

ELANTHIRAYAN MADHAVAN

Senior Applied AI Engineer

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Portfolio: <https://imelanthirayan.github.io>

Medium: <https://elanthirayan.medium.com>

PROFESSIONAL SUMMARY

Senior Applied AI Engineer with 11+ years of software engineering experience building production AI systems and emerging technology solutions. Hands-on experience across Generative AI, Agentic AI, RAG, model fine-tuning, HPC and cloud-native AI, with a strong focus on experimentation, technical evaluation and scalable deployment. Combines deep engineering experience with an applied research mindset to take AI opportunities from experimentation through to practical, production-ready enterprise solutions.

PROFESSIONAL EXPERIENCE

Shell India Markets Pvt Ltd | 2018 - Present

L&T Technology Services (2018–2023), Randstad India Pvt Ltd (2023–2025), Shell India Markets Pvt Ltd – Direct Employee (2025–Present)

Integrated Emerging Digital Tech Analyst

Generated an estimated USD 18 million uplift through improvements in safety and operational efficiency across oil and gas assets by applying emerging technologies including AI, GenAI, HPC and Spatial Computing.

Key Highlights

- Delivered enterprise AI solutions for engineering and technical knowledge management, including RAG, intelligent document processing, semantic search and multi-agent workflows, alongside LoRA-based model fine-tuning and experimentation.
- Designed scalable cloud-native architectures and production-ready applications using Python, FastAPI, Microsoft Azure, and Azure OpenAI, enabling secure and maintainable enterprise AI solutions.
- Improved large-scale document processing by leveraging High-Performance Computing (HPC) to parallelize extraction, preprocessing, embedding generation, and vector indexing for enterprise-scale workloads.
- Led Digital Twin and Spatial Computing initiatives for engineering and hazard-awareness use cases, including immersive 3D visualization and Apple Vision Pro applications, while exploring OpenUSD for future interoperable 3D workflows.
- Evaluated emerging AI and digital technologies through technical research, hands-on experimentation and PoCs, assessing technical feasibility, limitations and potential enterprise applications.
- Worked closely with business stakeholders, global engineering teams, and technology partners to define solution architectures, evaluate technologies, and successfully deliver enterprise digital transformation initiatives.
- Established reusable engineering frameworks and technical best practices that accelerated AI solution development across multiple enterprise initiatives.

ASM Technologies Ltd | 2017 - 2018

Full-Stack Software Engineer

Developed enterprise web applications, backend services, and immersive XR training solutions for automotive and semiconductor industries, integrating real-time visualization with cloud-based business systems.

Key Contributions

- Developed immersive VR training applications using Unity for automotive and semiconductor assembly/disassembly processes, reducing training time by 65% compared to conventional methods.
- Built interactive ADAS simulation environments, enabling engineers to visualize, configure, and evaluate vehicle systems from multiple perspectives, improving technical understanding by 40%.
- Designed and implemented REST APIs connecting XR applications with enterprise backend systems, enabling secure data exchange and real-time synchronization.
- Developed web-based administration portals for content management, user analytics, and training reporting using modern web technologies.
- Collaborated with cross-functional engineering teams to deliver enterprise XR solutions for manufacturing and industrial training.

Full-Stack Software Engineer

Designed and developed full-stack web applications, real-time collaboration platforms, and cloud-hosted enterprise solutions across education and event management domains.

Key Contributions

- Developed full-stack features for Skilladda and Xucore e-learning platforms, contributing across frontend, backend, database, and deployment.
- Designed and developed a real-time multiplayer event management platform using Node.js, WebRTC, and MySQL, enabling live audience participation at NVIDIA Gamer Connect events across Asia with 95% live quiz participation.
- Built hybrid mobile applications for Android and iOS using Apache Cordova, extending platform accessibility across mobile devices.
- Managed cloud deployments using Microsoft Azure App Services and Azure Blob Storage, supporting scalable application hosting and content delivery.
- Collaborated with stakeholders throughout the software development lifecycle, delivering production-ready web applications using modern full-stack development practices. Technologies: Node.js, PHP, JavaScript, MySQL, Apache Cordova, Microsoft Azure

OPEN SOURCE CONTRIBUTIONS

AI Concepts Playground - Open-source interactive AI learning platform with 100+ hands-on lessons covering LLMs, RAG, MCP, AI Agents, and LLM Architecture. Designed interactive visualizations and browser-based experiments to simplify complex AI concepts for developers. <https://imelanthirayan.github.io/aiplayground/>

Ask-Your-Markdown - AI documentation assistant that uses Google's Open Knowledge Format (OKF) to enable fast, structured question answering over Markdown documentation without relying on a vector database. <https://github.com/imelanthirayan/Ask-Your-Markdown>

MilvusLite_Kit - Built a lightweight Python toolkit simplifying vector database integration for Retrieval-Augmented Generation (RAG) applications. <https://github.com/imelanthirayan/milvuslite-kit>

Chat UI - Developed a configurable AI chat platform supporting multiple LLM providers and extensible backend integrations. <https://github.com/imelanthirayan/ChatUI>

FolderWatcher - Event-driven Python framework that monitors filesystem changes and automates document ingestion workflows for AI and RAG pipelines. <https://github.com/imelanthirayan/FolderWatcher>

FileTracker - Python utility for tracking file changes and triggering automated document processing workflows to support enterprise AI and knowledge management solutions. <https://github.com/imelanthirayan/FileTracker>

RESEARCH & TECHNICAL WRITING

- **Research:** Presented a research paper at IIM Bangalore on Reinforcement Learning for autonomous robotics, developing a 3D synthetic environment where robotic arms learned object grasping and pick-and-place tasks using vision and sensor feedback, with the trained policies designed for deployment to ROS-based robotic systems.
- **Technical Writing:** Published 80+ technical articles on AI, software engineering and emerging technologies through Medium, sharing practical learnings, experiments and technology insights. <https://elanthirayan.medium.com/>

EDUCATION

M.Tech in Data Science and Machine Learning | 2022 PES UNIVERSITY

Master of Computer Applications | 2018 ANNAMALAI UNIVERSITY

TECHNICAL SKILLS

- Applied AI & Agentic Systems: LLMs, RAG, LangGraph, AI Agents, Tool Calling, LoRA, MLflow, Azure AI Foundry, Azure OpenAI, Knowledge Graphs, Neo4j
- Cloud & DevOps: Microsoft Azure, Azure Storage Accounts, Docker, Azure App Services, GitHub Actions, CI/CD, High-Performance Computing (HPC)
- Programming: Python, C#, JavaScript, SQL
- Frameworks: FastAPI, React, Next.js, Node.js
- Spatial Computing & Digital Twins: OpenUSD, Digital Twins, Unity, Apple Vision Pro, XR