VINATHA VISWANATHAN

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EDUCATION

Master of Science in Data Engineering, Northeastern University, Seattle, WA   (2025 – Expected May 2027)
Bachelor of Technology in Chemical Engineering, Anna University, Chennai, India   (2017 – 2021)
- University Rank Holder (2021) & Outstanding CE Merit Scholarship (2018-2020)

WORK EXPERIENCE

Software Engineer at **Citi** (Chennai, India)   (Nov 2022 – Dec 2024)
- **[Real-Time Data Infrastructure]** Built and maintained a high-availability, low-latency backend service, enabling real-time financial data synchronization across global distributed systems.
  - Led the integration of IBM Db2 Analytics Accelerator (IDAA) into Spring Boot microservices, reducing analytical data latency from 2 hours to under 30 minutes, significantly enhancing reporting accuracy.
  - Collaborated with stakeholders to implement Spring State Machine workflow automation to track and recover from failure states, reducing Mean Time to Recovery (MTTR) by 35% and saving 10+ manual hours per week.
  - Designed and deployed an event-driven ingestion pipeline leveraging Apache Kafka, ensuring deterministic message routing, consumer-side fault isolation, and scalable data processing.
  - Integrated JUnit and Mockito test frameworks into Jenkins CI/CD pipelines, achieving over 85% code coverage, ensuring stable builds and preventing regressions.
- **[Internal Developer Platform and Bootstrapping Tools]** Partnered with cross-functional teams to deliver reusable developer tooling that standardized backend service creation and accelerated project onboarding.
  - Developed a Java-based framework with embedded integrations for microservice configuration and logging, reducing setup time by 16-20 engineering hours per project and ensuring compliance with internal standards.
  - Implemented an LRU caching layer to optimize template/config access, reducing latency by 75% for common lookups.
- **[Regulatory Reporting and Financial Compliance Systems]** Automated and optimized regulatory reporting workflows for real-time financial data compliance with monetary authorities.
  - Architected a scalable reporting engine to support hourly treasury report generation, transitioning critical deliverables from end-of-day batch runs to near-real-time pipeline.
  - Designed and implemented a Directed Acyclic Graph (DAG) based report validation workflow to model dependencies between multiple report components, enabling automated traversal and validation of compliance rules, improving error detection accuracy by 50% and reducing manual review time by 20+ hours per week.

Applications Analyst at **Zifo Technologies** (Chennai, India)   (Aug 2021 – Nov 2022)
- **[ELN System Extensions and Automation Frameworks]** Developed and enhanced tools to support pharmaceutical research
  - Built Sapio LIMS plugins to automate structured ELN data entry and validation, reducing manual input by over 40% and cutting experiment setup time by 25%.
  - Devised a modular audit logging subsystem to track granular record changes, enabling secure rollback and compliance-ready change tracking.

PROJECT EXPERIENCE

- **[Realtime Data Streaming Pipeline] [MLH Global Hackathon Challenge]** Developed custom data producers in Java and Python, benchmarking 60K+ and 2K+ records/sec respectively, highlighting trade-offs in concurrency models.
- **[AI/LLM HR Onboarding Assistant] [Citi's Digital Innovation Challenge]** Designed an onboarding assistant using Retrieval-Augmented Generation (RAG) that delivers personalized, real-time role-specific answers by combining vector semantic search with session-aware caching, enhancing contextual response relevance and minimizing redundant queries.
- **[AI/LLM SQL Assistant]** Implemented a Groq LLaMA 3.3-based chatbot that transforms natural language statements into SQL queries, achieving over 85% query accuracy.
- **[AI/LLM MCP based Document Search]** Designed a real-time assistant that dynamically searches the web based on user queries to fetch the latest documentation. Used a custom MCP server with a chatbot client to return accurate, natural language summaries using OpenAI's gpt-o4-mini. Utilized GitHub Copilot as client interface for validating MCP server responses.
- **[Huffman Coding – File Compression & Decompression]** Built a compression tool using priority queues, binary trees, and hash maps for encoding/decoding files achieving around 33% size reduction.
- **[Web Information Retrieval]** Built a lightweight search engine using Java, SQL, and a depth-limited DFS web crawler indexing 100+ pages with 40% lower memory usage compared to BFS.
- **[Credit Card Fraud Detection System]** Used scikit-learn, testing Logistic Regression, KNN, Decision Tree, Random Forest, SVM, and XGBoost on imbalanced transaction data. XGBoost outperformed all models with an F1 score of 0.869 and >90% accuracy, making it the most effective at minimizing false negatives in rare fraud cases.

SKILLS

Programming Languages: Java, Python, SQL, JavaScript, CSS, HTML
Databases: Oracle, PostgreSQL, IBM Db2, MongoDB
AI/ML Frameworks: PyTorch, TensorFlow, scikit-learn, Hugging Face Transformers, RAG, MCP, LangChain
Proficiencies: Data Structures & Algorithms, Object Oriented Programming, Distributed Systems, Multithreaded Programming
Tools & Platforms: Kafka, GitHub, Azure, Docker, JUnit, Mockito, Spring Boot, REST API, Postman, Swagger, Jenkins, Spark