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Computational Thinking

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BG/BRG Schwechat



Computational Thinking /Algorithm

Help the teacher erase the blackboard. They have suddenly forgotten how to do it and now need precise instructions. Agree on a 3-6 sentence algorithm as a group. The teacher will then carry out this sentence. What needs to be done to clean the blackboard?



Figure 1 Canva. (2025). – AI generated

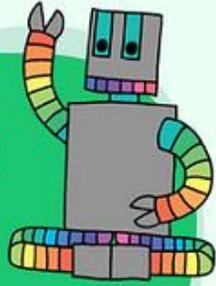
Decomposition

Larger problems or systems, broken down into smaller more manageable parts.



Patterns

Looking for similarities among and within problems, and data



Computational Thinking

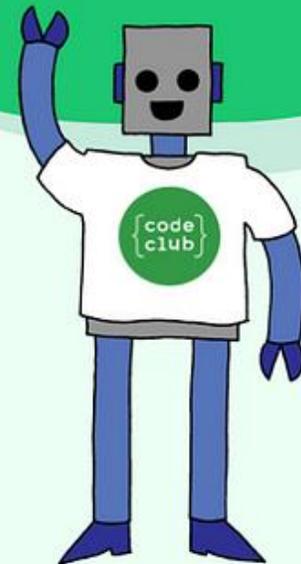
Abstraction

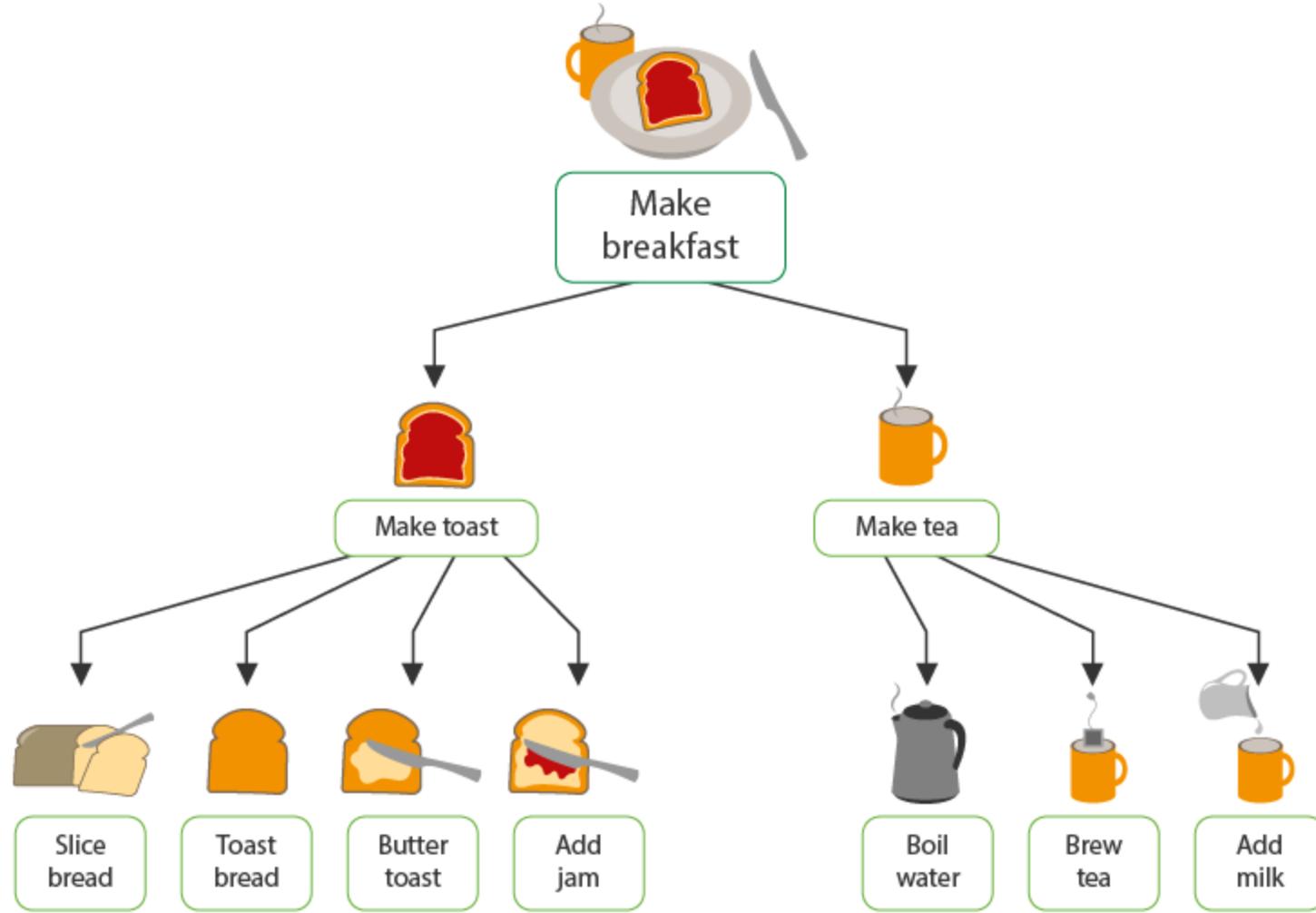
Focusing on the important information and ignoring or removing irrelevant details.



Algorithms

Developing a step by step solution







Example for use in school: (language)

Create step-by-step instructions for the task you have been given (e.g., spreading Nutella on bread). Write down the steps in algorithmic processes so that another team can carry them out WITHOUT asking any questions.

f.e. Why is the command “Cut the bread and spread it” misleading?



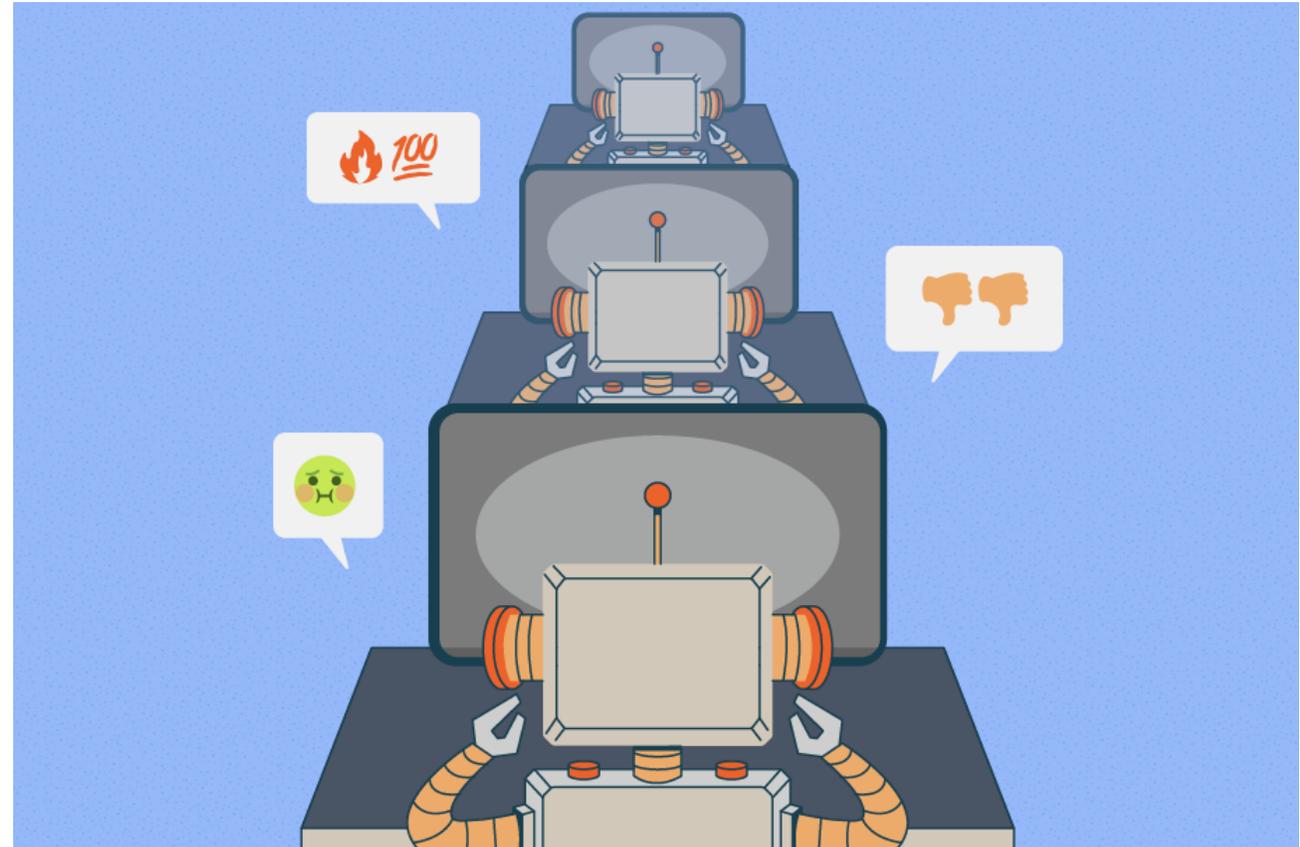
Figure 2 Canva (2025). KI-genraited



The Day the World Wide Web died: the dead Internet theory ?



The internet has given people a space for knowledge, culture, and entertainment. And some contemporaries rate its significance on the same level as that of writing and printing. But some experts believe that the internet is now heading toward an end. This is because artificial intelligence has recently taken over, flooding the internet with meaningless clickbait and drowning it in a flood of meaningless media masses.





„world wide web is less effiecent“ MELANIE MITCHELL

"AI slop", often simply "slop", is a term for low-quality media made with generative artificial intelligence. It is characterized by an inherent lack of effort and is currently being generated at an overwhelming volume.

Inferior AI products on social media
(bot posts on Twitter, AI music on Spotify, etc

e.g., AI “Scrimp Jesusu,” a well-known example from two years ago, nobody knows where it comes from
-> the goal is to interact with it, click on it, share it ... Money from Facebook, Instagram when interaction takes place
-> Danger of pseudo-journalism (fake facts, fake news ...)



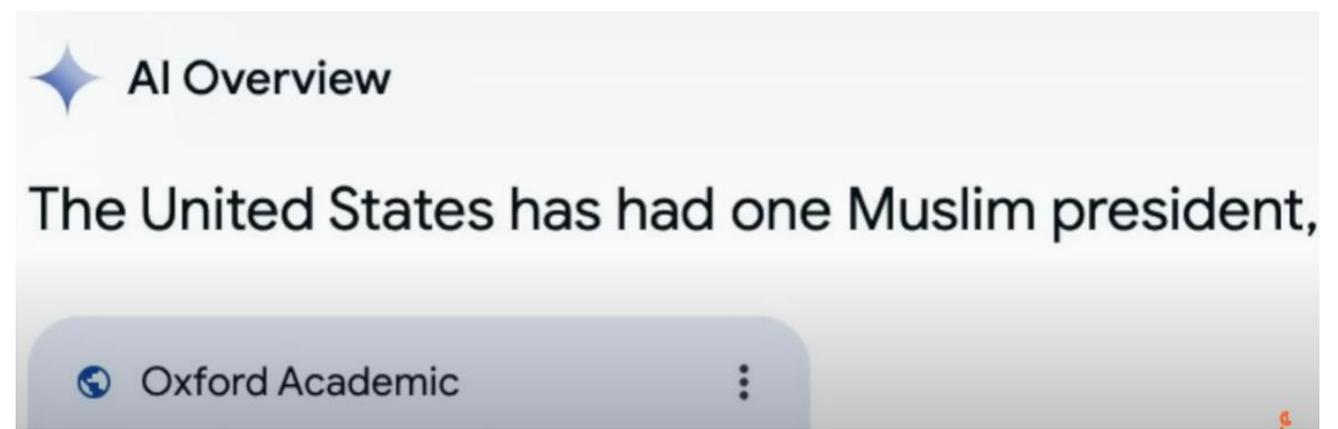


Google is attempting to counteract search slop: AI OVERVIEW

Test question: Has the United States ever had a Muslim president? – The AI did not understand the ironic source “?” but took it literally

MELANIE MITCHELL Study 2020:

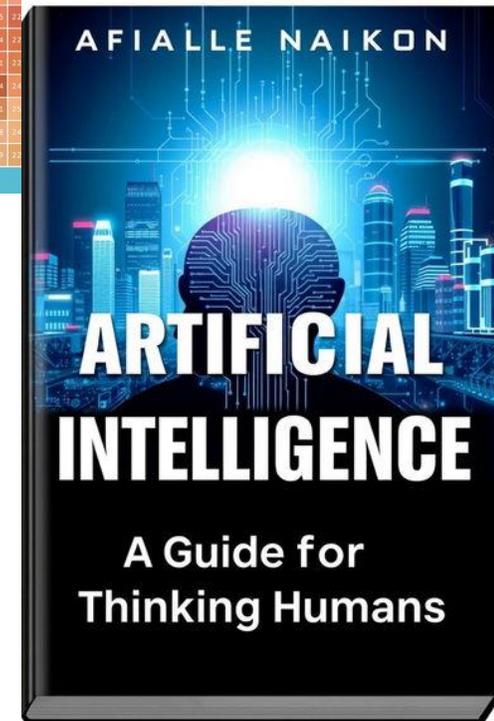
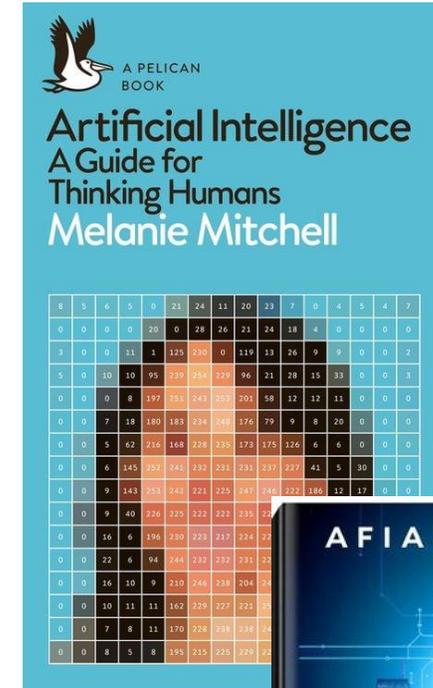
Test subjects had to read various poems and say which ones they liked. AI poems were preferred because they were simpler. Simpler rhyme structure and easier to understand. Human poems were more subtle and required thought and effort to understand. -> This shows that AI can write books that people buy. We may not think they are good, but they are bought. The real problem: AI reads huge amounts of data generated by humans, human creativity, and repackages it. Half of the internet is generated by AI.



MELANIE MITCHELL is an American computer scientist. She is a Professor at the Santa Fe Institute. Her major work has been in the areas of analogical reasoning, complex systems, genetic algorithms and cellular automata, and her publications in those fields are frequently cited)

Amazon Books: wrong informations fungus with wrong facts ! Because of AI Books !! -> bad Ai Books only needs Seconds... but generate money on amazone! Most famous exampe: „ Helene von Waldgraben“ over 200 bokks on amazone ratgäber, but she dosent exist!

Copy of Books: even AI Book Scientist was copied and written by AI!





Does AI can make it better than human ides? Cann KI create something bythem selfe?

An Answer from the musician Nick Cave:

Data doesn't suffer. ChatGPT has no inner being, it has been nowhere, it has endured nothing, it has not had the audacity to reach beyond its limitations, and hence it doesn't have the capacity for a shared transcendent experience, as it has no limitations from which to transcend. ChatGPT's melancholy role is that it is destined to imitate and can never have an authentic human experience, no matter how devalued and inconsequential the human experience may in time become.

<http://theredhandfiles.com/chat-gpt-what-do-you-think/>



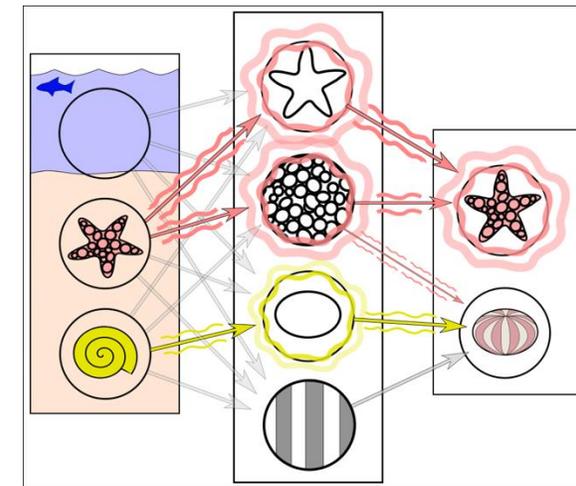
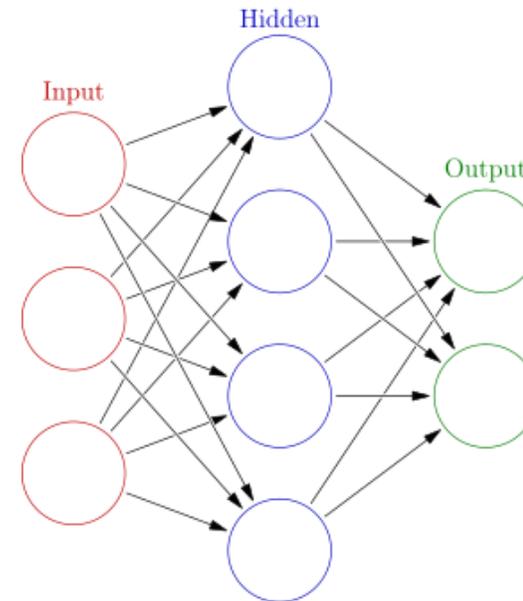
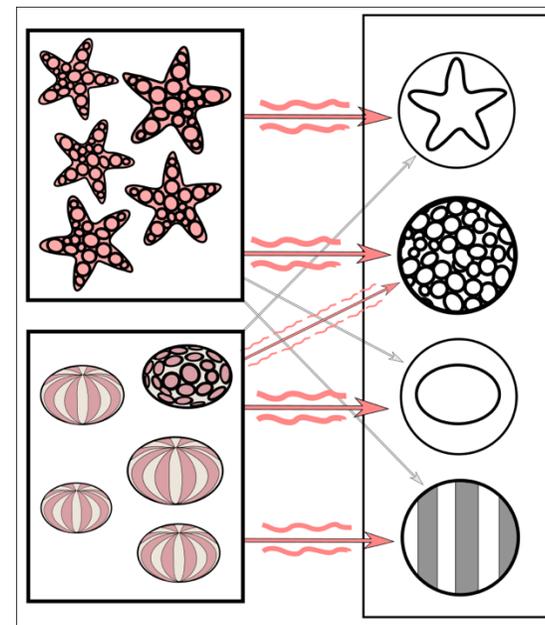
Reactions: e.g. mark for books written by human; transparency!



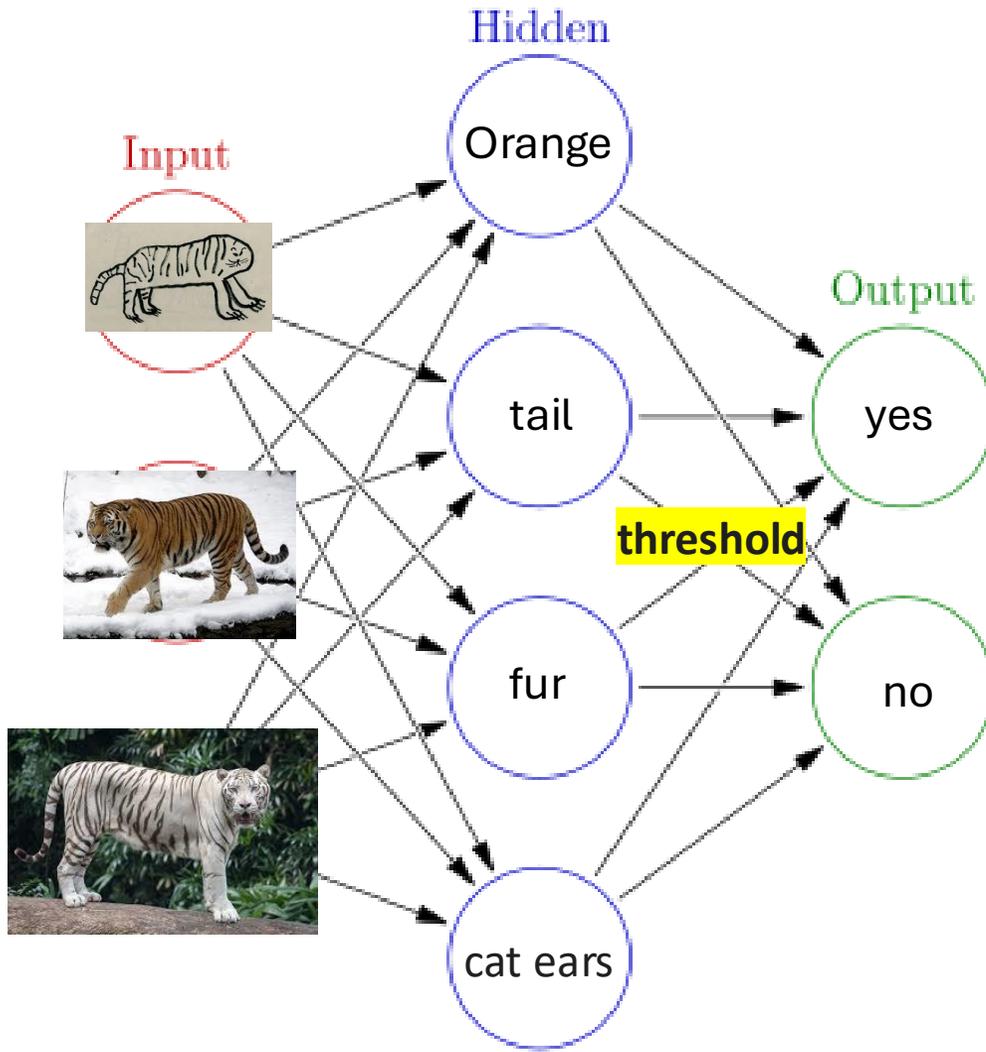
The neuronal Network – How does Ai work?

<https://youtu.be/SwEd3LTFXBQ>

AI works by using algorithms to process large amounts of data, identify patterns, and make decisions or predictions (“more likely to...”), mimicking human intelligence. Key techniques include machine learning, where systems use data without explicit programming and use multi-layered neural networks to perform complex tasks like language processing and image recognition. An artificial neural network is an interconnected group of nodes, inspired by a simplification of neurons in a brain. Here, each circular node represents an artificial neuron and an arrow represents a connection from the output of one artificial neuron to the input of another.



Is it a tiger?

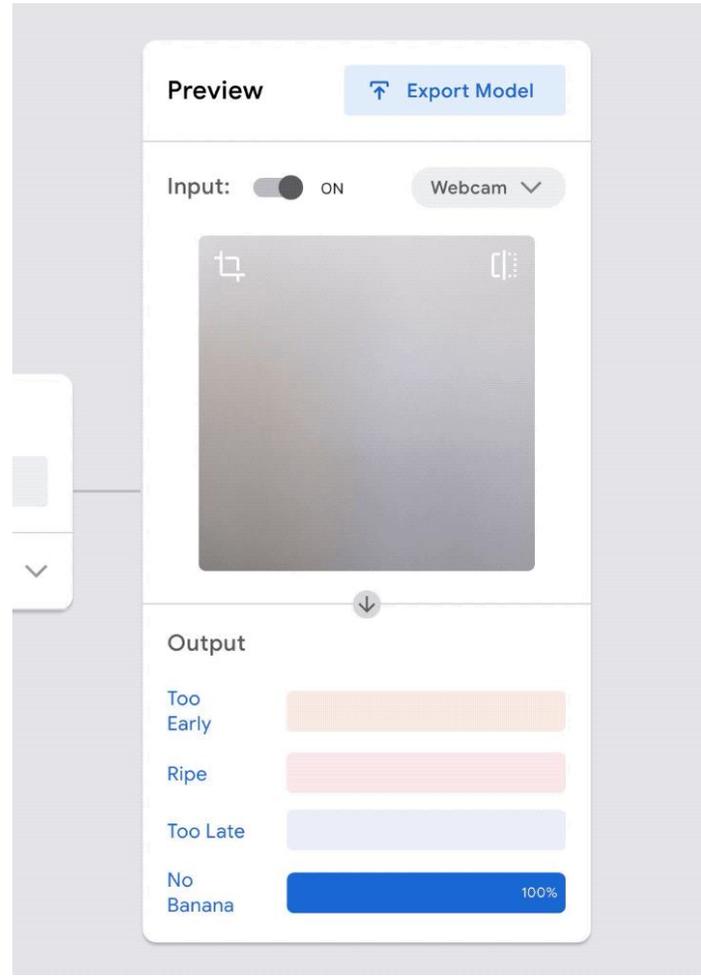
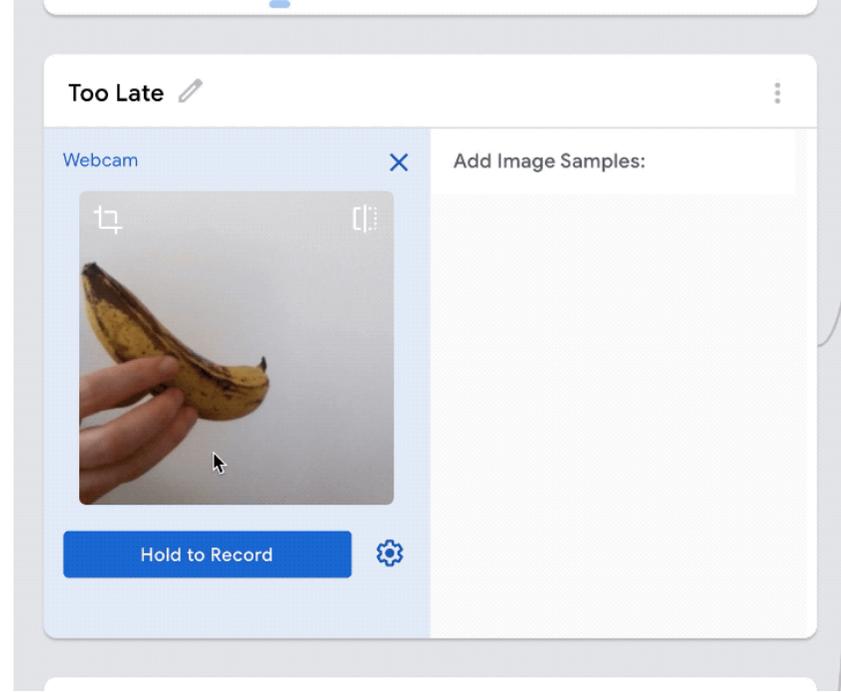
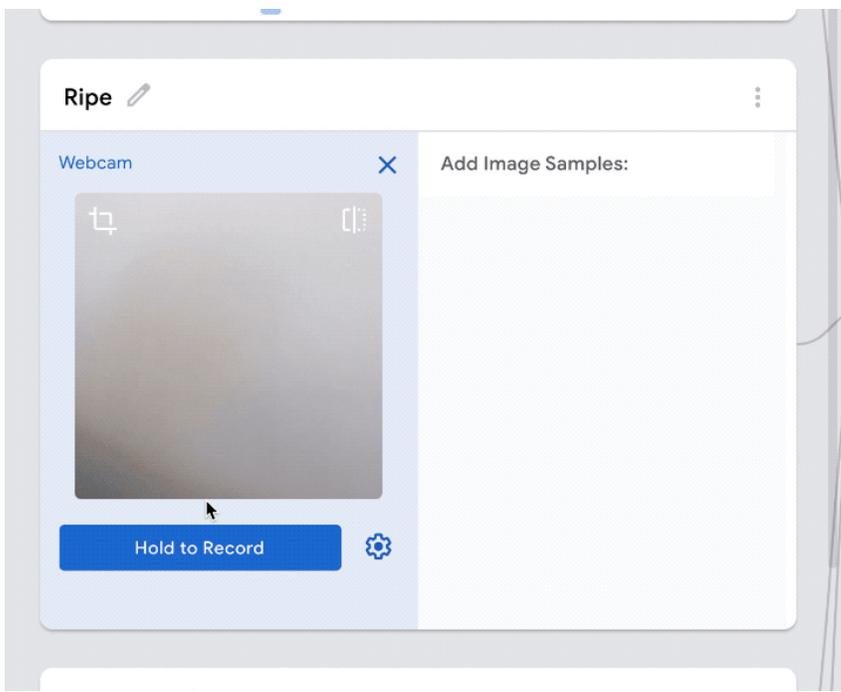


„more likely“

„less likely“



<https://teachablemachine.withgoogle.com/train/image>



<https://medium.com/@warronbebster/teachable-machine-tutorial-bananameter-4bffa765866>

<https://teachablemachine.withgoogle.com/>

Coding and AI



teachablemachine.withgoogle.com/train/image

Teachable Machine

up

154 Bild-Beispiele

Webcam Hochladen

down

218 Bild-Beispiele

Webcam Hochladen

Klasse hinzufügen

Training

Modell ist trainiert

Erweitert

Vorschau Modell exportieren

Eingabe AN Webcam

Ausgabe

up 76%

down 24%

cardboard.lofirobot.com/teachable-microbit/

up

LOFI LOFI ROBOT



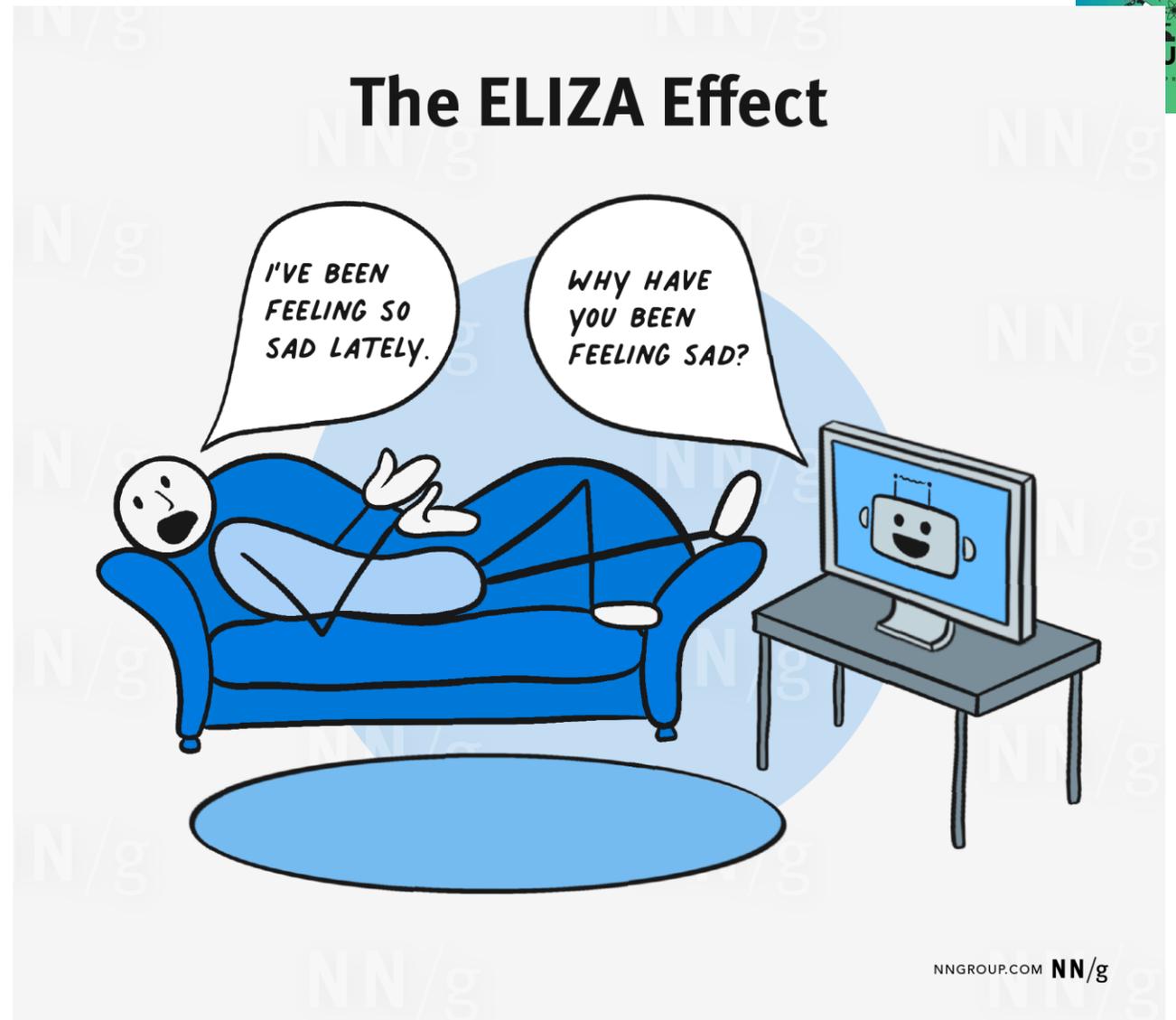
Why do we like using AI?

“Elisa Effekt” - Conversational AI interfaces like OpenAI’s ChatGPT, Microsoft’s Bing Chat, or Google’s Bard are fun to use in part because they feel personable and somewhat human; chatting with AI in this way can feel like talking to another person.

ELIZA was developed by Joseph Weizenbaum, a professor at M.I.T., in the 1960s. ELIZA would take the position of a text-based therapist. It would ask: *Is something troubling you?* Then it would identify a keyword in the user’s response (*I’m feeling sad*) and repeat it back in a question such as *Is it important that you’re feeling sad?* or *Why are you feeling sad?*

As soon as something can talk, we assume it is intelligent

<https://liacademy.co.uk/the-story-of-eliza-the-ai-that-fooled-the-world/#:~:text=Understanding%20the%20ELIZA%20Effect&text=For%20example%2C%20when%20a%20user,sharing%20their%20thoughts%20and%20feelings.>





Testing LLMs using Analogies by Puzzl: Melanie Mitchell's sibling's test

Julia has two sisters and one brother. How many sisters does her brother Martin have?

Some AI leaders have declared that the remarkable capabilities of **large language models (LLMs)** and other “generative” AI systems have finally crossed a barrier of understanding, and that we are already seeing the arrival of humanlike AI. After all, these systems exhibit uncanny abilities to converse with us in natural language, generate realistic images in response to our prompts, write functioning computer code, and even excel on standardized exams designed to test human reasoning abilities.

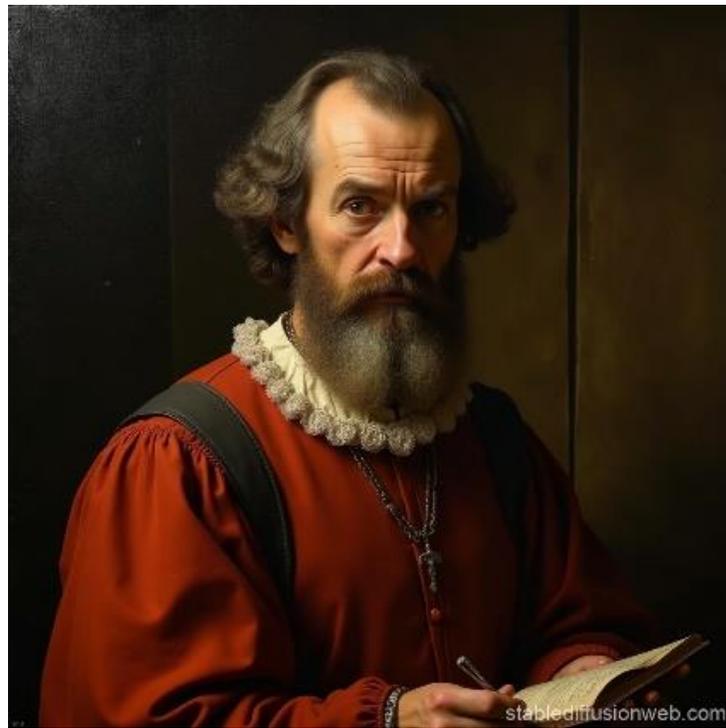


Solving this tiny puzzle requires a bit of thinking.. In other words, the answer to such a puzzle isn't something you immediately know, a central feature of human intelligence, and one that large language models (LLMs) like GPT-4 struggle with. It always gave me the wrong answer : Martin has two sisters.

Companies have recently created new kinds of AI systems, often called **large reasoning models (LRMs)**, that are specially trained to perform certain types of reasoning. OpenAI's o1 model gives “chain of thought” :

1. Julia has two sisters. That means there are three girls in total (Julia + two more).
2. Julia also has one brother, named Martin.
3. Altogether, there are four siblings: three girls and one boy (Martin).
4. From Martin's perspective, his sisters are all three of the girls (Julia and her two sisters).
5. Therefore, Martin has three sisters.

This sounds very much like a human thinking out loud, and indeed o1 and other LRMs are trained on many examples of human-generated chains of thought.



BUT AI can be used as a helping tool! (in a good way!) THIS IS NOT SLOP, but the idea of Databased working

the next Rembrandt project (<https://news.microsoft.com/europe/features/next-rembrandt/>) 2016



Collaboration between Microsoft, Delft University of Technology, the Mauritshuis in The Hague, and the Rembrandt House Museum in Amsterdam. 346 paintings attributed to Rembrandt served as the source material. Images of these works were broken down into 168,263 image fragments using AI[4], 150 gigabits of graphic files, and a new portrait with 148 million pixels was assembled from them. The team analyzed the facial features of the images individually (eyes, mouths, noses, etc.). An algorithm examined the geometric arrangement of the facial features in relation to each other and calculated the distances (https://de.wikipedia.org/wiki/The_next_Rembrandt).



- Afterwords use to recheck if original Rembrand



The integration of AI into education systems has the potential to significantly improve access to education. Digital tools can counteract educational disadvantages, e.g., tutoring.

<https://www.deepl.com/de/translator>

simulation models, and wildfire risk forecasting systems: Using AI to provide accurate wildfire information to affected communities and fire authorities

<https://blog.google/outreach-initiatives/sustainability/google-wildfire-boundary-maps-europe-africa/>

AI for scientific research
Elicit helps researchers be 10x more evidence-based

<https://elicit.com/c>

← → ↻ 🌐 artlist.io/text-to-image-ai?utm_source=google&utm_medium=cpc&utm_campaign=22359389... ☆ 📄 🌐

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AI Image Generator

This is an AI Image Generator. It creates an image from scratch from a text description.

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Submit

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Speed Quality

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/deepai.org

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Vokabeltests

Write the translation of words.

Word	Translation
apple	
banana	
bread	
butter	
cheese	
egg	
milk	
yogurt	

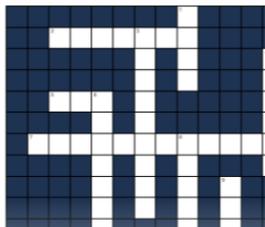
Choose the correct answer.
a place where you live
 house tree car
a meal you eat in the morning
 breakfast dinner lunch

Mindmaps/Tafelbilder



Erstelle Mindmaps
Erstelle Tafelbilder
Erstelle Arbeitsblätter

Kreuzworträtsel



<https://to-teach.ai/>



Goal

What is the specific security-related information you need?

"Give me information about incident 18718..."

+

Context

Why do you need it and how will you use the information?

"... for a report that I can submit to my manager."

+

Expectations

What format or audience do you want the response tailored to?

"Compile the information in a list, with a short summary."

+

Source

Is there a plugin, known info, or data source Security Copilot should use?

"Look in Defender incidents."



People respond to content that is
"AUTHENTIC," "GENUINE," and "HUMAN."
So let's include those words in our AI prompts.



TOM
FISH
BURNE