science, Major in Statistics and Data Science; Second Major in Computer Science

Amherst, MA

2016 - 2020

PUBLICATIONS

Breaking the Knowledge Acquisition Bottleneck for System Health Digital Twins

[Link to paper](#)

R. Rai et al. - **Concepts: LLMs, agentic AI, knowledge graphs, structured output, human-in-the-loop, auditability**

Accepted (Peer-reviewed), Springer Nature conference proceedings (CAC 2026, publication scheduled August 2026).

WORK EXPERIENCE

BYTESCALE LLC

Cromwell, CT

Founder / Software Engineer

Jan 2026 – Present

- Launched [etf-holdings.com](#), a pay-as-you-go distributed REST API for ETF constituent data, which parses issuer websites and SEC data. Launched multiple other SaaS services (see <https://bytescale.io>). Support thousands of users, multiple commercial customers and trading firms, and a growing base of paying customers across the services.
- Providing data engineering consulting services to a multi-location restaurant chain looking to create a cloud-based data lake and Power BI reporting layer for data within various restaurant systems, e.g. payroll, labor, inventory, etc.

QUALTECH SYSTEMS, INC.

Rocky Hill, CT

Principal Investigator / Software Engineer

Mar 2024 – Aug 2026

- Led design and implementation of a **GenAI knowledge-retrieval and reasoning system** for complex technical corpora, achieving an **~80% reduction in engineering hours**, alongside **91% response completeness and 92% correctness** (exceeding human benchmarks) during SME evaluation. Developed and hosted a production web application for evaluation.
- Independently wrote proposals and secured \$150K in funding for the GenAI research contract.
- Designed and implemented solutions for Department of Defense solicitations end-to-end, such as an **AR/VR application (A-Frame / THREE.js)** for immersive training, a **code generator (generated C# code using Node.js)** for Army ATE systems, a **HUMS prototype (LIN, J1939, various sensors; C#, Python)** for naval fleet monitoring, and parts of various **fault management solutions (C/C++/Java EE)** for NASA spacecraft and bases, among others.

INTERLINKZ LTD.

Congleton, UK (Remote from US)

Senior Applications Developer

Sep 2023 – Feb 2024

- Designed and delivered an ASP.NET, React, and Firebase based web application to an early-stage tech startup.

INFOSYS LTD.

Hartford, CT

Senior Associate SAP Consultant

Sep 2021 – Mar 2023

- Supported ticket triage and project management for production SAP systems of a large Infosys client in the energy industry.

PROJECTS

FINANCIAL RESEARCH PLATFORM (<https://bmarker.com/p/rajrai>)

Dec 2020 – Present

- Built a quantitative portfolio analytics platform featuring multi-portfolio benchmarking, risk analytics, drawdown analysis, rolling volatility tracking, and full QuantStats reporting.
- Developed **statistical and machine learning models** for security screening, portfolio construction, risk analysis, and strategy evaluation. Developed **machine learning and data abstractions** to allow for collaborative research.

GAME DEVELOPMENT

Jan 2021 – Present

- Led development and live operation of a multiplayer online game platform with **500+ DAU, 1.3M accounts, hundreds of millions of historical records**, and a distributed team of 10 developers/engineers. Mentored/junior trained developers, led code and design reviews, designed game systems and optimized UX within a desktop game client.

ADDITIONAL

Certifications: AWS Certified Solutions Architect - Associate (exp. Feb 2027)

Programming Languages & Frameworks: Python (Flask, FastAPI, Pandas/NumPy), Java (Spring, Restlet), Node.js (express), React/Next.js, TypeScript, JavaScript, C/C++ (MFC), C#

Data & Infrastructure: MySQL, PostgreSQL, SQLite, AWS, Google Cloud, Azure, Docker, Jenkins, GitLab CI/CD

AI & Technical Methods: Machine Learning, Supervised & Reinforcement Learning, Regression & Optimization, Time Series Analysis, LLMs, Knowledge Graphs, Agentic Retrieval Systems; TensorFlow, scikit-learn, FAISS, OpenAI Gym