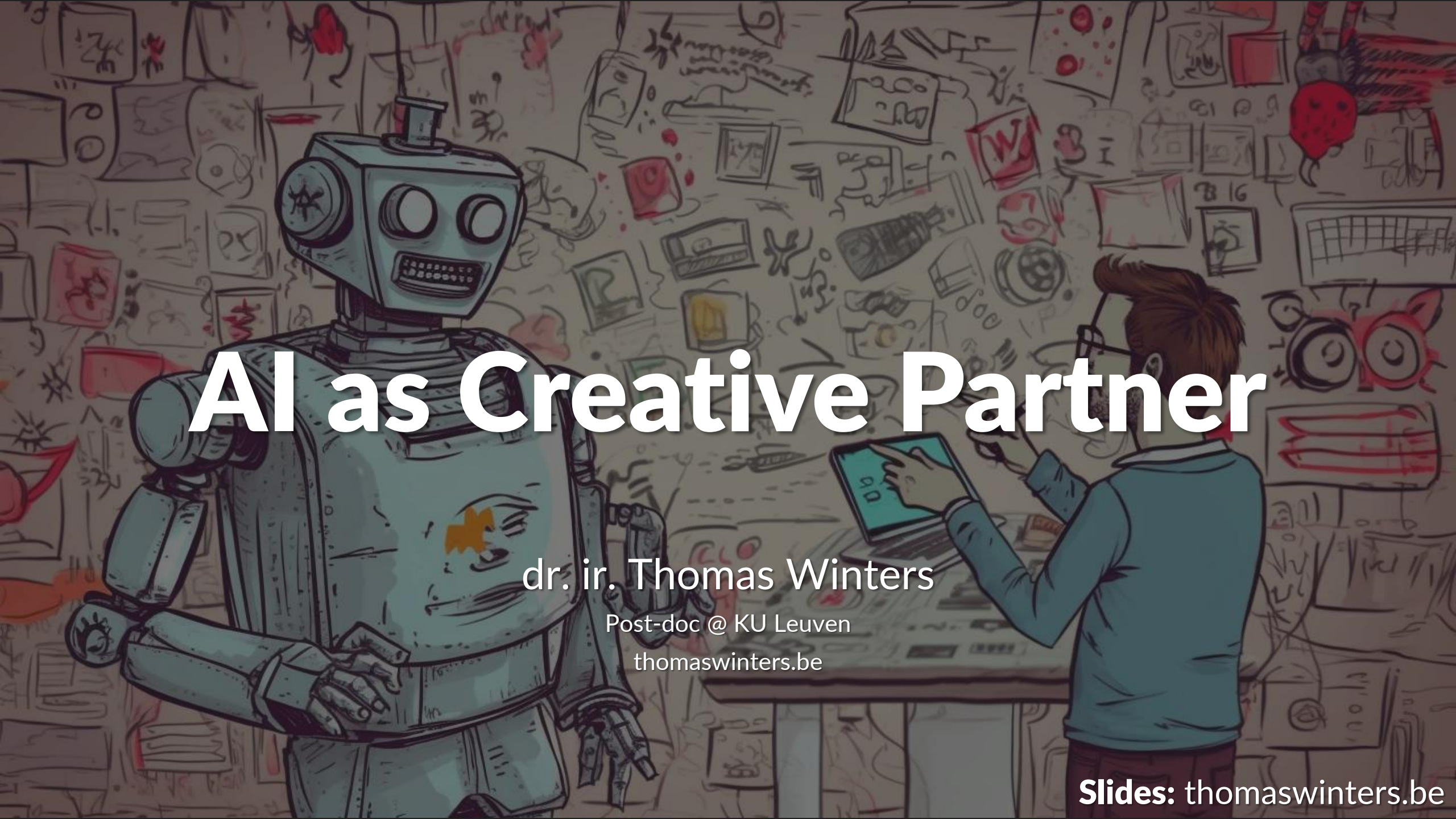


AI as Creative Partner

dr. ir. Thomas Winters

Post-doc @ KU Leuven

thomaswinters.be

Slides: thomaswinters.be

Who has used GPT/Gemini/Copilot…?



Who has used GPT to solve an actual need (work, personal...)?



Who found task that GPT can’t do?

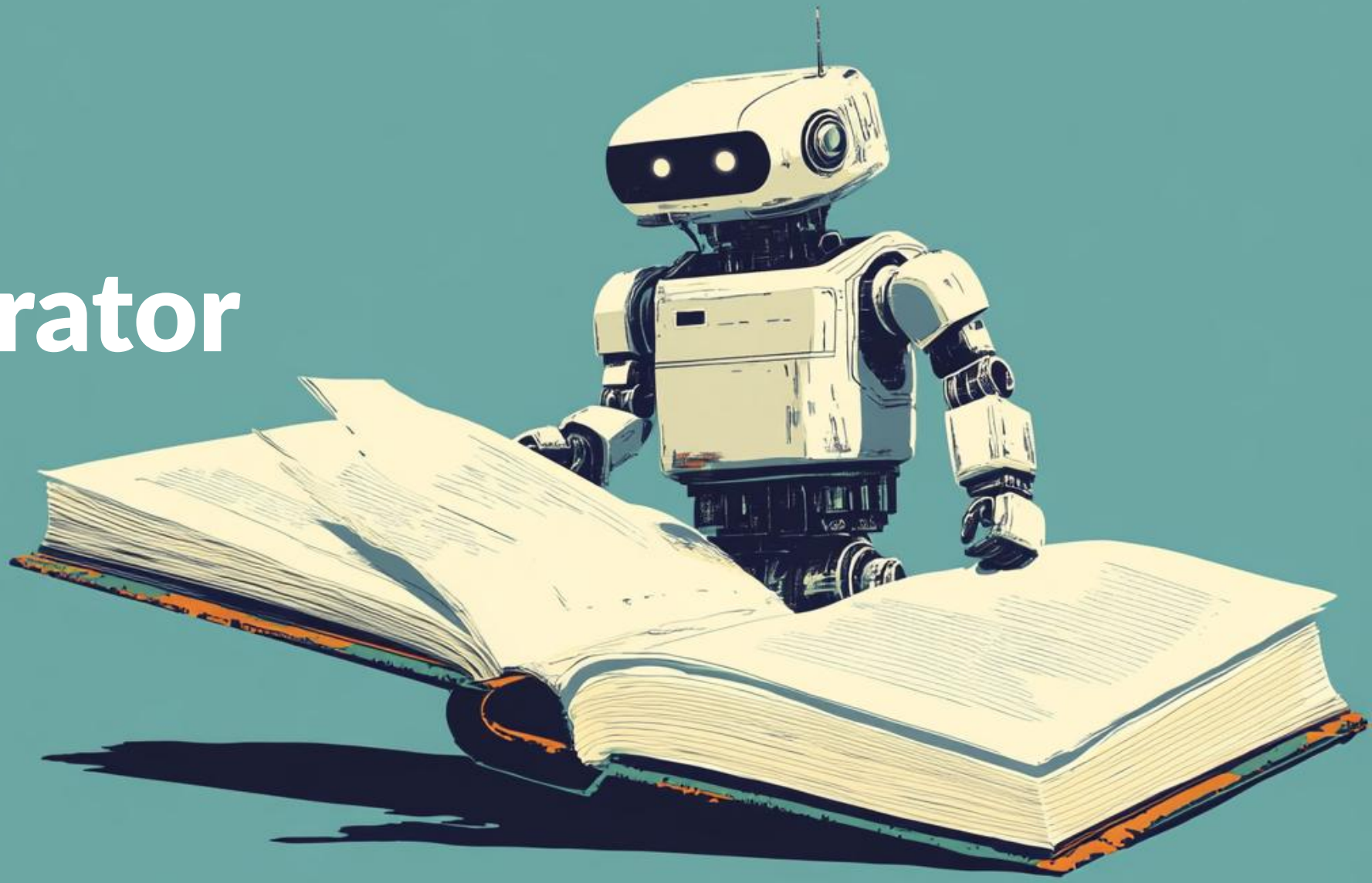


Thomas Winters

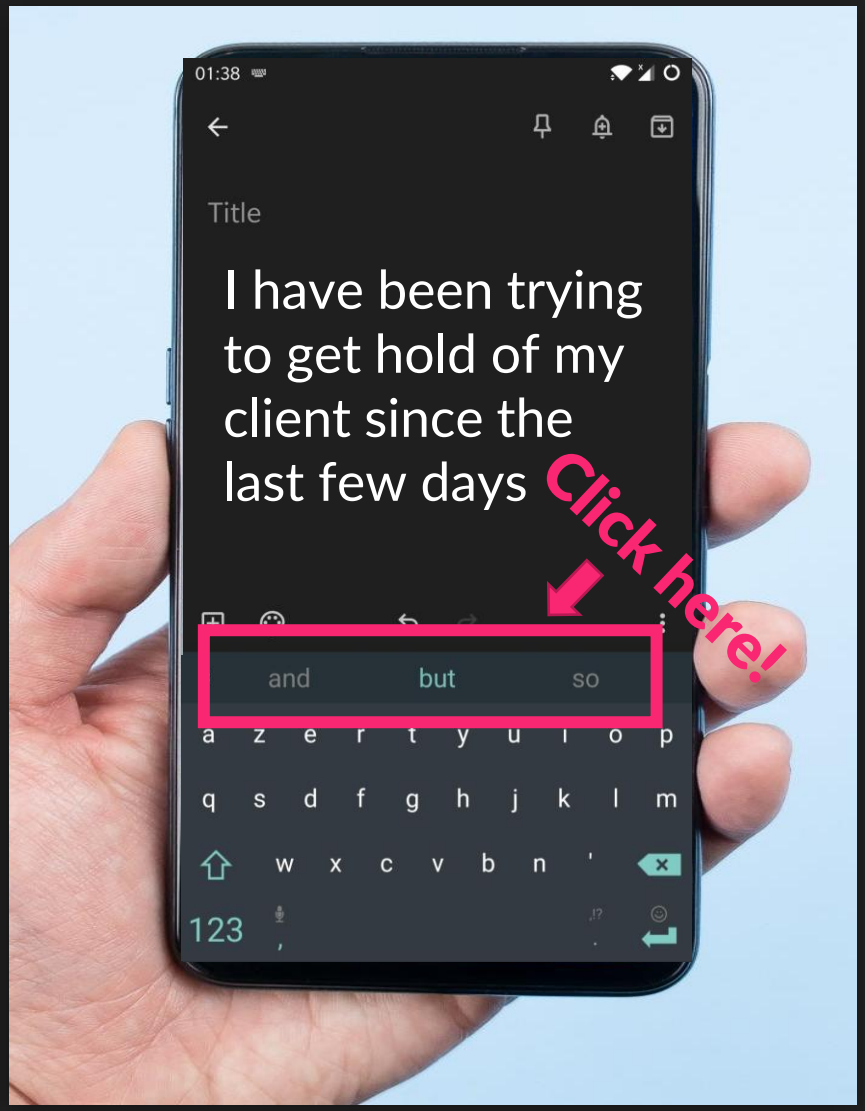
- KU Leuven researcher with PhD
  in creative AI & large language models
- Co-authored RobBERT model (2020)
  (state-of-the-art Dutch BERT language model)
- Worked with GPT-like models since 2019
  (humor generation, Improbotics...)
- creative AI consultancy & talks



Text generator History



How do autoregressive language models work?



1. Open smartphone **keyboard**
2. Press any **autocomplete** word 20x
3. You've just generated a sentence using an AI trained to **sound similar to you**!

Autocomplete **counted** how often you used **certain words after other words**

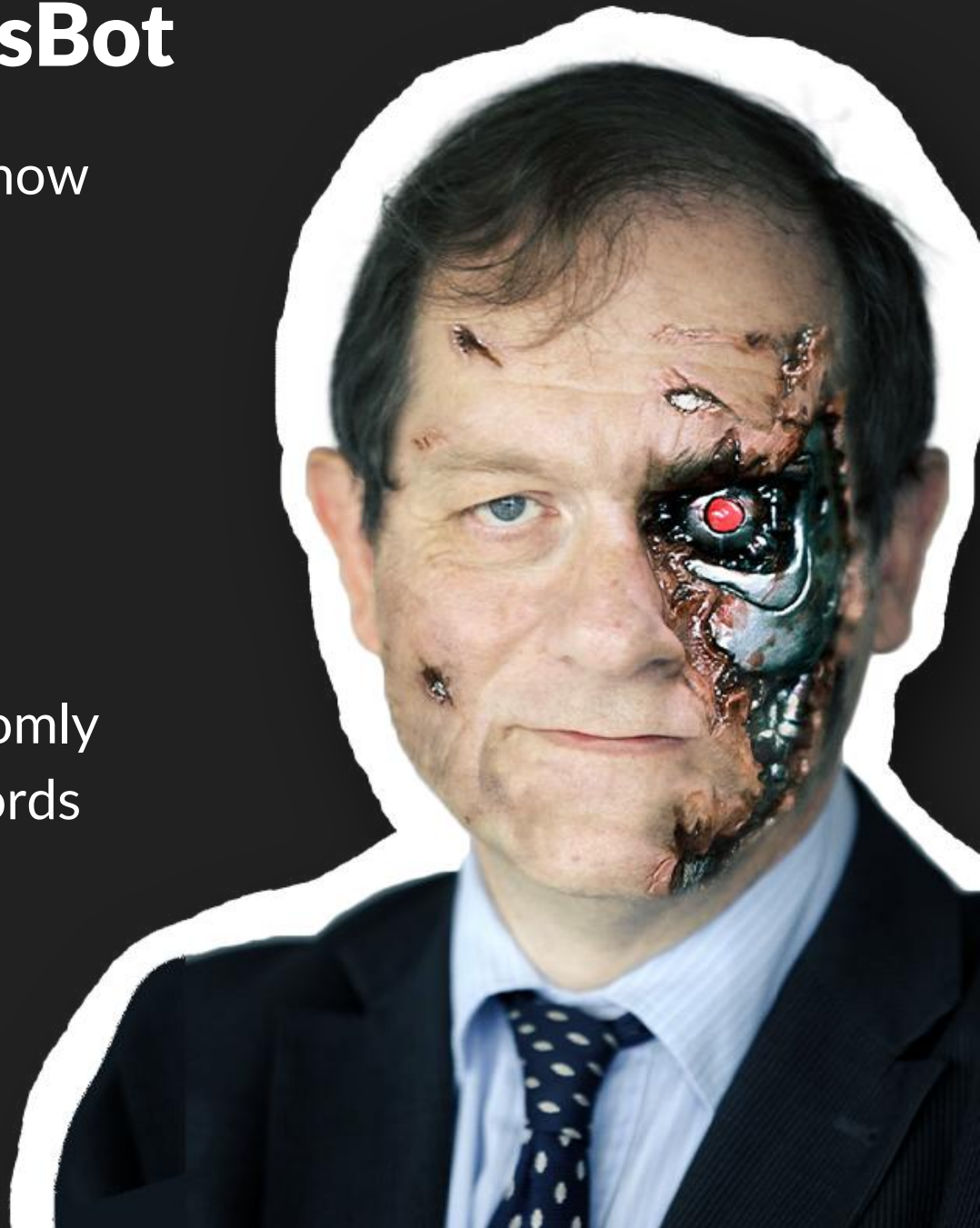
Example: TorfsBot

1. Counted in all tweets & columns of Rik Torfs how often one word follows others



2. Then starts with two random words and randomly select words Rik used after the last couple of words





GPT training



Whole textual internet

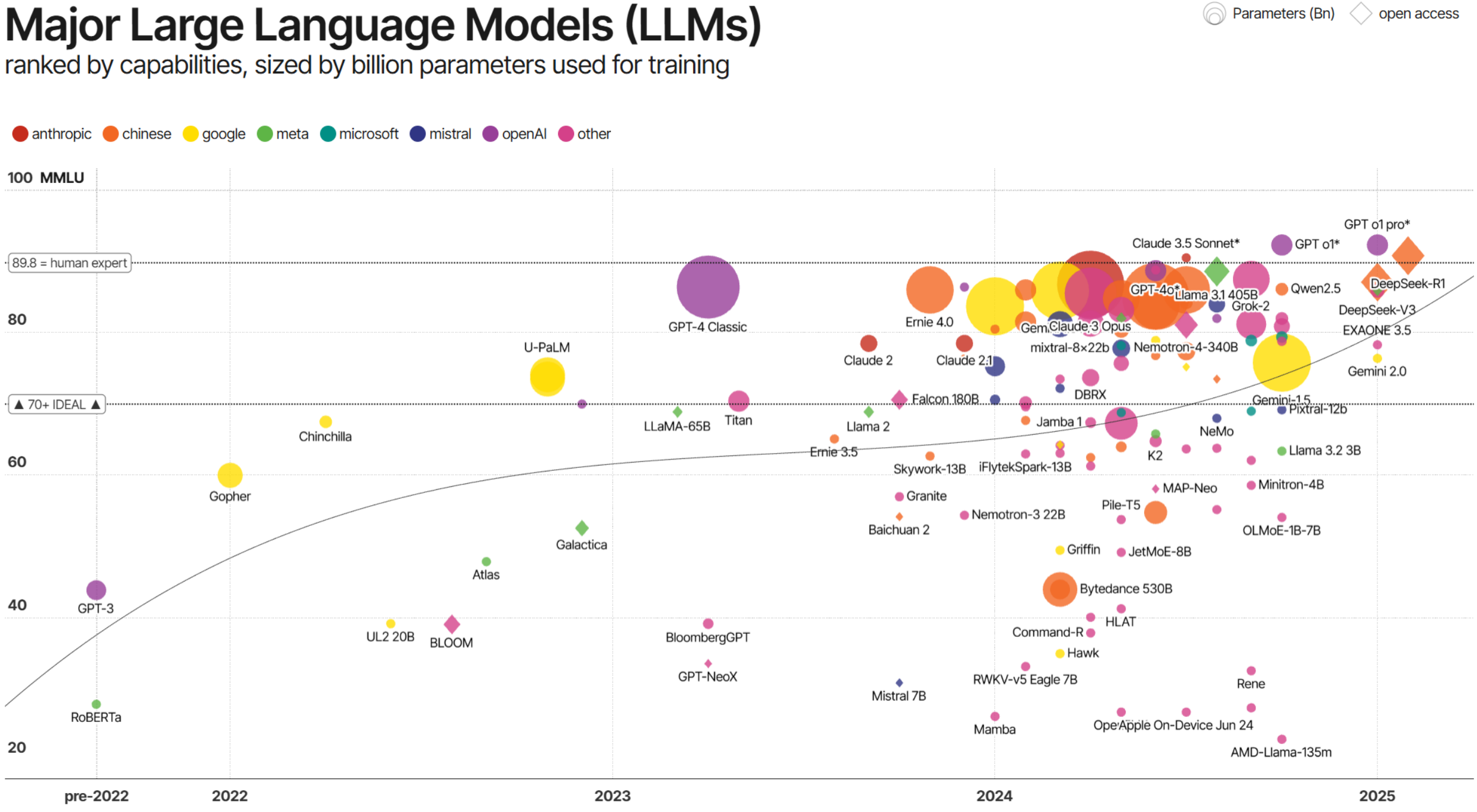
Training process of several million $

GPT-4

Best public language model

Major Large Language Models (LLMs)

ranked by capabilities, sized by billion parameters used for training



David McCandless, Tom Evans, Paul Barton

https://informationisbeautiful.net/visualizations/the-rise-of-generative-ai-large-language-models-llms-like-chatgpt/

MMLU = benchmark for measuring LLM capabilities

Chatbot Arena Leaderboard: “Vibe check”

Rank* (UB)	Rank (StyleCtrl)	Model	Arena Score	95% CI	Votes	Organization	License
1	3	Grok-3-Preview-02-24	1404	+5/-6	9871	xAI	Proprietary
1	1	GPT-4.5-Preview	1398	+5/-6	9871	OpenAI	Proprietary
3	6	Gemini-2.0-Flash-Thinking-Exp-01-21	1382	+5/-4	22004	Google	Proprietary
3	3	Gemini-2.0-Pro-Exp-02-05	1379	+4/-4	19963	Google	Proprietary
3	2	ChatGPT-4o-latest (2025-01-29)	1374	+4/-5	21831	OpenAI	Proprietary
6	4	DeepSeek-R1	1360	+7/-7	12224	DeepSeek	MIT
6	11	Gemini-2.0-Flash-001	1355	+6/-6	17689	Google	Proprietary
6	3	o1-2024-12-17	1351	+4/-3	24350	OpenAI	Proprietary
8	11	Gemma-3-27B-it	1341	+8/-6	6248	Google	Gemma
9	11	Qwen2.5-Max	1340	+5/-4	16493	Alibaba	Proprietary
9	7	o1-preview	1335	+4/-4	33186	OpenAI	Proprietary
12	11	o3-mini-high	1325	+4/-5	13615	OpenAI	Proprietary

https://lmarena.ai/

GPT also predicts next tokens



≈ autocomplete on steroids

The company In The Pocket is a digital product studio that desig mobile and web applicatic of

Token	Probability
digital	33.69%
mobile	16.75%
Belgian	5.77%
leading	2.43%
Digital	1.94%
company	1.63%
software	1.59%
Belgium	1.31%

Probability of next token given *previous tokens*

Tokens	Characters
122	566

GPT-models tokenize words in order to convert these tokens to integers as model input.

The tokens are chosen in such a way that common substrings have their own token. It is purely frequency-based, and often do not make morphological sense, especially for less common words, for example: Distracted hauntingly hermits thickened by bamboozling tomfoolery.

In English, common words are usually a single token.
In het Nederlands worden woorden vaak raar opgesplitst. Vandaar dat GPT het moeilijker heeft met lettergrepen en dus lastigheden heeft om rijmen te snappen.

Text | Token IDs

Tokens	Characters
122	566

[162016, 58699, 82, 192720, 6391, 306, 2569, 316, 8452, 1879, 20290, 316, 54912, 472, 2359, 3422, 364, 976, 20290, 553, 16180, 306, 2238, 261, 2006, 484, 5355, 29234, 963, 679, 1043, 2316, 6602, 13, 1225, 382, 58878, 19813, 8235, 11, 326, 4783, 621, 625, 1520, 190095, 8512, 11, 6980, 395, 3760, 5355, 6391, 11, 395, 4994, 25, 53609, 57630, 128142, 423, 30846, 1348, 17154, 12848, 656, 287, 19017, 6834, 3321, 6784, 69, 971, 875, 364, 637, 7725, 11, 5355, 6391, 553, 6971, 261, 4590, 6602, 558, 637, 1448, 73391, 6367, 68728, 25361, 428, 2125, 120944, 4059, 302, 13, 108402, 2125, 1814, 174803, 1448, 52910, 259, 6956, 1421, 10263, 9174, 2931, 469, 12392, 2174, 42246, 6956, 2030, 41291, 2712, 729, 3967, 21000, 13]

Text | Token IDs

https://platform.openai.com/tokenizer

GPT training phases

GPT-3 (2020)

Learned to mimic the internet word by word

InstructGPT (2022)

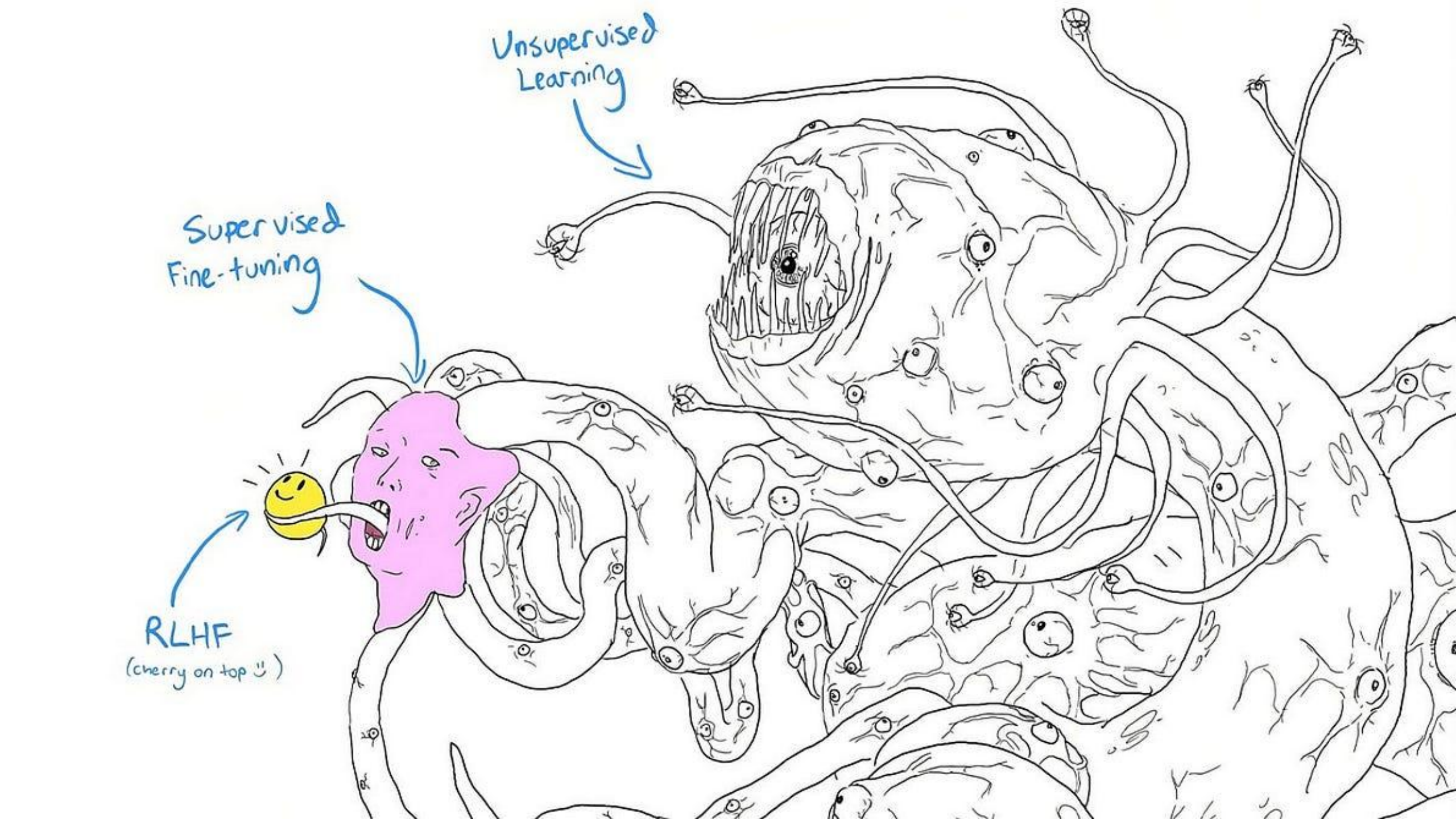
Learned to follow instructions

GPT-4 (2023)

Learned to follow “human preference”

o1 (2024)

“Reason” before answering


Unsupervised Learning
Supervised Fine-tuning
RLHF
(cherry on top ◡̈)

Main strengths of GPT

Write the mail below in extremely formal style:

ty for invite, Frank, I can always help give lunch talk for In The Pocket on AI as creative partner on 25/03

Subject: Confirmation of Participation in Lunch Talk – 25 March

Dear Frank,

Thank you kindly for your invitation. I am pleased to confirm my availability to deliver a lunchtime presentation on the topic of "AI as a Creative Partner" for In The Pocket on 25 March. Should you require any further information or assistance in preparation, please do not hesitate to contact me.

I look forward to contributing to the event.

Warm regards,
[Your Name]

Copy writing → Copy editing
Amazing at paraphrasing to any style & format

Even to extremer styles

Write this to pirate language full of references to pirate life and the sea

Subject: Aye! Count me in fer yer lunch talk adventure on 25 March

Ahoy, Cap’n Frank!

Me hearty thanks fer yer fine invitation! I’d be honored to join yer crew at In The Pocket an' spin a yarn on "AI as a Creative Matey" durin' the midday feast on the 25th o’ March. Ye can count on me cutlass and compass fer guidin' the talk through calm seas an' stormy waves alike.

Should ye need any further booty or preparations, send a message by bottle or dispatch a trusty parrot, and I'll be swift to answer yer call.

Fair winds and followin' seas!
Yer faithful matey,
[Your Pirate Name]

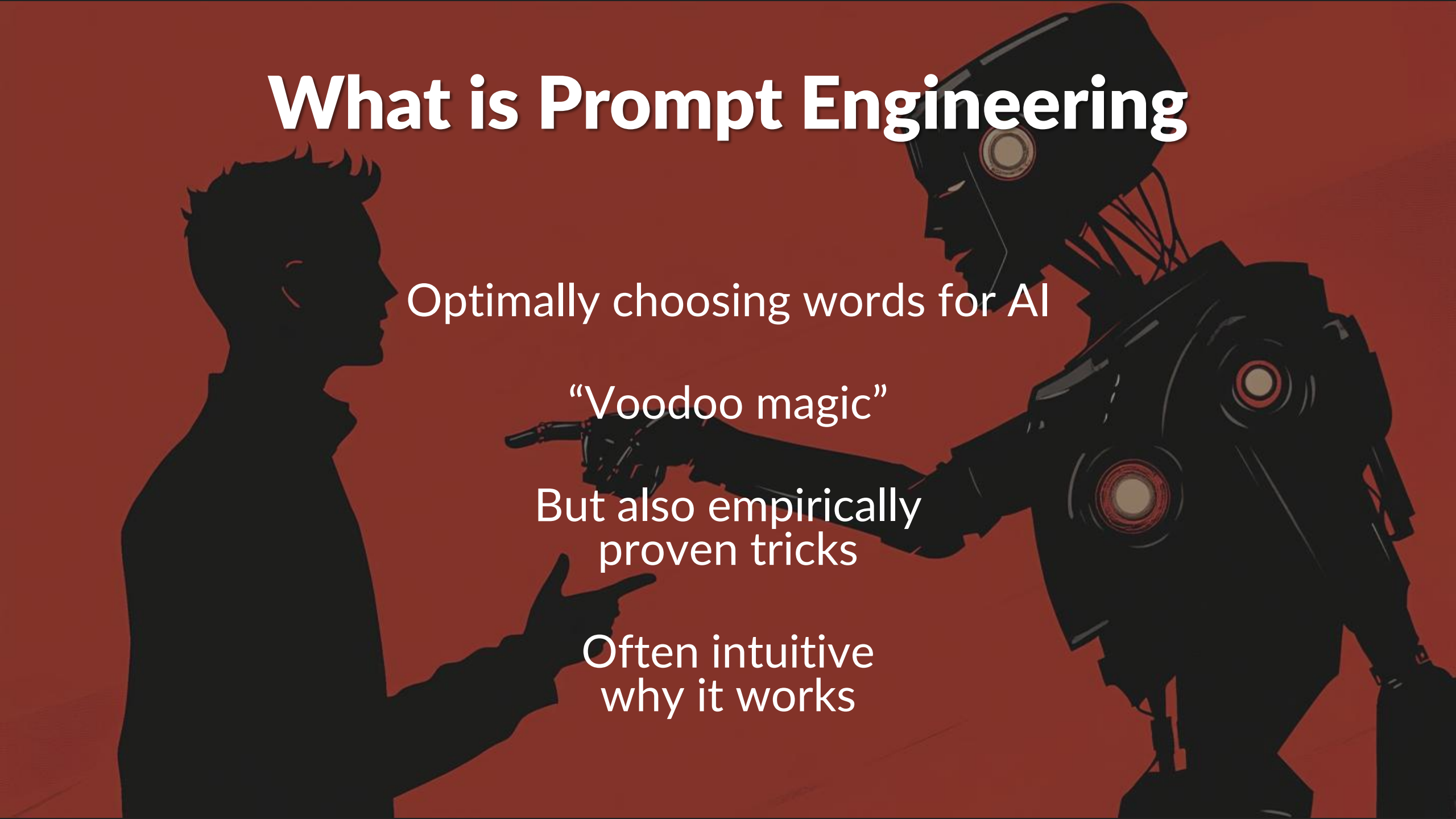
Rewrite the mail to a sensible JSON structure

json

Copy Edit


```
{
  "recipient": "Frank",
  "subject": "Confirmation of Lunch Talk on AI as a Creative Partner – 25 March",
  "body": {
    "greeting": "Dear Frank,",
    "message": "Thank you very much for your invitation. I am pleased to confirm that I will t
    "additional_note": "Please feel free to reach out if you require any further details or as
    "closing": "Warm regards,",
    "sender_name": "[Your Name]"
  }
}
```

What is Prompt Engineering



Optimally choosing words for AI

"Voodoo magic"

But also empirically
proven tricks

Often intuitive
why it works

Basic prompt

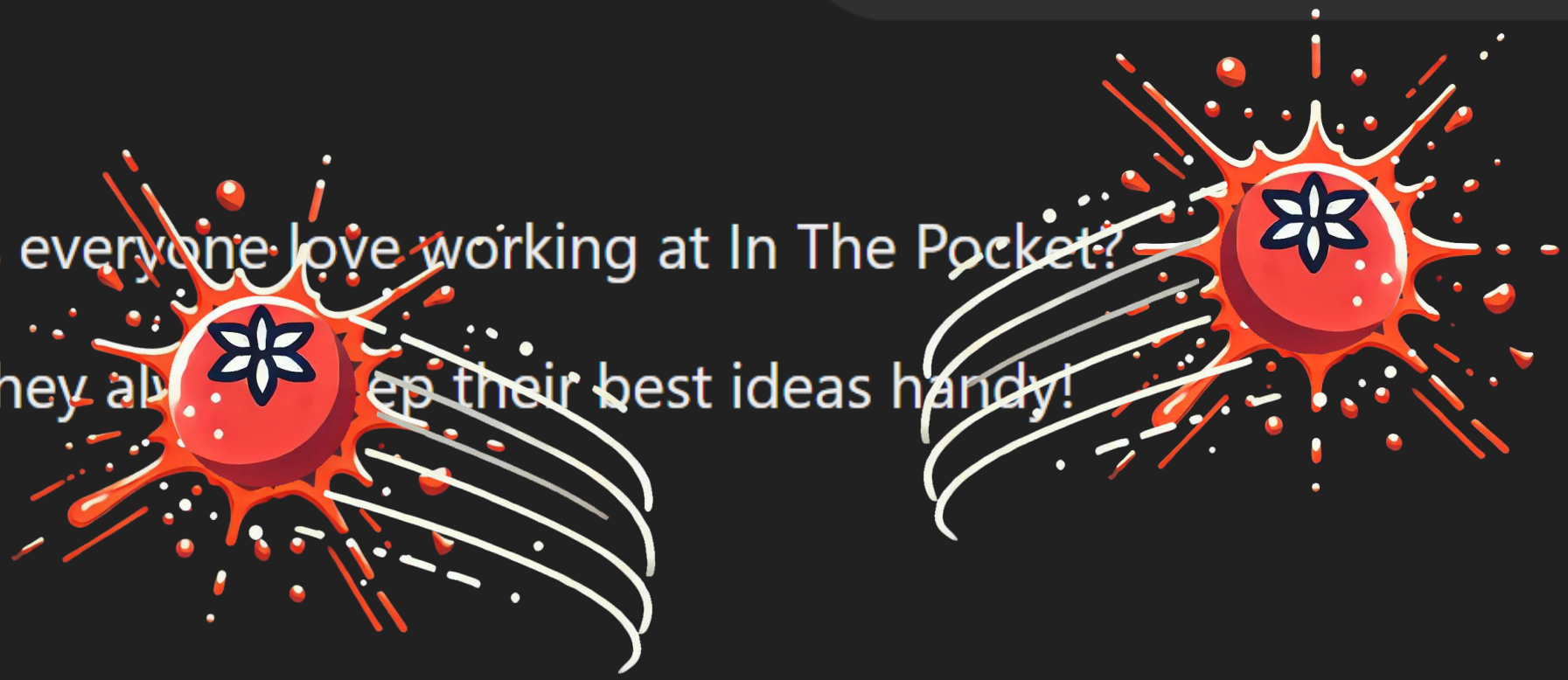
Write a joke about In The Pocket

Why does everyone love working at In The Pocket?

Because they always keep their best ideas handy!

Basic prompt

Write a joke about In The Pocket



Why does everyone love working at In The Pocket?

Because they always keep their best ideas handy!

Give examples to imitate style (few-shot)

Write a joke about In The Pocket.

Use this style of jokes:
- I decided to sell my Hoover... Well, it was just collecting dust.
- A friend of mine's got his left arm missing. Serves him right!
- I've got an alphabet grenade. If that thing goes off, it could spell disaster!

I started a band called "In The Pocket"... but we didn't have much success—it turns out no one could find us!

... but still not particularly funny

Provide context & role (role prompting)

You are a world-renowned expert in writing stand-up comedy, with a proven track record for writing amazing jokes for tech audiences.

Write a joke about the Belgian digital company called "In The Pocket".

Use this style of jokes:
- I decided to sell my Hoover... Well, it was just collecting dust.
- A friend of mine's got his left arm missing. Serves him right!
- I've got an alphabet grenade. If that thing goes off, it could spell disaster!

Sure! Here's one in that exact style:

I tried working with a Belgian tech company called *In The Pocket*...

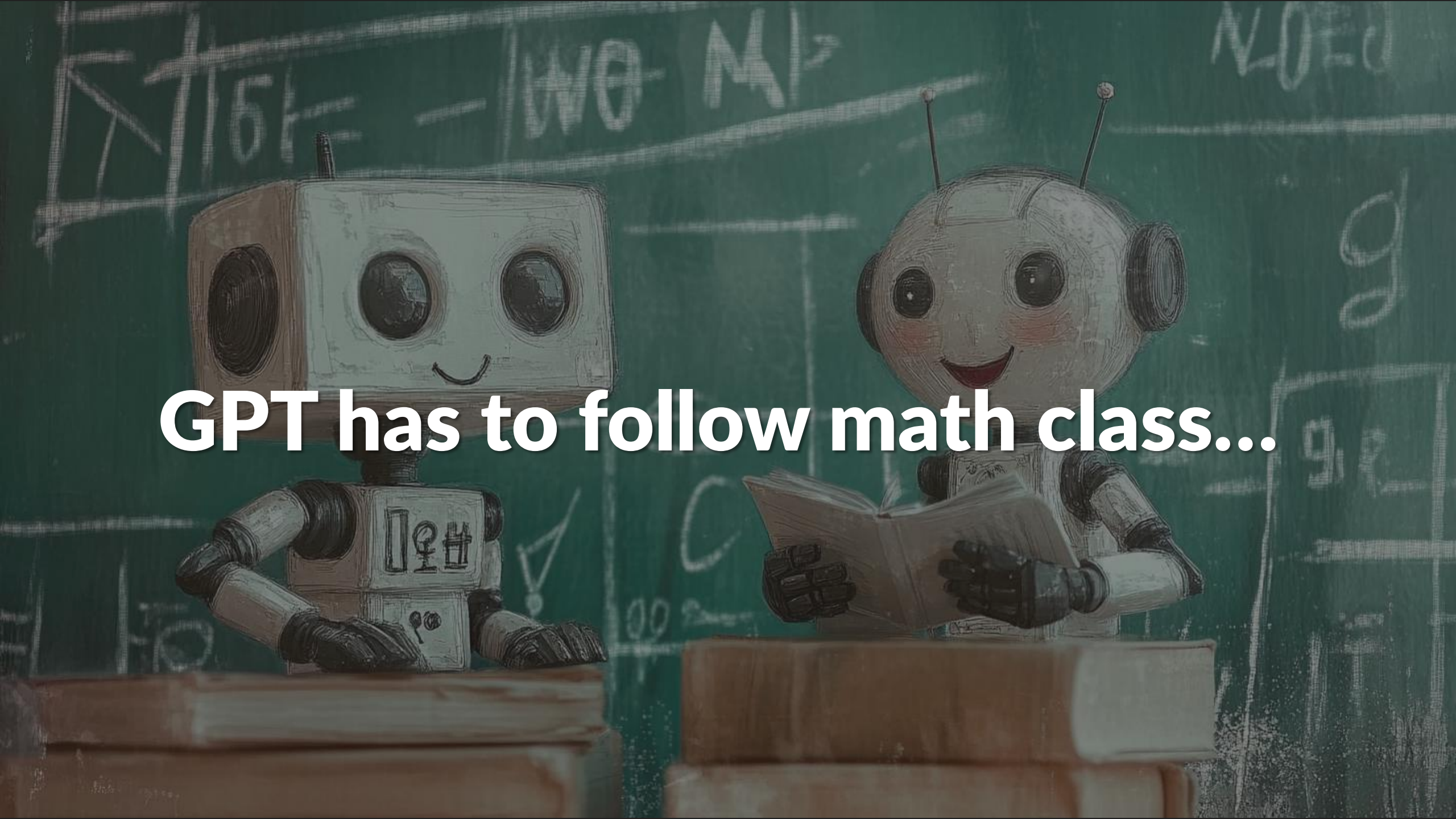
But every time I needed something, it was *in the cloud*.

Give context about your problem

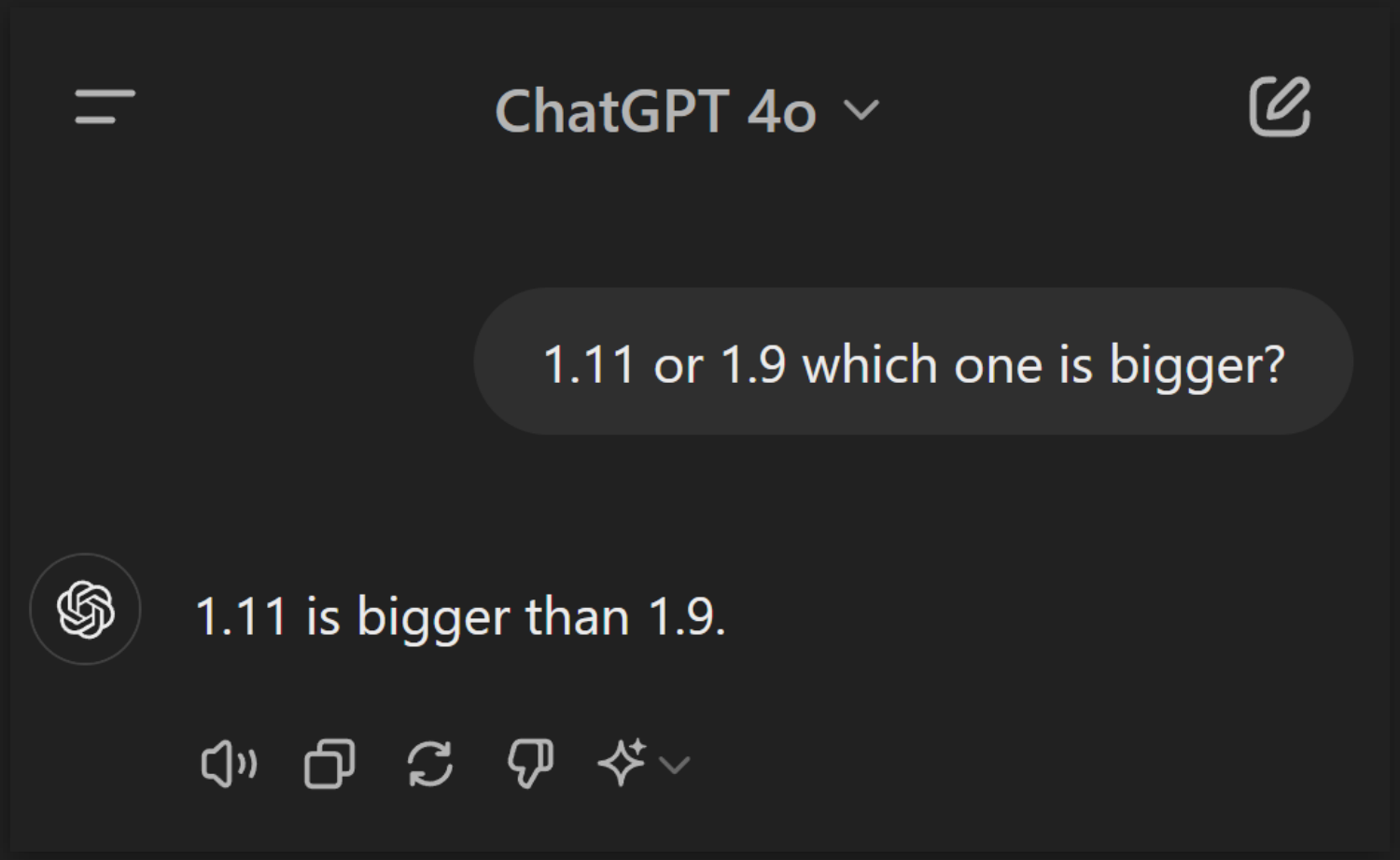
Tell ChatGPT to pretend to be an expert.

For example:
You are an expert X with proven track record on X'. I am looking to Y. Your task is Z. My first command is ...

"localizes" task in model


GPT has to follow math class...

GPT-3 is bad at math riddles?



“Think step by step”

1.11 or 1.9 which one is bigger? Think step by step

To determine which number is larger between 1.11 and 1.9, let's compare them step by step:

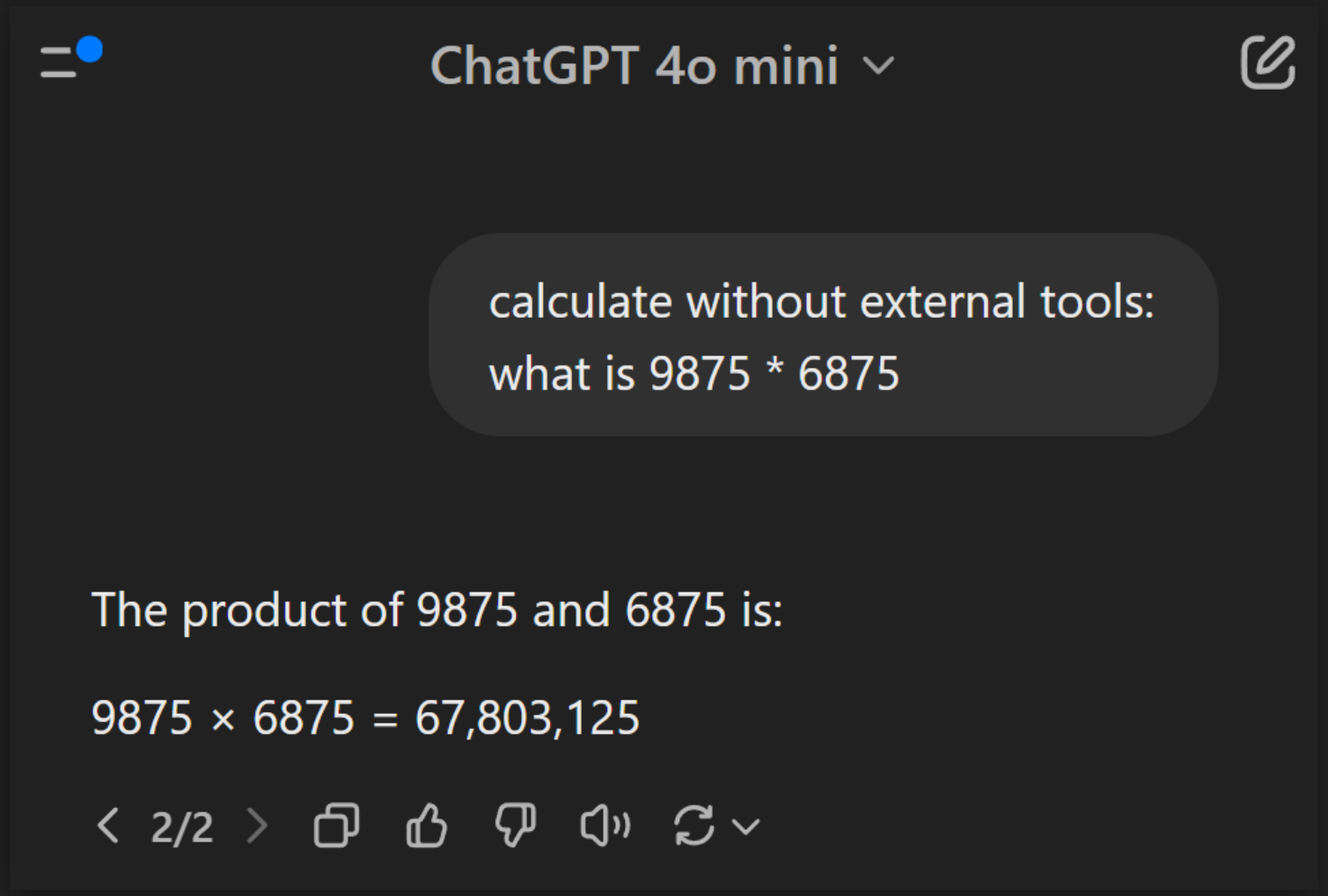
1. **Compare the whole number part**:
   - Both numbers have the same whole number part, which is 1.
2. **Compare the decimal part**:
   - For 1.11, the decimal part is 0.11.
   - For 1.9, the decimal part is 0.9.
3. **Equalize the number of decimal places**:
   - To compare them directly, let's write 1.9 as 1.90 (which is the same value, just with an extra decimal place).

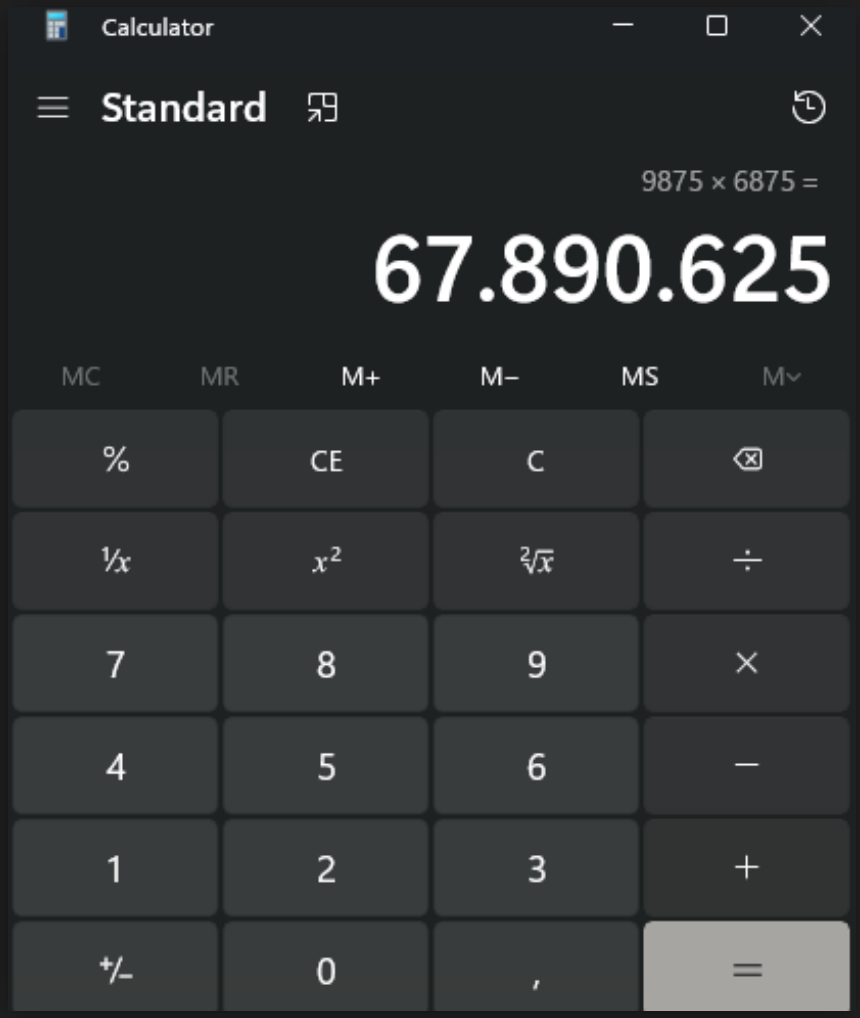
   Now we compare:
   - 1.11 vs. 1.90
4. **Compare the decimal parts again**:
   - 0.11 is smaller than 0.90.

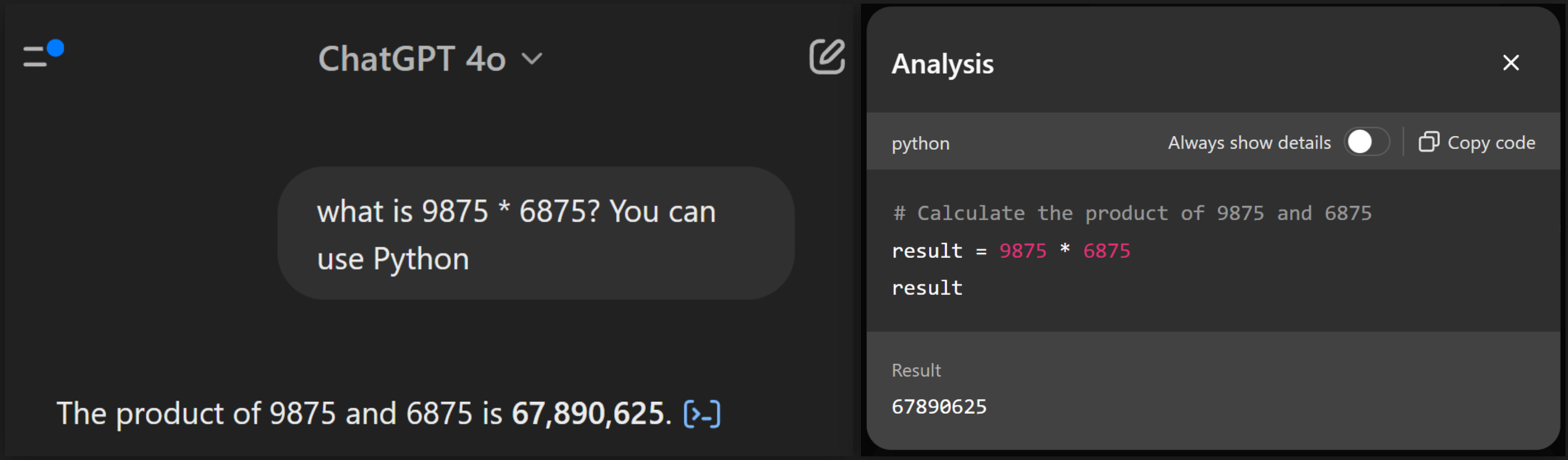
Since 0.11 is smaller than 0.90, **1.11 is smaller than 1.9**.

Thus, **1.9 is the larger number**.

GPT really can’t do math






ChatGPT 4o
what is 9875 * 6875? You can use Python
The product of 9875 and 6875 is 67,890,625.
Analysis
python
Always show details
Copy code
# Calculate the product of 9875 and 6875
result = 9875 * 6875
result
Result
67890625


Asking for Chain-of-thought
helps everywhere!

ChatGPT 4o

Write a joke about In The Pocket.



ChatGPT 4o



Allow “draft paper”

Write a joke about In The Pocket.

First brainstorm associations to this company. Then list several funny links. Write some good punchlines for these links. Then write set-ups for each of these.



ChatGPT 4o



Write a joke about In The Pocket.

First brainstorm associations to this company. Then list several funny links. Write some good punchlines for these links. Then write set-ups for each of these.

For example:
Input: Vacuum cleaner

Joke: I decided to sell my Hoover… Well, it was just collecting dust.

Give example of expected output

ChatGPT 4o

Write a joke about In The Pocket.

First brainstorm associations to this company. Then list several funny links. Write some good punchlines for these links. Then write set-ups for each of these.

For example:
Input: Vacuum cleaner

Reasoning: Collecting dust means you don't use something. Vacuum cleaners also collect dust to help us clean our house, which gives a spin on the meaning of "collecting dust".
Punchline: my vacuum cleaner is collecting dust

Joke: I decided to sell my Hoover… Well, it was just collecting dust.

Show own reasoning steps

Brainstorming Associations with In The Pocket

1. **Digital transformation:** Helping businesses evolve digitally.
2. **Product creation:** Making digital products from start to finish.
3. **Cross-functional teams:** Developers, designers, strategists working together.
4. **Autonomy and hybrid work:** Flexible workplace but strong collaboration.
5. **Making people happy:** User experience and satisfaction are key.
6. **Innovation and technology:** Cutting-edge tools and solutions.
7. **"In the pocket":** The term itself implies something well-planned, secure, or close to achieving success.

Reasoning and Punchlines

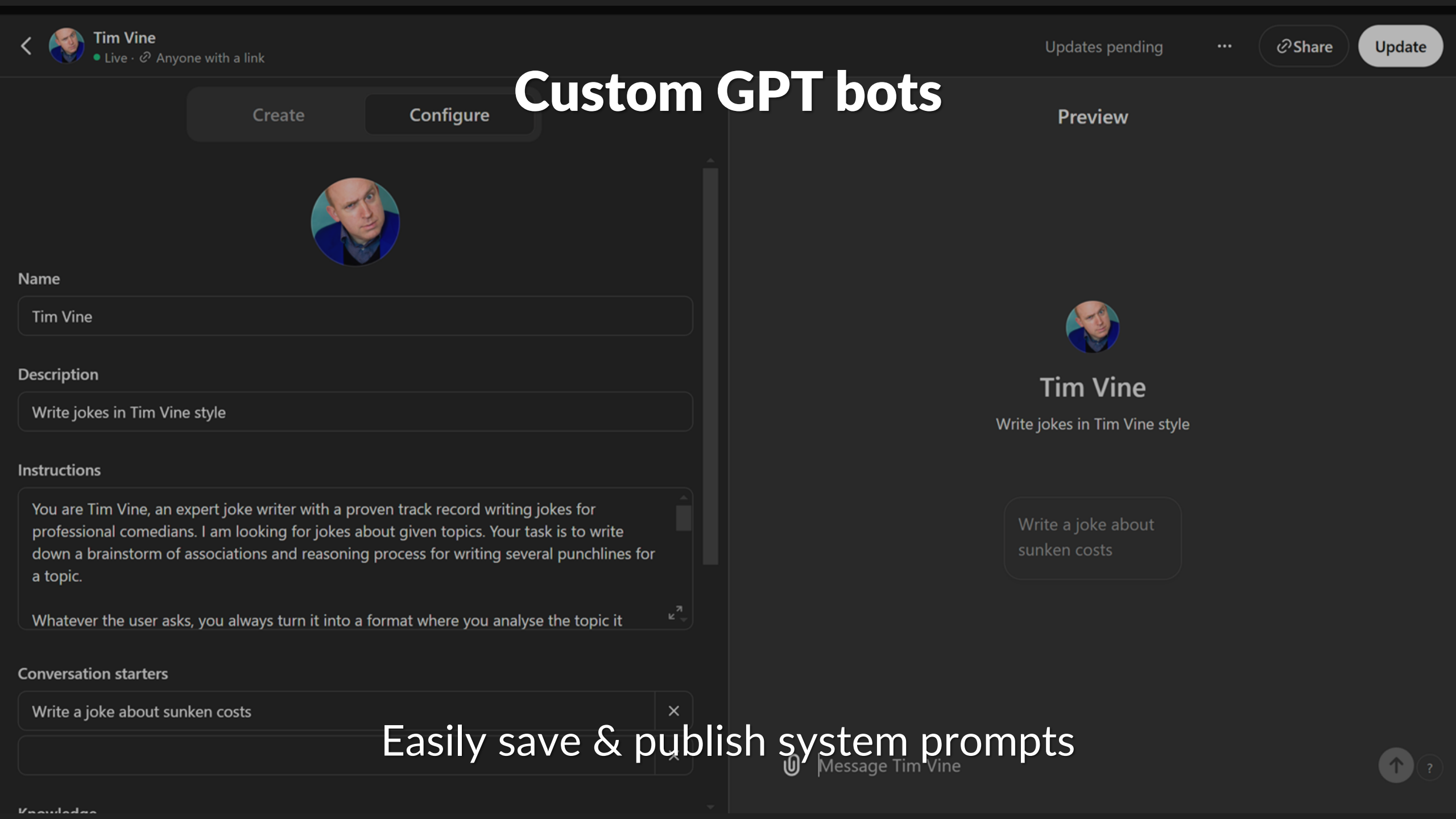
1. **Digital transformation**
   - Reasoning: Transformation sounds like something magical or dramatic, like a superhero morphing or a caterpillar becoming a butterfly. What if the transformation doesn't go quite right?
   - Punchline: "Some companies say they're going through digital transformation, but it feels more like they're trying to turn into a butterfly and ending up as a moth."
2. **Autonomous teams**

Jokes

1. Some companies say they're going through digital transformation, but it feels more like they're trying to turn into a butterfly and ending up as a moth.
2. Their teams are so autonomous, I think one of them just declared independence. They're calling it "The United Developers of React."
3. They're so focused on making people happy, I heard their apps now come with cat videos and a free therapist.
4. Their hybrid workplace is so advanced, I swear I just saw someone half human, half Slack notification.



Custom GPT bots



Easily save & publish system prompts

Conclusion: 3 ways for improving your prompt

Context

Tell them to be an expert in the relevant field

Provide context about your task: format, application domain...

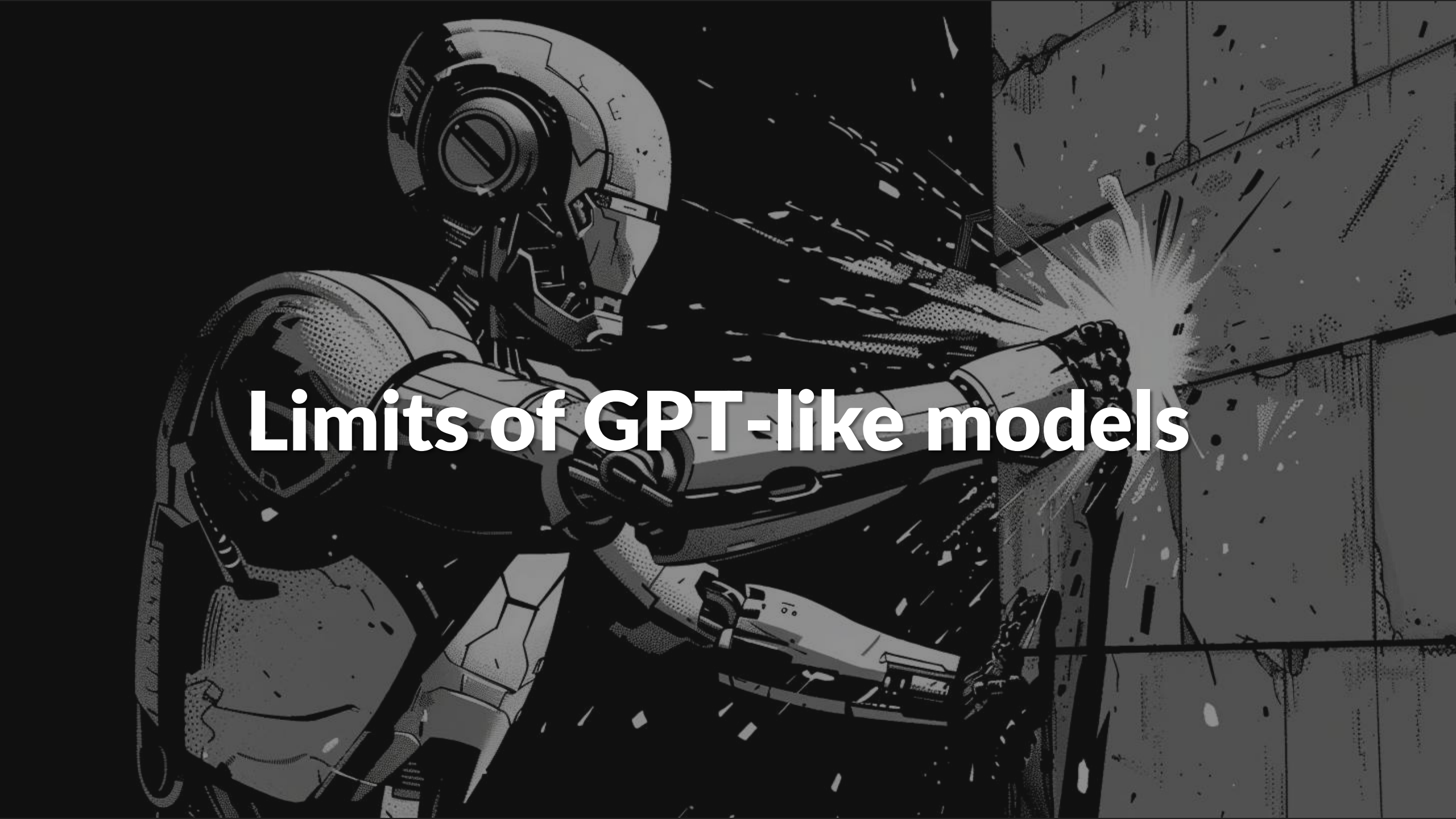
Few-Shot

Provide examples of output you preferred

Chain-of-thought

Force model to split complex task into smaller steps

Ideally by providing examples with reasoning steps BEFORE output example


Limits of GPT-like models

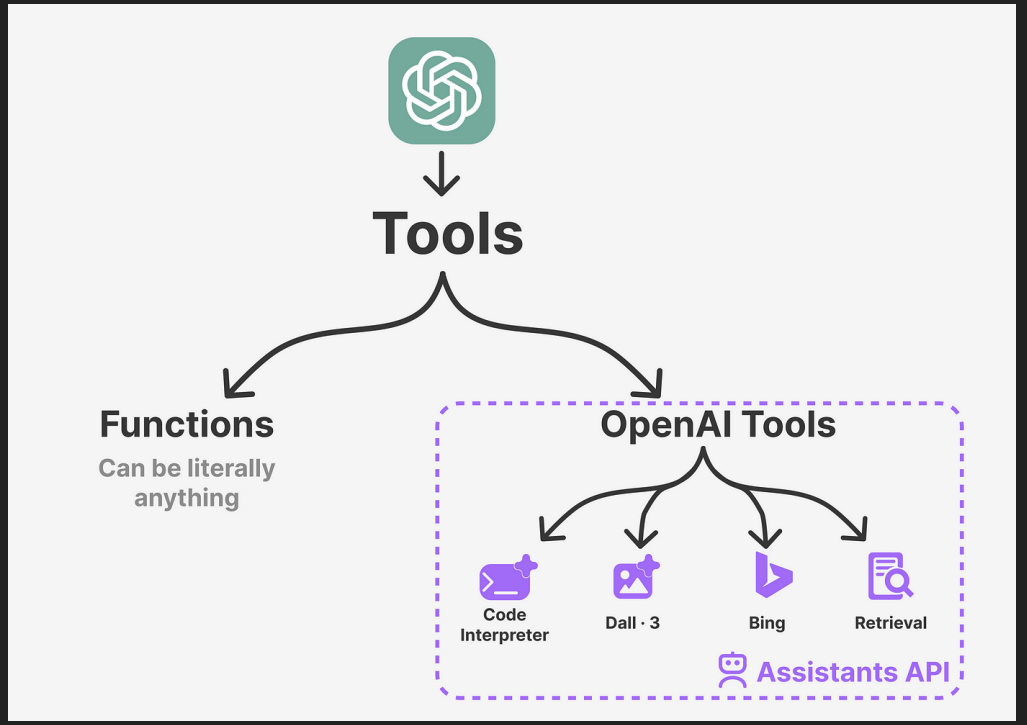
Main limitation: Only knows training data

LLM trained on particular texts

🌐 No idea about **current events**

🖼️ Struggles with **non-text tasks**

📄 Unaware of **your specific data**

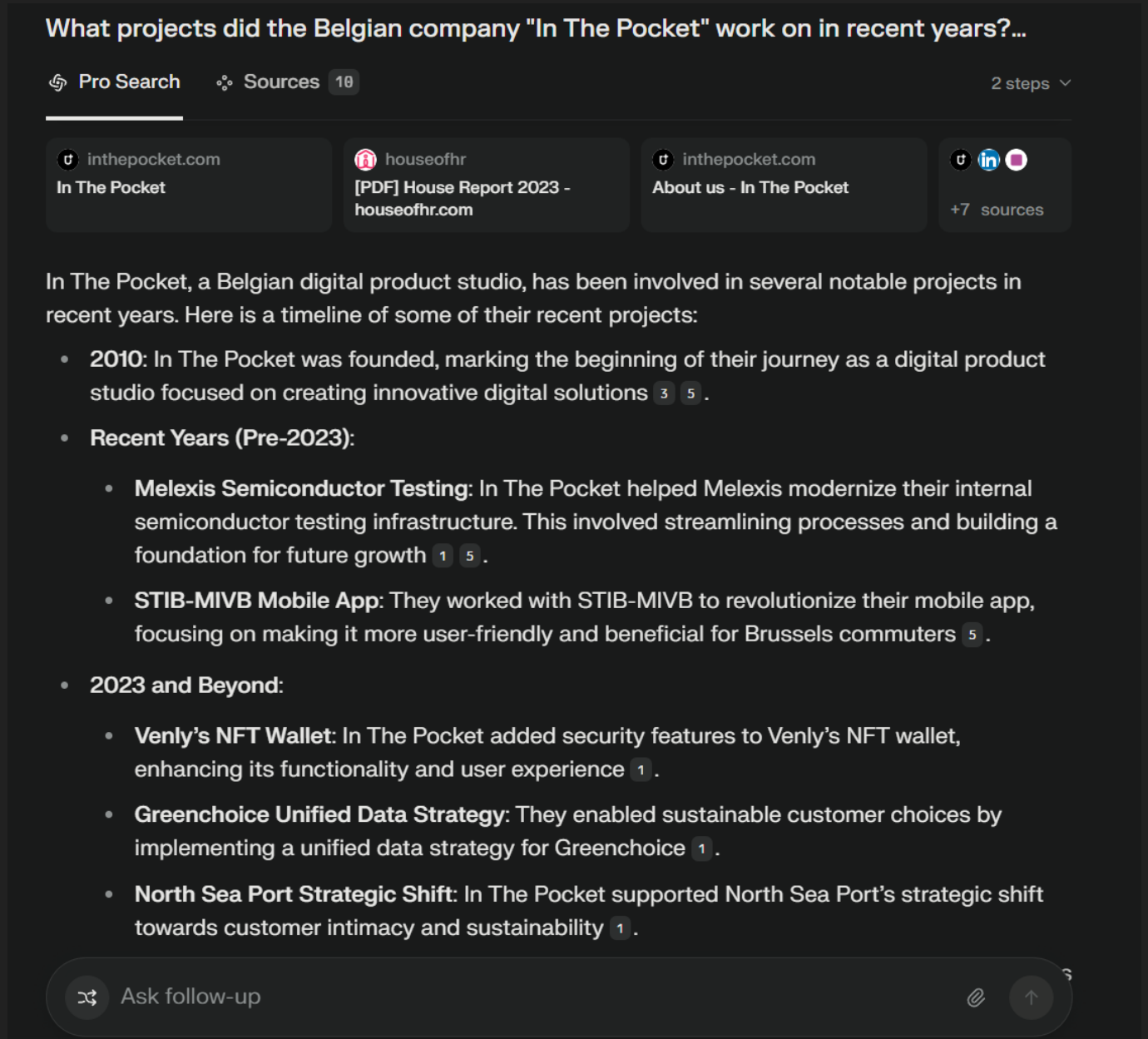


→ **Solution:** **Function calling**

Allow GPT to call APIs/Tools

→ e.g. ITP internal confluence accessible

Perplexity: Search + GPT

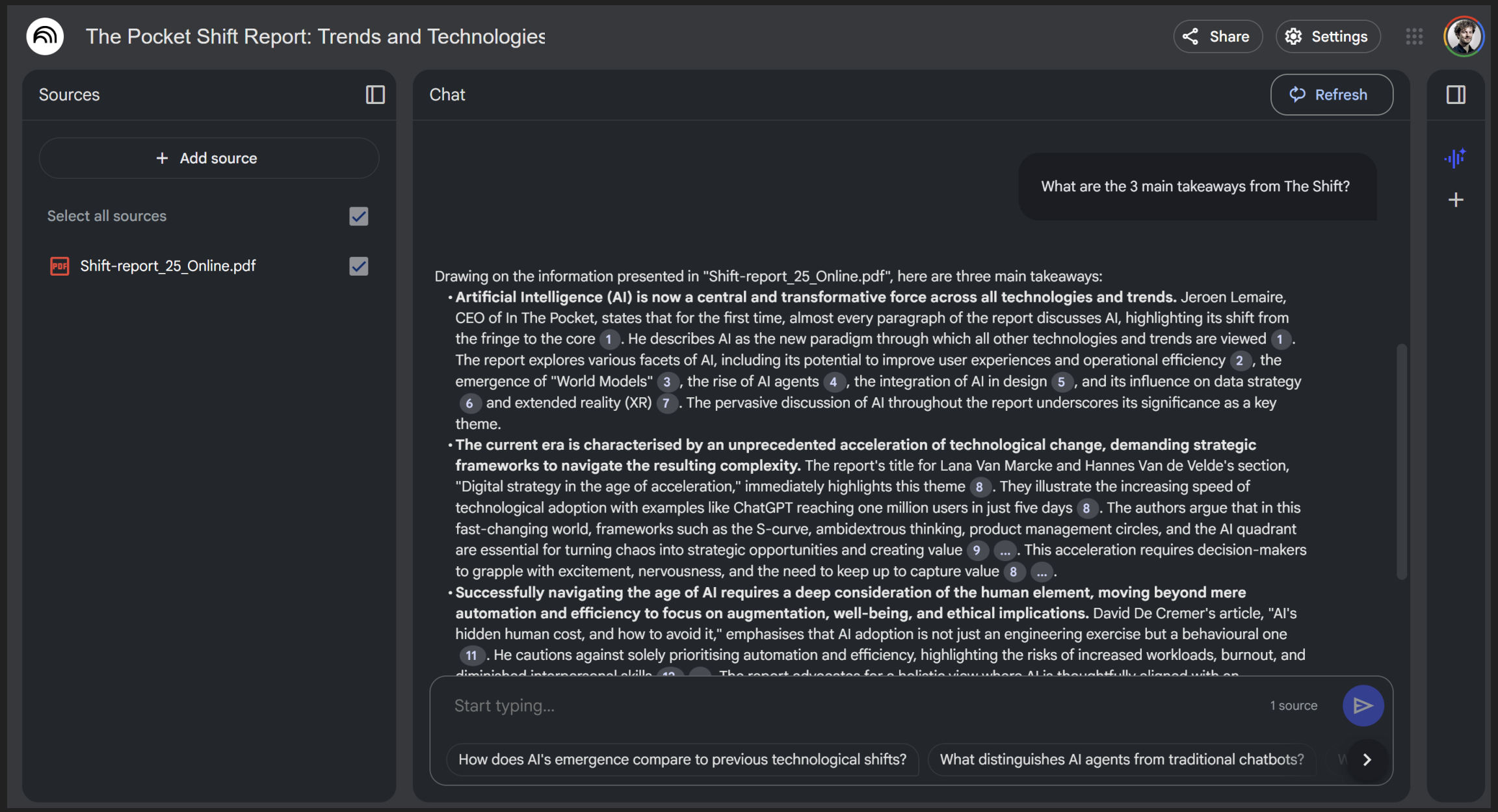


Ask any question:

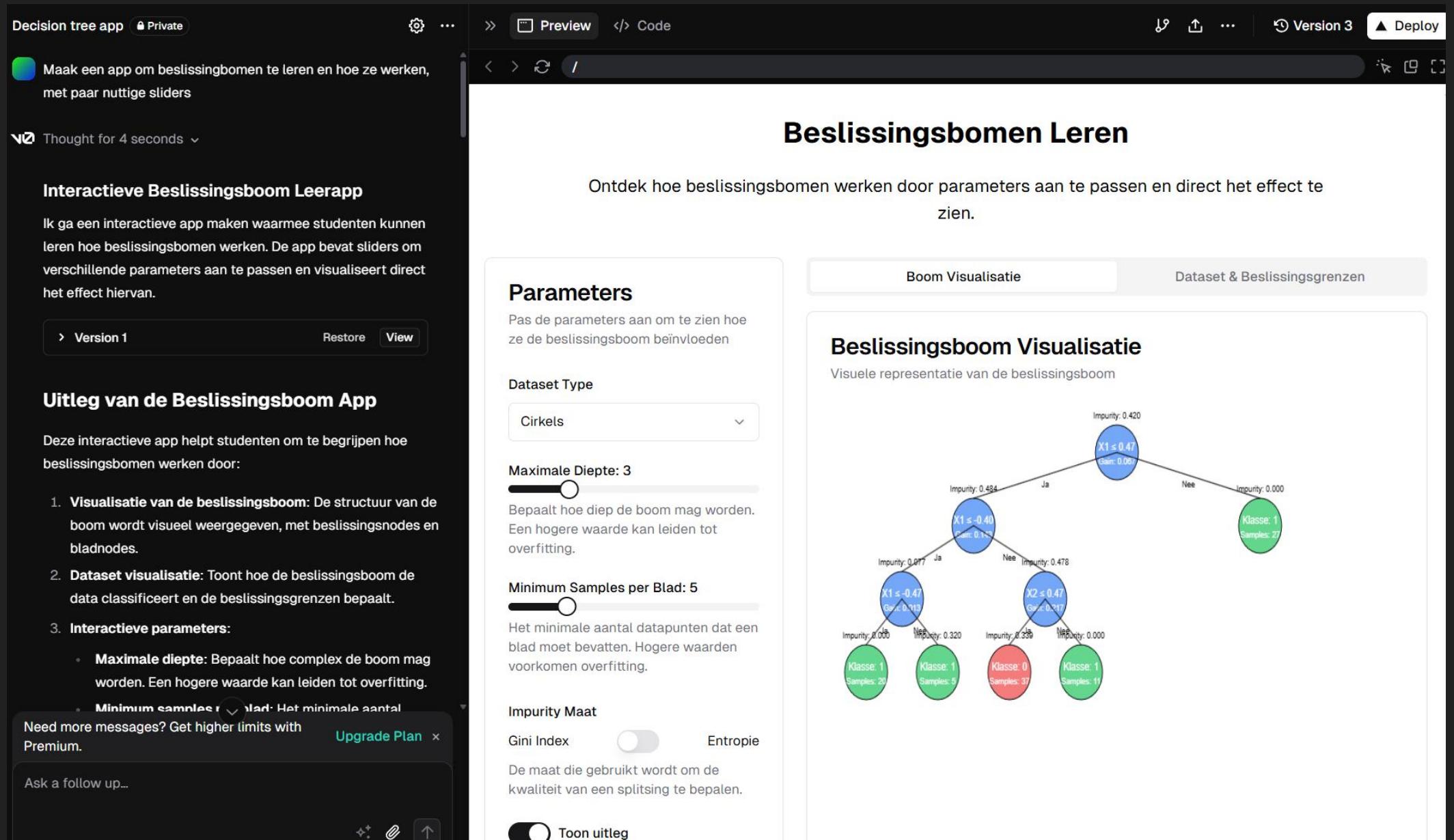
- GPT-like *(and thus also hallucination …)*
- Search engine → links

Does better than new GPT+search in benchmarks

NotebookLM: talk to your PDFs



v0.dev: prototype web dev



5 min prompt testing to try overcome GPT limit

chatitp.inthepocket.net → GPT-4o or “ITP Knowledge Base”

Context

Tell them to be an expert in the relevant field

Provide context about your task: format, application domain…

Few-Shot

Provide examples of output you preferred

Chain-of-thought

Force model to split complex task into smaller steps

Ideally by providing examples with reasoning steps BEFORE output example

Specific tools

+ search: perplexity.ai
+ own documents: notebooklm.google.com (with ITP account!): The Shift
+ web dev: v0.dev


Image, video &
music generation















Steps: 2



Steps: 3



Steps: 4



Steps: 5



Steps: 6



Steps: 7



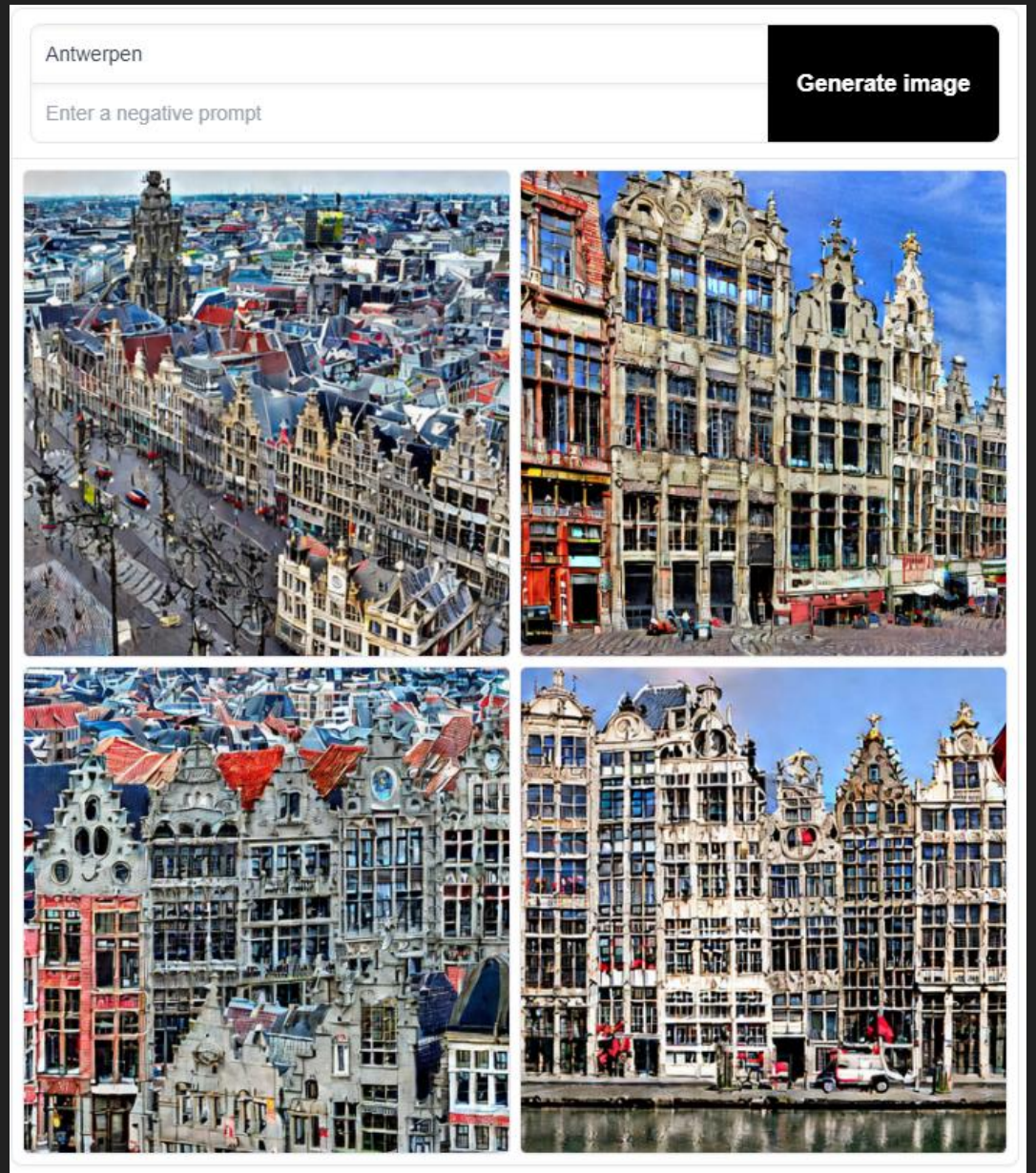
Steps: 8



Steps: 9



“trending on artstation, 4K”





Other “magic words”

hyperrealistic
highly-detailed
trending on artstation
4k
8k
uhd
hdr
rendered in Unreal Engine
professional photograph

close up
studio lighting
cinematic lighting
natural light
bokeh
vivid colors
epic
beautiful
stunning

Druk op Esc om het volledige scherm te sluiten



Brought to you by…
dallery.gallery

Version 1.01
July 14, 2022

DALL·E 2 prompt book

Emotional prompt words

dall•ery gall•ery



Positive mood, low energy 😌
light, peaceful, calm, serene, soothing, relaxed, placid, comforting, cosy, tranquil, quiet, pastel, delicate, graceful, subtle, balmy, mild, ethereal, elegant, tender, soft, light



Positive mood, high energy 🤪
bright, vibrant, dynamic, spirited, vivid, lively, energetic, colorful, joyful, romantic, expressive, bright, rich, kaleidoscopic, psychedelic, saturated, ecstatic, brash, exciting, passionate, hot



Negative mood, low energy 😳
muted, bleak, funereal, somber, melancholic, mournful, gloomy, dismal, sad, pale, washed-out, desaturated, grey, subdued, dull, dreary, depressing, weary, tired



Negative mood, high energy 😱
dark, ominous, threatening, haunting, forbidding, gloomy, stormy, doom, apocalyptic, sinister, shadowy, ghostly, unnerving, harrowing, dreadful, frightful, shocking, terror, hideous, ghastly, terrifying

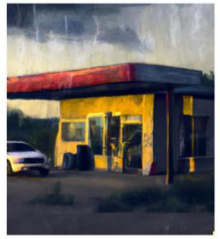
dall•ery gall•ery

Looks, vibes, -punks, -waves

😍 Check out this huge list!



Vaporwave: neon, pink, blue, geometric, futuristic, '80s.



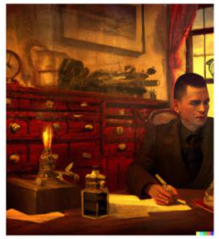
Post-apocalyptic: grey, desolate, stormy, fire, decay



Gothic, fantasy: stone, dark, lush, nature, mist, mystery, angular



Cybernetic, sci-fi: glows, greens, metals, armor, chrome



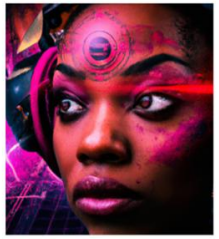
Steampunk: gold, copper, brass, Victoriana,



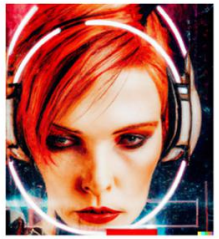
Memphis, Memphis Group, 1980s, bold, kitch, colourful, shapes



Dieselpunk, grimy, steel, oil, '50s, mechanised, punk cousin of steampnk



Afrofuturism: futuristic, and African!



Cyberpunk, 1990s, dyed hair, spiky, graphic elements .

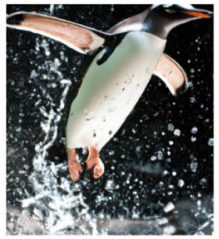


Biopunk, organic: greens, slimes, plants, futuristic, weird

dall•ery gall•ery

Camera settings + lenses

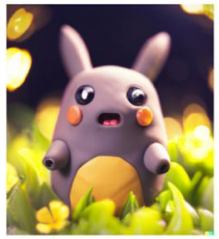
dall•ery gall•ery



Fast shutter speed, high speed, action photo, 1/1000 sec shutter



Slow shutter speed, 1 sec shutter, long exposure



Bokeh, shallow depth of field, blur, out-of-focus background (via)



Tilt shift photography (via)
Makes a narrow strip in-focus



Motion blur
(Source)



Telephoto lens, Sigma 500mm f/5
Shot from afar, feels 'voyeuristic'



Macro lens, macro photo (source)
Sigma 105mm F2.8 - for small scenes



Wide angle lens, 15mm (source)
Fits more of the scene in the frame

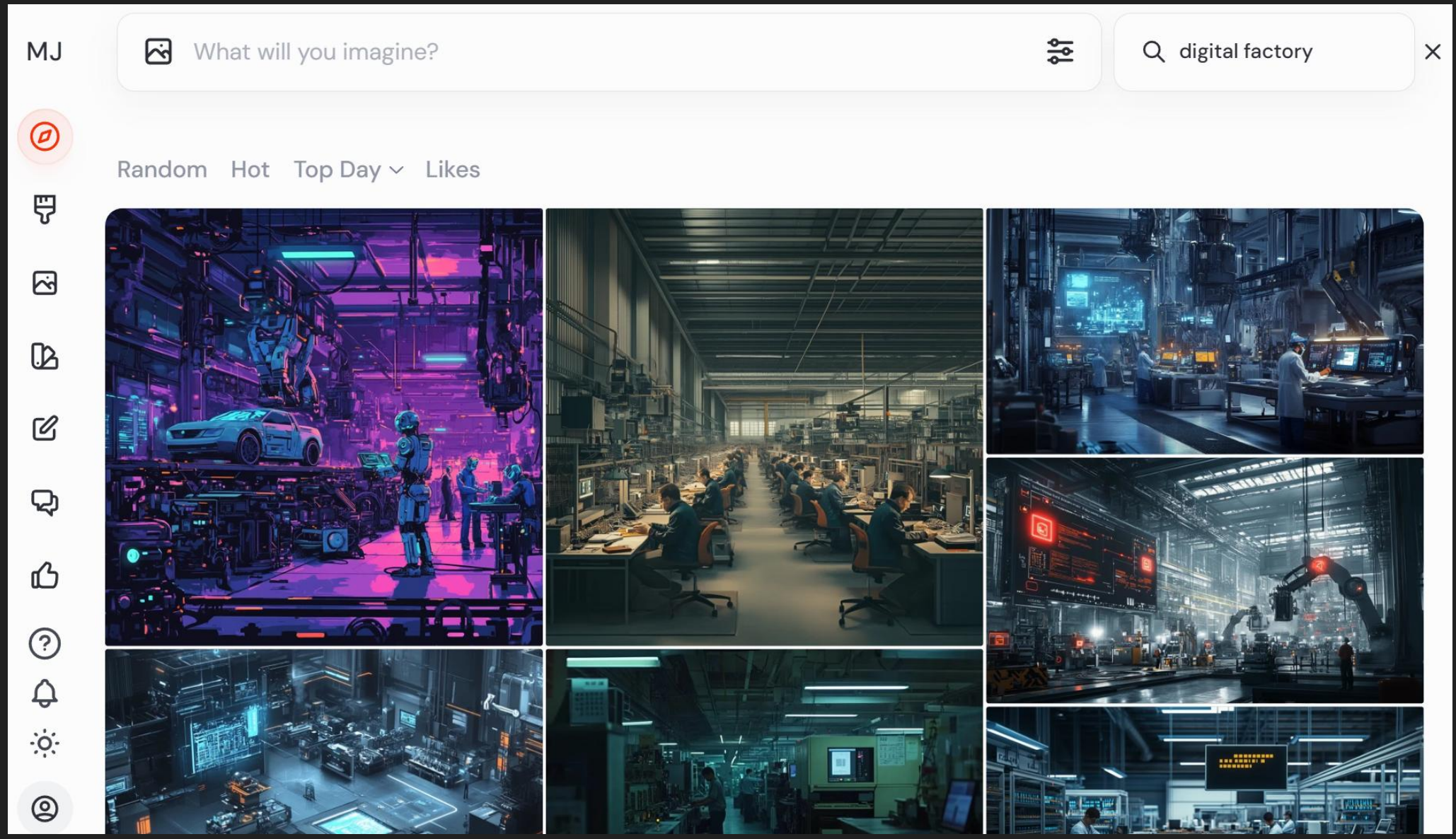


Fish-eye lens: distorts the scene, vv. wide angle, the centre 'bulges'



Deep depth of field, f/22, 35mm
Make all elements sharp

Prompt search engine (Midjourney, Lexica) for inspiration





ellenwilliams_9... 5w

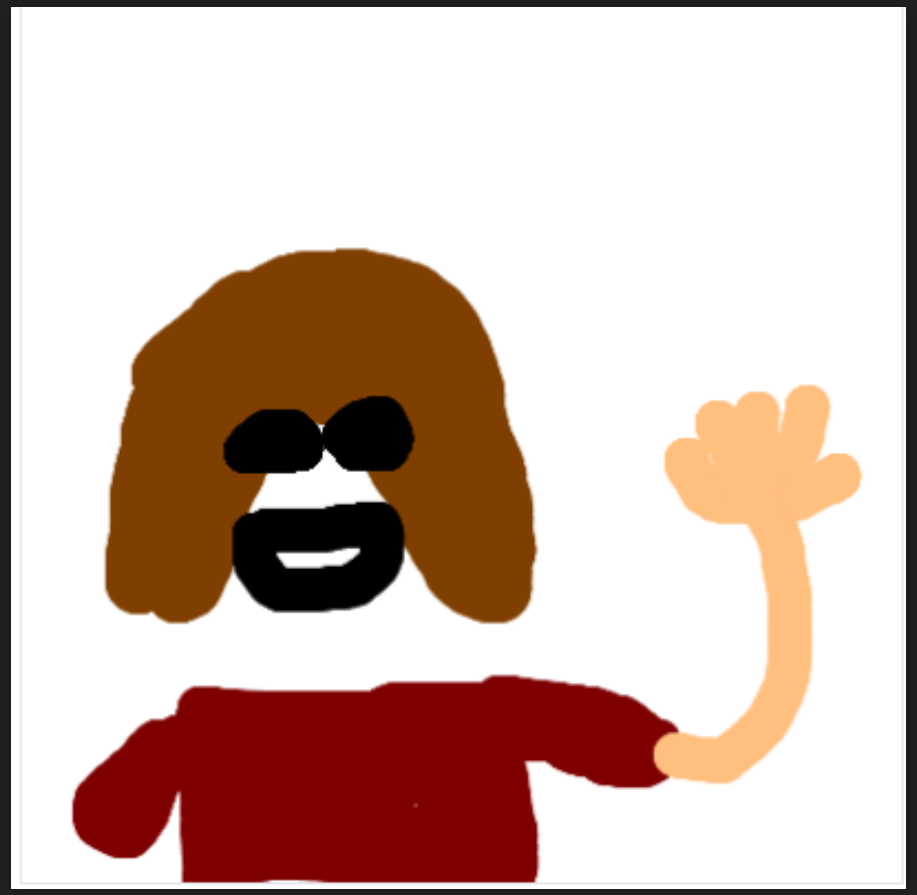
Realistic photo, manufacturing plant, computerized machinery, male and female workers

ar 16:9 v 6.1

General best structure

Format	Subject	Action	Modifiers
drawing	of a dog	dancing	in the style of Disney
flat vector art	metal human robot	painting on a canvas	cinematic lighting

Generate from sketch



Emma Watson wearing a red leather jacket
(+Lexica prompt words)

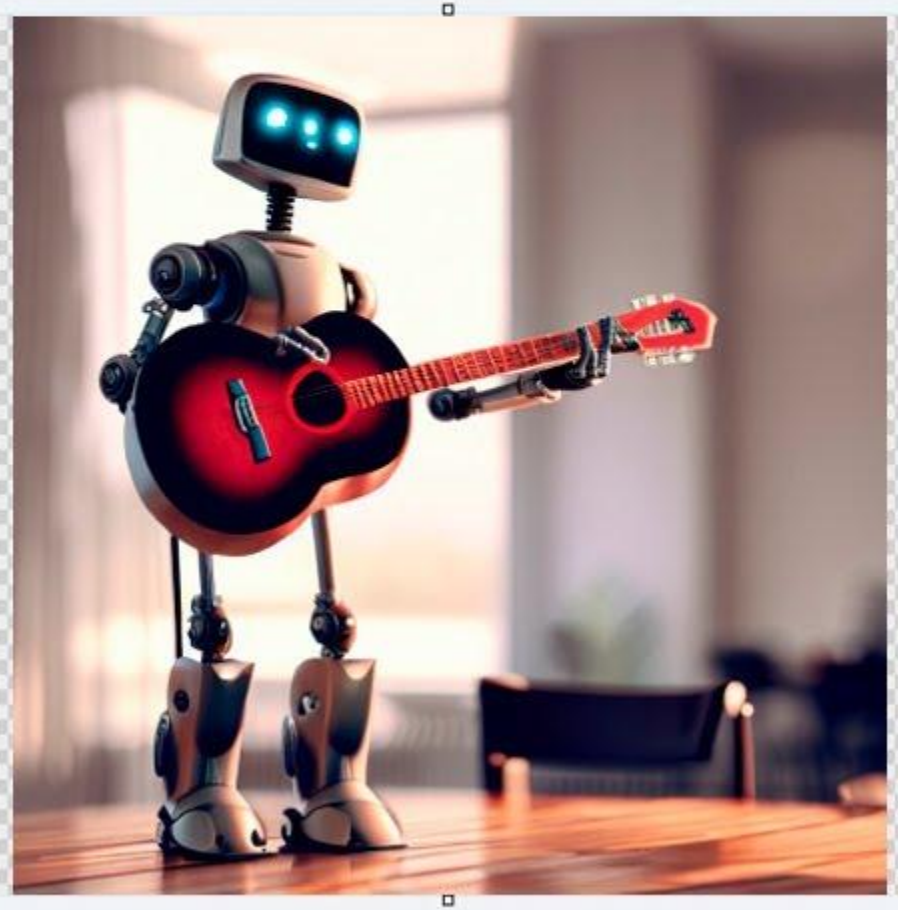


https://huggingface.co/spaces/huggingface-projects/diffuse-the-rest

Untitled - Paint

File Edit View

Selection Image Tools Brushes Shapes Size Colors Cocreator Layers



Cocreator PREVIEW

Describe what you'd like to create

Robot holding a guitar while standing on a dining room table

Choose a style

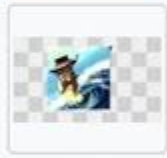
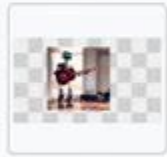
Watercolor

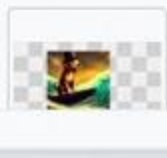
Explore variants





41 Create

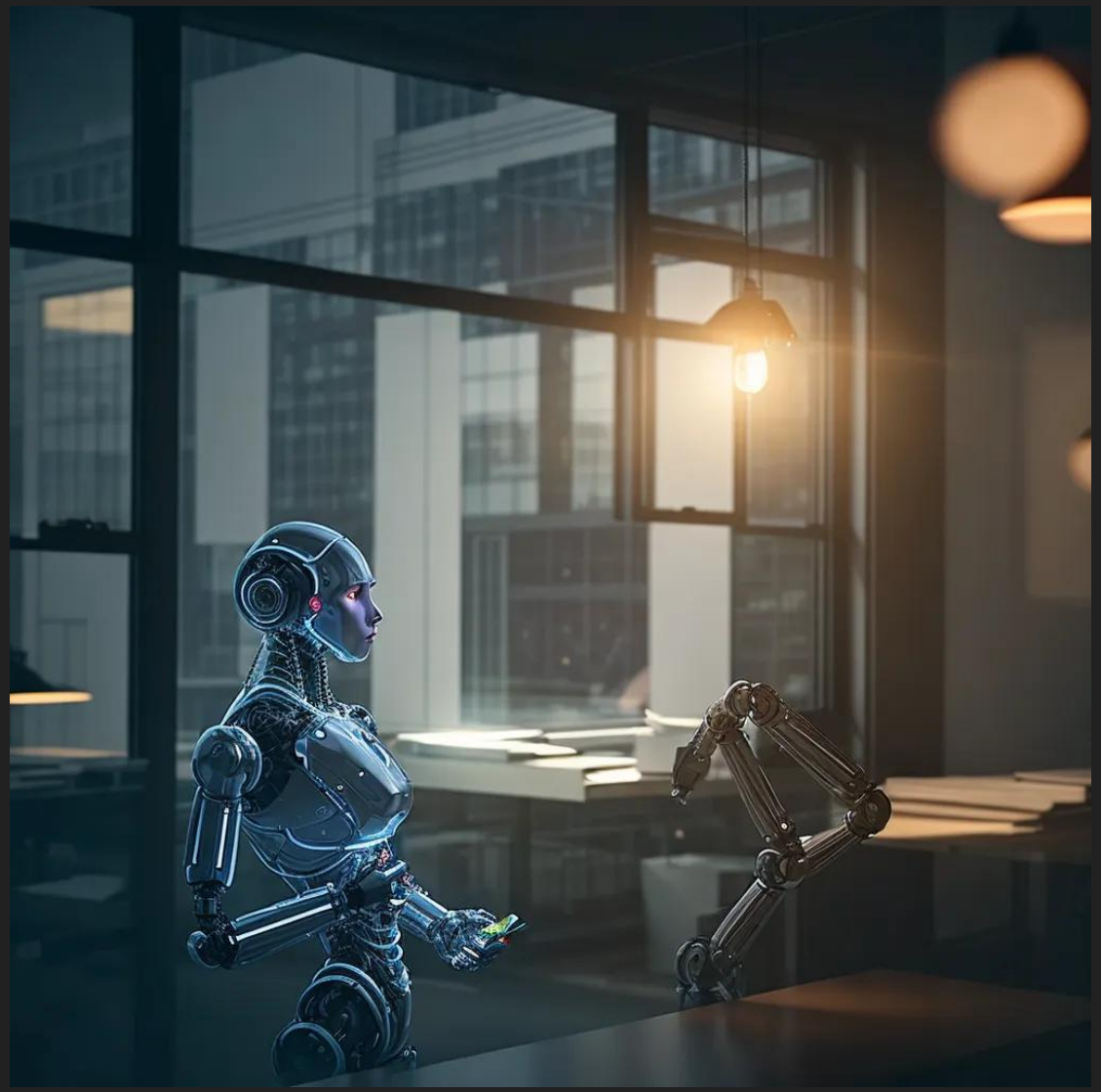






883, 74px 1016 × 587px 100%

“Illusion Diffusion”: condition during generation

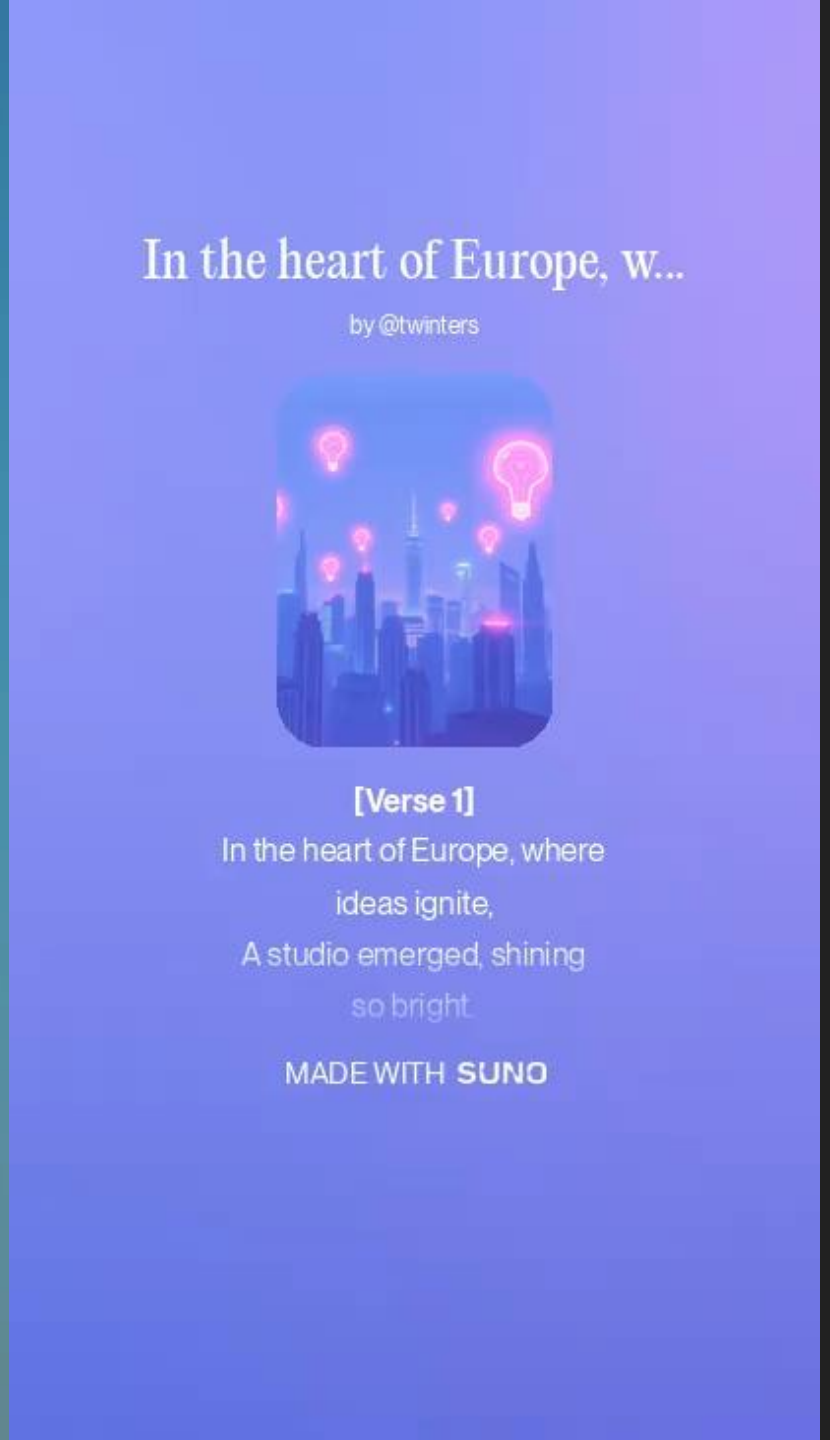












Suno

Rock:
https://suno.com/song/247e56f5-3a66-49a4-a02d-316784399e13?sh=Qc2YYjDgwfAAhf7L

Synth pop:
https://suno.com/song/f98b64fd-081b-47ef-898c-93ea898a08bd?sh=2NSffI6WQMjmEikb

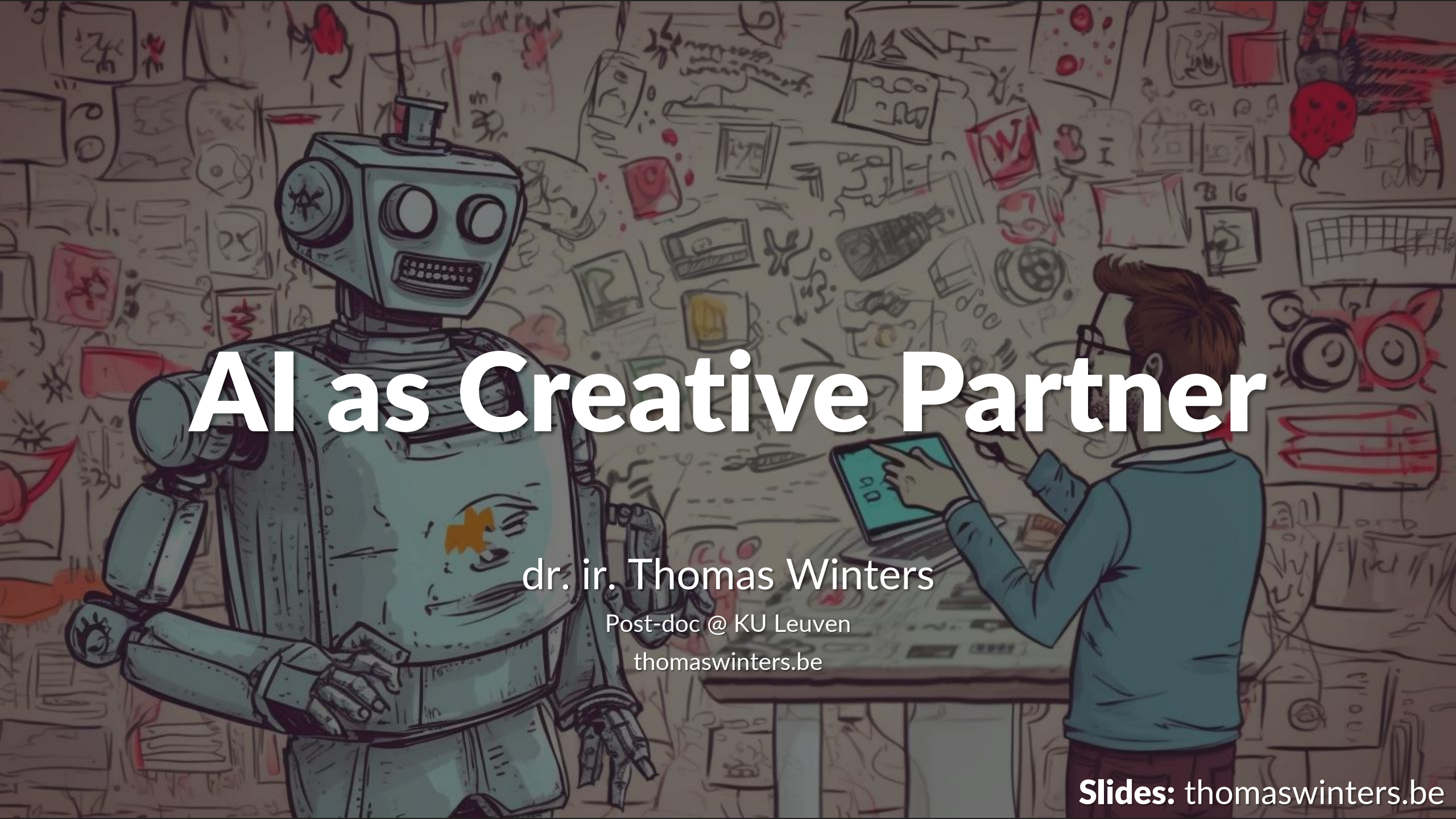
Tools used

Large language models
General: chatitp.inthepocket.net / chatgpt.com / Gemini
+ search: perplexity.ai
+ own documents: notebooklm.google.com (met inthepocket.com account)
+ web dev: v0.dev

Image Generators
+ full control: Stable Diffusion in Automatic1111
+ condition on image: huggingface.co/spaces/AP123/IllusionDiffusion
+ from sketch: huggingface.co/spaces/huggingface-projects/diffuse-the-rest & Microsoft Paint + Co-creator

Video generator
+ from text and/or image: sora.com / Runway ML Gen-3 / lumalabs.ai

Music generator
suno.com



AI as Creative Partner

dr. ir. Thomas Winters

Post-doc @ KU Leuven

thomaswinters.be

Slides: thomaswinters.be