Zero to AI Agent Expert Roadmap Syllabus

A 21-Week Learning Path by @DATASCIENCEBRAIN

Overview

This syllabus outlines a 21-week roadmap to becoming an AI Agent Expert. It starts with foundational concepts in generative AI and progresses to advanced topics like Retrieval-Augmented Generation (RAG) systems. Each week focuses on a specific skill or topic essential for building and mastering AI agents.

Syllabus Breakdown

Weeks 1–2: Introduction to Generative AI

- Understand the fundamentals of generative AI.
- Explore key concepts, models, and applications.
- Study the history and evolution of generative AI technologies.

Week 3: Build Your First No-Code Agent

- Learn to create AI agents using no-code platforms.
- Experiment with tools like Bubble, Zapier, or similar platforms.
- Build a simple AI agent for a practical use case.

Weeks 4–5: Basic Coding for AI

- Introduction to programming for AI (Python basics).
- Learn essential libraries: NumPy, Pandas, and Matplotlib.
- Write simple scripts to interact with AI models.

Weeks 6–7: LLM Essentials

- Study Large Language Models (LLMs) and their architecture.
- Explore popular LLMs like GPT, BERT, and their applications.
- Understand tokenization, embeddings, and fine-tuning.

Week 8: Prompt Engineering Essentials

- Learn the art of crafting effective prompts for LLMs.
- Experiment with prompt design for various tasks (e.g., text generation, Q&A).
- Analyze best practices for optimizing model outputs.

Weeks 9–10: LangChain Basics

- Introduction to LangChain framework for building AI applications.
- Learn to integrate LLMs with external tools and memory.
- Build a simple LangChain-based application.

Weeks 11–12: RAG Systems Essentials

- Understand Retrieval-Augmented Generation (RAG) systems.
- Learn to combine retrieval mechanisms with generative models.
- Implement a basic RAG system for improved AI responses.

Week 13: Introduction to AI Agents

- Explore the concept of AI agents and their roles.
- Study different types of AI agents (e.g., reactive, deliberative).
- Analyze real-world applications of AI agents.

Weeks 14–15: Agentic AI Design Patterns

- Learn design patterns for building agentic AI systems.
- Study agent coordination, decision-making, and autonomy.
- Implement a simple agentic AI system.

Weeks 16–17: Build an AI Agent from Scratch

- Design and develop a fully functional AI agent.
- Integrate LLMs, LangChain, and agentic design patterns.
- Test and refine the agent for a specific use case.

Weeks 18–19: Build Advanced Agentic AI Systems

- Explore advanced techniques for agentic AI systems.
- Implement multi-agent systems and collaboration.
- Optimize agents for scalability and performance.

Weeks 20–21: Build Advanced RAG Systems

- Deep dive into advanced RAG system architectures.
- Enhance retrieval mechanisms with vector databases (e.g., Pinecone, FAISS).
- Build a production-ready RAG system for real-world applications.