

# El moment Sputnik

Marc Alier - 2024 - <https://wasabi.essi.upc.edu/ludo>





**NO PATIU**

**TOT ES MOLT SENZILL**



THE  
TWILIGHT  
ZONE



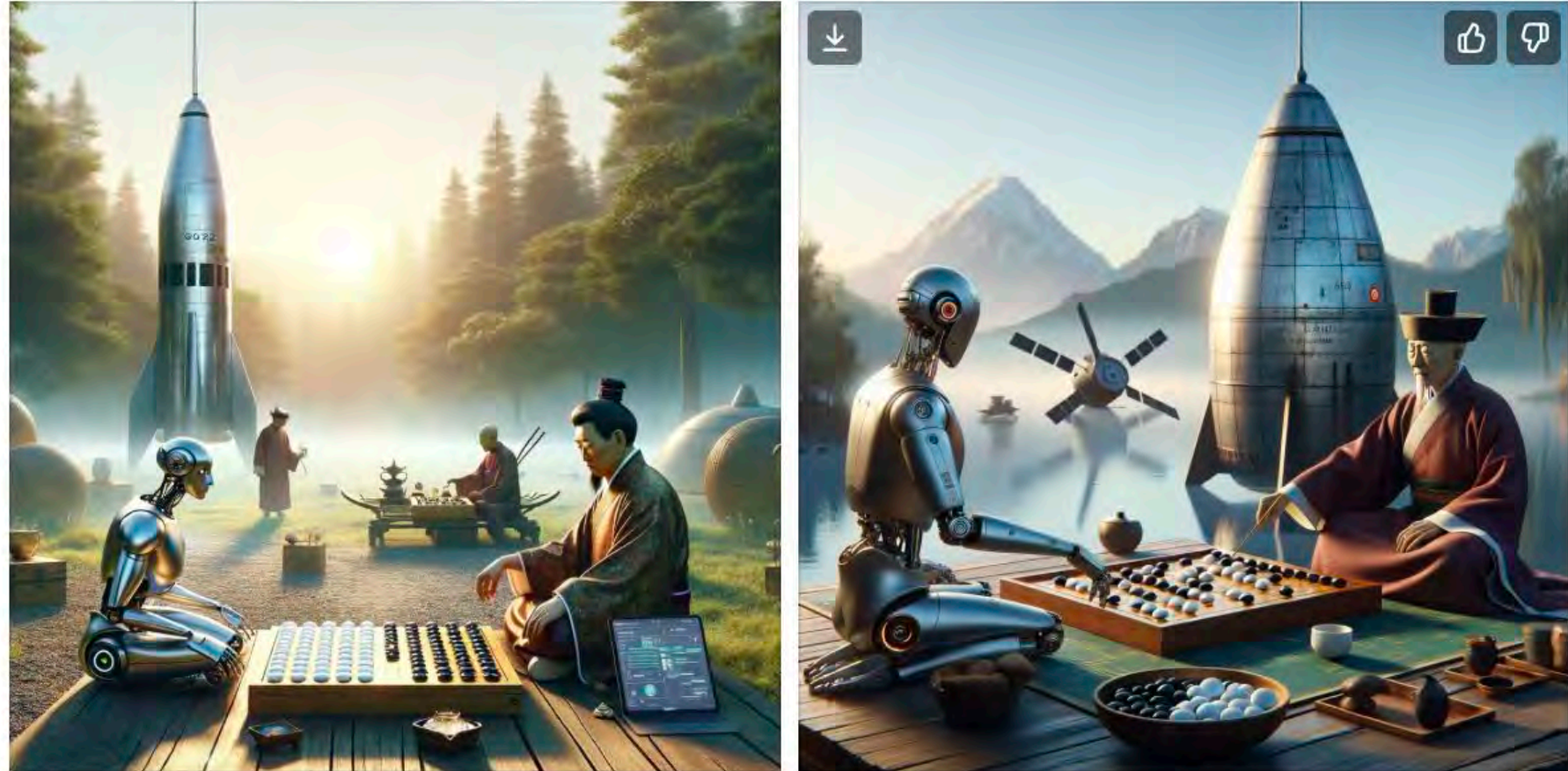


**You**

I need landscape image... It depicts the Sputnik , a robot and a chinese man playing go and a computer screen displaying an Ai chatbot interface



**DALL-E**



Here are the images based on your request. Please review them and let me know if there's anything else I can do for you!



**You**

the image needs to be landscape... the chinese man is young and wears a black suit, sputnick is on the sky



**DALL-E**



I've updated the images to meet your specifications, featuring a landscape orientation, a young Chinese man in a black suit, and the Sputnik satellite in the sky. Please take a look at the new images and let me know if there's anything else I can adjust or add for you!

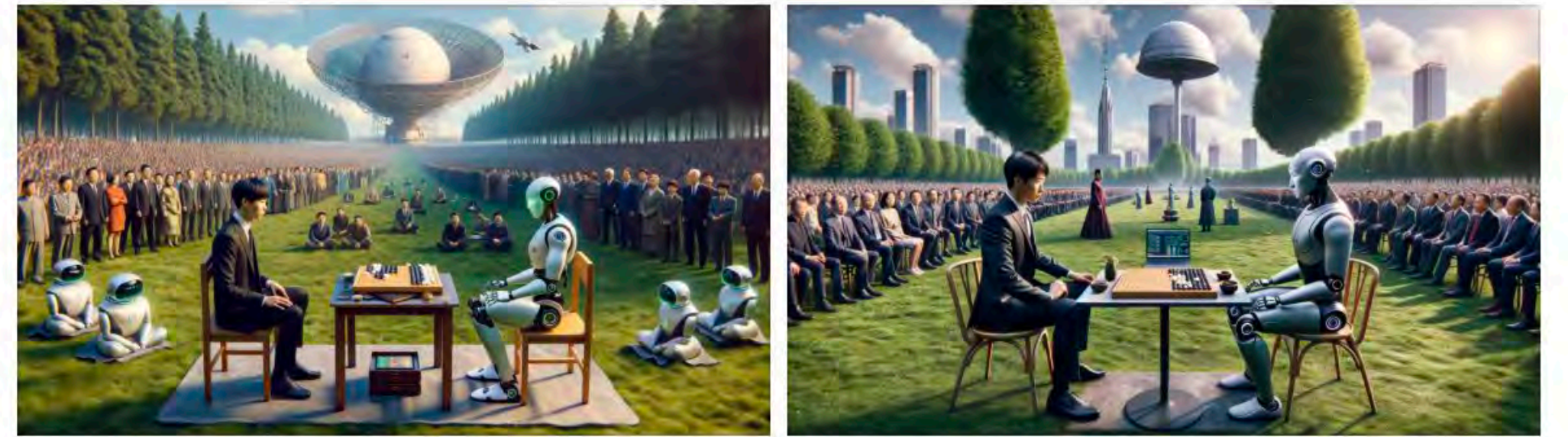


**You**

one of the players is a robot.. a crowd is whatching



**DALL-E**



The images have been updated to include a crowd watching the young Chinese man and the robot playing Go, with the Sputnik satellite visible in the sky. Please review the new images and let me know if there's anything else I can do for you!



**You**

that thing in the sky is not the sputnik russian satelite launched in the late 50s



**DALL-E**

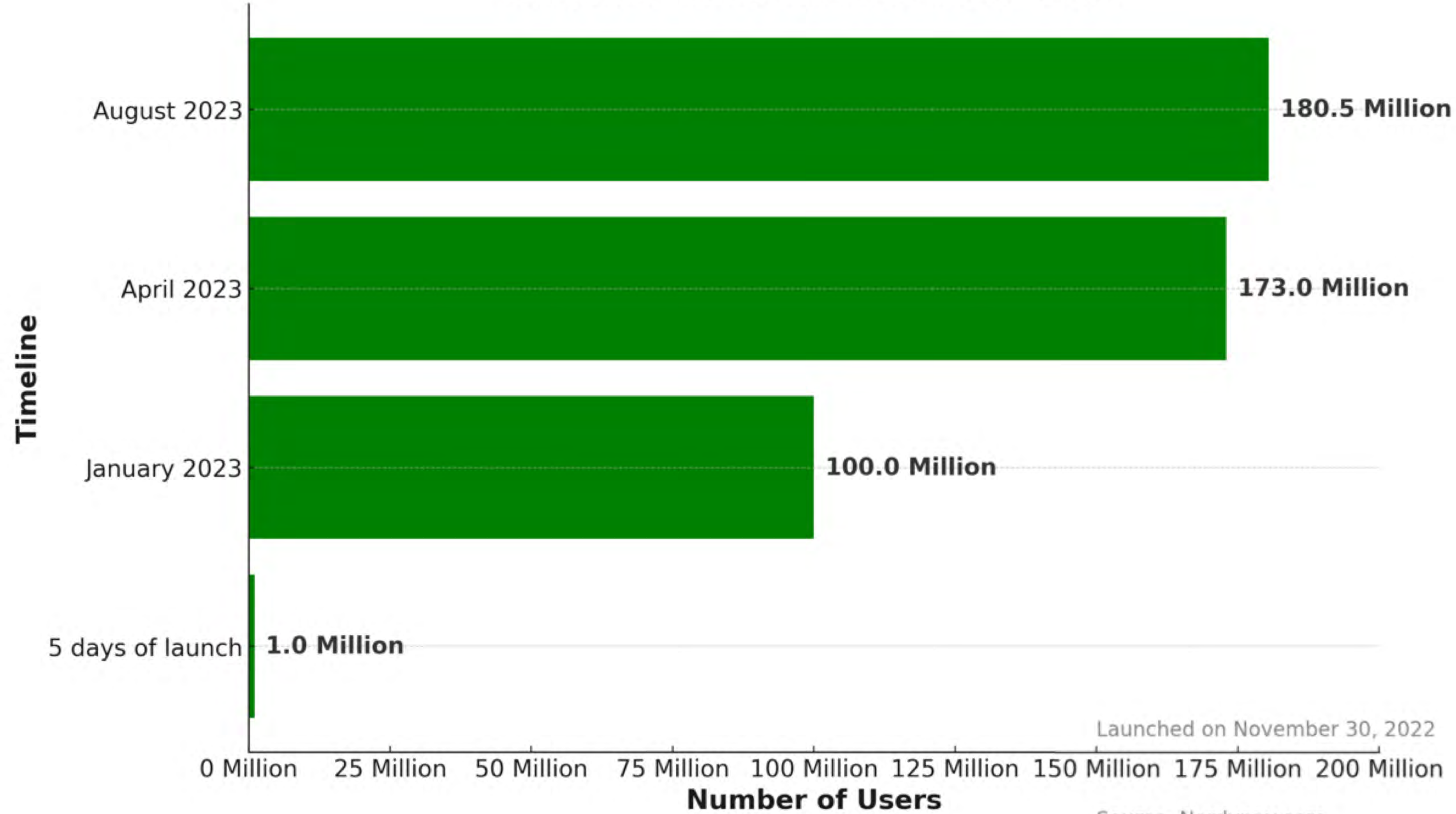


I've revised the images to more accurately depict the Sputnik satellite as it was in the late 1950s, along with the scene you described. Please take a look at the updated images and let me know if there's anything else you'd like to adjust or add!





# ChatGPT User Growth Over Time



Launched on November 30, 2022

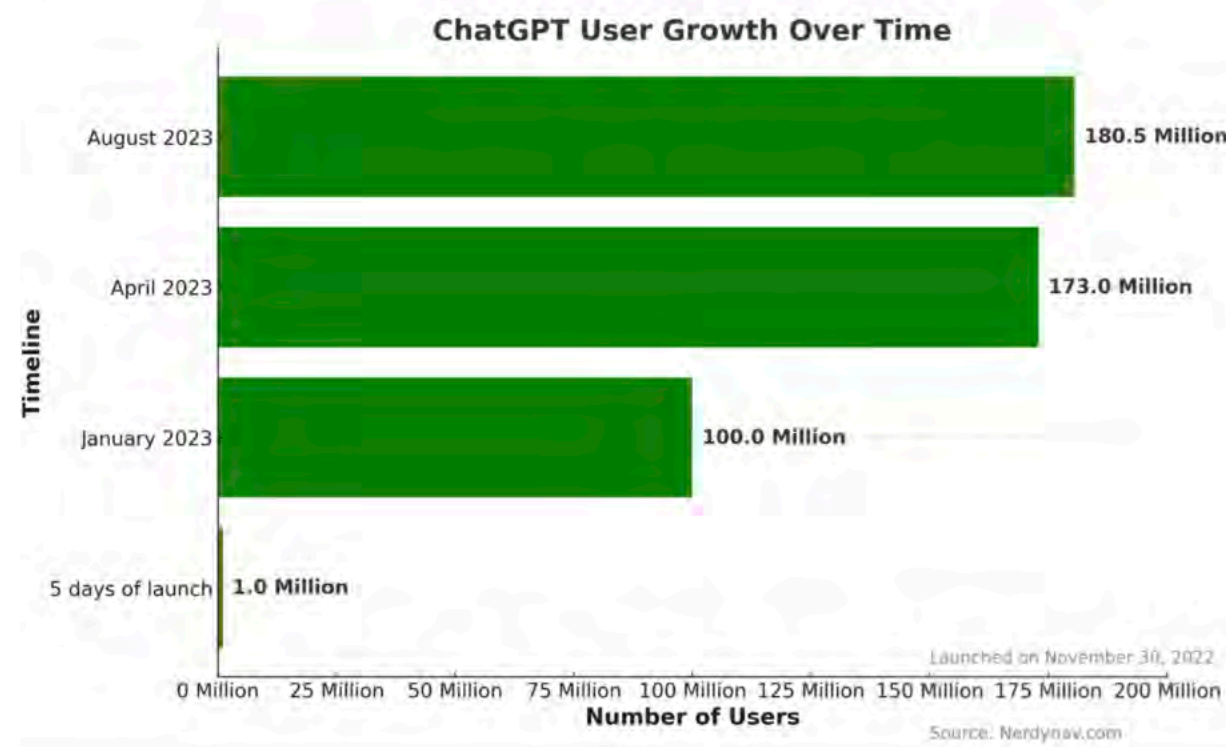
Source: Nerdynav.com





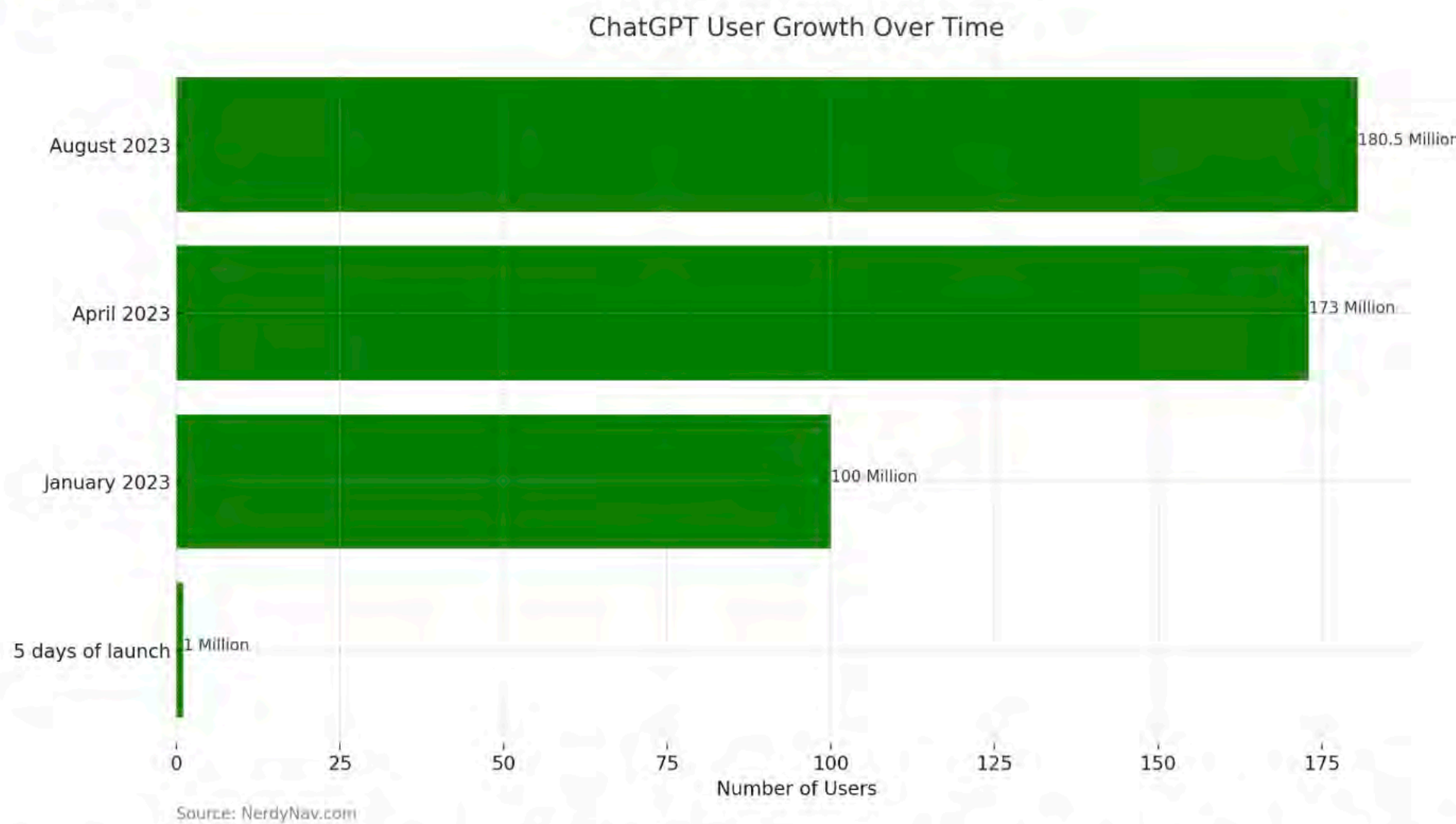


You



create a python script that plots a graph like this one

ChatGPT



I've created a bar chart that resembles the one in the image you uploaded. You can download the chart from the link below:

[Download the chart](#)

If you need any changes or additional information on the graph, let me know! [?]



You

hey dude ndo not be lazy ... I want the python script

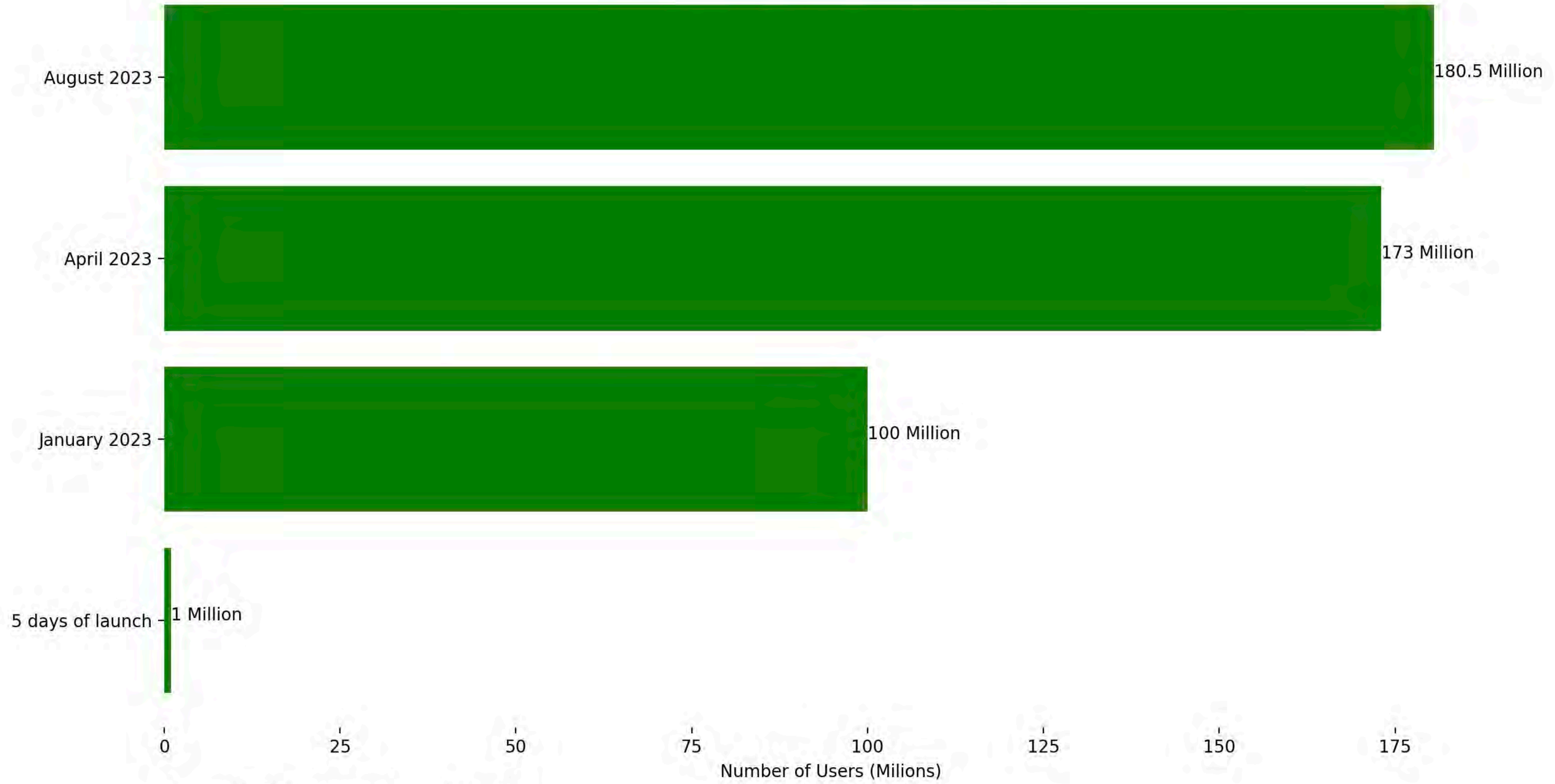
ChatGPT

Apologies for the oversight. Here's the Python script that generates a bar chart similar to the one you uploaded:

```
python Copy code  
  
import matplotlib.pyplot as plt  
  
# Data for plotting  
months = ['5 days of launch', 'January 2023', 'April 2023', 'August 2023']  
users = [1, 100, 173, 180.5]  
  
# Plotting the bar chart  
plt.figure(figsize=(14, 8)) # Size to match the provided aspect  
plt.barh(months, users, color='green')  
  
# Adding the data labels  
for index, value in enumerate(users):  
    plt.text(value, index, f"{value} Million")  
  
# Setting labels and title  
plt.xlabel('Number of Users')  
plt.title('ChatGPT User Growth Over Time')  
  
# Source text  
plt.text(0, -1, 'Source: NerdyNav.com', fontsize=10, color='gray')  
  
# Remove the frame of the chart.  
for spine in plt.gca().spines.values():  
    spine.set_visible(False)  
  
# Save the plot as a file  
plt.savefig('/mnt/data/user_growth_chart.png', bbox_inches='tight', dpi=150)  
  
# Show the plot  
plt.show()
```

This script uses the `matplotlib` library to create a horizontal bar chart. It sets up the data, adds the bars to the plot, labels each bar with its corresponding user number, and adds titles and axes labels. The source text is added at the bottom, and the chart frame is removed for a cleaner look. The script saves the chart to a file and also ws it in an output window.

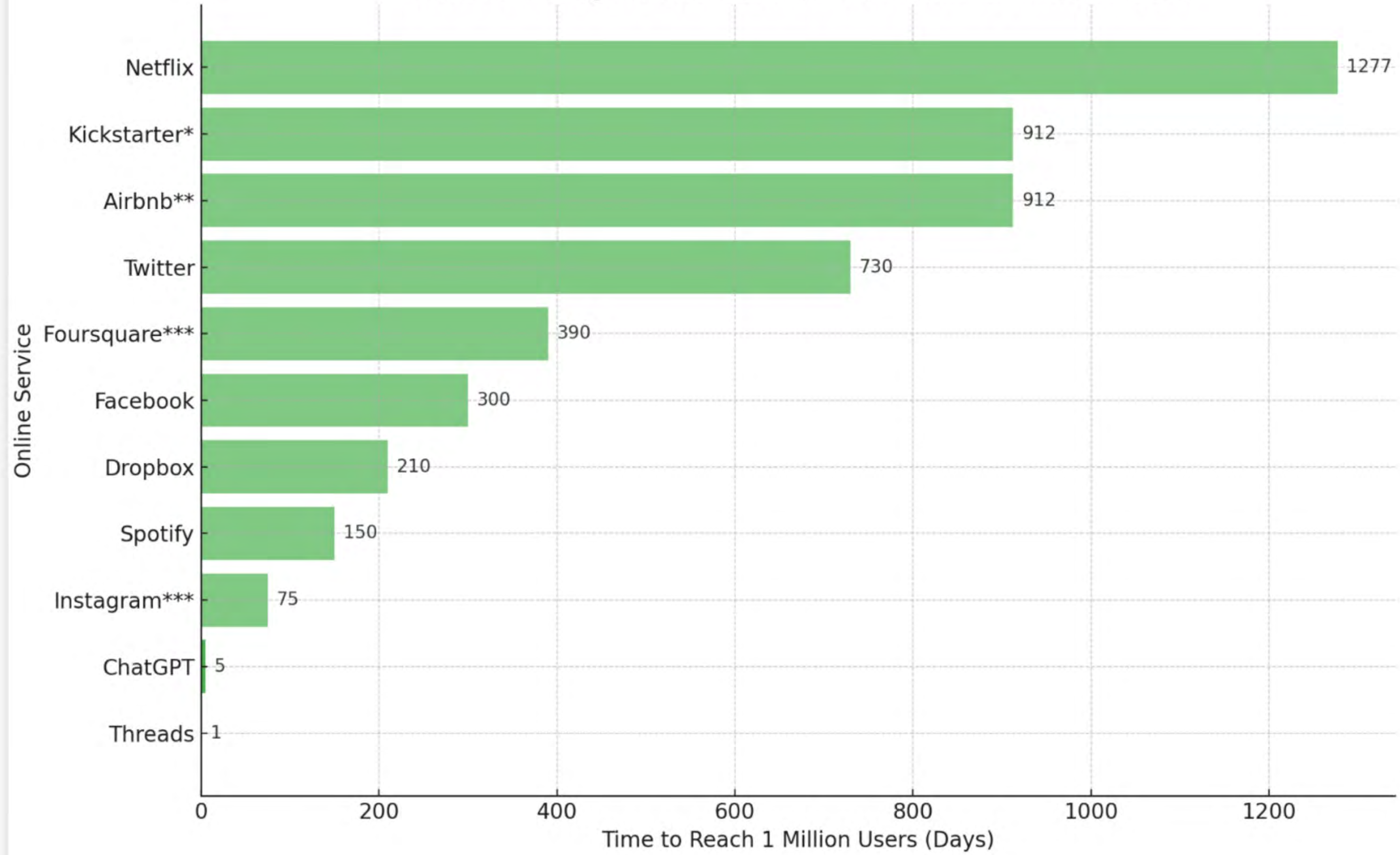
# ChatGPT User Growth Over Time



Source: NerdyNav.com --- Image by : Ludo



### Time Taken by Online Services to Reach 1 Million Users







ChatGPT

No està sol



THIS IS SPARTA!!





# LMSYS Chatbot Arena Leaderboard

[Vote](#) | [Blog](#) | [GitHub](#) | [Paper](#) | [Dataset](#) | [Twitter](#) | [Discord](#)

LMSYS [Chatbot Arena](#) is a crowdsourced open platform for LLM evals. We've collected over 200,000 human preference votes to rank LLMs with the Elo ranking system.

Arena Elo Full Leaderboard

Total #models: 56. Total #votes: 244024. Last updated: Jan 26, 2024.

Contribute your vote at [chat.lmsys.org](https://chat.lmsys.org)! Find more analysis in the [notebook](#).

| Rank | Model                                      | Arena Elo | 95% CI  | Votes | Organization | License             | Knowledge Cutoff |
|------|--|-----------|---------|-------|--------------|---------------------|------------------|
| 1    | <a href="#">GPT-4-Turbo</a>                | 1249      | +13/-13 | 30268 | OpenAI       | Proprietary         | 2023/4           |
| 2    | <a href="#">Bard (Gemini Pro)</a>          | 1215      | +16/-15 | 3014  | Google       | Proprietary         | Online           |
| 3    | <a href="#">GPT-4-0314</a>                 | 1189      | +14/-12 | 18062 | OpenAI       | Proprietary         | 2021/9           |
| 4    | <a href="#">GPT-4-0613</a>                 | 1161      | +13/-13 | 27441 | OpenAI       | Proprietary         | 2021/9           |
| 5    | <a href="#">Mistral Medium</a>             | 1150      | +15/-15 | 11480 | Mistral      | Proprietary         | Unknown          |
| 6    | <a href="#">Claude-1</a>                   | 1150      | +13/-13 | 17630 | Anthropic    | Proprietary         | Unknown          |
| 7    | <a href="#">Claude-2.0</a>                 | 1131      | +14/-13 | 11698 | Anthropic    | Proprietary         | Unknown          |
| 8    | <a href="#">Mixtral-8x7b-Instruct-v0.1</a> | 1123      | +14/-13 | 14165 | Mistral      | Apache 2.0          | 2023/12          |
| 9    | <a href="#">Gemini Pro (Dev API)</a>       | 1122      | +15/-16 | 6332  | Google       | Proprietary         | 2023/4           |
| 10   | <a href="#">Claude-2.1</a>                 | 1119      | +14/-13 | 23323 | Anthropic    | Proprietary         | Unknown          |
| 11   | <a href="#">GPT-3.5-Turbo-0613</a>         | 1117      | +14/-13 | 30326 | OpenAI       | Proprietary         | 2021/9           |
| 12   | <a href="#">Gemini Pro</a>                 | 1114      | +16/-15 | 6981  | Google       | Proprietary         | 2023/4           |
| 13   | <a href="#">Yi-34B-Chat</a>                | 1112      | +13/-15 | 5807  | 01 AI        | Yi License          | 2023/6           |
| 14   | <a href="#">Claude-Instant-1</a>           | 1110      | +13/-12 | 17623 | Anthropic    | Proprietary         | Unknown          |
| 15   | <a href="#">WizardLM-70B-v1.0</a>          | 1106      | +13/-13 | 8079  | Microsoft    | Llama 2 Community   | 2023/8           |
| 16   | <a href="#">Tulu-2-DPO-70B</a>             | 1105      | +16/-15 | 5127  | AllenAI/UW   | AI2 ImpACT Low-risk | 2023/11          |



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




Arena Elo Full Leaderboard

Total #models: 64. Total #votes: 299816. Last updated: Feb 15, 2024.



Contribute your vote  at [chat.lmsys.org](https://chat.lmsys.org)! Find more analysis in the [notebook](#).

| Rank ▲ |  Model ▲ | ★ Arena Elo ▲ |  95% CI ▲ |  Votes ▲ | Organization ▲ | License ▲       | Knowledge Cutoff ▲ |
|--------|---|---------------|--|---|----------------|-----------------|--------------------|
| 1      | <a href="#">GPT-4-1106-preview</a>  | 1254          | +5/-5  | 38745   | OpenAI         | Proprietary     | 2023/4             |
| 2      | <a href="#">GPT-4-0125-preview</a>  | 1253          | +10/-8   | 6308  | OpenAI         | Proprietary     | 2023/4             |
| 3      | <a href="#">Bard (Gemini Pro)</a>   | 1218          | +8/-7  | 10313   | Google         | Proprietary     | Online             |
| 4      | <a href="#">GPT-4-0314</a>  | 1191          | +6/-6  | 20430   | OpenAI         | Proprietary     | 2021/9             |
| 5      | <a href="#">GPT-4-0613</a>  | 1164          | +5/-6  | 32941   | OpenAI         | Proprietary     | 2021/9             |
| 6      | <a href="#">Mistral Medium</a>  | 1152          | +5/-7  | 17847   | Mistral        | Proprietary     | Unknown            |
| 7      | <a href="#">Claude-1</a>  | 1150          | +7/-5  | 19017   | Anthropic      | Proprietary     | Unknown            |
| 8      | <a href="#">Qwen1.5-72B-Chat</a>  | 1147          | +8/-8  | 5204  | Alibaba        | Qianwen LICENSE | 2024/2             |
| 9      | <a href="#">Claude-2.0</a>  | 1132          | +6/-8  | 12753   | Anthropic      | Proprietary     | Unknown            |
| 10     | <a href="#">Gemini Pro (Dev API)</a>  | 1122          | +7/-7  | 9024  | Google         | Proprietary     | 2023/4             |
| 11     | <a href="#">Claude-2.1</a>  | 1120          | +6/-4  | 27723   | Anthropic      | Proprietary     | Unknown            |
| 12     | <a href="#">Mixtral-8x7b-Instruct-v0.1</a>  | 1120          | +5/-6  | 18410   | Mistral        | Apache 2.0      | 2023/12            |
| 13     | <a href="#">GPT-3.5-Turbo-0613</a>  | 1118          | +5/-5  | 36704   | OpenAI         | Proprietary     | 2021/9             |
| 14     | <a href="#">Gemini Pro</a>  | 1115          | +9/-9  | 6958  | Google         | Proprietary     | 2023/4             |
| 15     | <a href="#">Yi-34B-Chat</a>   | 1111          | +7/-8  | 7734  | 01 AI          | Yi License      | 2023/6             |
| 16     | <a href="#">Claude-Instant-1</a>  | 1109          | +7/-5  | 20090   | Anthropic      | Proprietary     | Unknown            |




- New Chat
- Modelfiles
- Prompts
- Documents
- Search
- "Mixtral: What Is It"  
- New Chat
- "Computing History 1950-19"  
- Greetings in Spanish! (Note:  
- "Welcome Phrase for Chat"  


 Marc

 "Mixtral: What Is It?" I understand that you'd like a concise phrase with a strict 3-5... 







**mixtral:latest (24.6GB)**   


Set as default


 **You**  
que es mixtral?

 **Ollama** Mixtral:Latest 30/01/2024 16:01  
Mixtral is not a commonly used word in English, and I'm assuming you are asking about its meaning. However, I was unable to find any reference to "mixtral" as a standalone word in any major English language dictionaries or linguistic resources.

It's possible that there might be a typo or error in the spelling, and you meant to ask about something else. If you could provide more context or clarify your question, I would be happy to try and help you further.

 **You**  
and mistral.ai?

 **Ollama** Mixtral:Latest  
Mistral AI is a cutting-edge company based in Paris, France, developing large language models. The company was founded in 2021 by several leading experts in artificial intelligence, including Criteo's former research director, Iadine Chades, and Mozilla's former head of AI, Pierre-Yves Oudeyer.

Mistral AI's mission is to create large language models that can understand and generate human-like text while ensuring alignment with human values and ethical considerations. The company has gained significant attention in the tech industry for its innovative approach to developing large language models, as well as its commitment to responsible AI development.

Mistral AI's technology has numerous applications across various industries, including customer service, content creation, translation, and more. By building advanced language models that can understand and generate human-like text, Mistral AI aims to unlock new possibilities for natural language processing and revolutionize how humans interact with artificial intelligence systems.





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## Get up and running with large language models, locally.

Run Llama 2, Code Llama, and other models.  
Customize and create your own.

[Download ↓](#)

Available for macOS & Linux  
Windows coming soon



## Models

Find a model

## llama2

The most popular model for general use.

↓ 273.6K Pulls   ↻ 102 Tags   Updated 4 weeks ago

## mistral

The 7B model released by Mistral AI, updated to version 0.2.

↓ 174.0K Pulls   ↻ 53 Tags   Updated 4 weeks ago

## llava

🔥 A novel end-to-end trained large multimodal model that combines a vision encoder and Vicuna for general-purpose visual and language understanding.

↓ 18.8K Pulls   ↻ 33 Tags   Updated 4 weeks ago

## mixtral

A high-quality Mixture of Experts (MoE) model with open weights by Mistral AI.

↓ 40.0K Pulls   ↻ 34 Tags   Updated 4 weeks ago

## starling-lm

Starling is a large language model trained by reinforcement learning from AI feedback focused on improving chatbot helpfulness.

↓ 6,868 Pulls   ↻ 18 Tags   Updated 2 months ago

## neural-chat

A fine-tuned model based on Mistral with good coverage of domain and language.

↓ 8,584 Pulls   ↻ 50 Tags   Updated 5 weeks ago

## codellama

A large language model that can use text prompts to generate and discuss code.

↓ 117.1K Pulls   ↻ 199 Tags   Updated 9 hours ago

## dolphin-mixtral

An uncensored, fine-tuned model based on the Mixtral mixture of experts model that excels at coding tasks. Created by Eric Hartford.

↓ 97.7K Pulls   ↻ 70 Tags   Updated 4 weeks ago

## mistral-openorca

Mistral OpenOrca is a 7 billion parameter model, fine-tuned on top of the Mistral 7B model using the OpenOrca dataset.

↓ 88.5K Pulls   ↻ 17 Tags   Updated 3 months ago

## llama2-uncensored

Uncensored Llama 2 model by George Sung and Jarrad Hope.

↓ 56.3K Pulls   ↻ 34 Tags   Updated 2 months ago

## orca-mini

A general-purpose model ranging from 3 billion parameters to 70 billion, suitable for entry-level hardware.

↓ 41.5K Pulls   ↻ 119 Tags   Updated 2 months ago

## vicuna

General use chat model based on Llama and Llama 2 with 2K to 16K context sizes.

↓ 25.4K Pulls   ↻ 111 Tags   Updated 2 months ago

## deepseek-coder

DeepSeek Coder is a capable coding model trained on two trillion code and natural language tokens.

↓ 22.8K Pulls   ↻ 102 Tags   Updated 4 weeks ago

## wizard-vicuna-uncensored

Wizard Vicuna Uncensored is a 7B, 13B, and 30B parameter model based on Llama 2 uncensored by Eric Hartford.

↓ 22.6K Pulls   ↻ 49 Tags   Updated 2 months ago



# Més enllà de ChatGPT en IA Generativa

- ChatGPT: Una part petita de la IA Generativa.
- Utilitza models transformadors i tècniques de difusió.
- Basat en LLM GPT-3 i GPT-4.
- Arquitectura transformador: Clau en la recerca d'IA.

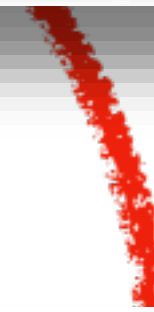




PUBLICATIONS ›

## Attention is All You Need

Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N. Gomez, Lukasz Kaiser, Illia Polosukhin  
*NIPS* (2017)



### Agency [\[ edit \]](#)

An LLM is a language model, which is not an agent as it has no goal, but it can be used as a component of an [intelligent agent](#).

The ReAct ("Reason+Act") method constructs an [agent](#) out of an LLM, using the LLM as a planner. The LLM is prompted to "think out loud". Specifically, the language model is prompted with a textual description of the environment, a goal, a list of possible actions, and a record of the actions and observations so far. It generates one or more thoughts before generating an action, which is then executed in the environment.<sup>[48]</sup> The linguistic description of the environment given to the LLM planner can even be the LaTeX code of a paper describing the environment.<sup>[49]</sup>

The Reflexion method<sup>[50]</sup> constructs an agent that learns over multiple episodes. At the end of each episode, the LLM is given the record of the episode, and prompted to think up "lessons learned", which would help it perform better at a subsequent episode. These "lessons learned" are given to the agent in the subsequent episodes.

**Wikipedia:LLM**

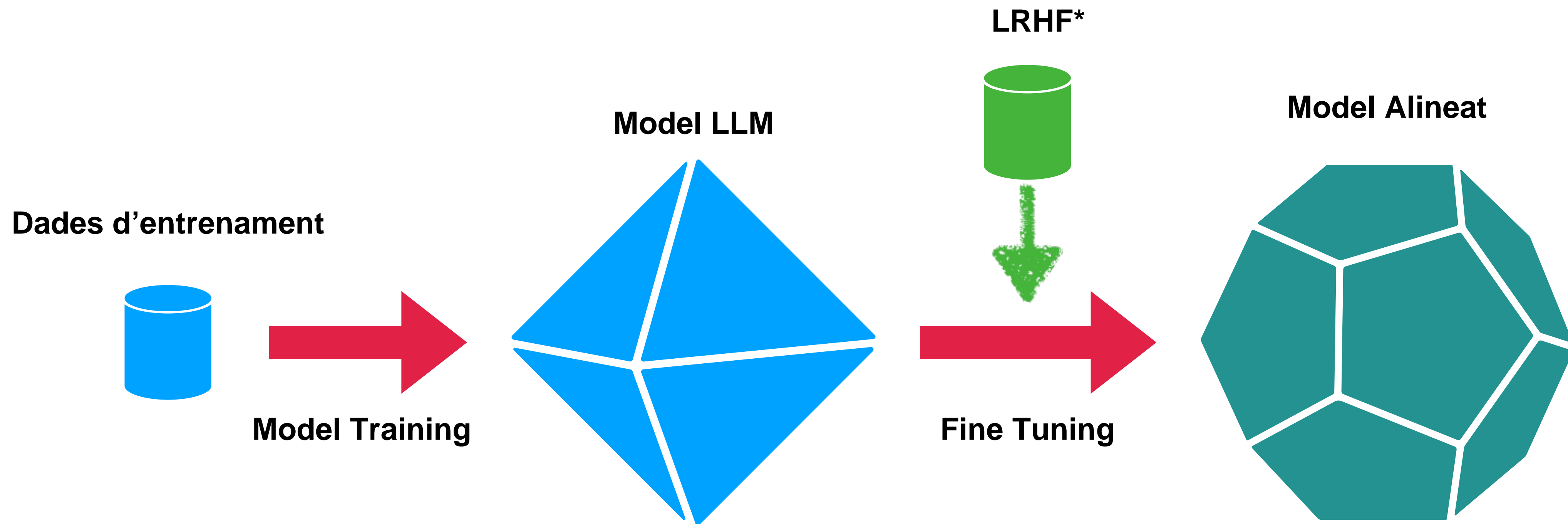


# Recepta per a un LLM

- Software
- Moltes, moltes, moltes dades
- Supervisió
- Supercomputadors
- Refinat (fine tuning)







Learning Reinforcement through Human Feedback

<https://openai.com/research/learning-from-human-preferences>



# Phrenology

Article Talk

From Wikipedia, the free encyclopedia

*Not to be confused with [Phenology](#).*

*For the music album by the Roots, see [Phrenology \(album\)](#).*

**Phrenology** (from [Ancient Greek](#) φρήν (*phrēn*) 'mind', and λόγος (*logos*) 'knowledge') is a **pseudoscience** that involves the measurement of bumps on the skull to predict mental traits.<sup>[1][2]</sup> It is based on the concept that the **brain** is the organ of the mind, and that certain brain areas have localized, specific **functions** or modules.<sup>[3]</sup> It was said that the brain was composed of different muscles, so those that were used more often were bigger, resulting in the different skull shapes. This led to the reasoning behind why everyone had bumps on the skull in different locations. The brain "muscles" not being used as frequently remained small and were therefore not present on the exterior of the skull. Although both of those ideas have a basis in reality, phrenology generalized beyond empirical knowledge in a way that departed from science.<sup>[1][4]</sup> The central phrenological notion that measuring the contour of the skull can predict **personality traits** is discredited by empirical research.<sup>[5]</sup> Developed by [German](#) physician [Franz Joseph Gall](#) in 1796,<sup>[6]</sup> the discipline was influential in the 19th century, especially from about 1810 until 1840. The principal British centre for phrenology was Edinburgh, where the [Edinburgh Phrenological Society](#) was established in 1820.

This article is part of a series on **Alternative medicine**



**General information** [show]

**Fringe medicine and science** [show]

**Conspiracy theories** [show]

**Classifications** [show]

**Traditional medicine** [show]

**Diagnoses** [show]

V T E



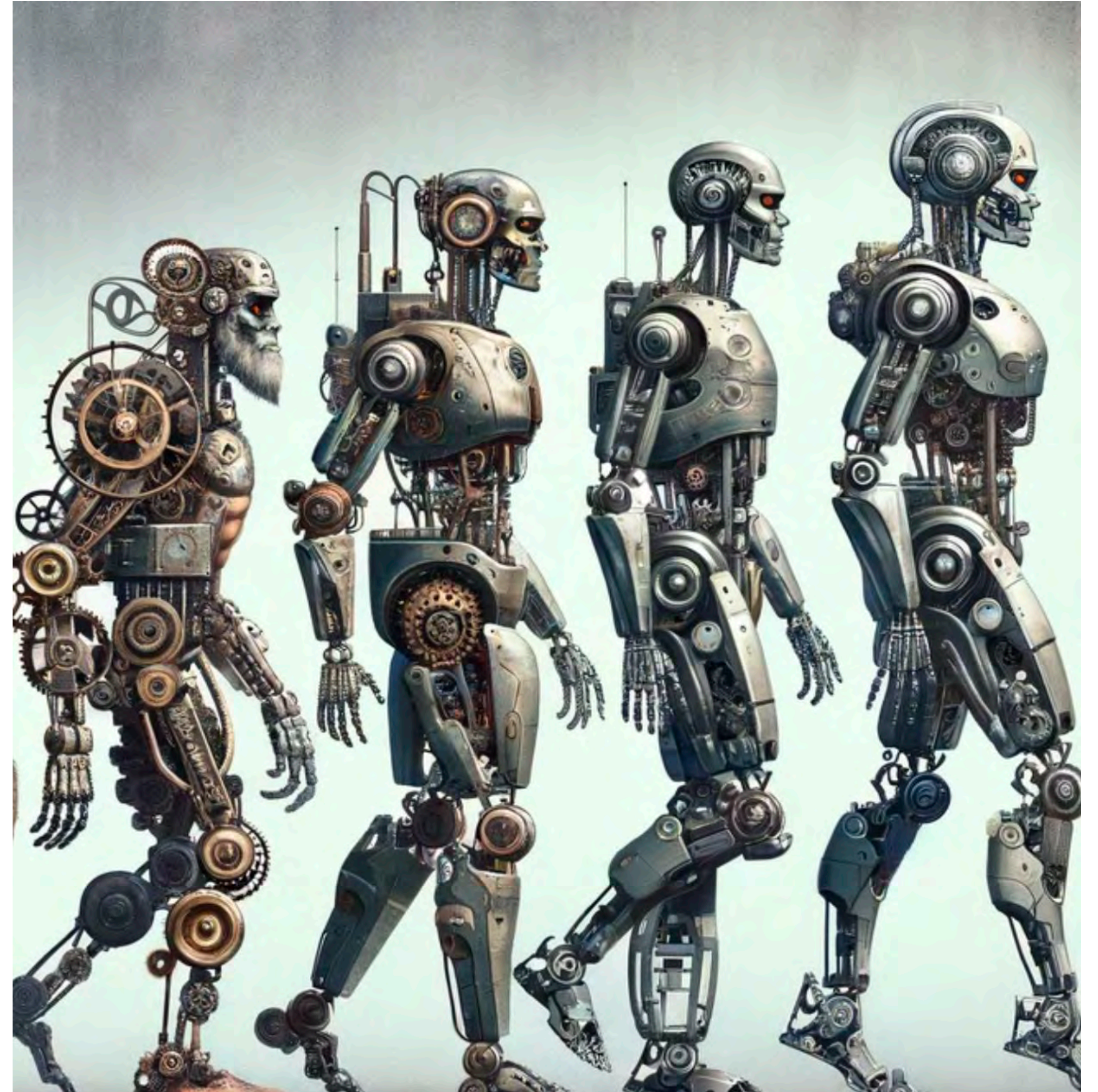
Phrenological skull, European, 19th century. Wellcome Collection, London



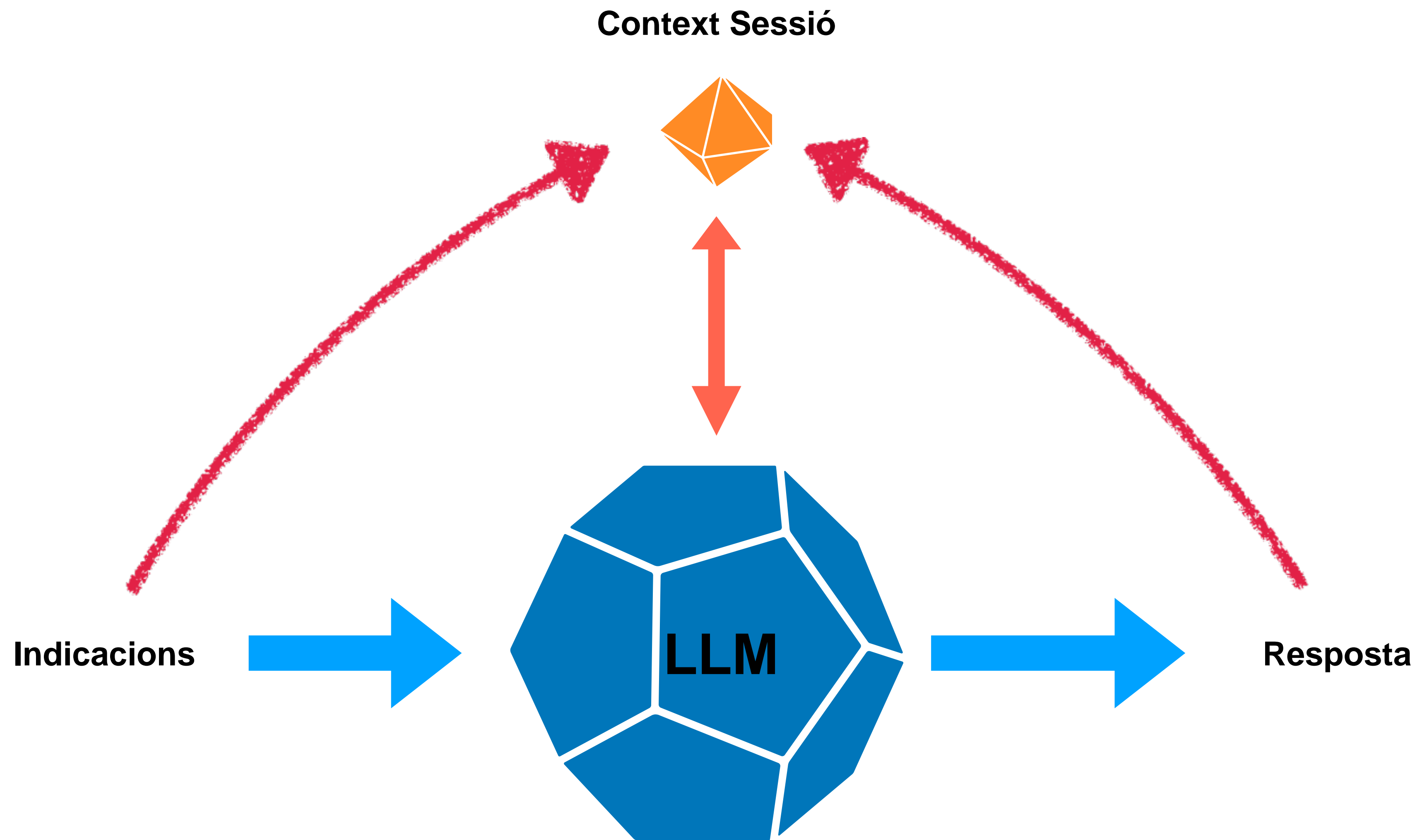
# La quantitat té una qualitat en si mateixa

A mesura que es fan grans apareixen qualitats emergents

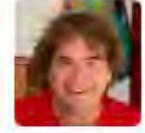
- Capacitat d'aprenentatge ràpid amb pocs exemples.
- Raonament en cadena de pensament en tasques complexes.
- Habilitats no anticipades en programació, aritmètica i correcció de conceptes erronis.
- Evidència de representacions internes per a raonament abstracte més enllà de l'estructura lingüística.
- Exemples:
  - Representació interna de colors alineada amb la percepció humana.
  - Diferenciació entre conceptes erronis i fets, i proves de raonament de sentit comú.











explica que es un haiku



Un haiku és una forma de poesia breu que es va originar al Japó. Tradicionalment, un haiku està format per tres línies i un total de 17 síl·labes, distribuïdes de la següent manera:

- La primera línia conté 5 síl·labes.
- La segona línia conté 7 síl·labes.
- La tercera línia conté 5 síl·labes.

Els haikus solen centrar-se en temes relacionats amb la natura, les estacions, la bellesa, la tranquil·litat i els moments efímers de la vida. També és habitual que presentin una espècie de "salt" o "gir" en el pensament, conegut com a "kireji", que serveix per aprofundir la comprensió del lector o evocar emocions.

Però és important assenyalar que la forma tradicional del haiku s'ha adaptat i variat en diverses cultures i llengües, i per tant, es poden trobar haikus que no segueixen estrictament la regla de les 17 síl·labes.





tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be





tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be



Escollim "paella". La paraula "paella" té 6 lletres, que és un número parell, així que escrivim un haiku sobre aquest plat.

Aroma de marisc,  
sobre l'arròs daurat s'estén,  
paella al sol ponent.

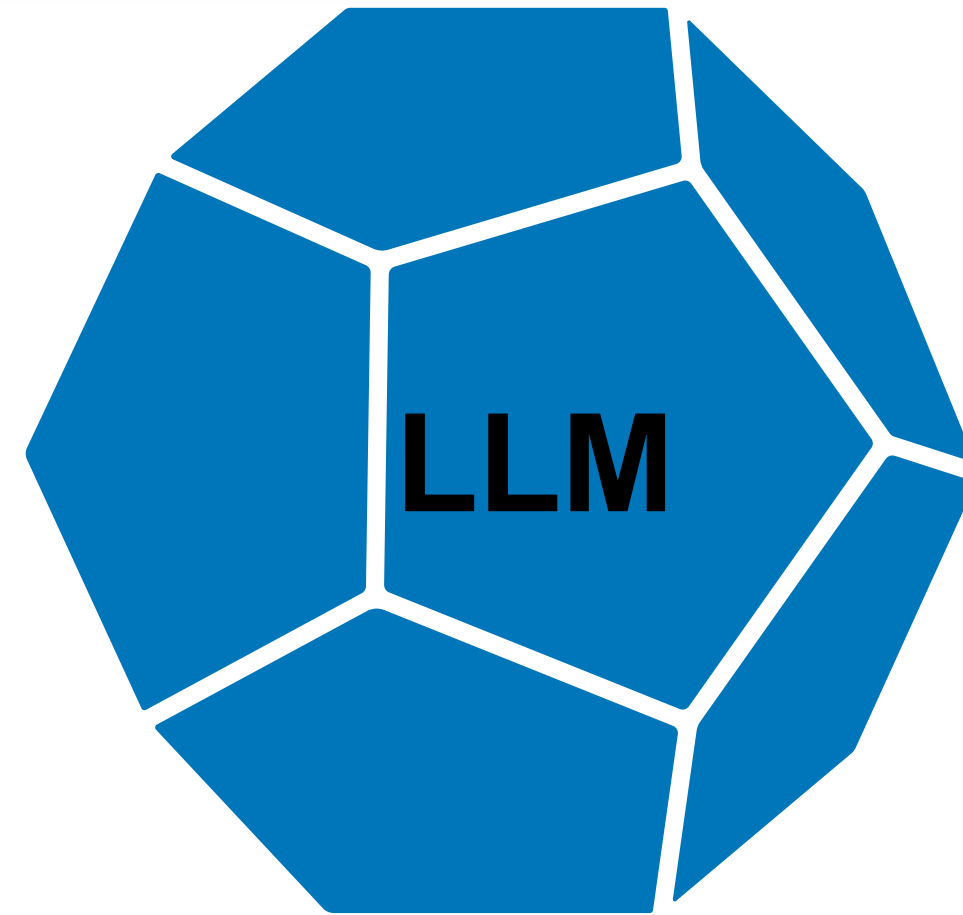
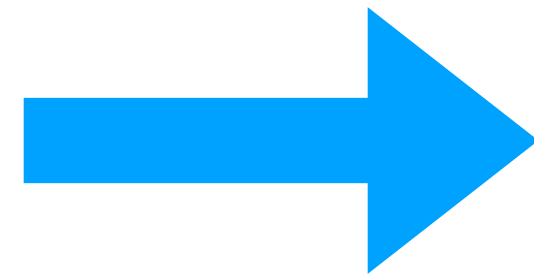


## Context Sessió

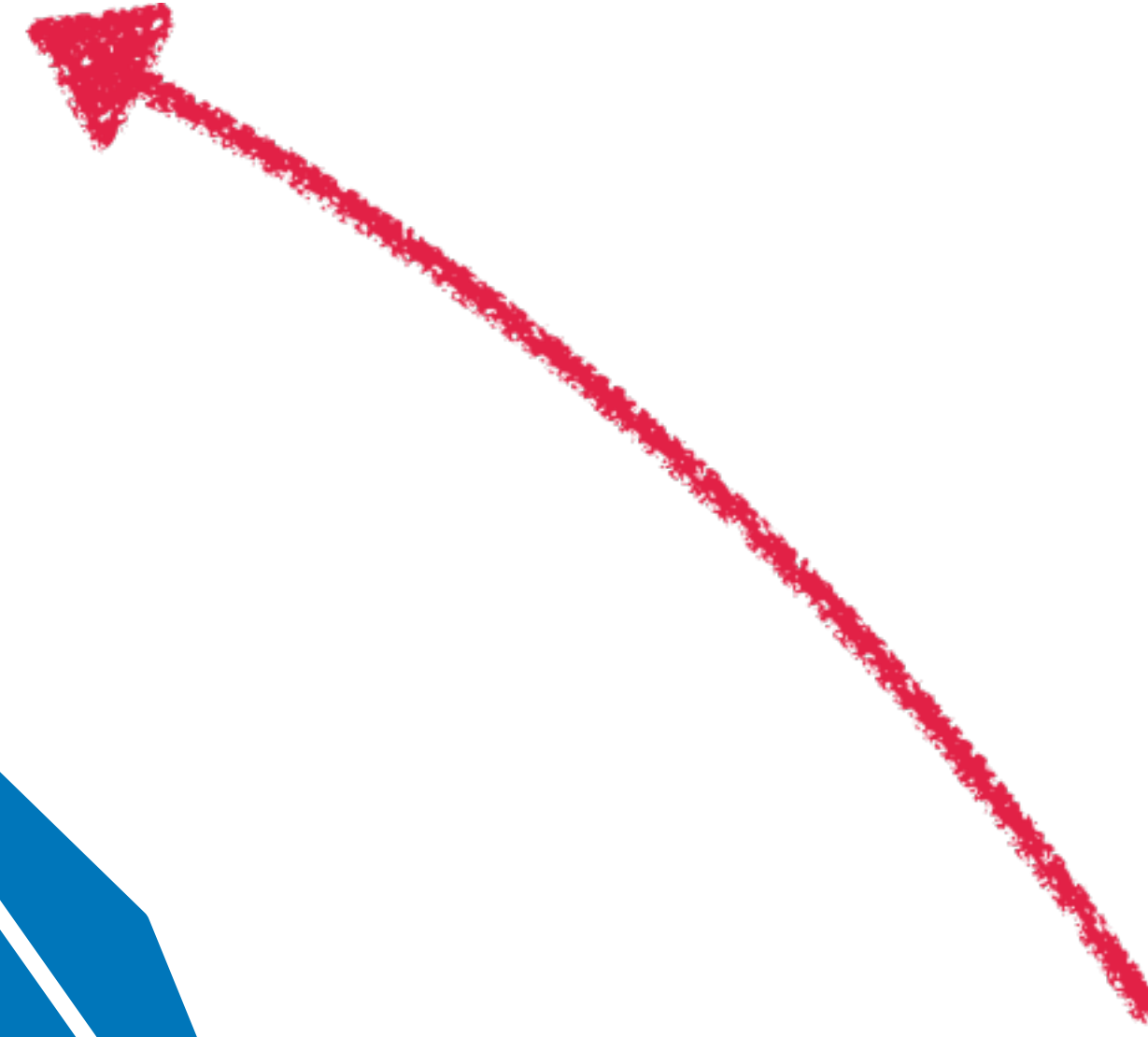
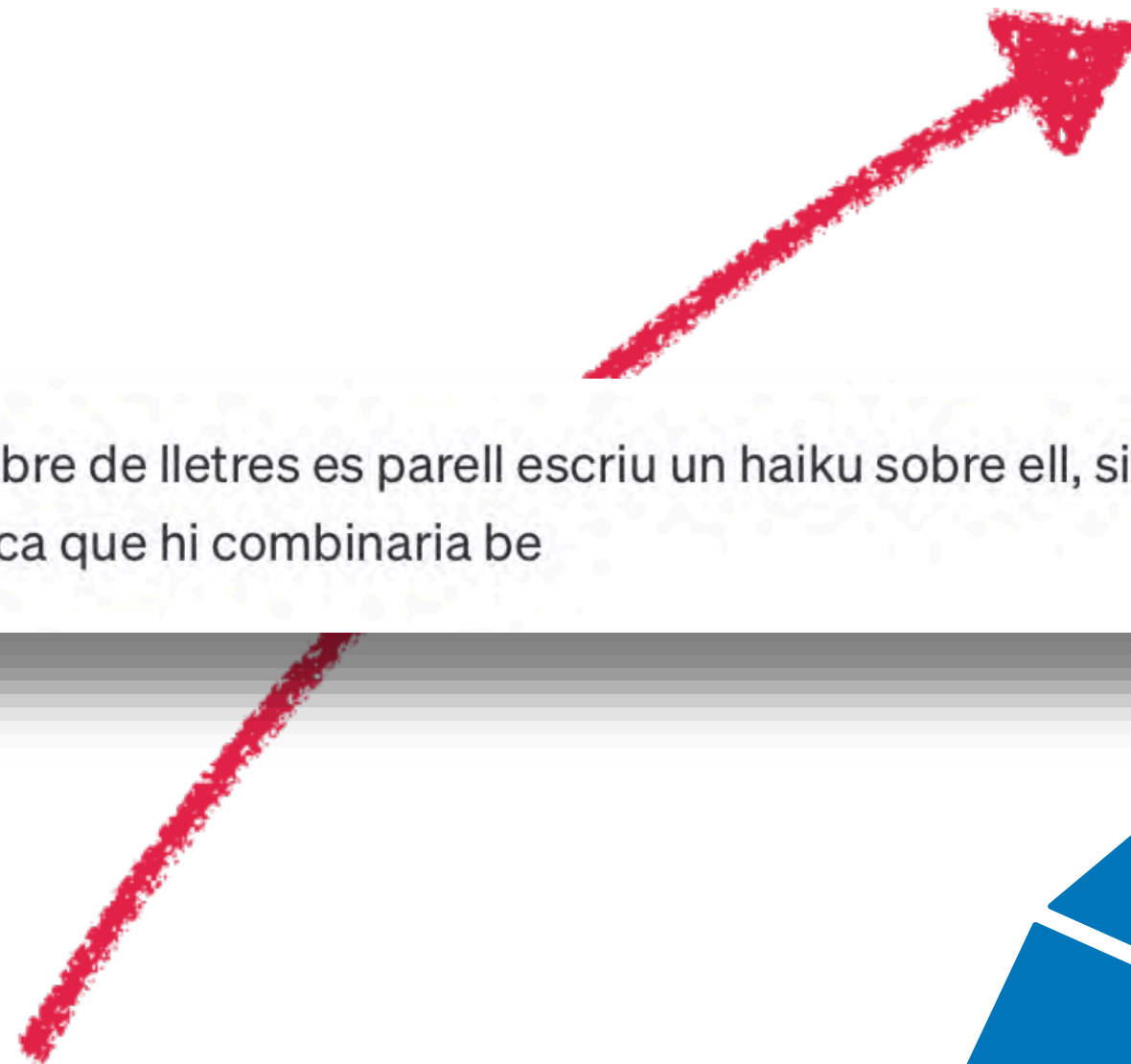


tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be

Indicacions



Resposta

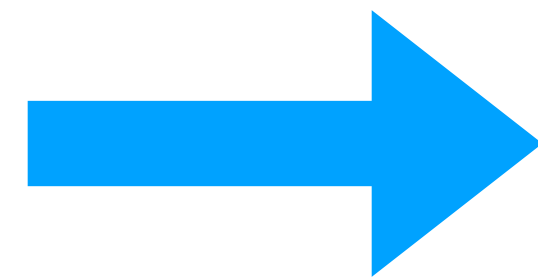




## Context Sessió

tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be

Indicacions



LLM



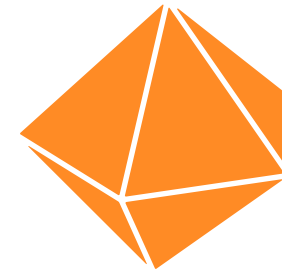
Resposta



Escollim "paella". La paraula "paella" té 6 lletres, que és un número parell, així que escrivim un haiku sobre aquest plat.



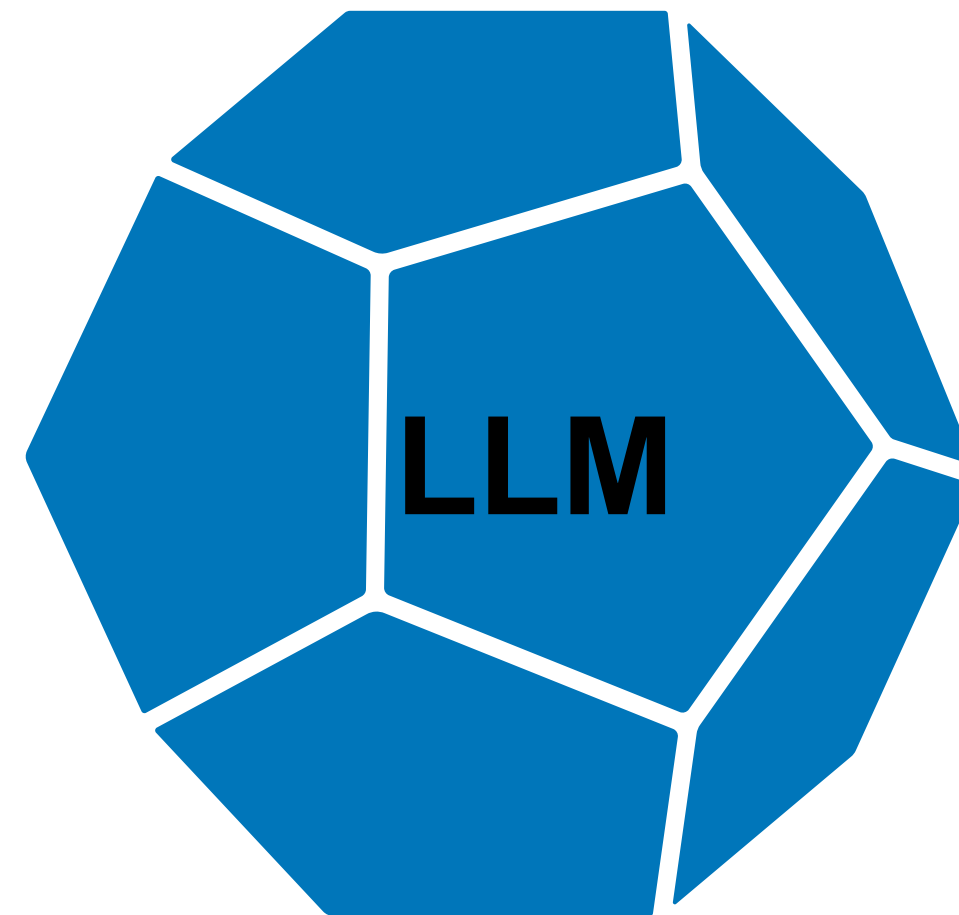
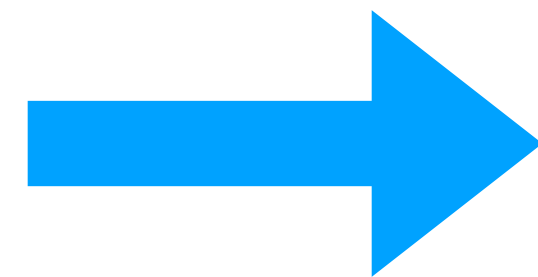
## Context Sessió



Escollim "paella". La paraula "paella" té 6 lletres, que és un número parell, així que escrivim un haiku sobre aquest plat.

tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be

Indicacions



Resposta





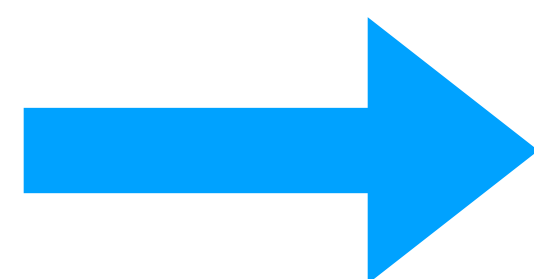
## Context Sessió



Escollim "paella". La paraula "paella" té 6 lletres, que és un número parell, així que escrivim un haiku sobre aquest plat.

tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be

**Indicacions**

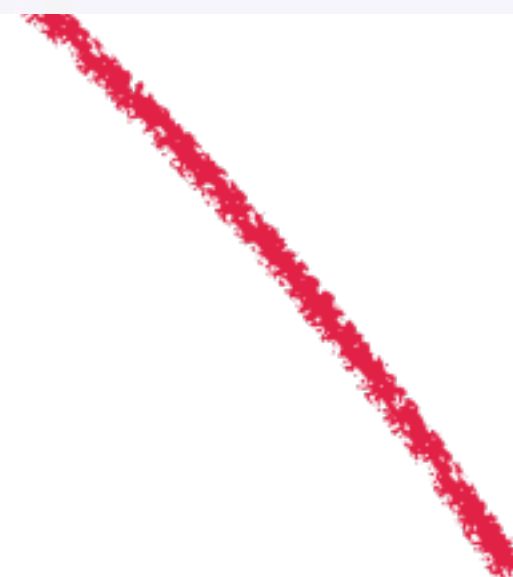
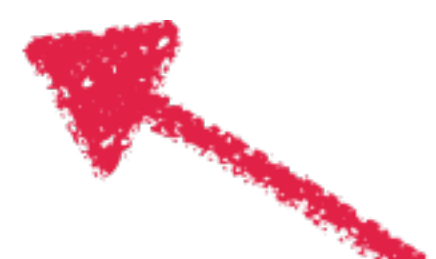
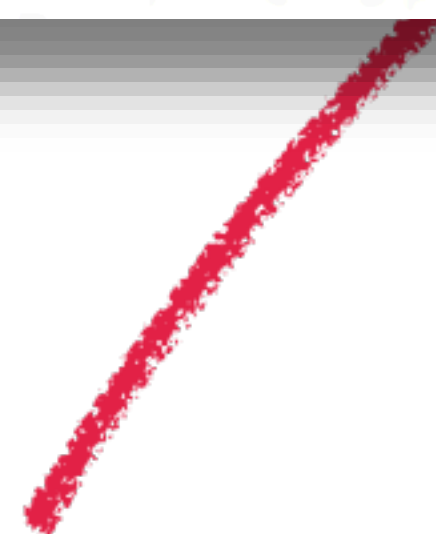


**LLM**



**Resposta**

Aroma de marisc,  
sobre l'arròs daurat s'estén,  
paella al sol ponent.







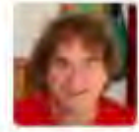
tria el nom d'un aliment o un plat, si el nombre de lletres es parell escriu un haiku sobre ell, sino escriu un haiku sobre una beguda alcohòlica que hi combinaria be



Escollim "sushi". La paraula "sushi" té 5 lletres, que és un número senar, així que escrivim un haiku sobre una beguda alcohòlica que hi combinaria bé, el "sake".

Sake suau i net,  
sushi fresc, màgia al paladar,  
batega el cor d'Orient.





te voy a dar un texto entre triples tildes, transformalo en una lista de instrucciones del estilo :

Paso 1:

Paso 2:

...

Paso N:

Si no te doy ninguna lista de instrucciones coherente, simplemente di:

No hace falta hacer nada:

''' Con 10 cañones por banda viento en popa a toda vela..

'''



No hace falta hacer nada.





te voy a dar un texto entre triples tildes, trasformalo en una lista de instrucciones del estilo :

Paso 1:

Paso 2:

...

Paso N:

Si no te doy ninguna lista de instrucciones coherente, simplemente di:

No hace falta hacer nada:

''' Colocamos el choco en un colador para que pierda el líquido. Lo secamos con papel de cocina y lo metemos en una bolsa junto con la harina. Sacudimos la bolsa para que la harina se adhiera al pescado. Se puede usar solo harina especial para freír, pero le da un punto más crujiente añadir un tercio de harina de sémola de trigo duro.

Con las manos vamos sacudiendo para eliminar el exceso de harina y ponemos inmediatamente en el aceite caliente.

Freímos hasta que doren por fuera y servimos al momento. Podemos rociar los chocos fritos con unas gotas de limón.

'''





te voy a dar un texto entre triples tildes, trasformalo en una lista de instrucciones del estilo :

Paso 1:

Paso 2:

...

Paso N:

Si no te d

No hace t

''' Coloc

de cocina

harina se

punto má

Con las m

inmediat

Freímos h

fritos con

'''



Aquí está el texto transformado en una lista de instrucciones:

Paso 1: Colocamos el choco en un colador para que pierda el líquido.

Paso 2: Lo secamos con papel de cocina y lo metemos en una bolsa junto con la harina.

Paso 3: Sacudimos la bolsa para que la harina se adhiera al pescado.

Paso 4: Se puede usar solo harina especial para freír, pero le da un punto más crujiente añadir un tercio de harina de sémola de trigo duro.

Paso 5: Con las manos vamos sacudiendo para eliminar el exceso de harina y ponemos inmediatamente en el aceite caliente.

Paso 6: Freímos hasta que doren por fuera.

Paso 7: Servimos al momento.

Paso 8: Opcionalmente, podemos rociar los chocos fritos con unas gotas de limón.

Espero que esta lista de instrucciones te sea útil. ¡Disfruta de tus chocos fritos!



# Trucs d'enginyeria de prompts

- Ser específic
- Indentificar que es cada part del prompt
- Especificar o donar un exemple del format de sortida
- Deixa que el model "pensi"





---

# Can AI-Generated Text be Reliably Detected?

---

**Vinu Sankar Sadasivan**  
vinu@umd.edu

**Aounon Kumar**  
aounon@umd.edu

**Sriram Balasubramanian**  
sriramb@umd.edu

**Wenxiao Wang**  
wwx@umd.edu

**Soheil Feizi**  
sfeizi@umd.edu

Department of Computer Science  
University of Maryland





La ricerca canvia?



# Can AI-Generated Text be Reliably Detected?

Vinu Sankar Sadasiv  
vinu@umd.edu

Sriram Balasubramanian  
sriramb@umd.edu

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## Abstract

The rapid progress of large language models (LLMs) has made them capable of performing astonishingly well on various tasks including document completion and question answering. The unregulated use of these models, however, can potentially lead to malicious consequences such as plagiarism, generating fake news, spamming, etc. Therefore, reliable detection of AI-generated text can be critical to ensure the responsible use of LLMs. Recent works attempt to tackle this problem either using certain model signatures present in the generated text outputs or by applying watermarking techniques that imprint specific patterns onto them. In this paper, both empirically and theoretically, we show that these detectors are not reliable in practical scenarios. Empirically, we show that *paraphrasing attacks*, where a light paraphraser is applied on top of the generative text model, can break a whole range of detectors, including the ones using the watermarking schemes as well as neural network-based detectors and zero-shot classifiers. Our experiments demonstrate that retrieval-based detectors, designed to evade paraphrasing attacks, are still vulnerable against *recursive* paraphrasing. We then provide a theoretical *impossibility result* indicating that as language models become more sophisticated and better at emulating human text, the performance of even the best-possible detector decreases. For a sufficiently advanced language model seeking to imitate human text, even the best-possible detector may only perform marginally better than a random classifier. Our result is general enough to capture specific scenarios such as particular writing styles, clever prompt design, or text paraphrasing. We also extend the impossibility result to include the case where *pseudorandom* number generators are used for AI-text generation instead of true randomness. We show that the same result holds with a negligible correction term for all polynomial-time computable detectors. Finally, we show that even LLMs protected by watermarking schemes can be vulnerable against *spoof-*






# Generative IA i Recerca



# El gran asistent

## Calculating black hole shadows: Review of analytical studies

[Volker Perlick](#)<sup>a</sup>  , [Oleg Yu. Tsupko](#)<sup>b</sup>  

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### Abstract

In this article, we provide a review of the current state of the research of the black hole shadow, focusing on analytical (as opposed to numerical and observational) studies. We start with particular attention to the definition of the shadow and its relation to the often used concepts of escape cone, critical impact parameter and particle cross-section. For methodological purposes, we present the derivation of the angular size of the shadow for an arbitrary spherically symmetric and static space-time, which allows one to calculate the shadow for an observer at arbitrary distance from the center. Then we discuss the calculation of the shadow of a Kerr black hole, for an observer anywhere outside of the black hole. For observers at large distances we present and compare two methods used in the literature. Special attention is given to calculating the shadow in space-times which are not asymptotically flat. Shadows of wormholes and other black-hole impostors are reviewed. Then we discuss the calculation of the black hole shadow in an expanding universe as seen by a comoving observer. The influence of a plasma on the shadow of a black hole is also considered.



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Hello and welcome to this informative PDF file on calculating black hole shadows! This review focuses on analytical studies, providing insights into the definition of shadows, methods for calculating them, and considerations for different types of black holes and space-time scenarios.

- How does the definition of a black hole shadow relate to concepts like escape cone and critical impact parameter?
- What are the different methods used to calculate the shadow of a Kerr black hole for observers at large distances?
- How does the presence of plasma affect the shadow of a black hole, and what implications does this have for observational studies?

How does the presence of plasma affect the shadow of a black hole, and what implications does this have for observational studies?

The presence of plasma can have significant effects on the shadow of a black hole. While most studies involving the impact of a medium on light propagation require numerical investigations, there are cases where the effect of a non-magnetized, pressure-less electron-ion plasma on the shadow can be treated analytically. This analytical treatment has been applied to several space-time scenarios.

The influence of plasma on the shadow of a black hole is crucial for observational studies as it provides a way to understand how the surrounding environment affects the appearance of the shadow. By analytically considering the plasma's refractive influence on the shadow, researchers can gain insights into how the shadow is modified in the presence of such a medium. This analytical approach allows for a deeper understanding of the interplay between the black hole and its surrounding plasma, providing valuable information for observational studies and theoretical modeling.

Analyzing the impact of plasma on the shadow of a black hole not only enhances our understanding of the complex interactions in astrophysical environments but also contributes to the development of more accurate models for interpreting observational data. This analytical treatment offers a unique perspective on the behavior of light around black holes immersed in plasma, shedding light on the intricate dynamics of these systems and their observational signatures.



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# what is a black hole

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## Answer

A black hole is a region of spacetime where gravity is incredibly strong, to the extent that nothing, not even light, can escape from it. These phenomena form at the end of some stars' lives when their energy dissipates, causing them to collapse in on themselves. The remaining material, often many times the mass of our Sun, condenses into an infinitely small point known as a singularity. This singularity exerts immense gravitational influence, creating an event horizon around it where gravity is so intense that nothing can escape, hence the term "black hole." Approaching a black hole would lead to a process called spaghettification, where the gravitational forces would stretch objects like a piece of spaghetti due to the extreme difference in gravity across them <sup>1</sup> <sup>2</sup> <sup>3</sup>.

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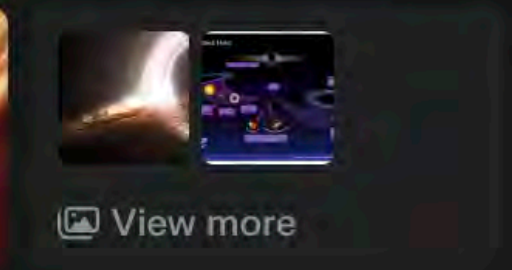
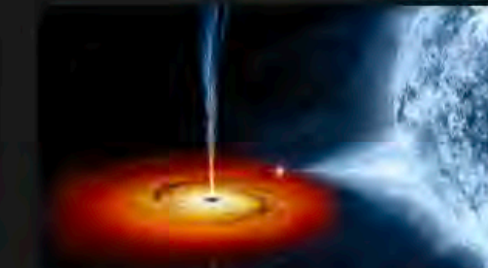
how are black holes formed



what happens to light that enters a black hole



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## assistant by scite\_

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Proteins are essential for the proper functioning of living organisms, and their structure plays a crucial role in their function. The structure of a protein is determined by its amino acid sequence, which in turn affects its folding and stability [6]. The interactions between charged amino acids significantly influence the structure and function of proteins [1]. The number of hydrophobic methylenes linking the backbone to the charged functionality of amino acids affects protein structure stability [1]. Protein secondary structures, such as  $\beta$ -sheet structures, are the fundamental three-dimensional building blocks of protein structures [1]. Intrinsically disordered proteins (IDPs) are a family of proteins that fail to form rigid 3-D structures under physiological conditions, either along their entire lengths or only in localized regions [2]. IDPs exist as dynamic ensembles within which atom positions and backbone Ramachandran angles exhibit extreme temporal fluctuations without specific equilibrium values [2].

### References

#### Reference #1

##### Longer charged amino acids favor $\beta$ -strand formation in hairpin peptides

Jingyuan Chang<sup>1</sup>, Jing-Yuan Chang<sup>2</sup>, Nian-Zhi Li<sup>3</sup> et al. 2021J Pep Sci

 3  1  7  0

Interactions between charged amino acids significantly influence the structure and function of proteins. The encoded charged amino acids Asp, Glu, Arg, and Lys have different number of hydrophobic methylenes linking the backbone to the charged functionality...

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#### Reference #2

##### Understanding protein non-folding

Vladimir N. Uversky<sup>1</sup>, A. Keith Dunker<sup>2</sup> 2010 *Biochimica et Biophysica Acta (BBA) - Proteins and Proteomics*

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This review describes the family of intrinsically disordered proteins, members of which fail to form rigid 3-D structures under physiological conditions, either along their entire lengths or only in localized regions...

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 Como combatr la inflación?



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 **You**

Como combatr la inflación?

**OI Jose-V1** 06/03/2024 09:46

▶ Ver fuente 1

▶ Ver video 1

▶ Ver fuente 2

▶ Ver video 2

▶ Ver fuente 3

▶ Ver video 3

## Respuesta:

Para combatir la inflación, se puede implementar una política fiscal restrictiva. Esto implica reducir el gasto público, aumentar impuestos y disminuir las subvenciones. También se pueden llevar a cabo políticas monetarias, como aumentar los tipos de interés, incrementar el encaje legal y vender deuda pública. Estas medidas contribuyen a frenar la inflación al reducir la cantidad de dinero en circulación y controlar el gasto en la economía. Se busca estabilizar los precios y mantener un nivel de inflación que sea considerado óptimo para la economía.



## ✎ Como combarrtr la inflación?



▼ Ver fuente 2

¿Qué es la inflación? Vamos a llevar a cabo políticas tanto fiscales como monetarias. Políticas fiscales, aumentaremos el gasto público, reduciremos impuestos y daremos subvenciones a la gente. Y políticas monetarias, reduciremos tipos de interés, reduciremos el encaje legal y compraremos deuda pública. ¿Qué va a ocurrir a corto plazo? A corto plazo, que es de aquí a un año, ¿qué va a ocurrir con los tipos de interés, el consumo, la inversión y la demanda agregada? ¿Qué va a ocurrir con la ocupación? ¿Qué va a ocurrir a medio plazo? A medio plazo es dos, tres, cuatro años. ¿Qué va a ocurrir con los tipos de interés, el consumo, la inversión, la demanda agregada y la ocupación? La idea es poner una fecha para arriba, para abajo o se queda igual.

▼ Ver video 2







You

Explain this text. Be specific and provide definitions for non experts.

In this article, we provide a review of the current state of the research of the black hole shadow, focusing on analytical (as opposed to numerical and observational) studies. We start with particular attention to the definition of the shadow and its relation to the often used concepts of escape cone, critical impact parameter and particle cross-section. For methodological purposes, we present the derivation of the angular size of the shadow for an arbitrary spherically symmetric and static space-time, which allows one to calculate the shadow for an observer at arbitrary distance from the center. Then we discuss the calculation of the shadow of a Kerr black hole, for an observer anywhere outside of the black hole. For observers at large distances we present and compare two methods used in the literature. Special attention is given to calculating the shadow in space-times which are not asymptotically flat. Shadows of wormholes and other black-hole impostors are reviewed. Then we discuss the calculation of the black hole shadow in an expanding universe as seen by a comoving observer. The influence of a plasma on the shadow of a black hole is also considered.



ChatGPT

This text is about the study of black hole shadows, specifically focusing on the mathematical side rather than computer simulations or direct observations through telescopes. Let's break down the main points and some terms for clarity:

1. **Black Hole Shadow:** The shadow of a black hole is essentially the dark area seen against the backdrop of surrounding light, created because the black hole's strong gravity pulls in light, preventing it from escaping. Think of it as the silhouette of the black hole against the glow of light from nearby stars or matter being pulled into the black hole.
2. **Analytical Studies:** This means the article focuses on using mathematical and theoretical methods to understand black hole shadows, rather than relying on computer simulations (numerical studies) or observing them with telescopes (observational studies).
3. **Escape Cone:** Imagine throwing a ball in different directions; some directions allow the ball to escape your vicinity, while others don't. For light around a black hole, the escape cone would be the range of directions in which light can be emitted and not get sucked into the black hole.
4. **Critical Impact Parameter:** This is a fancy way of saying the specific distance from the center of the black hole at which light (or anything else) can pass closely without getting captured by the black hole's gravity. It's like the perfect close shave.
5. **Particle Cross-Section:** This term refers to the effective area that an incoming particle (like a photon of light) "sees" that can lead to it being captured by the black hole. Think of it as the target area for the black hole's gravitational pull.

6. **Spherically Symmetric and Static Space-Time:** This is a way to describe a simplified model of space around a black hole, assuming it doesn't rotate and its gravitational pull is the same in all directions.
7. **Angular Size of the Shadow:** This refers to how large the shadow of the black hole appears from a specific viewpoint, measured as an angle rather than in units of length. It's how wide the shadow looks to an observer, which can change based on where the observer is located.
8. **Kerr Black Hole:** A Kerr black hole is one that spins. The rotation changes how the black hole's gravity affects space and time around it, and as a result, affects the shape and size of its shadow.
9. **Asymptotically Flat Space-Time:** This term describes a theoretical condition where, far away from any massive object, the curvature of space caused by gravity becomes negligible, and space is effectively flat. When the article talks about space-times that are not asymptotically flat, it means they're considering more complicated scenarios where space's curvature doesn't simplify at great distances.
10. **Wormholes and Black-Hole Impostors:** These are exotic theoretical objects that could mimic some aspects of black holes, including possibly casting shadows. Wormholes are hypothetical tunnels through space-time that could connect distant points.
11. **Expanding Universe and Comoving Observer:** This part deals with how the expansion of the universe affects the observation of black hole shadows. A comoving observer is moving along with the expansion of the universe, which could influence how the shadow looks.
12. **Influence of a Plasma:** Plasma, a state of matter similar to gas but with some of its particles ionized (charged), can affect light's propagation. The article discusses how the presence of plasma around a black hole might alter the appearance of its shadow.

In simple terms, this article is about using math to understand how black holes create shadows, how these shadows look from different points in space, and how various factors like the black hole's spin, the universe's expansion, or the presence of plasma can change the appearance of these shadows.



# I ara què?

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# El moment Sputnik

Alier, M., García-Peñalvo, F.-J., & Camba, J. D. (2024). Generative artificial intelligence in education: From deceptive to disruptive. *International Journal of Interactive Multimedia and Artificial Intelligence*, 8(Special issue on Generative Artificial Intelligence in Education), 5-14.

<https://doi.org/10.9781/ijimai.2024.02.011>

