

ARVIND NACHIAPPAN LAKSHMANAN

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PROFESSIONAL SUMMARY

AI-focused Software Engineer with experience in software development and AI research, backed by a strong academic foundation in Computer Science spanning high school, bachelor's, and master's studies. Experienced in designing and developing scalable full-stack applications, enterprise APIs, and AI-powered solutions using Large Language Models (LLMs), Retrieval-Augmented Generation (RAG), vector databases, and AI agents. Strong domain expertise in supply chain management, eCommerce, and FinTech, with a passion for combining academic research and industry experience to build intelligent, scalable, and production-ready AI systems.

SKILLS

Programming Languages | Java, Python, JavaScript, SQL

Backend Frameworks | Spring Boot, FastAPI, Node.js, Java Servlets

AI & LLM Engineering | Hugging Face, Ollama, LangChain, LangGraph, Agentic RAG, MCP, LLM Tool Calling, AI Agents, Prompt Engineering, PyTorch, Scikit-learn, Guardrails, LoRA, QLoRA, PEFT, Prompt Injection

Databases & Vector Search | MySQL, PostgreSQL, MongoDB, Vector Databases

Cloud & DevOps | AWS, Docker, Kubernetes, Redis, Jenkins, Travis CI, Nginx, Redis, Apache Kafka

Development & Testing Tools | Git, GitHub, JUnit, OpenAI Codex, Claude Code

EXPERIENCE

Zoho Corporation | Chennai, India

Software Developer

May 2022 - December 2024

- Developed and delivered production features, APIs, and eCommerce integrations connecting Zoho Inventory with **4 major eCommerce platforms: Amazon, eBay, Etsy, and Shopify**, supporting high-volume, multi-channel commerce operations.
- Developed 20+ production features and APIs, supporting **10M+ orders** and **5M+ product** records synchronization, including automated workflows for shipping, invoicing, sales returns, fulfillment, inventory synchronization, and stock updates.
- Worked on **Identity and Access Management (IAM)** systems involving concepts such as **database sharding, database clustering, proxy architectures, caching mechanisms, user identity management, asynchronous processing, and task submission workflows**.
- Identified and remediated **10+ severe security vulnerabilities** and **15+ medium-severity vulnerabilities**, strengthening application security, reducing security risks, and ensuring compliance with security audit requirements.
- Optimized SQL queries, reducing query latency from **350 ms to 180 ms (49% improvement)**, enhancing database performance and application responsiveness.
- Executed large-scale data and metadata migrations involving **millions of records**, developed and implemented multiple data migration scripts to identify and repair corrupted data, and maintained decade-old legacy codebases.
- Represented the engineering team during **Deloitte-led security audits**, coordinated remediation activities, addressed identified security findings, and implemented required fixes to complete the audit process.

Project Trainee

November 2021 - May 2022

- Maintained and enhanced **inventory and sales reporting frameworks**, supporting reporting operations across **millions of inventory records and sales transactions**.
- Diagnosed and resolved **invoice tax calculation defects across 2 regional application versions (EU and India)**, addressing region-specific tax scenarios, improving calculation accuracy, and ensuring compliance with applicable tax requirements.
- Gained hands-on experience with **internal development tools, frameworks, software testing, and product architecture**.

Know - I | Sri Venkateswara college of engineering | Chennai, India

Research Lead

October 2021 - July 2022

- Mentored more than **250** junior students on AI concepts, research methodologies, literature review, and academic research practices.
- Conducted more than **10 literature reviews** and comparative analyses of AI/ML research, identifying technical challenges, research gaps, methodologies, and opportunities for further investigation.
- Conducted research in **Artificial Intelligence and Deep Learning**, resulting in a peer-reviewed research publication in the **International Journal of Computer Science Trends and Technology (IJCSST)**, Volume 10, Issue 4, focused on handwritten Tamil character recognition using Convolutional Neural Networks (CNNs) to classify **156 unique characters**.

Senior Executive Member

July 2020 - October 2021

- Planned and executed technical, academic, and student-development events from concept through completion.
- Coordinated **20 plus workshops, technical sessions, research discussions**, and **student engagement programs** with cross-functional student teams.

EDUCATION

Concordia University | Montreal, QC

January 2025 - August 2026

Master of Engineering (Computer Science)

Relevant courses: Distributed System Design, Software Design Methodologies, Advanced Programming Practices, Software Debugging & Repair, Software Comprehension & Maintenance, Software Project Management, Program & Problem Solving.

Sri Venkateswara College of Engineering | Chennai, TN, India

August 2018 - September 2022

Bachelor of Engineering in Computer Science

Relevant courses: Design & Analysis of Algorithms, Database Management Systems, Computer Networks, Software Engineering, Artificial Intelligence, Machine Learning Techniques, Cloud Computing & Virtualization, Cryptography & Network Security, Computer Architecture, Compiler Design.

PROJECTS AND PUBLICATIONS

Handwritten Tamil Character Recognition Using Deep Neural Networks | [Publication: IJCST](#)

- Developed a deep learning-based handwritten Tamil character recognition system using the Unconstrained Tamil Handwritten Character Database (uTHCD).
- Applied a Convolutional Neural Network (CNN) to classify handwritten images across 156 unique Tamil character classes.
- Co-authored and published the research in the **International Journal of Computer Science Trends and Technology (IJCST)**, Volume 10, Issue 4.

Employee RAG System | Full-Stack AI Application | [GitHub](#)

- **Technologies:** Python, FastAPI, React, TypeScript, LangChain, Hugging Face, PostgreSQL, PGVector, Redis, Docker, REST APIs, LLMs
- **Designed and developed a full-stack Retrieval-Augmented Generation (RAG) system** for employee document intelligence, implementing automated ingestion, data cleaning, overlapping chunking, Hugging Face embeddings, and vector storage using PostgreSQL/PGVector across **7 document formats**.
- **Engineered an advanced hybrid retrieval pipeline** combining semantic search, keyword search, Reciprocal Rank Fusion (RRF), query rewriting, embedding-based reranking, and source diversification to support accurate, context-aware, citation-grounded responses.
- **Built scalable RESTful APIs using FastAPI** with a React/TypeScript frontend, integrating **4 LLM providers (OpenAI, Anthropic, Hugging Face, Grok)**, Redis-backed background processing, concurrency-safe ingestion, and AES-256-GCM encryption for API credential security.
- **Implemented a comprehensive RAG evaluation framework** featuring automated ground-truth generation, LLM-as-a-Judge scoring, Precision@K, Recall@K, NDCG, answer correctness, groundedness, citation accuracy, latency monitoring, and token-cost analytics.