AI/ML/Data Science Interview Roadmap & Preparation Strategy

This roadmap is tailored for a professional with 12 years of IT experience and 3 years in Data Science/ML Engineering, preparing for AI Engineer, ML Engineer, and Data Scientist roles in Bangalore. It focuses on end-to-end coverage of concepts, practical skills, and interview preparation strategy.

1. Core Concepts to Master

- Machine Learning Fundamentals: regression, classification, clustering, bias-variance tradeoff, feature engineering.
- Statistics & Probability: hypothesis testing, p-values, confidence intervals, A/B testing, causal inference.
- Deep Learning: CNNs, RNNs, Transformers, attention mechanism, optimization methods (SGD, Adam).
- Generative AI (GenAI/LLMs): RAG, embeddings, fine-tuning, LoRA, hallucination mitigation.
- MLOps & Deployment: ML pipeline design, CI/CD, model registry, drift detection, serving with FastAPI/Docker/Kubernetes.
- Big Data: Spark fundamentals (shuffles, partitions, joins), HDFS, distributed training.
- SQL & Data Handling: advanced joins, window functions, aggregations.
- Python & Libraries: OOP, decorators, generators, Pandas, NumPy, scikit-learn, PyTorch/TensorFlow.
- REST APIs & Django/DRF: API design, authentication, error handling, serializers.
- AI System Design: designing recommender systems, fraud detection pipelines, RAG chatbots.

2. Role-Specific Priorities

- AI Engineer: Focus on DL, LLMs, deployment, scalable APIs, GPU optimization.
- ML Engineer: Emphasize ML algorithms, Spark/SQL, MLOps, scalable real-time pipelines.
- Data Scientist: Strong in statistics, experimentation, SQL, ML modeling, business framing, case studies.

3. 60-Day Preparation Strategy

- Phase 1 (Days 1-20): Refresh ML fundamentals, statistics, SQL. Solve ML case studies.
- Phase 2 (Days 21-40): Deep dive into DL, Transformers, LLMs, MLOps pipelines, deployment.
- Phase 3 (Days 41-60): Mock interviews, AI system design practice, Kaggle/real datasets, end-to-end project demos.

4. Mock Interview Preparation

- Solve coding problems in Python (LeetCode/Easy-Medium) focusing on DS/Algo relevant to ML.
- Practice SQL case studies (business questions with window functions).
- Build a portfolio with 2–3 end-to-end projects (GenAI chatbot with RAG, recommender system, ML pipeline with MLOps).
- Simulate AI system design interviews (whiteboard end-to-end architecture).

5. Key Takeaways

For Bangalore companies, expect interviews to cover ML theory, DL/LLMs, MLOps, Spark/SQL, deployment, and strong business understanding. Prioritize role-specific areas but maintain a balanced foundation.