

Training Program: Agentic AI - LangGraph and MCP on Azure

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DESCRIPTION OF THE TRAINING:

Generative AI has transformed the way we interact with language models.

The next step is to make these models autonomous: capable of reasoning, using tools, and interacting with external data sources to accomplish complex tasks.

This is the principle of agentic AI.

This two-day course allows participants to understand the fundamentals of agentic AI, build an agent with LangGraph connected to an MCP server, and make it accessible via a Gradio interface deployed on Azure.

EDUCATIONAL OBJECTIVES:

At the end of this training, participants will be able to:

- Explain the principles of agentic AI and identify its added value compared to generative AI Classic conversational
- Design and Develop an Agent with LangGraph and Microsoft Foundry
- Implement Model Context Protocol (MCP) by connecting an agent to a server MCP
- Integrate a Gradio UI with an Agent
- Deploy an Agentic application on Azure

TEACHING METHODS AND METHODS:

- This training will consist of theory and technical workshops that will allow you to be quickly operational.
- Material: A course material will be given to participants in electronic format.
- Evaluation: The achievements are evaluated throughout the training by the trainer (regular questions, practical work, MCQs or other methods).
- Satisfaction: at the end of the training, each participant answers an evaluation questionnaire which is then analysed with a view to maintaining and improving the quality of our training.
- Follow-up: a sign-in sheet is signed for the half-day by each of the participants.

TRAINING PROGRAM:

Understanding agentic AI and why it's the "next step"

- Situating agentic AI in the continuity of generative AI: from chatbots to autonomous agents.
- Understand the limits of the classical conversational approach and what the agentic brings.
- Discover the fundamental concepts: reasoning, planning, use of tools, agentic loop.
- Explore the ReAct (Reasoning + Acting) pattern and how it works.
- Ecosystem overview: LangGraph, Semantic Kernel, AutoGen, CrewAI.

Discover LangGraph and build a first agent

- Understand the architecture of LangGraph: graphs, nodes, states, and transitions.
- Learn about the role of Azure OpenAI as an agent reasoning engine.
- Build a first LangGraph agent with Azure OpenAI capable of using simple tools (search, calculation).

Enriching your agent: memory and robustness

- Add conversational memory and checkpointing to an agent.
- Understand the human-in-the-loop principle for sensitive actions.
- Manage errors and edge cases in the agentic loop.
- Enrich the agent of the previous lab with memory management and human validation on certain actions.

Understanding the Model Context Protocol (MCP)

- Discover MCP: origins, objectives and positioning in the agent ecosystem.
- Understand the MCP architecture: Host, Client, Server and the primitives (tools, resources, prompts).
- Identify use cases: Connect an agent to data sources, APIs, or documentation.
- Check out the Microsoft Learn MCP server as a real-world example.

Connect your agent to an MCP server

- Connect the LangGraph agent to the MCP server in the Microsoft Learn documentation. The agent becomes able to search and synthesize technical documentation to answer questions.
- Test, iterate, and refine agent behavior when faced with different types of queries.

Integrate a Gradio interface and deploy on Azure

- Learn about Gradio and its integration with AI agents.
- Understand the deployment architecture provided: FastAPI server, Gradio, Docker containerization, Azure Container Apps.
- From a provided repository (FastAPI server, Dockerfile, CI/CD pipeline, Terraform), integrate the agent developed during the training to the Gradio interface, customize the interface by following the Gradio documentation, and then deploy the whole thing to Azure.

PREREQUISITES:

The candidate for this training must have knowledge of generative AI (how an LLM works, notions of tokens, distinction between classic AI and generative AI). A working knowledge of Python is also required.

The course materials and practical work are in English. A B1 level of English is recommended, find the language levels on this link: [Classification of language levels](#).

DURATION: 2 days (14 hours)

CONTACT PERSONS: Developers, AI engineers, data engineers, data scientists, technical architects, MLOps engineers.

LEVEL: Intermediate