**datasciencedojo**
— data science for everyone —

# Agentic AI Bootcamp

Learn to build enterprise-grade agentic ai applications

# Course Overview

The Agentic AI Bootcamp by Data Science Dojo is an 8-week, hands-on program designed to teach professionals how to build intelligent, autonomous AI agents capable of reasoning, planning, and acting with minimal human input. Through a blend of live sessions and practical projects, participants will gain deep expertise in context-aware LLM application development, vector databases, multi-agent system design with LangGraph, and agentic workflows. The curriculum also covers agent communication protocols, interoperability, observability, and modern design patterns like ReAct and Reflection. Taught by leading experts from top AI organizations, the bootcamp equips developers, data scientists, and engineers with the tools and knowledge to create production-ready agentic AI applications.

# Learning Outcomes

- Understand the foundations of agentic AI and how it differs from traditional chatbot systems.
- Design and implement LLM-powered agents capable of reasoning, planning, and tool use.
- Use prompt engineering techniques to structure multi-step reasoning and decision-making processes.
- Integrate external tools and APIs through function calling, tool routing, and dynamic execution.
- Leverage orchestration frameworks such as LangChain, LangGraph, and CrewAI to build modular agent pipelines.
- Build agents with memory and state awareness using vector databases and stateful loops.
- Evaluate and debug agent behavior using tracing, observability tools, and performance metrics.
- Deploy end-to-end agentic applications that can interact with users, environments, or systems in real time.
- Identify and mitigate risks in autonomous systems, including safety, alignment, and hallucination handling.
- Translate business workflows into intelligent agentic systems for automation and augmentation across domains.

# What you will learn

## The program will enable you to:

- Context-Aware LLM application development
- Introduction to vector databases
- Multi-Agent system design with LangGraph
- Agentic AI workflows and node-based execution
- Agent communication and interoperability
- Agentic design patterns: ReAct, Reflection, CodeAct
- Observability and monitoring of agentic workflows

In today's AI-driven world, leaders who understand how to harness agentic workflows are better positioned to drive transformation, enhance productivity, and maintain a competitive edge. By mastering the principles of agentic AI, professionals can unlock new levels of automation and decision-making across business functions.

The Agentic AI Bootcamp offers a practical and strategic foundation in building AI agents using tools like LangChain and OpenAI. It covers planning and designing agent workflows, integrating APIs, deploying autonomous agents, and exploring real-world use cases—all while addressing key considerations such as evaluation, reliability, and scalability for enterprise environments.

## Raja Iqbal

*Founder at* **Ejento AI**, *Founder at* **Data Science Dojo**

# Program Highlights

**Building Context-Aware LLM Applications and MCP**
Use components like Model I/O, loaders, memory, and retrieval chains to develop applications that retain and use context effectively.

**Vector Databases**
A comprehensive introduction to vector databases

**Multi-Agent Applications**
Build collaborative agents using tools and LangGraph to handle complex, multi-step tasks dynamically.

**Agentic Workflow Fundamentals**
Explore LangGraph's node-based workflows, async execution, and memory-aware agent routing.

**Agentic Design Patterns**
Implement reusable LLM behavior patterns like ReAct, Reflection, and CodeAct for dynamic reasoning and action.

**Interoperability of Agents**
Understand how agents communicate and collaborate across platforms like Google A2A and others for seamless orchestration.

**Observability and Monitoring**
Track, debug, and evaluate agent behavior and LLM performance using robust observability tools.

# Learning Journey

The Agentic AI Bootcamp offers a comprehensive, hands-on introduction to building such LLM-powered autonomous agents. By the end of this bootcamp, you'll be equipped to design, build, and deploy advanced agentic systems tailored to real-world tasks and business needs.

# Core Modules | 8 Weeks

## Building Context-Aware LLM Applications and MCP

Learn how to create intelligent applications that maintain context over time using LLM-specific tooling and architecture.

**Key Topics:**
- Understanding Model I/O: prompts, responses, parsers
- Retrieval chains using loaders and retrievers
- Implementing memory: buffer memory, summarization memory, vector-backed memory
- Combining modules into coherent, state-aware workflows
- An Introduction to model context protocol
- Hands-on exercises on module topics

## Vector Databases

Learn about efficient vector storage and retrieval with vector database, indexing techniques, retrieval methods, and hands-on exercises.

- Rationale for vector databases
- Vector search, text search, hybrid search
- Product Quantization (PQ), Locality Sensitive Hashing (LSH) and Hierarchical Navigable Small World (HNSW)
- Retrieval: Cosine Similarity, Nearest Neighbor Search
- Relevance scoring in hybrid search using Reciprocal Rank Fusion (RRF)
- Using auto-cut feature to remove irrelevant results dynamically
- Improving search relevance by using language understanding to re-rank search results
- Challenges: Scaling optimization. Reliability optimization. Cost optimization
- Hands-on exercise on similarity search, hybrid search, vector compression, generative search and semantic caching.

## Multi-Agent Applications

Build distributed, multi-tasking agents that collaborate to perform complex actions using tools, task routing and modular workflows.

**Key Topics:**
- Introduction to tools, agents and autonomous behavior
- Tools for building multi-agent systems (LangChain agents, toolkits)
- Designing task-specific agents (e.g., planner, executor, summarizer)
- Communication protocols between agents
- Hands-on: Create a multi-agent system for a business use case

## Agentic Workflow Fundamentals

Dive into LangGraph's orchestration engine to create structured workflows, decision trees, and looping behaviors.

**Key Topics:**
- Graph-based orchestration models
- A Practical Guide to Coordinated LLM Agents Using LangGraph: Nodes (functions or agents), Edges (data/control flow), Cycles (iteration, self-correction), State
- Add memory or context passing between agents
- Node-based task design
- Async vs sync execution in agentic flows
- Conditional routing and stateful transitions
- Integrating memory into LangGraph workflows
- Hands-on exercises using LangGraph

## Agentic Design Patterns

Implement advanced reasoning and decision-making patterns that enable LLMs to plan, reflect, and act intelligently.

**Key Topics:**
- ReAct (Reason + Act) framework
- Reflection: self-checking and improvement
- CodeAct: write + execute code dynamically
- Combining patterns into flexible agents
- Use cases: coding agents, research agents, evaluators
- Hands-on exercises on building ReAct, Reflection and CodeAct agentic workflows

## Interoperability of Agents

Learn how to make agents interoperable across platforms, tools, and APIs for broader AI orchestration.

**Key Topics:**
- Google A2A (Agents-to-Agents) overview
- Cross-agent communication architecture
- Creating API-ready agents
- Token hand-off strategies across multiple LLMs
- Building language-agnostic agent endpoints
- Hands-on: Deploy agents that call and respond to each other

## Observability and Monitoring

Establish robust monitoring to understand agent behavior, debug workflows, and ensure safety and reliability in production.

Key Topics:
- Logging and tracing agent decisions
- Callback mechanisms in LangChain & LangGraph
- Tracking token usage, latency, success rate
- Visual debugging of agent flows

**Hands-on Exercise:**
- Add observability to your agent workflow

# Instructors and guest speakers

Learn from though leaders at the forefront of building agentic AI applications

## Raja Iqbal

*Founder at **Ejento AI**, Founder at **Data Science Dojo***

**Luis Serrano**

Founder, Serrano Academy

**Sebastian Witalec**

Director of Developer Relations, Weaviate

**Zain Hasan**

Senior DevRel Engineer, Together AI

**Kartik Talamadupula**

Head of AI, Wand AI

**John Gilhuly**

Head of Developer Relations, Arize AI

**Sage Elliot**

AI Engineer, Union AI

**Hamza Farooq**

Founder, Travesaal AI

# Loved by customers and partners

More than **10,000 working professionals** have gone through our training program and recommend us.

"Partnering with Data Science Dojo aligns with our mission to make Data Science accessible. Their bootcamps contribute to safe AI deployment education."

**- ALESSYA VISNJIC**
CEO & Co-founder, WhyLabs

"LLM Bootcamp provides hands-on experience with expert instructors, a comprehensive framework, and extensive resources for substantial upskilling."

**- BURNARD TUMANJONG**
Cheif, Operations Analysis, USA Airforce

"Collaborating with Data Science Dojo nurtures the next generation of LLM Developers commendable for fostering a dedicated creator community."

**- HARRISON CHASE**
CEO & Co-founder, LangChains

"The bootcamp exceeded my expectations, offering comprehensive trainings for both beginners, and experienced data scientists. Highly recommended for all!"

**- SHAKEEB SYED**
Data Scientist, Nationwide

"The bootcamp helped me fill the gap between academia and industry, offering insightful talks and practical problem-solving exercises."

**- YASHWANTH REDDY**
AI Leader, Fidelity Investments

"The bootcamp accelerated my text analysis skills by engaging in-person experience, industry insights, and valuable hands-on learning. Highly recommended!"

**- FLORIAN KLONEK**
Senior Lecturer, Deakin University

"Data Science Dojo's LLM bootcamp provides exceptional, hands-on initiation into LLMs & practical applications. A deep dive into the subject with theoretical knowledge, is highly recommended."

**- JEFF FONG**
Principal Product Manager, HOVER Inc.

"This bootcamp provided great content, equipping me with skills and confidence for efficient job execution. Enjoyable class and projects, a rewarding decision."

**- LUIS ARMANDO M**
Sales and Services Manager, RAISA

"The LLM Bootcamp offered an enlightening, well-structured learning experience, invaluable networking, & profound insights into real-world AI challenges. Highly recommend Raja's teaching approach."

**- AMITY FOX**
Data Scientist, 343 Industries

"Instructors simplified complex topics effectively. Hands-on learning enhanced my LLM understanding. Intensive but immeasurable rewards. A robust foundation gained in just five days."

**- FATEMEH SHAH-MUHAMMADI**
Research Assistant Professor, University of Utah School of Medicine

"A rewarding opportunity to help students of all backgrounds learn new techniques. Being part of a passionate and caring data science community was a real privilege."

**- SAGE ELLIOT**
AI Engineer | ML Ops & Robotics, WhyLabs

"The effort in providing resources was commendable. Teachers and assistants were helpful, making it one of the best courses. I learned a lot for future use."

**- FAHAD ALSWAINA**
Senior Data & Model Solutions Associate, KAPSARC

"Six months of course material access post-training is valuable. Instructors ensure success, making it a top-notch learning experience in AI."

**- ABRAR BHUIYAN**
Supervisor Software Application Engineer, ICF

"Top-notch speakers, hands-on workshops, and networking make it a wonderful tech experience. Raja's in-depth teaching focuses on learning concepts."

**- KEVIN SONG**
Software Engineer, ICF

"Outstanding collaboration on the LLM Bootcamp. Comprehensive curriculum in generative AI, prompt engineering, and data retrieval. Excited about practical training opportunities."

**- TAIMUR RASHID**
Advisor, Weaviate

"Seamless navigation, invaluable hands-on exercises, and well-structured technical aspects for optimal, cost-effective results. Highly recommended for practical LLM knowledge."

**- MARYAM BAGHERI**
Senior Data Scientist, Deloitte Business

"Comprehensive curriculum for in-depth understanding, seamless hands-on learning with cloud-based tools, and insightful talks by industry experts. Highly recommended."

**- JARED MILLER**
Software Development Manager, Gursey

"Outstanding boot camp, engaging discussions on coding and data security. A valuable and refreshing experience, recommended for advancing data science skills."

**- KSHITIJ SINGH**
Machine Learning Lead, Trade Union

"Explored Data Science Dojo's LLM Bootcamp, gaining confidence with a comprehensive understanding. In-person experience, insightful instructors, and diverse insights."

**- VICTOR GREEN**
Dev-Ops Engineer

"LLM Bootcamp surpassed expectations, bridging theory with practical examples. Engaging with cohorts, invaluable insights, and balanced intensity elevated understanding. Highly recommended for language models."

**- KEN BUTLER**
Solutions Architect, ICF

"LLM Bootcamp enriched my understanding of the language-tech intersection. Collaborating with peers was wonderful. Sophie DA's insightful presentation on practical applications is recommended for foundational knowledge."

**- ERIKA DAVIS**
Senior Business Reporting Analyst, Starbucks

"LLM Bootcamp shifted my problem-solving approach, sparking creativity with limitless applications. Highly recommended for anyone building their toolkit, fostering creativity in problem solvers, & providing invaluable insights for diverse applications."
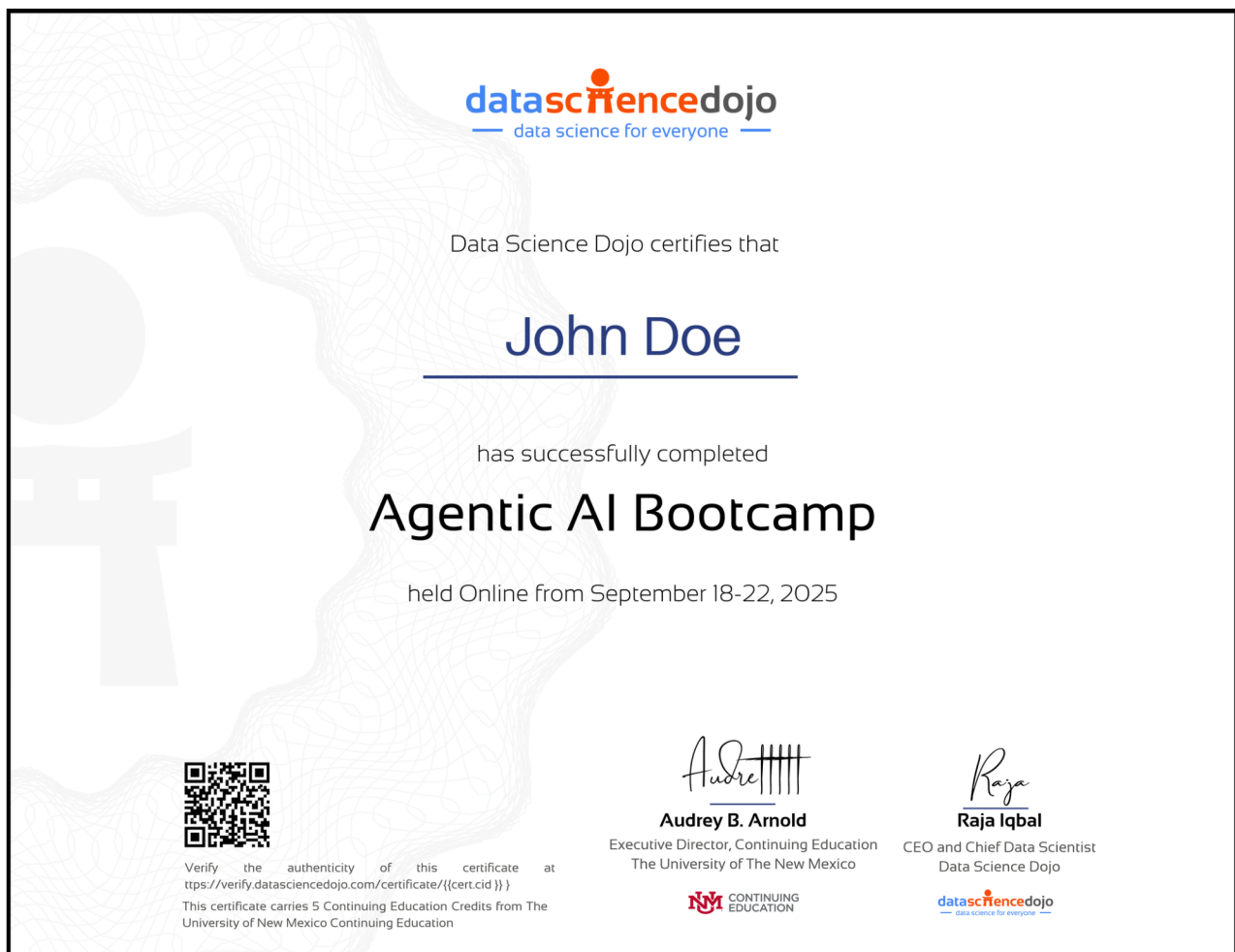
**- AISHWARIYA RAMAN**
Senior Software Engineer, Microsoft

# Certificate

Upon successful completion of the Agentic AI Bootcamp, participants receive a verified certificate with 3 CEUs, carrying the same benefits of recognition, validation, and shareability.



**datasciencedojo**
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Data Science Dojo certifies that

## John Doe

has successfully completed

## Agentic AI Bootcamp

held Online from September 18-22, 2025

**Audrey B. Arnold**
Executive Director, Continuing Education
The University of The New Mexico

**UNM CONTINUING EDUCATION**

**Raja Iqbal**
CEO and Chief Data Scientist
Data Science Dojo

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Verify the authenticity of this certificate at ttps://verify.datasciencedojo.com/certificate/{{cert.cid }} }
This certificate carries 5 Continuing Education Credits from The University of New Mexico Continuing Education

Note: Upon successful completion of the bootcamp, your verified digital certificate will be emailed to you using the name provided at registration. Certificate designs are for illustrative purposes only and may be subject to change at the discretion of The University of New Mexico Continuing Education and Data Science Dojo.

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Data Science Dojo is collaborating with The University of New Mexico Continuing Education to offer a portfolio of high-impact bootcamps. These programs combine Data Science Dojo's expertise in practical AI and data science training with the academic excellence and credibility of a leading public university.

Schedule a call with an advisor to learn more.

You can apply to the program here

**Email:** help@datasciencedojo.com
**Phone:** +1 (877) 360-3442

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