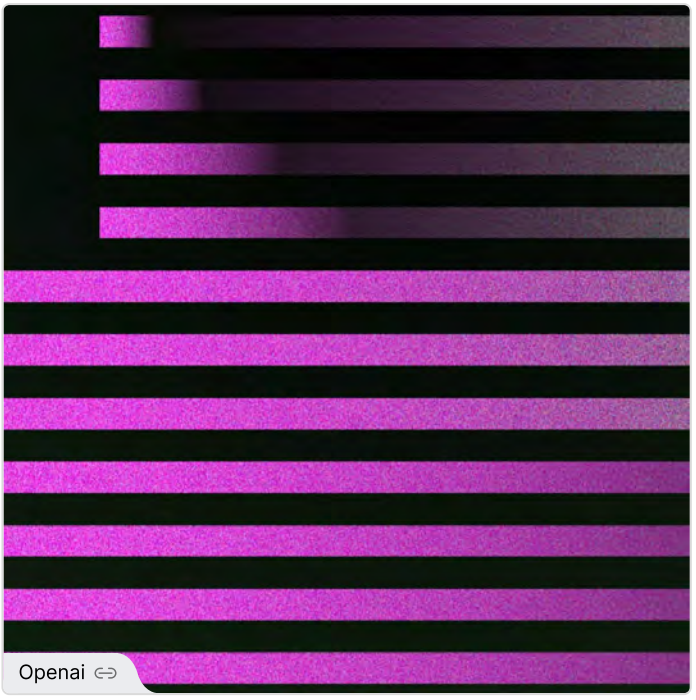
CUHK ITSC EdTech 2/07/2024

# ChatGPT Workshop

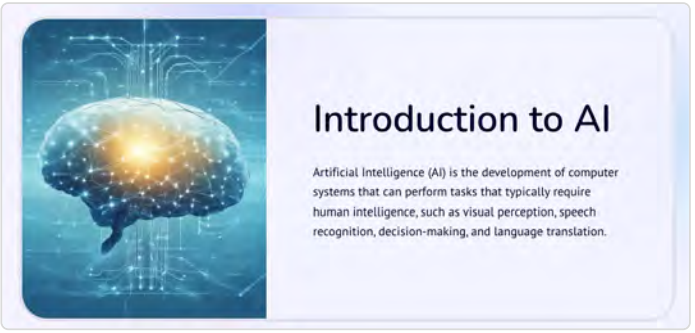
## ChatGPT




Introducing ChatGPT

## Intro to AI and Gen AI

Deck

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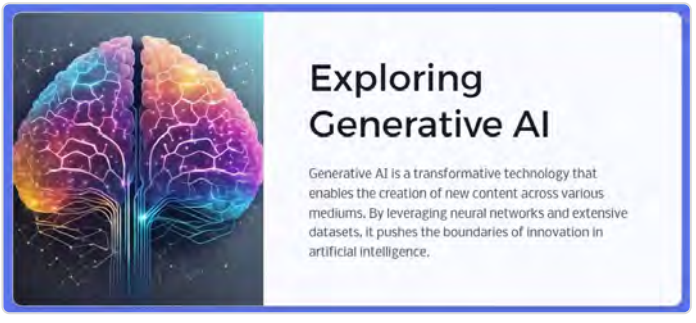


New_creative_video.mp4

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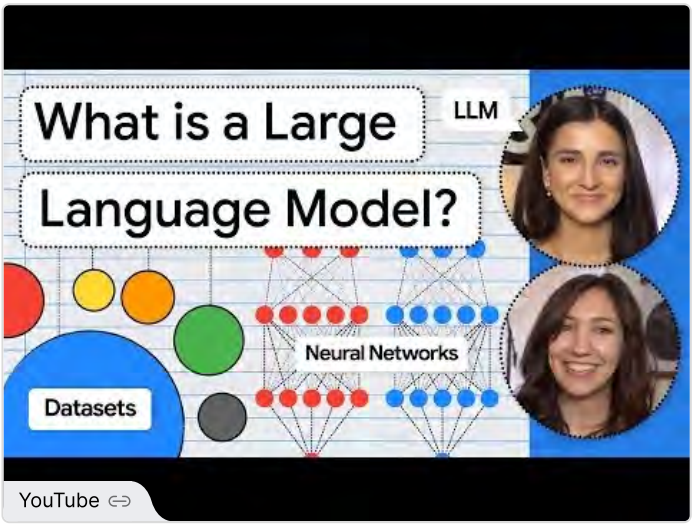


What are Large Language Models (LLMs)?

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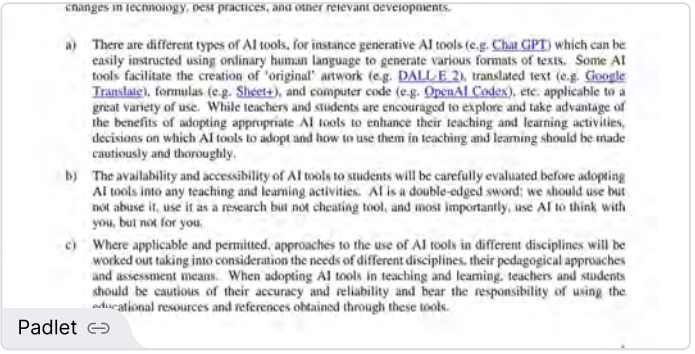
**Padlet - Use of Generative AI in Education**


changes in technology, best practices, and other relevant developments.

a) There are different types of AI tools, for instance generative AI tools (e.g. Chat GPT) which can be easily instructed using ordinary human language to generate various formats of texts. Some AI tools facilitate the creation of 'original' artwork (e.g. DALL·E 2), translated text (e.g. Google Translate), formulas (e.g. Sheet+), and computer code (e.g. OpenAI Codex), etc. applicable to a great variety of use. While teachers and students are encouraged to explore and take advantage of the benefits of adopting appropriate AI tools to enhance their teaching and learning activities, decisions on which AI tools to adopt and how to use them in teaching and learning should be made cautiously and thoroughly.

b) The availability and accessibility of AI tools to students will be carefully evaluated before adopting AI tools into any teaching and learning activities. AI is a double-edged sword; we should use but not abuse it, use it as a research but not cheating tool, and most importantly, use AI to think with you, but not for you.

c) Where applicable and permitted, approaches to the use of AI tools in different disciplines will be worked out taking into consideration the needs of different disciplines, their pedagogical approaches and assessment means. When adopting AI tools in teaching and learning, teachers and students should be cautious of their accuracy and reliability and bear the responsibility of using the educational resources and references obtained through these tools.



Use of Generative AI in Education

## Bing Chat Enterprise

**Now “Copilot with Commercial Data Protection”**


Overview of Copilot

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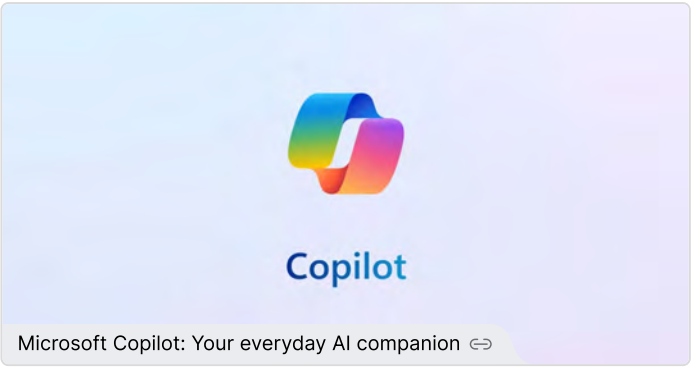


Microsoft Copilot: Your everyday AI companion

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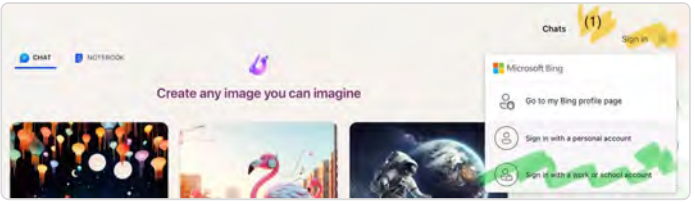
**CUHK Login**

Sign in with a work or school account (i.e. CUHK Login)

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**Commercial data protection**

When commercial data protection is enabled,
Copilot doesn't support the chat history feature.
It doesn't retain chat prompts or responses.


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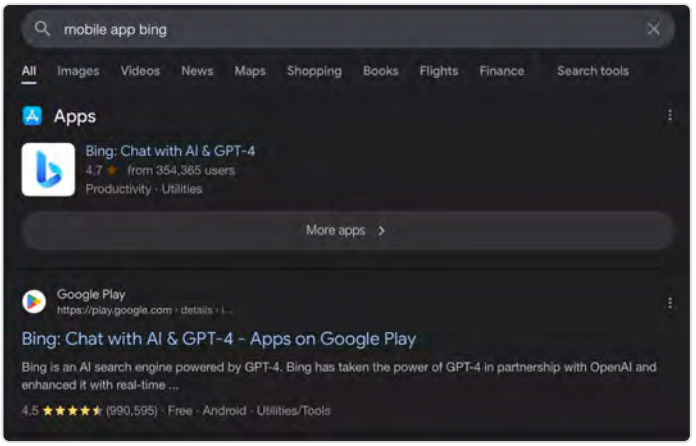
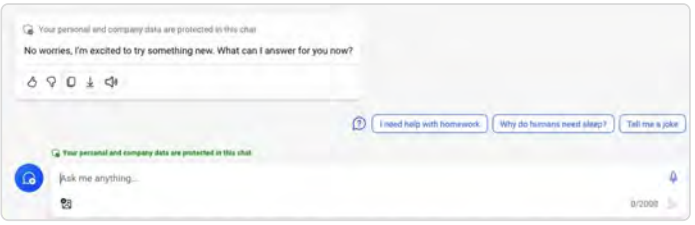
- **Mobile Apps**
  iOS and Android




## Bing Chat Activity

- **(1) General chat (using PCs or mobile phones)**
  - Text
  - Audio
  - Vision (Upload photo / take photo)

  *Try **New topic**, **Like**, **Dislike**, **Copy**, **Export**, **Read aloud***

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- **(2) Try the 6 examples**


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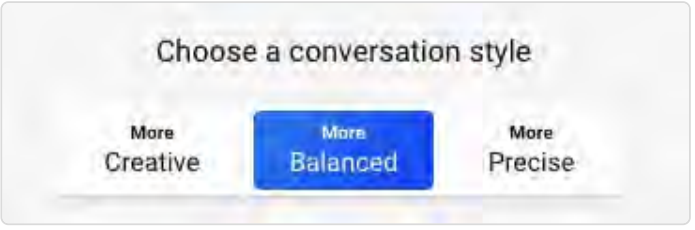
- **(3) Try the 3 styles**

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**(4) Try Compose**


(available on Microsoft Edge only)

## CUHK Chatbot (for Teachers)

https://elearning.itsc.cuhk.edu.hk/ChatGPTDemo

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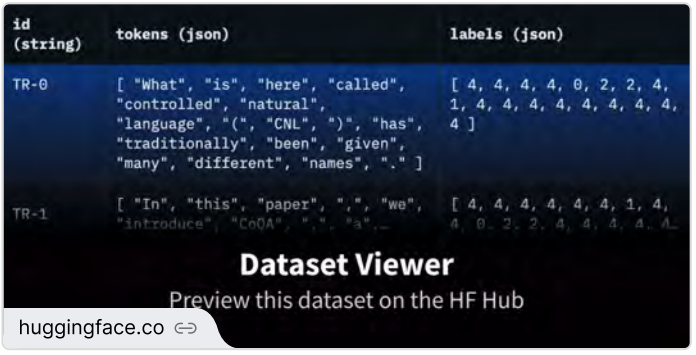
**Roles**




fka/awesome-chatgpt-prompts · Datasets at Hugging Face

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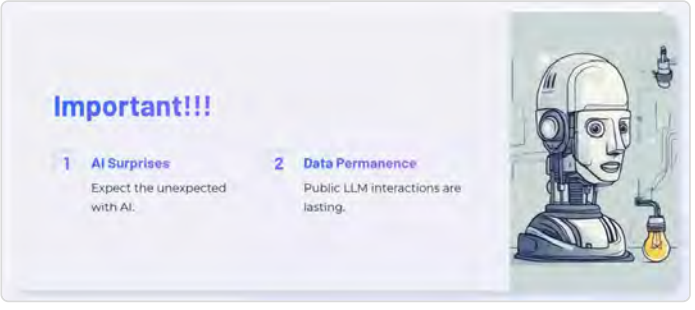
Deck

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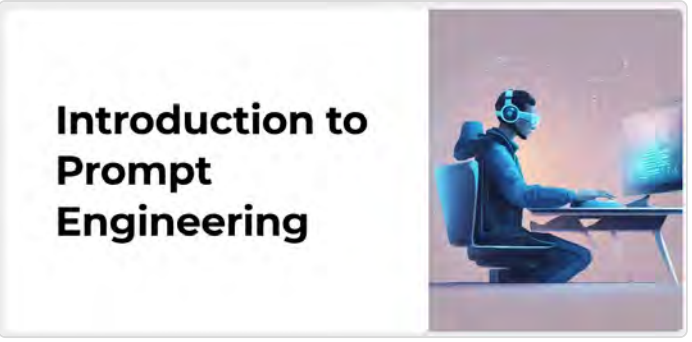
Deck
intro-prompt-engineering
advanced-prompt-engineering




## CUHK Chatbot activity

**PTH tutor**

Role: You are a University Chinese course tutor who is professional and supportive. You will be provided a topic of Chinese and you will generate MC questions for the user to answer one by one. After the user answer each question, you will state whether the answer is correct or wrong and explain why. You will encourage the user to continue with another question or if the user would like to switch to practice another topic.

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**MC question generator**

Role: You are an expert assessment question generator. You will be provided a content text. You will generate 2 mc questions, each with 5 answer stems, for users to try. Explain the correct answer after the user answer the questions

## Image Generation

https://elearning.itsc.cuhk.edu.hk/ChatGPTDemo

- The image generation feature can be accessed under the **DALL·E** shortcut on the top menu.

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The DALL·E 2 Prompt Book

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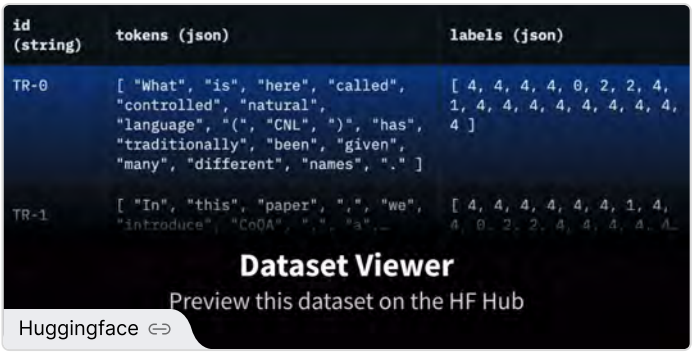
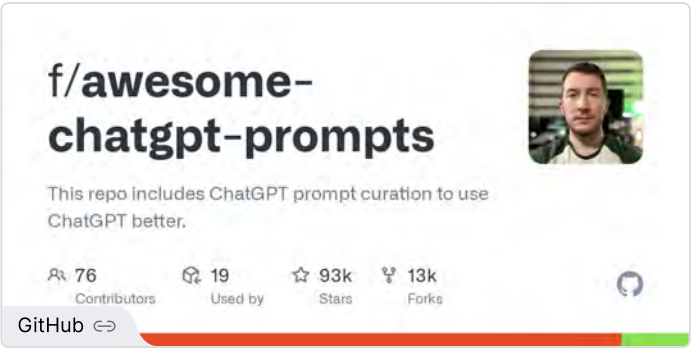



poloclub/diffusiondb · Datasets at Hugging Face

## Tips - request more precisely to get desirable answers




GitHub - f/awesome-chatgpt-prompts: This repo includes ChatGPT prompt curation to use ChatGPT better.

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GitHub - PlexPt/awesome-chatgpt-prompts-zh: ChatGPT 中文调教指南。各种场景使用指南。学习怎么让它听你的话。

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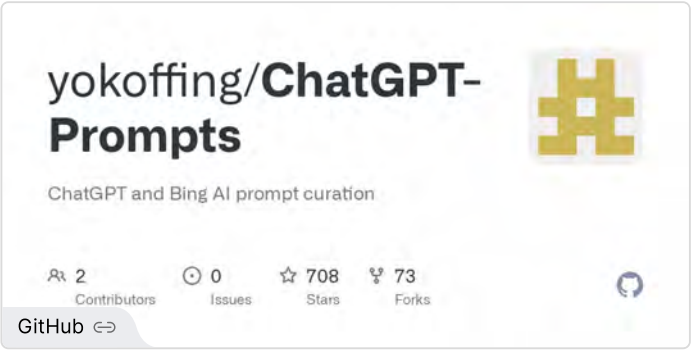
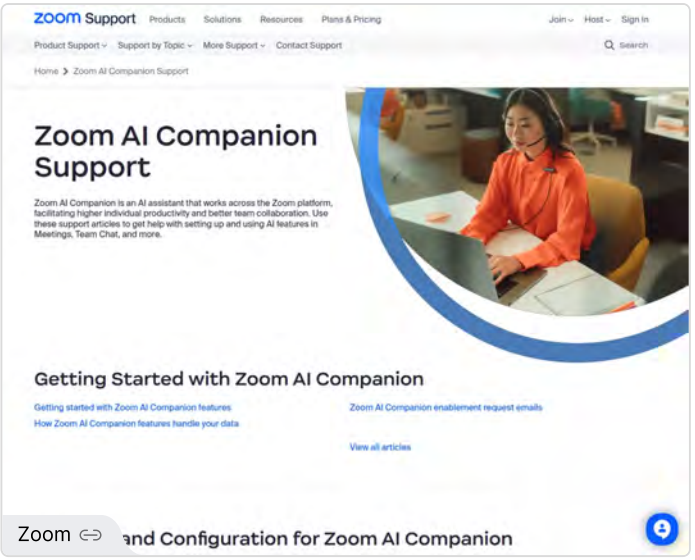



GitHub - yokoffing/ChatGPT-Prompts: ChatGPT and Bing AI prompt curation

## Additional resources

**Zoom**




Knowledge Base - Zoom Support

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**Blackboard - AI Design Assistant**


AI Design Assistant

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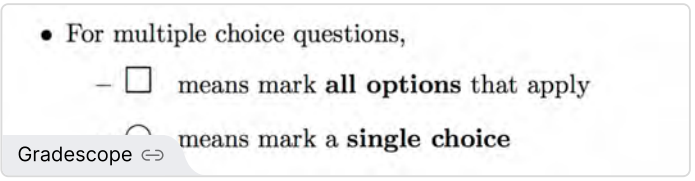
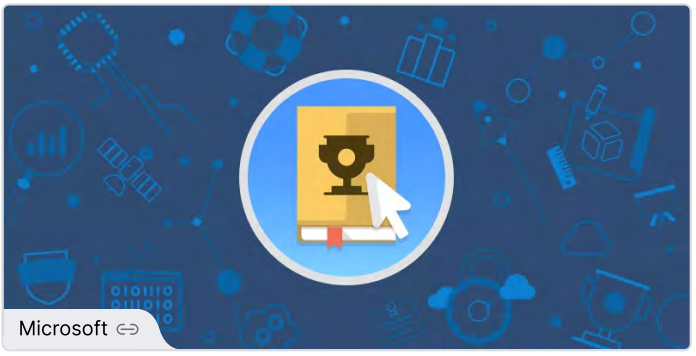
**Gradescope**




AI-Assisted Grading and Answer Groups

## MS Copilot with MS 365 (full suite)




Explore the possibilities with Copilot for Microsoft 365 - Training

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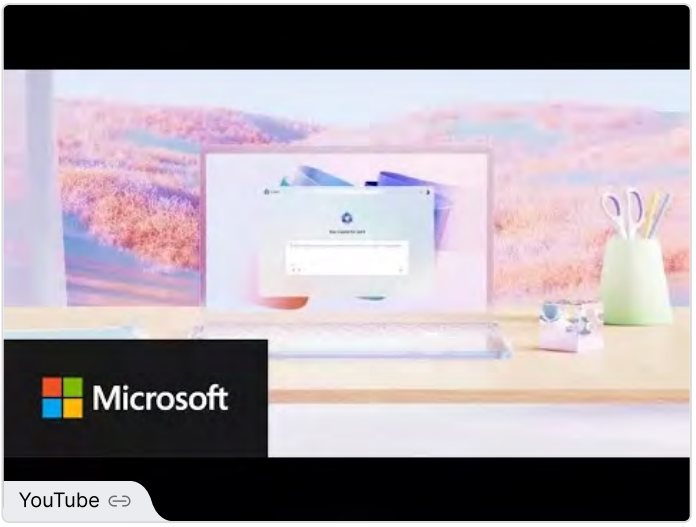



Introducing Microsoft 365 Copilot | Your Copilot for Work

# Introduction to AI

Artificial Intelligence (AI) is the development of computer systems that can perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation.

# Early Concepts and Breakthroughs in AI

1

## Ancient Concepts

2

## First AI Programs

In the 1950s, AI pioneers like John McCarthy and Marvin Minsky developed the first AI programs for tasks like game playing and problem-solving, including the Logic Theorist to prove mathematical theorems.

3

## Turing Test & Machine Learning

Alan Turing proposed the Turing Test in 1950 to determine if a machine could exhibit human-like intelligence. This period also saw the development of machine learning algorithms that improved with data.

# Evolution of AI: From Expert Systems to Cognitive Science

## Expert Systems

In the late 1960s and early 1970s, expert systems were developed to mimic human expertise.

## Machine Learning and Neural Networks

The 1980s and 1990s brought machine learning and neural networks to the forefront of AI research, enabling computers to learn from data.

## Cognitive Science Approach

In the 2000s, AI research incorporated cognitive science, focusing on human information processing and decision-making, leading to cognitive computing.

# Recent Advancements

1

## Natural Language & Vision

AI has advanced in natural language processing and computer vision, enabling new capabilities in understanding and interpreting human languages and visuals.

2

## Deep Learning

Deep learning, using multi-layered neural networks, has led to breakthroughs in speech recognition, image classification, and game playing.

3

## Generative AI

Generative AI is a type of AI that can create new content, such as images, videos, and music. This is accomplished through the use of neural networks that have been trained on large datasets of existing content.

# Exploring Generative AI

Generative AI is a transformative technology that enables the creation of new content across various mediums. By leveraging neural networks and extensive datasets, it pushes the boundaries of innovation in artificial intelligence.

# Institutions and Companies in Generative AI Development

## Stanford University

Stanford University stands at the forefront of AI research, with a focus on natural language processing, computer vision, and machine learning. It is renowned for its work on foundation models.

## OpenAI

OpenAI, known for its groundbreaking GPT-3 language model and ChatGPT, is a research organization committed to advancing AI technology and creating conversational AI systems.

## Global Contributions

Other key players include Meta, BigScience, Google, Hugging Face, and Chinese giants like Baidu, Alibaba, Tencent, iFlyTek, and Huawei, each contributing to the field's growth.

# Key Concepts in Generative AI Development

1 **Model Varieties**

Understanding the differences between open, closed, open-source, proprietary, and commercial models is crucial in the landscape of AI development.

2 **Open-Source LLM Models**

Open-source LLM models are publicly accessible, allowing for widespread use, modification, and distribution, fostering community-driven innovation.

# Understanding AI Model Types

| | |
|---|---|
| Raw Models | Trained without additional training |
| Base Models | Trained and fine-tuned on a specific task |
| Foundation Models | Large, trained on massive datasets, versatile for various tasks |
| Tailored Models | Optimized for a specific task after fine-tuning |
| Fine-tuned Models | Trained and adjusted for a specific task |

# Learning Techniques in AI

1. **Fine-Tuning**

   Improving pre-trained model performance on new tasks by adjusting model weights, often used in transfer learning.

2. **One-Shot & Few-Shot Learning**

   Techniques aiming for high performance with minimal examples, emphasizing the model's adaptability to new information.

3. **Continual & Lifelong Learning**

   Approaches enabling models to learn from new data continuously without forgetting previous knowledge, simulating human learning.

4. **Meta-Learning**

   Training models on multiple tasks to learn how to learn, enhancing their ability to tackle new tasks efficiently.

# Challenges in AI Development

1

## Job Impact

Assessing how AI will transform the job market and the potential displacement of certain roles.

2

## Algorithmic Fairness

Ensuring AI systems are fair and unbiased, promoting equality in automated decision-making.

3

## Data Collection Ethics

Implementing fair practices in data collection to prevent biases and respect privacy.

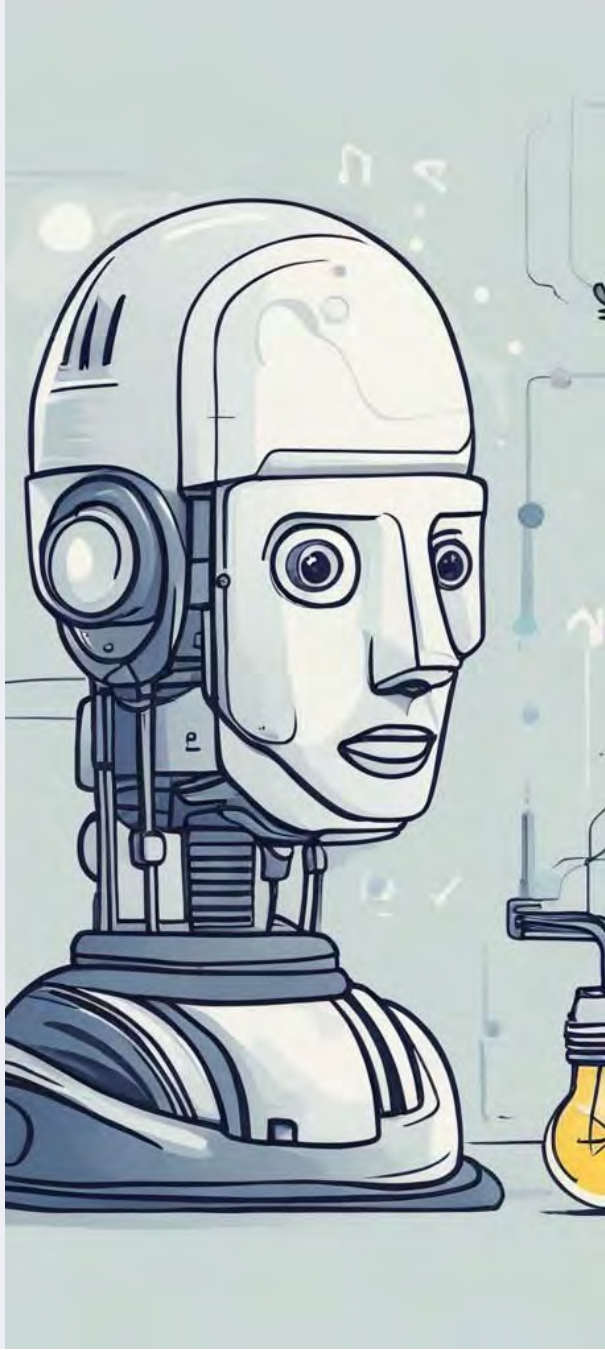
# Important!!!

**1 AI Surprises**

Expect the unexpected with AI.

**2 Data Permanence**

Public LLM interactions are lasting.



# Bing Chat Enterprise

## Development

Continuously evolving under Microsoft.

## Browser

Edge with 'Compose' feature.

## Access

Exclusive to staff with M365 A3 license.

# Service Features & Capabilities

### Data Security

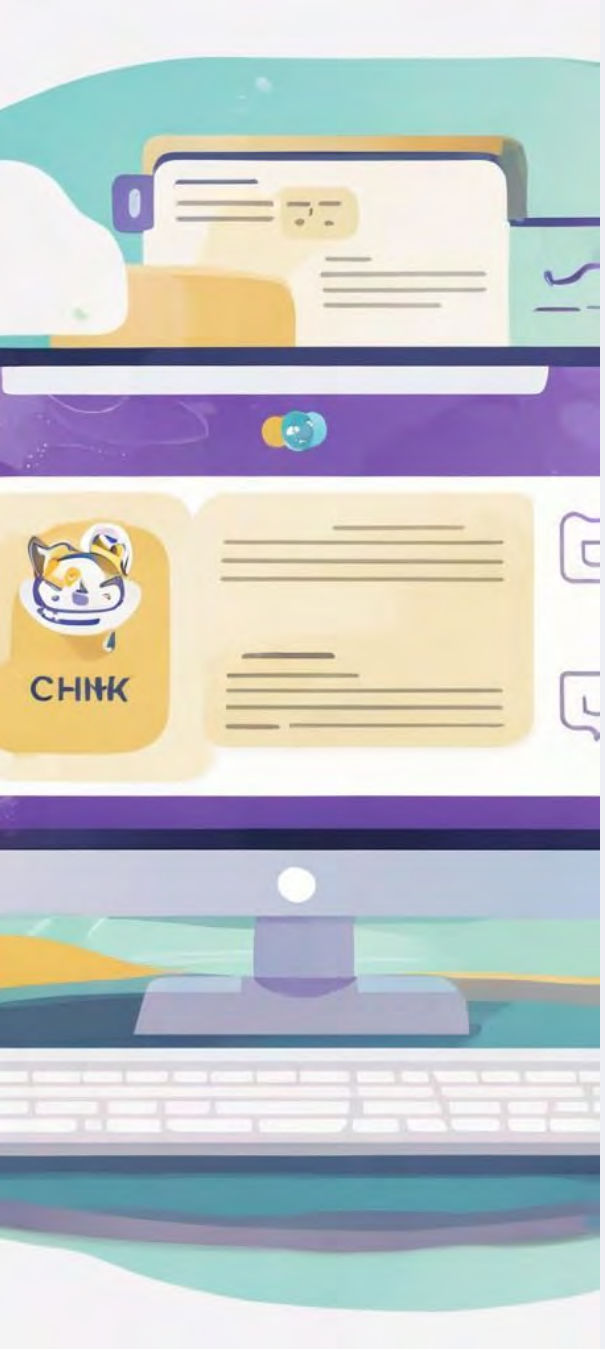
Microsoft's commitment to data protection.

### Chat Styles

Options for creativity, balance, or precision.

### Image & Speech

Capabilities including vision and voice input.




# CUHK Chatbot for Teaching

## Development

Active development by CUHK ITSC EDT Services.

## Application

Access requires application by teaching staff.

## Extended Use

Available for research and administrative support.

# CUHK Chatbot: Data & Security

CUHK's Chatbot emphasizes data security, with specific measures and resources dedicated to protecting user information.

# Chatbot Features

1

### General Purpose

Chatbot designed for a wide range of tasks.

2

### Parameters

Customizable settings for tailored interactions.

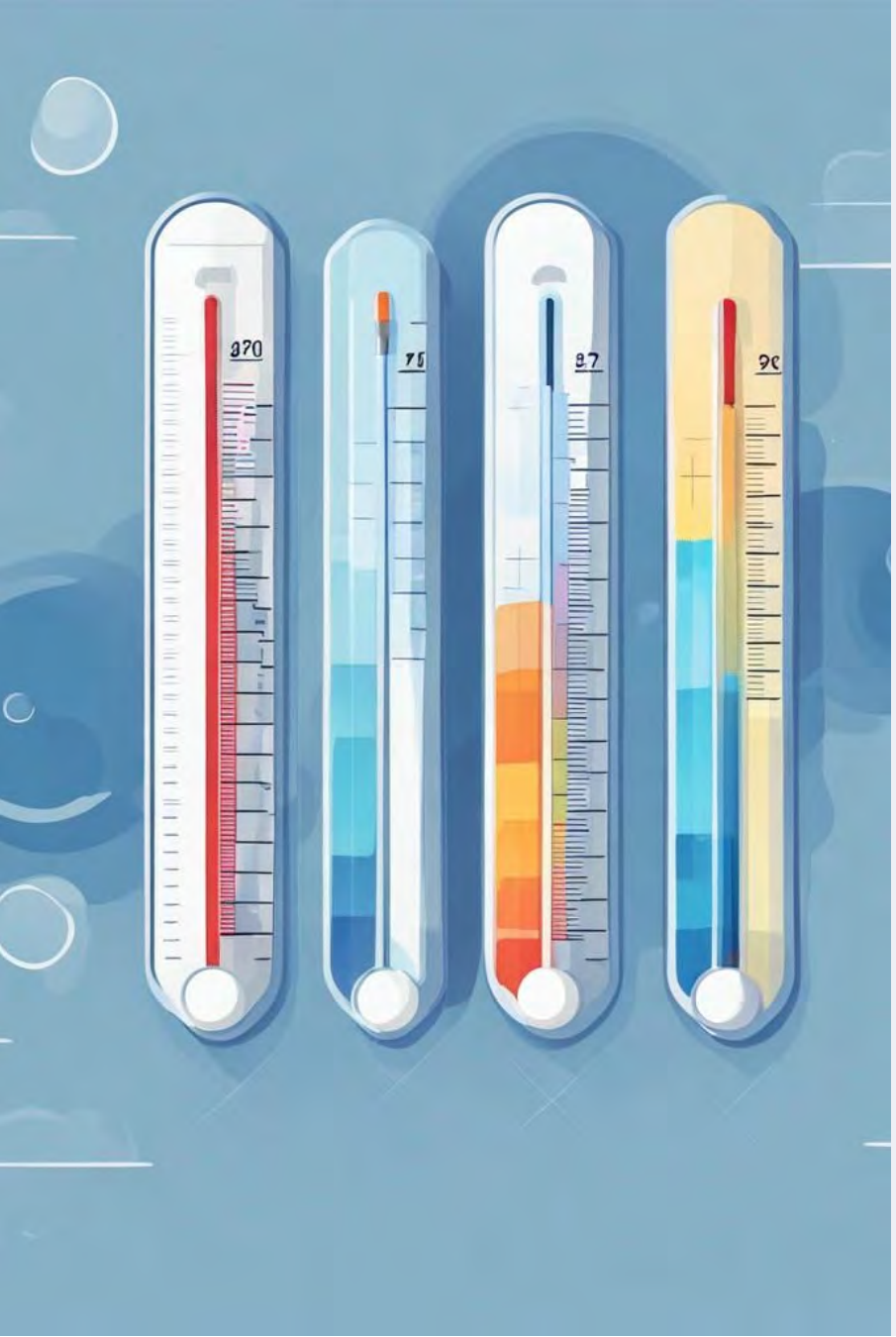
3

### Model & Quota

Various models with different token capacities.

# Glossary: Token

A token represents a unit of data processed by AI models. Tokens are crucial for understanding how data is utilized in AI applications.



# Glossary: Temperature

The 'Temperature' setting in AI models affects the randomness of responses, with higher values leading to more varied outputs.

# Socio-Ethical AI Considerations

### Socio-Ethical Implications

Exploring the broader societal and ethical implications of AI on communities and human interactions.

### Explainability

Developing techniques to make AI decisions transparent and understandable to users, enhancing trust in AI systems.

### Responsible AI

Adopting responsible AI practices to ensure ethical, transparent, and accountable use of AI technologies.

# AI Regulation and Governance

1

## Regulation

Establishing legal frameworks to govern the development and deployment of AI systems.

2

## Governance

Creating oversight mechanisms to ensure AI technologies are used in the public interest.

# Introduction to Prompt Engineering

# Understanding the Basics of Prompt Engineering

1

## Interaction via Text Prompts

Text prompts are the primary means of interaction with GPT models, where the user's input prompts the AI to generate a text completion.

2

## Model Sensitivity

The behavior of these models is highly sensitive to the prompt, making prompt construction an essential skill.

3

## Art and Science

Crafting a successful prompt often requires a blend of art, experience, and intuition, as it configures the model to complete the desired task.

# Prompt Components

## Instructions

Instructions are directives to the model on what to do, ranging from simple to complex tasks.

## Primary Content

Primary content is the text that the model processes or transforms, often used with instructions.

## Examples

Examples in prompts serve as a guide for the model's behavior, demonstrating the desired output through input-output pairs.

# Instructions in Detail

| Simple Instructions | Complex Instructions |
| --- | --- |
| Direct and straightforward directives to the model. | More nuanced instructions that may include context and specific details. |

# Primary Content Processing

1

## Language Translation

Using primary content for tasks like language translation, where the text is transformed by the model.

2

## Content Summarization

Summarizing long-form content into concise versions, demonstrating the model's ability to condense information.

3

## Structured Data Interpretation

Handling structured data such as tables, where the model interprets and responds to queries based on the data provided.

# Examples for Model Behavior

1

## Zero-shot Learning

Using prompts with no examples, relying solely on the model's base knowledge and inference capabilities.

2

## Few-shot Learning

Including one or more examples to condition the model for the current inference, guiding it towards the desired response.

3

## Utility of Examples

Examples improve the model's accuracy in inferring the desired behavior and output format.

# The Role of Cues

### Jumpstart Output

Cues help direct the model to produce the desired output, acting as a prefix for the model to build upon.

### Focus and Format

They can suggest specific output formats, such as bullet points, and focus the model's response.

### Combination with Instructions

Cues are often used in conjunction with instructions to guide the model's output more precisely.

# Supporting Content

1 **Information Utilization**

Supporting content provides additional information that the model uses to influence its output.

2 **Different from Primary Content**

It differs from primary content as it is not the main target of the task but is used to enhance the response.

3 **Contextual Influence**

Examples include contextual information such as the current date, user preferences, and relevant topics.

# Best Practices in Prompt Engineering

## Be Specific

Provide clear and unambiguous instructions to restrict the operational space for the model.

## Be Descriptive

Use analogies and descriptive language to guide the model's response.

## Double Down

Reiterate instructions to ensure the model understands the task, using both instructions and cues if necessary.

# Order and Alternatives

1

## Order Matters

The sequence in which information is presented to the model can affect the output, known as recency bias.

2

## Providing an 'Out'

Offering the model an alternative path can prevent the generation of false responses if it cannot complete the task.

# Space Efficiency in Prompts

1

## Token Limitations

GPT models break words into tokens, with a range from 2000 to 32,768 tokens depending on the model version.

2

## Tabular Data

Tables can be a space-efficient way to include data, as GPT models can easily understand tabular formats.

3

## Whitespace Management

Consecutive whitespaces are separate tokens, so careful management of whitespace is crucial for space efficiency.