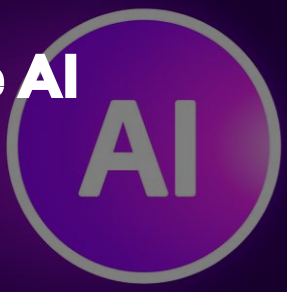
Unit 2 - Generative AI



Unit 2
Generative AI

2.1 Unit Introduction

Welcome to the second unit of the AI Fundamentals course!

In this unit, you will learn about generative AI (GenAI), one of the most used AI technologies today.

You will learn:

- what is generative AI
- how it works
- where it can be used

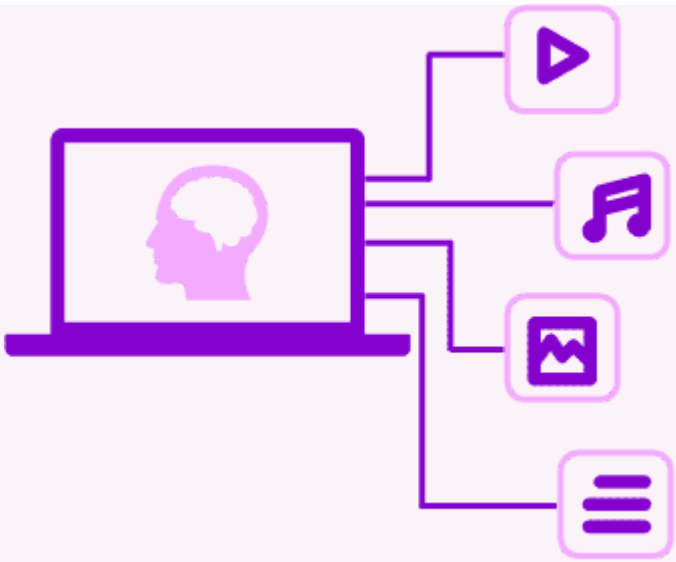
Let's start!

Continue to 2.2: What is generative AI?

2.2 What is generative AI?

Generative AI or **GenAI** is a category of artificial intelligence that creates new content, such as text, images, audio, and video.

GenAI uses deep learning algorithms to recognize patterns from large datasets and **generates content based on user prompts or requests**.



It’s the technology behind tools like ChatGPT or Gemini.

Continue to 2.2.1: How is text generated?

2.2.1 How is text generated?

Let's focus on text generation.

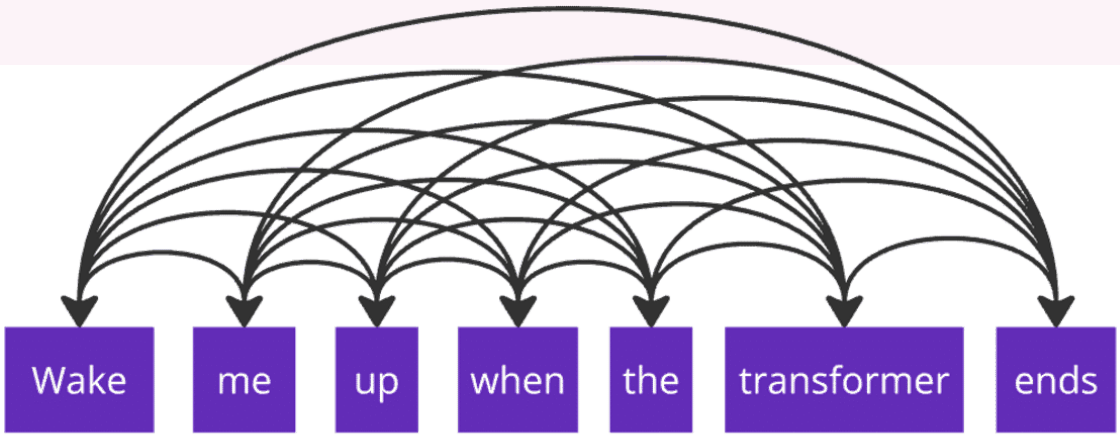
It begins with unsupervised and supervised learning, where models, such as **Large Language Models (LLMs)**, are trained on vast datasets that include examples of text, images, audio, video or code.

> During training, LLMs break down text into smaller parts, called **tokens**, and then predict the most likely words to follow based on the context.
>
> They do this using a technology called **transformers**, which helps them understand the relationships between different parts of the data, like how words fit together in sentences. The models that use the transformer are called **GPT** (Generative Pre-trained Transformer) models.

🔑 **Key Concept**

A **transformer** is a type of neural network used in machine learning, especially for **understanding language**. It's designed to process data like sentences by focusing on different parts of the input using an **attention mechanism**.

It is a technique that allows transformers to **look at all words in a sentence at once** instead of one by one, helping them understand context more effectively. This design is the foundation for many advanced AI models, like **Large Language Models (LLMs)**, which use transformers to understand and generate human-like text.



Once trained, these models can generate **new** content by predicting what should come next **based on the patterns they've learned**.

In the next course you will learn about this in more detail.

Continue to 2.2.2: GenAI application

2.2.2 GenAI application

GenAI can be used in various contexts, with thousands of tools available for each application. Here you will explore some examples that highlight GenAI's broad potential.

- Content creation
- Personalization
- Extraction and analysis
- Transcription and translation
- Matching
- Code generation

Content creation

1

Content creation

Text Generation

Writing articles, blog posts, and marketing content.

Image Generation

Creating original artwork or product images.

Music Composition

Composing new songs or soundtracks.

Video Generation

Generating animations of promotional videos.

Personalization

2

Personalization

Chatbots

Enhancing customer service with conversational agents.

Personal Assistants

Providing personalized responses and recommendations.

Recommendation systems

Suggesting products, music, or content based on user preferences.

Tailored marketing

Creating personalized marketing messages for users.

Extraction and analysis

3

Extraction and analysis

Text Summarization

Condensing long articles or

Data Extraction

Pulling specific information

reports into key points.

from large datasets.

Data Analysis

Extracting insights from large datasets and presenting them.

Transcription and translation

4

Transcription and translation

Speech Recognition

Converting spoken language into text.

Language Translation

Translating text from one language to another.

Matching

5

Matching

Applicant-job Matching

Identifying candidates whose

Company-segment Matching

Identifying the best market

skills align with job requirements.

segments for a company's products or services.

Code generation

6

Code generation

Code Completion

Assisting developers by suggesting code snippets.

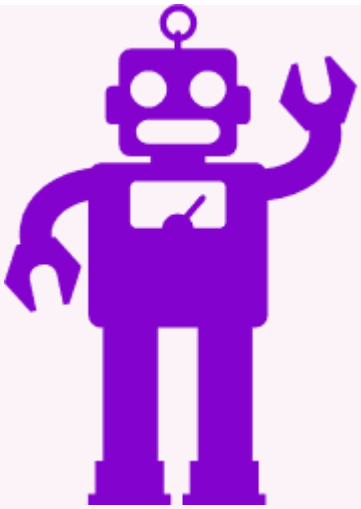
Automated Testing

Generating test cases for software applications.

Continue to 2.2.3: AI agents

2.2.3 AI agents

AI agents use GenAI to go beyond just generating content, they can act, make decisions, and carry out tasks autonomously.



An AI agent is a system that **works on its own** to observe its surroundings, make decisions, and take actions to reach a goal. AI agents are designed to **perform tasks or make decisions without direct and continuous input from the user**.

AI agents leverage GenAI to generate responses, analyze data, and make decisions, allowing them to perform tasks independently. AI agents have various applications, such as virtual assistants, customer service chatbots, and autonomous vehicles.

Think of a janitor who works independently to keep the school clean and organized.

You will learn more about AI agents in the AI agents course in this learning path.

Continue to the wrap up for this unit

2.3 Wrap up

1

Generative AI (GenAI) is a type of AI that **creates new content such as text, images, audio, and video**. It's used for content creation, personalization, extracting and analyzing information, transcription and translation, matching data, and even generating code.

2

GenAI **learns patterns from large datasets** using deep learning and transformers. It **breaks data into smaller parts**, **understands the relationships between them, and then predicts what comes next** to generate content based on user prompts.

3

AI agents use GenAI to analyze information, make decisions, and carry out tasks independently.

Unit complete!

Well done!

You have completed the AI Fundamentals course!

In the next course you will dive deep into how GenAI works by focusing on LLMs.

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Mark this task complete to continue to the next unit.