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)

WORK EXPERIENCE

Software Engineer at **Citi** (Chennai, India) (2022 – 2024)

- **Real-Time Data Infrastructure:** Built and maintained a high-availability, low-latency backend system supporting large-scale web applications for real-time financial data synchronization across globally distributed environments.
  - 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 over 35%.
  - 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 LRU caching layer to optimize 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 over 50%.

PROJECT EXPERIENCE

- **EV Adoption Analytics Pipeline:** Designed a scalable data pipeline using Airflow enabling one-time data load automation for 250K+ records. Developed star schema data model in PostgreSQL and built Grafana Dashboards for monitoring trends.
- **Realtime 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.
- **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.
- **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, with query success/failure telemetry logged for iterative tuning.
- **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.

SKILLS

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