Padmanabha Pavan Chandra Vundurthy

AI/ML Engineer

pavanchandra2494@gmail.com |padmanabha.pavan@outlook.com | +91 9182884038 | India

LinkedIn: https://www.linkedin.com/in/pavanchandravundurthy | Github: https://github.com/pavanchandra2494

Professional Summary

Machine Learning Researcher with over 5 years of experience (professional work and academic research) designing and deploying end-to-end ML systems in Computer Vision, Generative AI, and LLMOps. AI/ML Engineer specializing in production-grade Retrieval-Augmented Generation (RAG) systems, agent-based AI workflows, and backend ML services. Hands-on experience building chunking/indexing pipelines, embeddings, reranking, MCP-enabled tools, and evaluation frameworks for grounding and retrieval quality. Strong ownership across APIs, dashboards, observability, and scalable Python-based ML services.

Core Competencies

- **Languages:** Python, C++, JavaScript, R, SQL, Fortran, Matlab
- **ML/LLM**: TensorFlow, PyTorch, Hugging Face, LangChain, LangGraph, CrewAI, AutoGen, PEFT, LoRA, RLHF
- **Computer Vision:** YOLO, MRCNN, SAM, MobileNet SSD, OpenCV
- **MLOps & Cloud:** AWS (SageMaker, EC2, S3), Azure ML, MLflow, Airflow, Docker, Kubernetes, Terraform, GCP (Vertex AI)
- **Vector Databases & RAG:** FAISS, Pinecone, Weaviate
- **Data & Visualization:** Pandas, Numpy, Plotly, Streamlit, Tableau, Matplotlib, ParaView

Professional and Research Experience

Member of Technical Staff – Machine Learning Engineer (Computer Vision, NLP, GenAI)

DeepSkillZ Innovations Pvt. Ltd, Chennai | 1st January, 2023 – 31st July, 2025

- Designed & deployed **end-to-end ML pipelines** on AWS/GCP achieving **40% reduction in inspection costs** in the field of Structural Health Monitoring.
- Developed and deployed **predictive analytics suites** for **non-destructive inspection** and maintenance using **Computer Vision** SOTA models like YOLO, MRCNN, SAM, MobileNet SSD
- Built production RAG pipelines including chunking, embedding generation, indexing, retrieval, and reranking.
- Designed and deployed **RAG** pipelines combining vector databases (**FAISS/Chroma**) with domain-tuned LLMs for technical knowledge retrieval from inspection manuals, reducing hallucinations and improving answer accuracy by 35% on real-time queries.
- Developed multi-tool agents with reasoning, validation, and fallback logic. Built orchestration pipelines using LangGraph/LangChain with step-level tracing.
- Built **agentic AI workflows** with LangChain & LangGraph for document triage achieving **60% effort reduction** for L1, L2, L3 inspectors in non-destructive inspection.
- Built interactive LLM prototypes using Streamlit and integrated models with REST APIs via FastAPI.
- Productionized ML systems using **MLflow & Airflow**, implementing **model monitoring and A/B testing**, integrating CI/CD pipelines for continuous training and deployment.
- Built MCP-enabled services exposing tools and APIs for agent orchestration and secure tool execution.

Consultant – Machine Learning Engineer (Computer Vision, NLP)

Scild Innovations LLC, Sunnyvale, CA (Remote) | 18th April, 2022 – 31st December, 2022

- Developed **real-time image/video analytics** services (100k+ daily inferences) on SageMaker & Vertex AI.
- Deployed scalable ML microservices with **Docker + Kubernetes** (sub-second latency).
- Designed multi-agent orchestration (CrewAI, AutoGen) → **35% throughput improvement**.
- Implemented **streaming inference pipelines** with multimodal detection (speech, image, video).
- Developed custom **NLP models (BERT, GPT-2)** for text classification and summarization tasks in the legal domain.

Graduate Research Assistant – Big Data & Deep Neural Networks

Micro-mechanical Materials Modeling, TU Freiberg, Germany | 1st June, 2019 – 30th September, 2019 & 1st April, 2020 – 2nd July, 2021 (M.Sc. Thesis)

- Built **distributed data pipelines with Hadoop & MPI** to accelerate large-scale materials simulations by **40%**.
- Applied **deep neural networks for inverse fracture mechanics problems**, enabling predictive modeling with improved accuracy.
- Supervised under graduation students in the IMFD(Institute for Mechanics and Fluid Dynamics, TU Freiberg) for developing and optimizing FEM Models.
- **M.Sc. Thesis:** Applied **Deep Neural Networks** titled "Machine Learning Approaches to the Inverse Problem of Identifying Cracks from Electrical Signals in Structural Health Monitoring".

Education

M.Sc. Computational Materials Science

Technische Universität Bergakademie Freiberg, Germany | 12th October, 2017 – 2nd July, 2021

- Awarded **Certificate of Excellence** for outstanding project in Big Data Analysis.
- Recipient of the **DAAD STIBET** Academic Performance Grant.

Integrated Dual Degree - B.E. & M.E. in Mechanical Engineering & Machine Design

Andhra University, Visakhapatnam, India | June, 2011 – August, 2016

- Graduated **top of class** with a cumulative **GPA of 9.14/10**

Professional Certifications

- **Cloud & ML Certifications:** AWS ML Speciality | AWS AI Practitioner | GCP Professional ML Engineer | Azure DP-100
- **Coursera Specializations:** Deep Neural Networks, RAG systems, NLP, OpenCV, Agentic AI

Projects and Thesis

- **Agentic AI for Contract Analysis:** Multi-agent system (CrewAI + LangGraph) for legal text routing & summarization.
- **LLM-powered Enterprise Summarizer:** GPT-4 + LangChain solution achieving **95% validation accuracy**.
- **Real-Time AI Fraud Detection:** Streaming pipeline with Kafka + Spark + XGBoost on GCP (**<500ms latency**).

Languages

English (C1), German (B1), Hindi (Fluent), Telugu (Native)