PANKAJ SHARMA

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PROFILE

Results-driven AI/ML and Data Analytics professional with 5+ years of hands-on experience in building machine learning models, PEFT using LoRA, QLoRA for optimisation, building knowledge graph for deeper analysis, extracting actionable insights from data, and deploying end-to-end data solutions. Proven ability to translate business challenges into data-driven strategies using Python, Pytorch, tensorflow, vectorDB, SQL, and advanced ML algorithms. Skilled in data visualization, predictive modeling, and statistical analysis, using langchain, hugging face models, with a strong foundation in mathematics and computer science. Adept at working with cross-functional teams to deliver measurable impact in real-world applications across finance, healthcare, and e-commerce sectors. Using dockers , containers for devops and LoRA, QLoRa, with PEFT for efficeint utilisation of memory and processing, Retrieval-Augmented Generation (RAG), and Multi-Modal AI Systems with expertise in Amazon SageMaker and S3 for data lakes, Power BI tools for data visualization.

CORE COMPETENCIES

- Artificial Intelligence & Machine Learning (LLMs, RAG, Guardrails, Agentic AI)

- Vector Databases (FAISS, Pinecone) & Knowledge Graphs

- Multi-Modal AI Systems (text, vision, structured data)

- Predictive Analytics & Decision Support Systems

- Railway Safety & Reliability (RAMS)

- Project Planning, Execution & Commissioning

- Cross-Functional Team Leadership & Innovation

- Expertise in Amazon SageMaker and S3 for data lakes

Power BI tools for data visualization

PROFESSIONAL EXPERIENCE

Indian Railways – Deputy General Manager (DGM)
Dec 2013 – OCT 2025

- Spearheaded the first vector database–powered AI system at Indian Railways, enabling real-time retrieval and operational intelligence.

- Designed and deployed an agentic RAG framework with re-ranking, guardrails, and data-leak prevention, ensuring secure and context-aware outputs.

- Integrated structured, unstructured, and IoT sensor data into multi-modal databases for advanced decision-making.

- Led development of predictive maintenance models to forecast accidents, improve asset reliability, and reduce downtime.

- Hands-on in building ML pipelines with Python, PyTorch, TensorFlow, SQL, leveraging LoRA/QLoRA, PEFT, Hugging Face, LangChain, and containerized deployment (Docker, Kubernetes) , Retrieval-Augmented Generation (RAG), and Multi-Modal AI Systems with expertise in Amazon SageMaker and S3 for data lakes, PowerBI tools for data visualization

- Collaborated with finance, healthcare, and e-commerce partners to extend AI solutions beyond railways.

Compro Technologies – Software Developer
Dec 2010 – Dec 2012

- Delivered enterprise-scale web applications using C#, .NET, SQL Server, MySQL, HTML5, jQuery, and Web Services.

- Designed and optimized database backends for high-performance systems.

- Built strong foundations in SDLC, software design, and system integration.

PROJECTS
- Decision Support System: Using RAG and PEFT post trained LLM for creation of decision support system, using 13 departments' data to build a specialized model with evaluation and performance metrics benchmarked to ROUGE and BERT score

- Video Surveillance Systems – Face recognition system for live streamed data using OPenCV and LLM for creation of alerts and seamless integration across 233 stations

- Railway Chatbot (Agentic RAG System) – Built Indian Railways' first agentic chatbot handling 100K+ requests daily; used transformers for embeddings, FAISS HNSW for retrievals, LoRA/QLoRA for efficiency, and guardrails for secure AI interactions.

- AI Decision Support System – Created a vector DB integrating multiple data sources; delivered predictive analytics for accident trends and asset maintenance forecasting.

EDUCATION

- B.Tech, Electronics & Communication Engineering – Ajay Kumar Garg Engineering College, Ghaziabad | 2010 | 80.08%

- XII – KDB Public School, Ghaziabad | 2006 | 81.4% (CBSE)

- X – Ingraham Institute, Ghaziabad | 2004 | 79.8% (ICSE)

GLOBAL CERTIFICATION & TRAINING

- AWS S3, Sagemaker certification

- 18-Months Training, Indian Railways: RRI (German & British), EI (Microlok, Westrace, SIMIS S20), SDH STM, ERTMS L1/2/3, CBTC, GSM-R.

- Equivalent to IRSE Certification eligibility.

KEY STRENGTHS

- AI Solutions Architect & Innovator

- Railway Digital Transformation Specialist

- Strategic Leader with Execution Focus

- Passion for Emerging Technologies

⏺ Ghaziabad, U.P. | Nationality: Indian