Essentials of Generative AI

Getting Started with GenAI

Engage and Think

Why do you think generative AI is causing such a disruption across various industries when AI technology has been around for years?

Learning Objectives

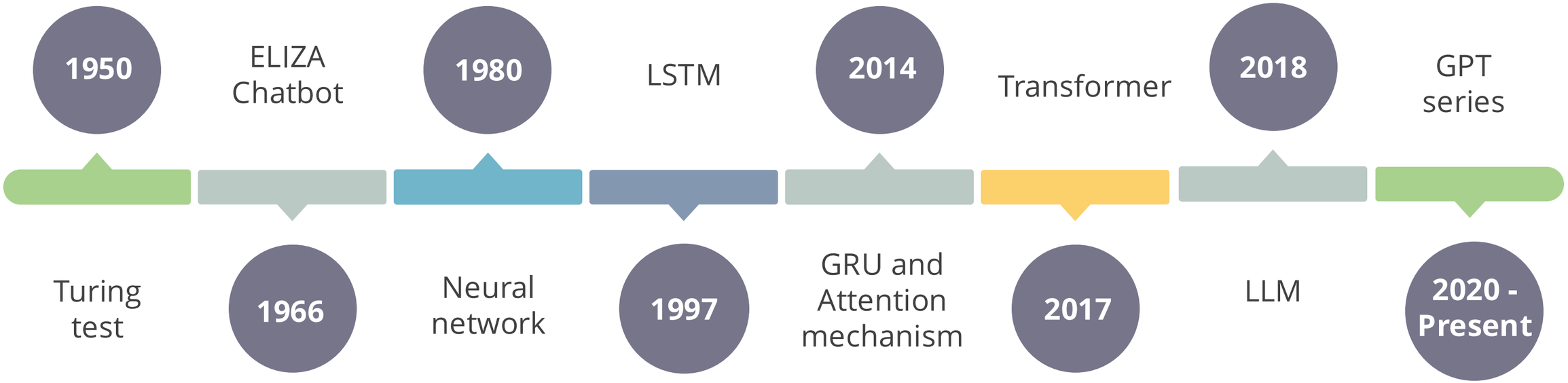
By the end of this lesson, you will be able to:

- Identify the applications of GenAI in solving real-world problems
- Create prompts to communicate effectively with Gen AI tools for desired outcomes
- Apply GenAI tools to create personalized documents such as resumes or conduct research
- Use powerful GPTs, such as Write For Me, Canva AI, DesignerGPT, Consensus, and Universal Primer, to explore diverse Gen AI capabilities for various tasks

Introduction to Generative AI

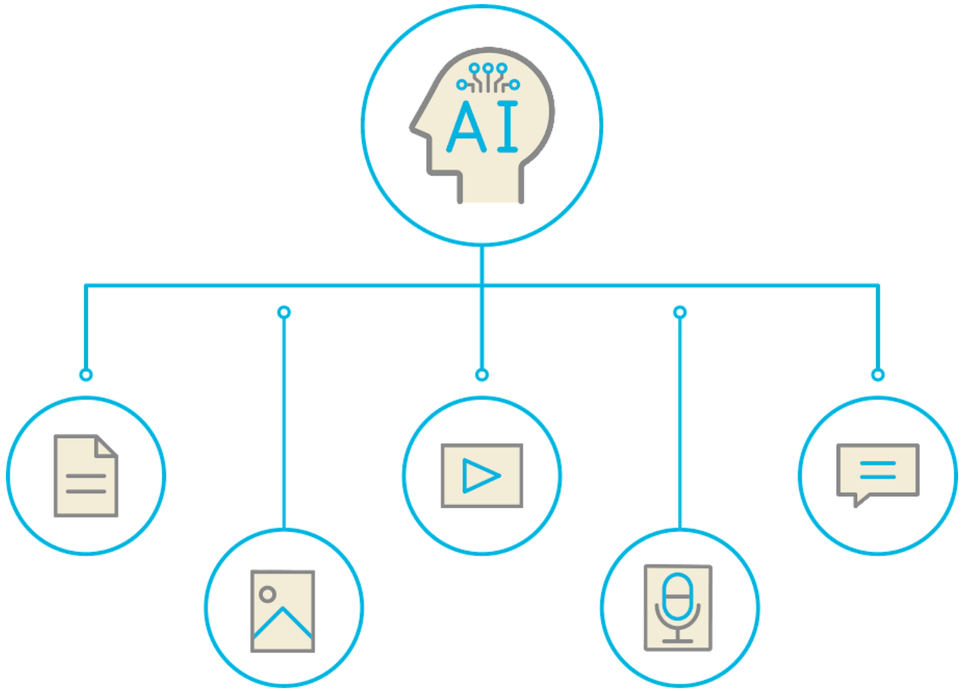
Evolution from AI to Generative AI

This timeline visually represents significant milestones in the field of artificial intelligence.



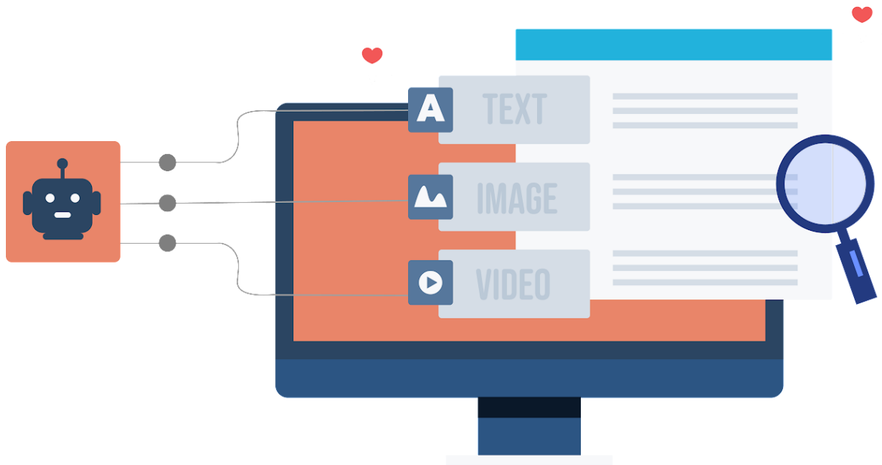
Generative AI

Generative artificial intelligence (GenAI) is a category of AI systems that focus on generating new content, such as images, text, music, or other forms of creative output.



It is a subset of artificial intelligence that leverages machine learning and deep learning techniques to generate data.

Objectives of Generative AI



It is designed to independently generate new content by deriving its structure from recognized patterns.

It assists with complex problem-solving by generating numerous potential solutions, thus offering users a wide array of options.

It boosts human creativity by producing unique outcomes, enabling users to discover new ideas and possibilities.

Generative AI and LLM

Large Language Models (LLMs) provide a foundation for generative AI by offering powerful, pretrained models capable of understanding and generating human-like text across various tasks and domains.

Generative AI can serve as building blocks for more advanced models, enabling the development of innovative AI systems that create content ranging from natural language text to images and music.

Large Language Models(LLM)

LLMs are state-of-the-art AI models designed to comprehend and generate human language and perform natural language processing tasks like Translation, Classification, and so on.

Large	Refers to the significant size and complexity of these models, which contain hundreds of millions or even billions of parameters
Language	Denotes their primary function, which is to understand and generate human language
Model	Describes them as mathematical representations that capture the patterns and structure of language data

Widely Used LLMs

Model	Developer	Key features
GPT 3.5/4	OpenAI	It helps generate content, text summarization, sentiment analysis, data extraction, and language translations. The GPT 4 upgraded version bolsters multimodal capabilities, including the power to process different formats other than texts, like images and videos.
Gemini	Google	It aids in complex problem-solving and code generation.
Llama	Meta AI	It enables natural language understanding, content creation, and language translation.
Falcon	Technology Innovation Institute(TII)	It provides language translation, common-sense reasoning, and sentiment analysis.
Claude	Anthropic	It supports open-ended dialogues, coding tasks, and data analysis of visual inputs like charts and graphs.

GenAI Tools

Top GenAI tools transforming various industries:

Demo: Resume and Cover Letter Creation Using ChatGPT

Duration: 10 minutes

Learn how to create a resume and a cover letter using ChatGPT.

Imagine you have a resume ready, but you're unsure if it matches the job description you're applying for. Additionally, you're pressed for time to update it according to the job requirements.

In this scenario, how can you quickly and efficiently update your resume to align with the job description and save time?

Join us in a demonstration where we will use ChatGPT to help you quickly and effectively tailor your resume to the job description.

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

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Quick Check

As an intern at a tech company, you've been tasked with choosing an LLM for a project that requires generating highly accurate and factual content for technical documentation. Which of the following LLMs would be best suited for this purpose?

A. GPT-4

B. Gemini

C. Falcon

D. Claude

Understanding Prompts

What Is a Prompt?

A prompt is a natural language text that instructs generative AI models to perform a specific task.

Here are some key reasons why prompts are essential:

A well-crafted prompt guides the GenAI to understand the context and the specific requirements of the task at hand.

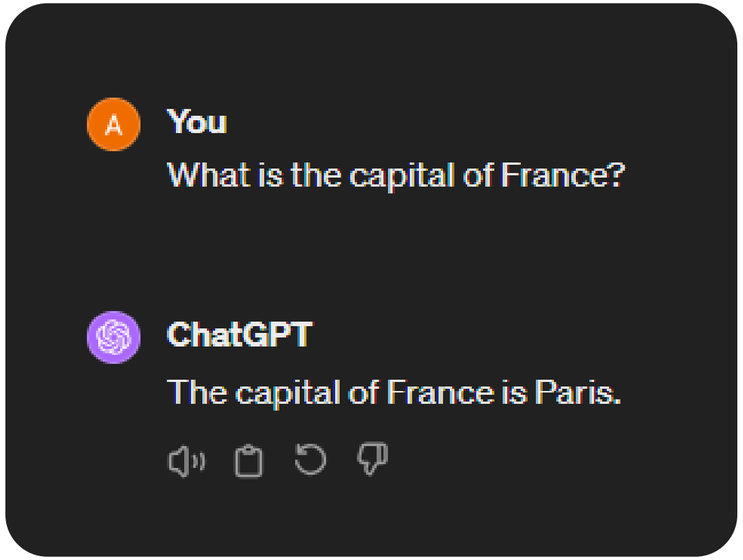
A precise prompt can lead to a more focused and useful output.

The prompt serves as a bridge between the user's intent and the AI's execution.

How Prompts Work?

When you give a prompt to a language model, it generates a response based on the patterns and information it has learned during its training.

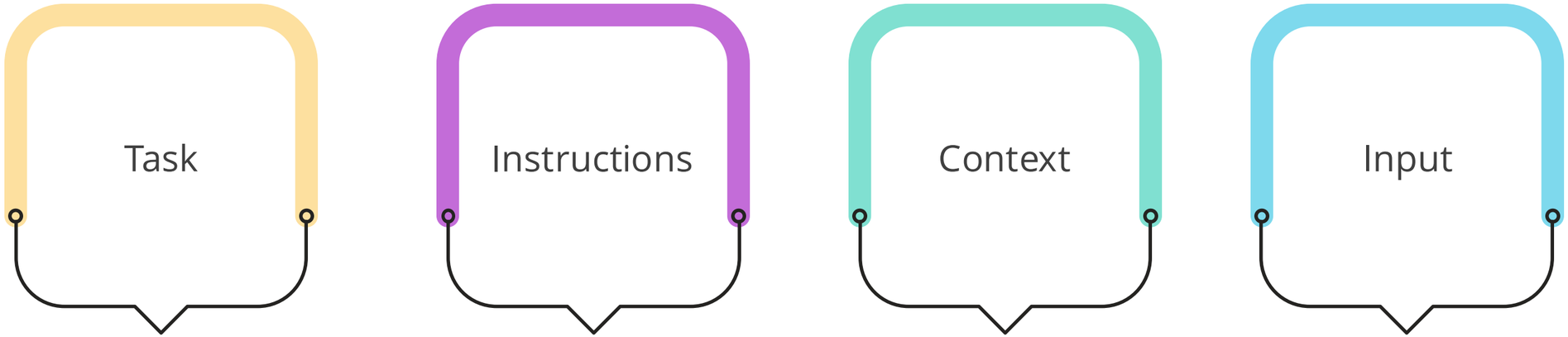
Here's a simple example:



- Here, the prompt is a straightforward question, and the language model provides an answer based on its training data.
- Prompts can also be more complex and used for various tasks such as text completion, translation, summarization, and even creative writing.
- The effectiveness of the response often depends on how well the prompt is crafted.

Important Components of a Prompt

Four important components that make up a great prompt are as follows:



Specific action or process

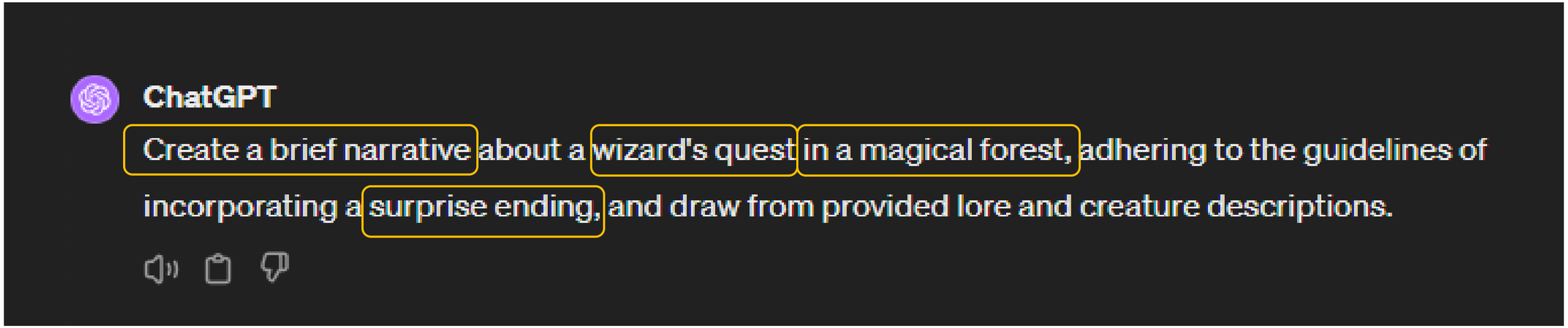
Rules to follow to achieve the desired outcome

Background information or situation that surrounds a task

Images, text, and dataset

Important Components of a Prompt: Example

Consider the below example to understand the important components of a prompt better:



Task:	**Create a brief narrative.**
Instructions:	**The story must involve a wizard's quest** and include a surprise ending.
Context:	The narrative is set in a **magical forest**, with the protagonist on a quest.
Input:	Use the **provided lore and descriptions of creatures** within the forest.

Quick Check

Which component should be included in a prompt for a language model to translate a technical document from English to French?

A. Specify the source and target languages in the instructions.

B. Use a dataset unrelated to the technical field of the document.

C. Exclude any background information about the document's content.

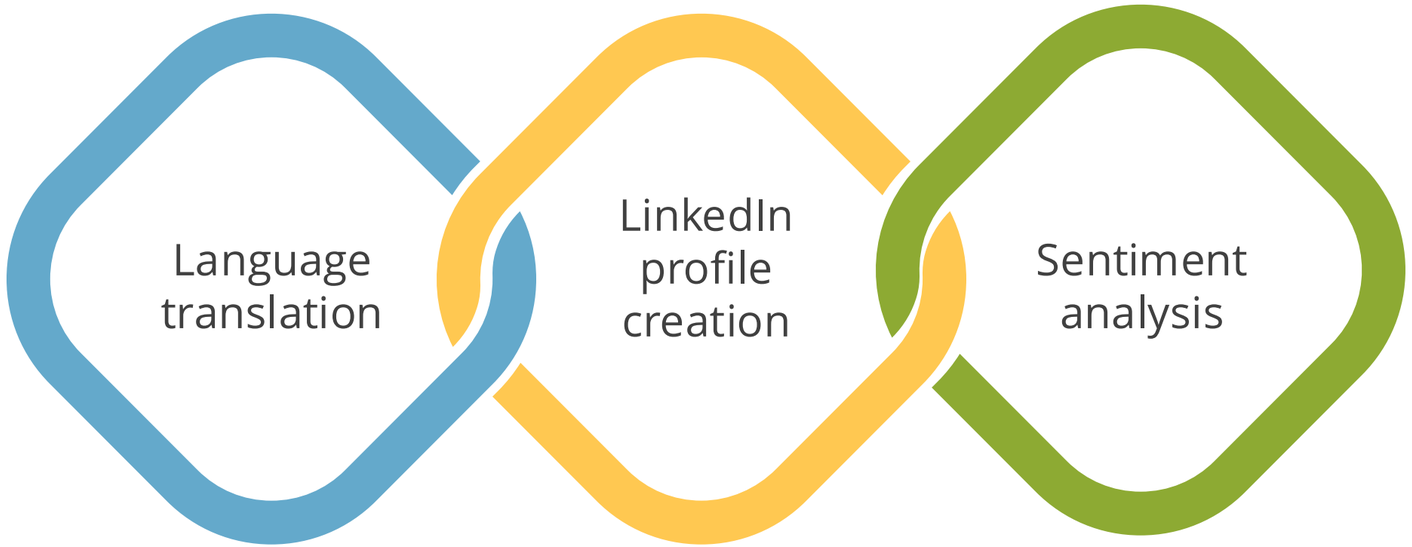
D. Include technical jargon without explanations.

Hands-on with ChatGPT

Day-to-Day Tasks ChatGPT Can Do

ChatGPT is adept at handling a multitude of complex tasks beyond mere conversation.

Here are a few notable examples:



Demo: Multilingual Book Translation Using ChatGPT

Duration: 10 minutes

Demonstrate how to translate user reviews in various languages using ChatGPT.

Imagine you operate an online bookstore that is popular worldwide. You offer books in multiple languages to cater to a diverse, global audience. To expand your reach and provide readers with books in their preferred languages, you use ChatGPT for real-time book translation.

To explore this further, let’s consider a demonstration in which we'll utilize ChatGPT to facilitate the translation process and demonstrate its effectiveness in handling language barriers.

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Demo: LinkedIn Profile Creation Using ChatGPT

Duration: 10 minutes

Demonstrate how to create an impressive LinkedIn profile using ChatGPT.

Imagine you're preparing to create your LinkedIn profile, but you're aiming for something more exciting by creating a personal brand.

Let's check out this demo, where we'll use the ChatGPT prompt to help make your LinkedIn profile awesome and stand out from the crowd!

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Demo: Sentiment Analysis of User Reviews Using ChatGPT

Duration: 10 minutes

In this demo, we're showcasing sentiment analysis with ChatGPT to distinguish between praises, complaints, and many other types of feedback.

Have you ever scrolled through tons of online reviews, wondering which ones are positive and which are negative? This can be time-consuming.

ChatGPT can instantly analyze the reviews and provide the percentage of positive and negative feedback.

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

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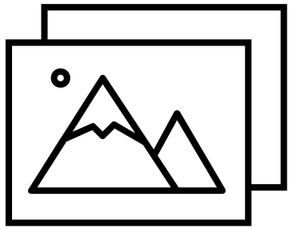
ChatGPT: Multimodal Capabilities

ChatGPT: Multimodal Capabilities

The advanced version of the ChatGPT (ChatGPT – 4) model has multimodal capabilities that go beyond just text generation.

Text/Document



Image

Text-to-speech/
Speech-to-text

Note: ChatGPT has the capability to convert text-to-speech and speech-to-text in the mobile version.

ChatGPT: Multimodal Capabilities

- **Integration of multiple modalities**: Combines text, images, videos, audio, and more to understand and generate responses
- **Enhanced context awareness**: Utilizes visual and auditory cues to provide more comprehensive and accurate answers
- **Dynamic and interactive responses**: Enable a more natural and human-like conversation experience
- **Image captioning**: Describes images using natural language
- **Video analysis**: Extracts information from video content and responds accordingly
- **Virtual assistants**: Offer image-based responses for enhanced assistance

Demo: Exploring Multimodal Capabilities of ChatGPT

Duration: 10 minutes

Demonstrate how ChatGPT works beyond text.

In this demo, our objective is to delve into the realm of multimodal tasks, where ChatGPT will be equipped to handle both visual and textual inputs concurrently.

Through this endeavor, we aim to showcase the potential of ChatGPT in addressing complex multimodal tasks and advancing the capabilities of GenAI systems.

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Demo: Customer Feedback Analysis Using ChatGPT-4

Duration: 10 minutes

Demonstrate how to use ChatGPT to categorize customer feedback into positive, negative, constructive, or neutral sentiments and visualize the results.

As a data analyst at a large e-commerce company, your task is to analyze the customer feedback collected after a major sales event. The objective is to identify areas of success and opportunities for improvement, thereby aiding the company in enhancing its future sales strategies.

To address this, let's explore a demo where we'll experiment with using ChatGPT prompts to tackle this issue.

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Explore Powerful GPTs

Comparison between ChatGPT 3.5,4, and 4o

Here is a comparison highlighting key differences:

Feature	ChatGPT-3.5	ChatGPT-4	ChatGPT-4-turbo (4o)
Model size	Medium	Large	Large
Context length	Up to 4,096 tokens	Up to 8,192 tokens	Up to 128,000 tokens
Speed	Fast	Slower than 3.5	Faster than 4
Use cases	General conversation, basic tasks	Complex tasks, nuanced understanding	Complex tasks, faster responses
Optimizations	Basic	Advanced	Turbocharged for efficiency
Multimodal capabilities	No	Yes	Yes

ChatGPT Comparison Based on a Use Case

Scenario: A researcher needs to summarize a 20-page research paper to identify key findings, methodologies, and conclusions.

Responses	ChatGPT-3.5	ChatGPT-4	ChatGPT-4-turbo (4o)
Summary quality	Provides a general summary but may miss some nuanced details	Produces a detailed and accurate summary, capturing nuanced details and methodologies	Matches the detail and accuracy of ChatGPT-4
Speed	Fast response	Slower compared to 3.5	Faster than ChatGPT-4
Context handling	May struggle with longer context, requiring multiple prompts	Handles longer context better, providing a more cohesive summary	Handles very long context efficiently, making it ideal for summarizing lengthy documents in one go

Comparison Based on a Prompt

Here are the responses from different ChatGPT models based on a single prompt.

Prompt: Explain polymorphism to me in a line

ChatGPT-3.5

ChatGPT

Polymorphism refers to the ability of different objects to be treated as instances of a common superclass, allowing for flexible and interchangeable use of objects within a hierarchy.

‹ 1 / 3 ›

ChatGPT-4

ChatGPT

Polymorphism is a programming concept that allows objects to be treated as instances of their parent class, enabling methods to operate differently depending on the class of the object they are called on.

‹ 2 / 3 ›

ChatGPT-4-turbo (4o)

ChatGPT

Polymorphism is a programming concept where objects of different classes can be treated as instances of the same class through a common interface, allowing methods to be used interchangeably.

‹ 3 / 3 ›

Explore GPTs: Categories of GPTs

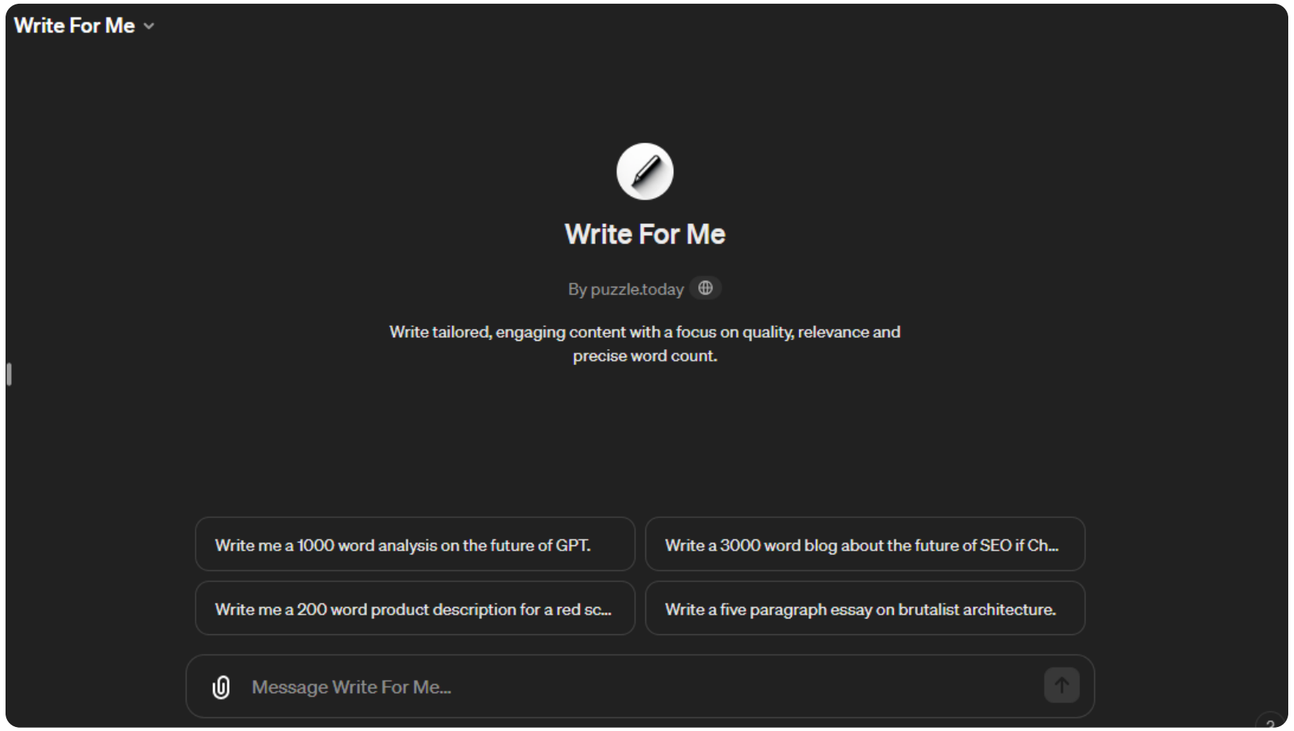
The explore GPTs are custom GPTs accessible only with the GPT-4 version.

The Explore GPTs can be categorized in different ways, as shown below:

Writing GPTs: Write For Me

This GPT is focused on writing, such as content generation, writing assistance, or editing.

Write For Me is a personal writing assistant. It crafts tailored content, focusing on needs, audience, and SEO, ensuring ideas are transformed into engaging written material.



Demo: Content Creation for Eco-Friendly Reusable Water Bottles Marketing Using Write For Me GPT

Duration: 10 minutes

In this demo, you will be able to illustrate the use of the **Write For Me** GPT for creating marketing content for an eco-friendly reusable water bottle, aiming to connect with environmentally conscious consumers.

The purpose is to demonstrate the application of GPT technology in creating engaging content that resonates with the target audience's environmental values.

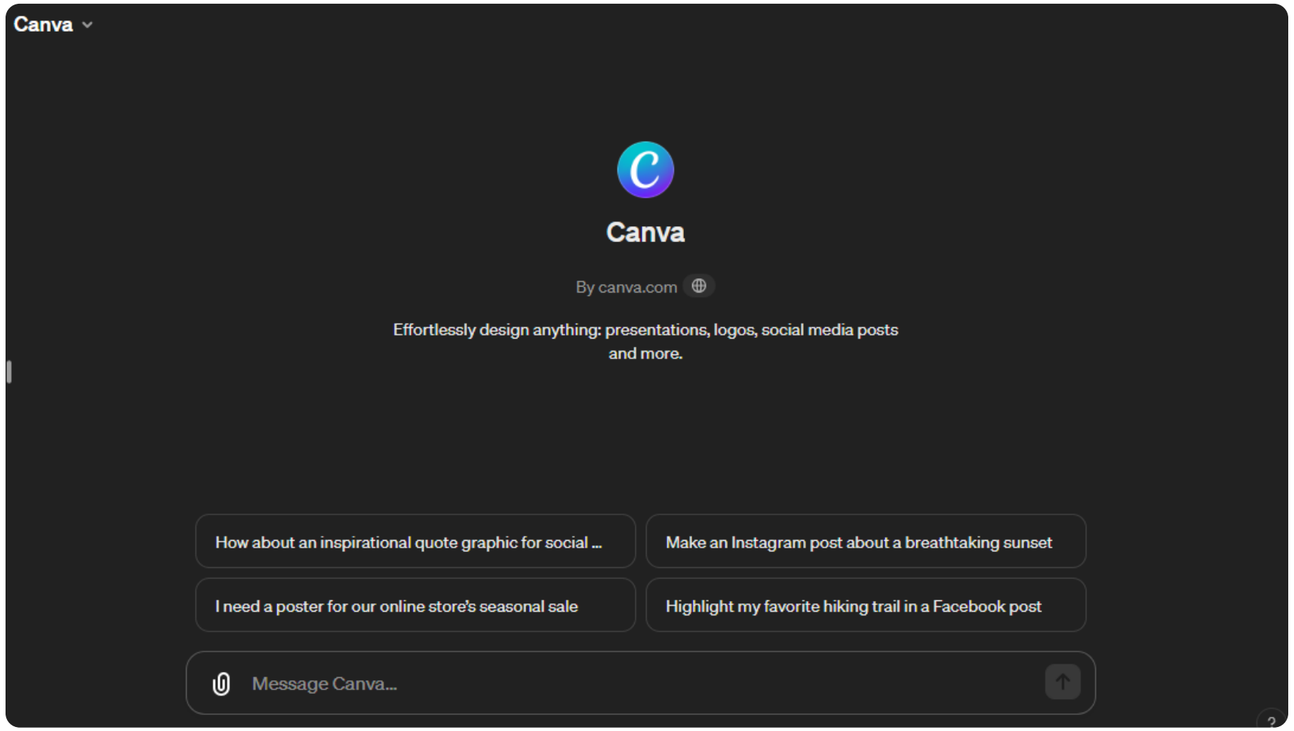
Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Productivity GPTs: Canva AI

This helps with increasing efficiency in tasks or workflows.

Canva AI makes designing easy by creating designs from your descriptions. Perfect for beginners and pros, it helps you make social media posts and presentations and turns text into images.



Demo: Creative Branding Makeover for Coffee Shops with Canva GPT

Duration: 10 minutes

In this demo, you will be able to showcase **Canva** GPT's role in boosting productivity by designing appealing content for a coffee shop's new product, Sunrise Brew.

This demonstrates how GPT technology can streamline the design process and enhance marketing productivity.

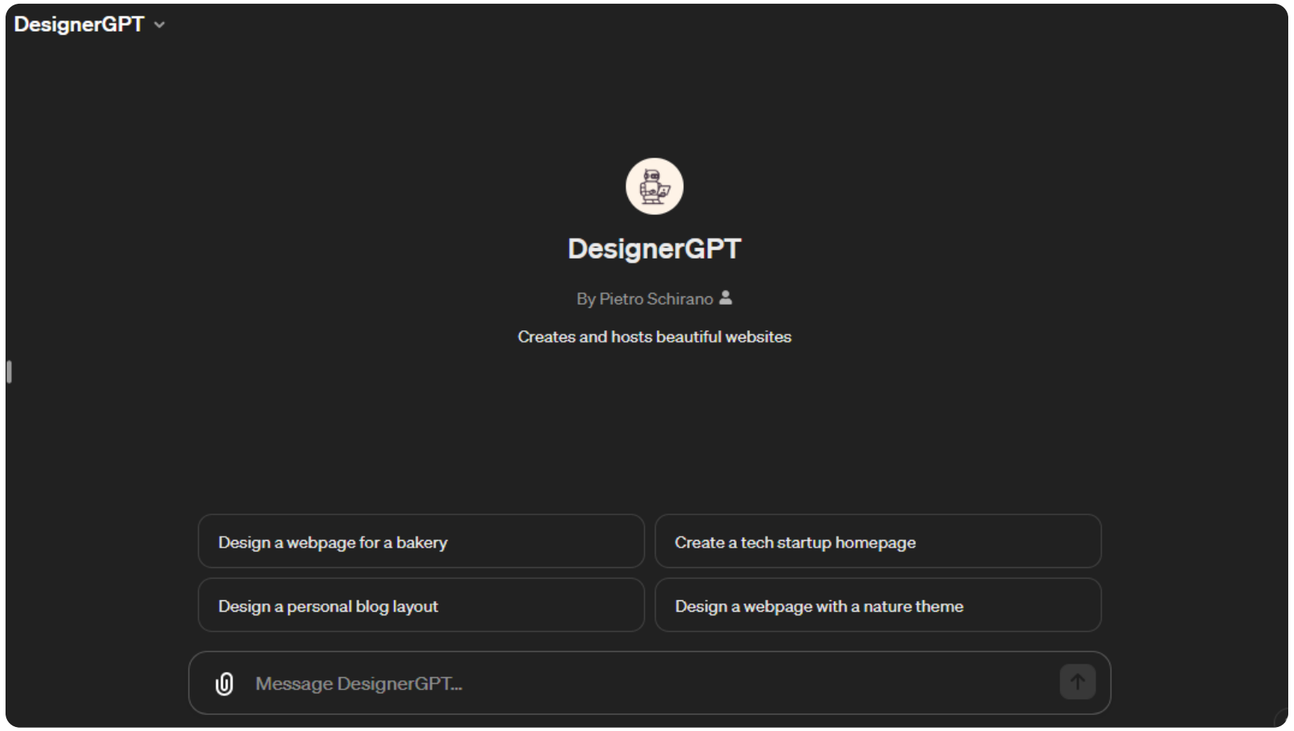
Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Programming GPTs: DesignerGPT

This helps with coding, such as automatic code generation, code reviews, or even educational tools for learning programming.

DesignerGPT is a specialized AI designed to instantly create and host beautiful, responsive HTML web pages tailored to user requests, streamlining web design with precision and efficiency.



Demo: Creating a Website Design Using DesignerGPT

Duration: 10 minutes

In this demo, you will be able to use **DesignerGPT** to generate a visually appealing website design or product landing page for an online store, focusing on Programming GPT.

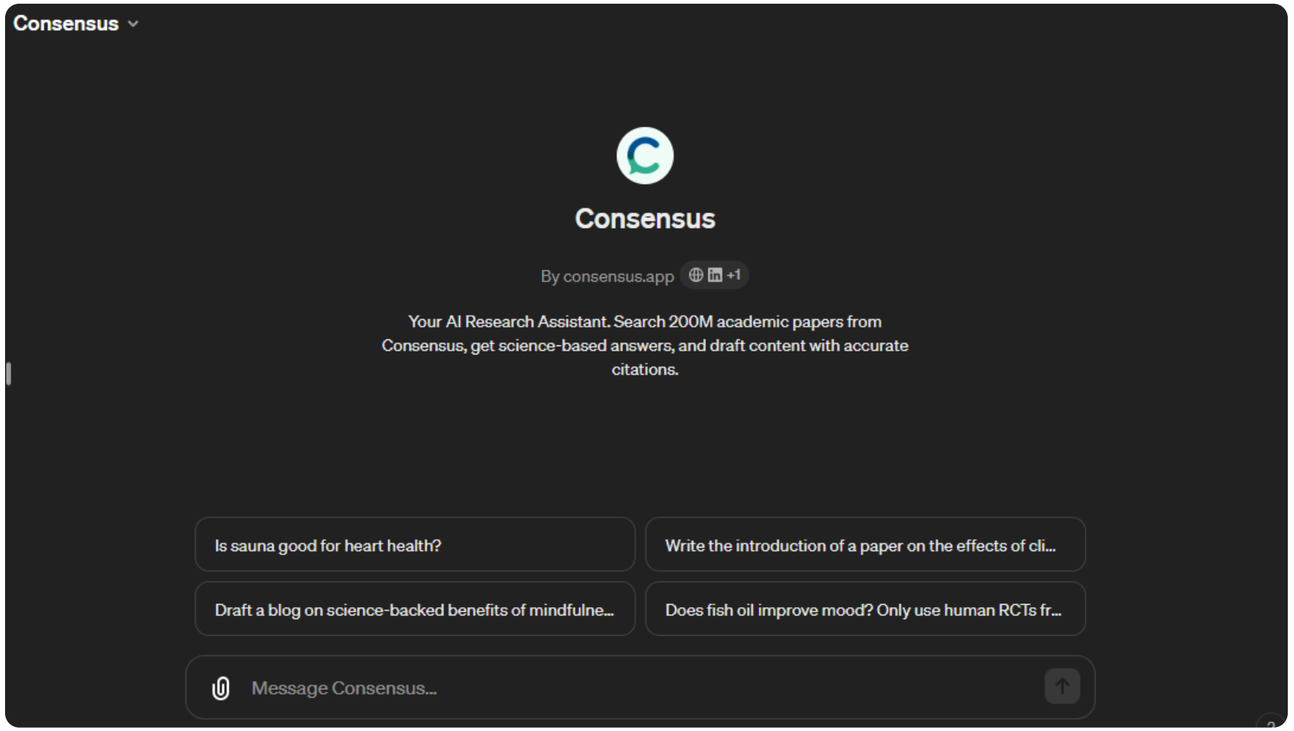
Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Research and Analysis GPTs: Consensus

This aids with research, data analysis, or information synthesis.

Consensus is a scientific research assistant leveraging AI to synthesize insights from academic papers, providing clear, concise summaries and evidence-based responses to your inquiries.



Demo: Streamlining Literature Surveys on LLM Impact with Consensus GPT

Duration: 10 minutes

In this demo, you will be able to use the **Consensus** GPT for research and analysis to conduct a literature survey on the impact of Large Language Models (LLMs) on natural language understanding (NLU) tasks.

The goal is to gather recent studies on LLM advancements, particularly in question answering, text summarization, and sentiment analysis, and analyze key trends and challenges while highlighting the role of fine-tuning and transfer learning.

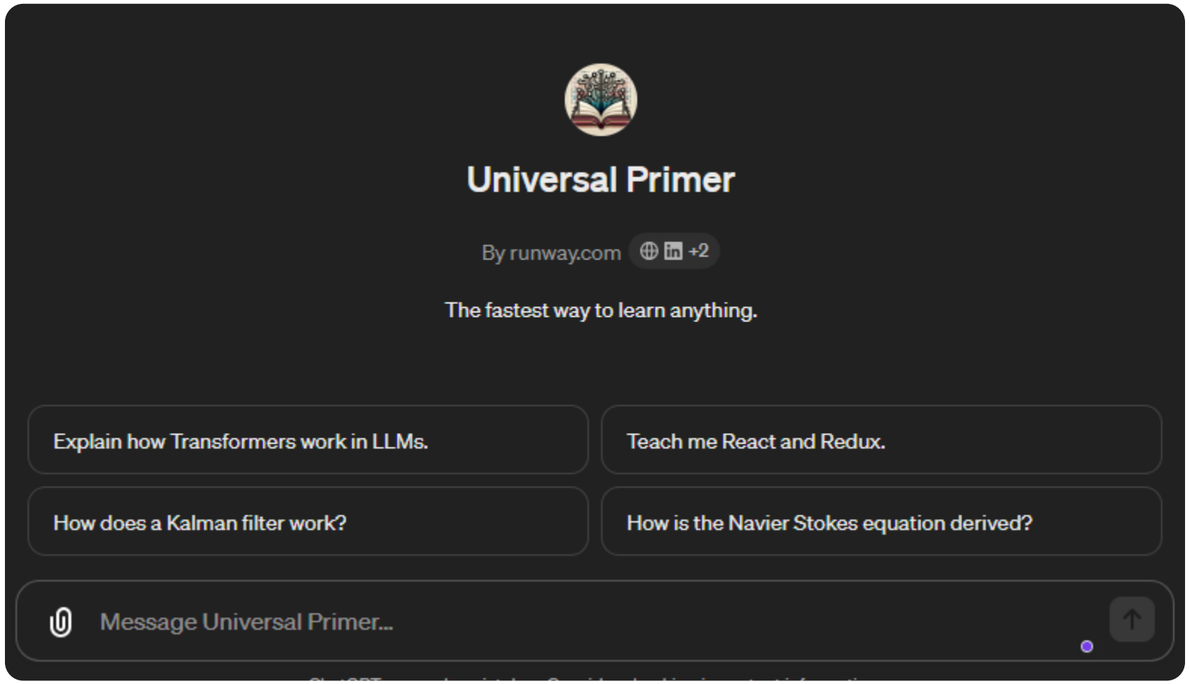
Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Education GPTs: Universal Primer

This encompasses GPT for teaching, tutoring, or creating educational content.

Universal Primer is the fastest way to learn everything about anything.



Demo: Enhancing Learning with the Universal Primer GPT

Duration: 10 minutes

In this demo, you will be able to use the **Universal Primer** GPT to enhance educational content on chemical equilibrium for high school students.

The main goal is to demonstrate the Education GPT tool's ability to improve learning materials and help students understand complex concepts.

Note: Please download the demo documents from the LMS **Reference Material Section** for a detailed explanation.

DEMONSTRATION

Key Takeaways

- GenAI is a subset of artificial intelligence that leverages machine learning and deep learning techniques to generate data.
- LLMs can be classified in several ways, depending on their functions and users.
- Prompts guide the GenAI to understand the context and specific requirements of the task.
- GenAI tools perform tasks of various complexities, such as creating resumes, LinkedIn profiles, email classification, sentiment analysis, and other day-to-day tasks.
- The multimodal capabilities of ChatGPT can simultaneously process and generate varied data types, such as text and images.

Additional Resources

- Top Generative AI Tools: Boost Your Creativity

Q&A