

Les 02



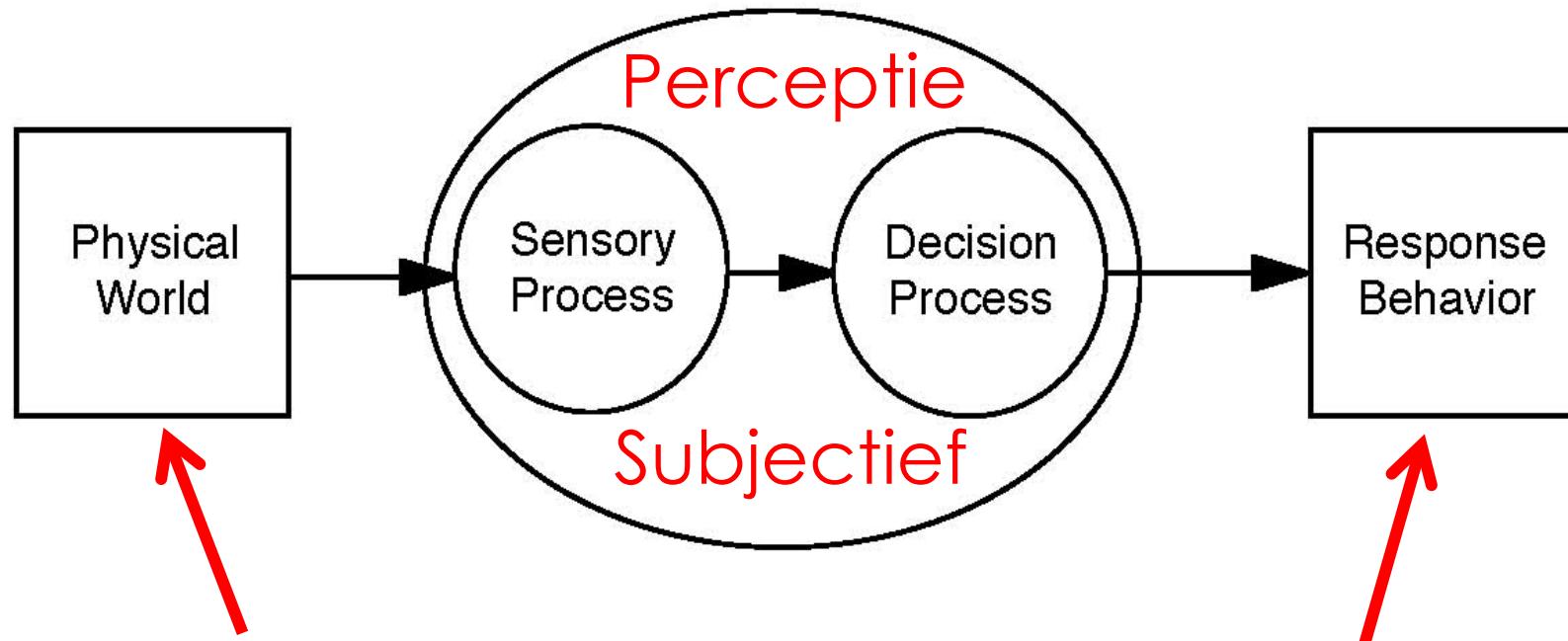
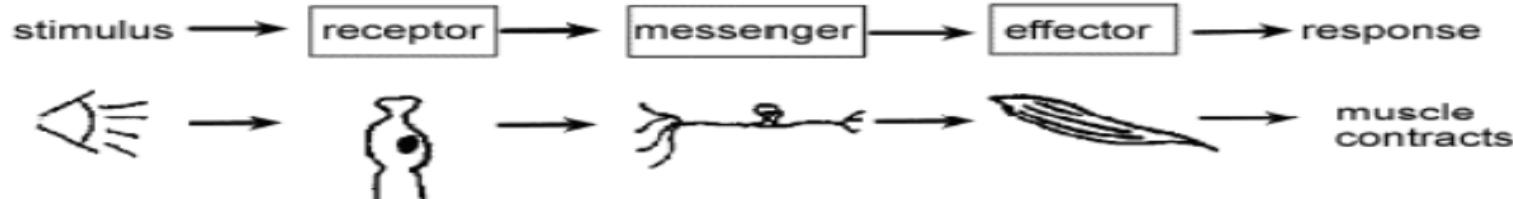
Digital Humans

**“Conversational
Agents
&
Prompt
Engineering”**



hr.nl/ai

GEWAARWORDEN & PERCEPTIE



Alleen de Fysieke wereld en ons Gedrag kunnen objectief worden gemeten

Sensatie [gewaarwording]

Proces waarbij een gestimuleerde receptor een patroon van neurale impulsen creëert

{=> registratie van externe /interne prikkels}

Perceptie [Waarnemen]

Proces dat de inkomende sensorische patronen bewerkt en er betekenis aan geeft

{=>interpretatie van de geregistreerde prikkels}.

Wordt sterk beïnvloed door herinneringen, motivatie, emotie en andere psychologische processen.

Sensation: [Sensibilisatie]

'...immediate and basic experiences generated as stimuli fall on our sensory systems'

➔ Verwerken van ruwe data (prikkels of Fysieke stimuli) volgens een vast patroon

Perception: [Perceptie]

'...interpretation of those sensations, giving them meaning and organization'

➔ Gestuurd door "ingebouwde" informatie (niet lerend),

Cognition: [Cognitie]

'...acquisition, storage, retrieval, and use of information'

➔ Gestuurd door "verworven" informatie (zelf-lerend)

M.W. Matlin & H.J. Foley, 1992



**Human-Computer
Interaction**

An Empirical Research Perspective



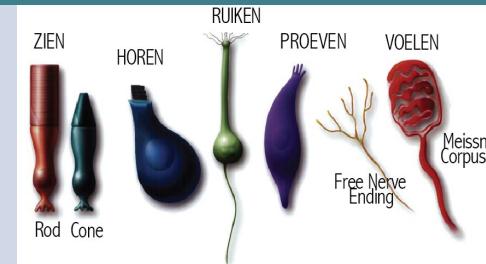
I. Scott MacKenzie

Recap lesson 01

Sensorische informatieverwerking

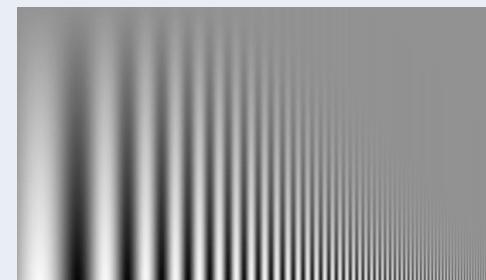
[1] Stimulus (Energie)

direct meetbaar



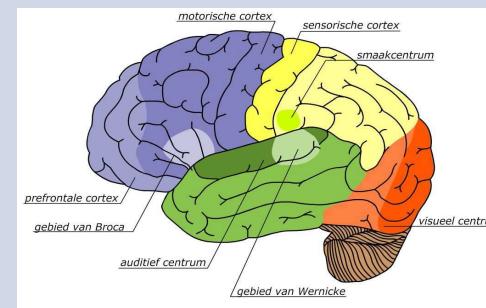
Externe prikkel

[2] Vindt gefilterd zijn weg naar het brein



Zintuigelijke waarneming

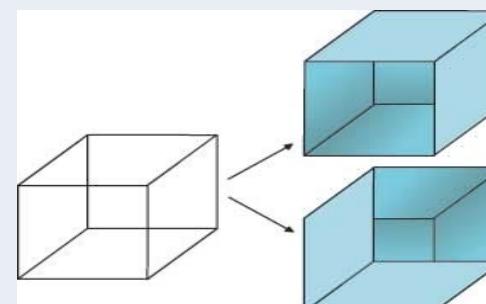
[3] Codering in het brein (corticale gebieden)



Opslag & Integratie

[4] Interpretatie, Beoordeling & besluitvorming

niet direct meetbaar



Perceptie & Cognition

Zintuigelijke informatieverwerking & gedrag

DE ZINTUIGEN

INTEGRATIE VAN HUN INPUT

EINDRESULTATEN

Auditief

Visueel

Vestibulair

Proprioceptief

Tactiel

Smaak

Reuk

- oogbewegingen
- houding en tonusregulatie
- evenwicht en balans
- gevoeligheid voor beweging
- cocontracties
- zekerheid t.o.v. zwaartekracht
- zuig-slik-ademsynchroniteit
- tactiel comfort
- ouder-kind-binding
- eten en drinken

- preverbale communicatie
- non-verbale communicatie
- houding en ademsteun voor spraak
- mondmotoriek
- imitatie
- lichaamsschema
- bilaterale coördinatie
- motorplanning
- emotionele stabiliteit
- activiteitsniveau
- aandacht

- auditieve functies
- taal
- articulatie
- taalondersteuning voor praxis
- visuele perceptie
- ooghandcoördinatie
- doelgerichte activiteit

- communicatie
- concentratie
- organisatie
- abstract denken/
redeneren
- schoolleervermogen
- zelfbeeld
- zelfvertrouwen
- zelfcontrole
- specialisatie van de
twee lichaam- en
hersenhelften

Sensation: [Sensibilisatie]

'...immediate and basic experiences generated as stimuli fall on our sensory systems'

➔ Verwerken van ruwe data (prikkels of Fysieke stimuli) volgens een vast patroon

Perception: [Perceptie]

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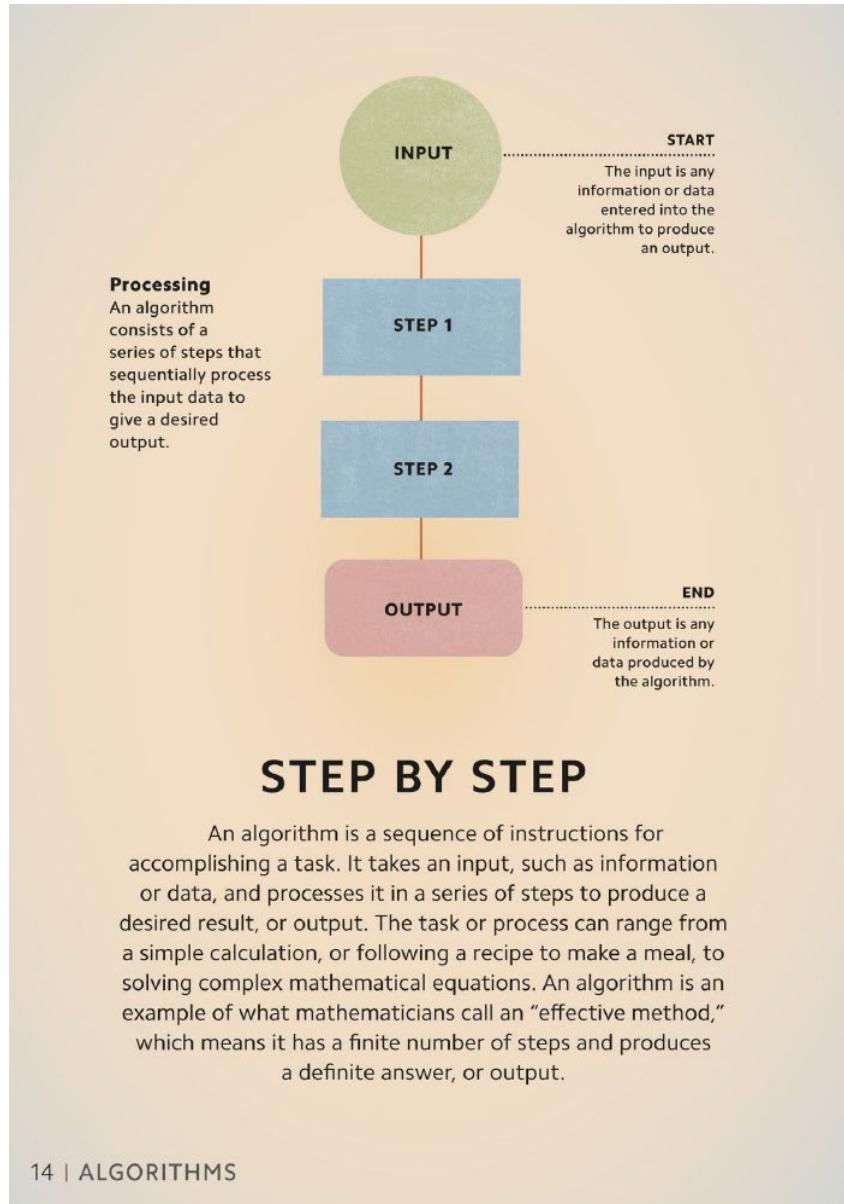
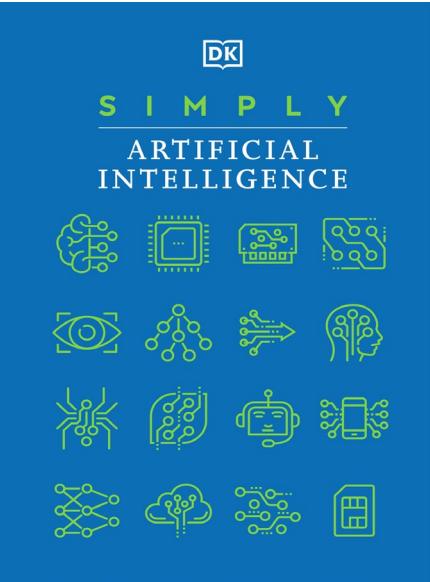
'...acquisition, storage, retrieval, and use of information'

➔ Gestuurd door "verworven" informatie (zelf-lerend)

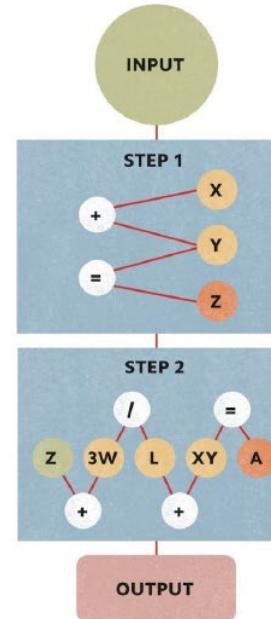
M.W. Matlin & H.J. Foley, 1992

Artificial intelligence {AI}

“Kunstmatige Intelligentie”
Wat is dat eigenlijk?



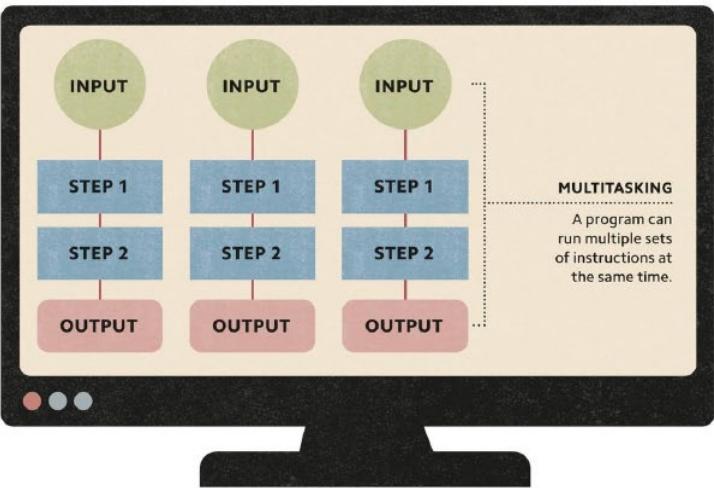
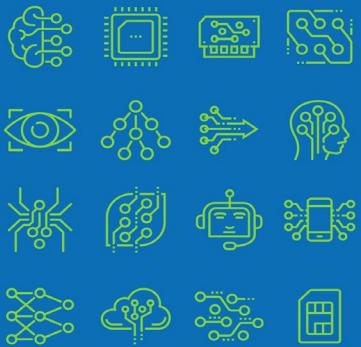
Components of calculation
Computations have an input and an output, and multiple steps. They can vary from simple sums to complex equations.



ALGORITHMS IN ACTION

A computation is a calculation that follows the steps of an algorithm (see opposite). The most straightforward example of computation is arithmetic calculation. For example, if you add together a pair of three-digit numbers in your head, you follow a series of steps, or an algorithm, to achieve this calculation. Computations use symbols to represent numbers, but symbols can represent almost anything else (see p.36). With the right symbols and the right algorithms, immensely complex computation becomes possible.

SIMPLY

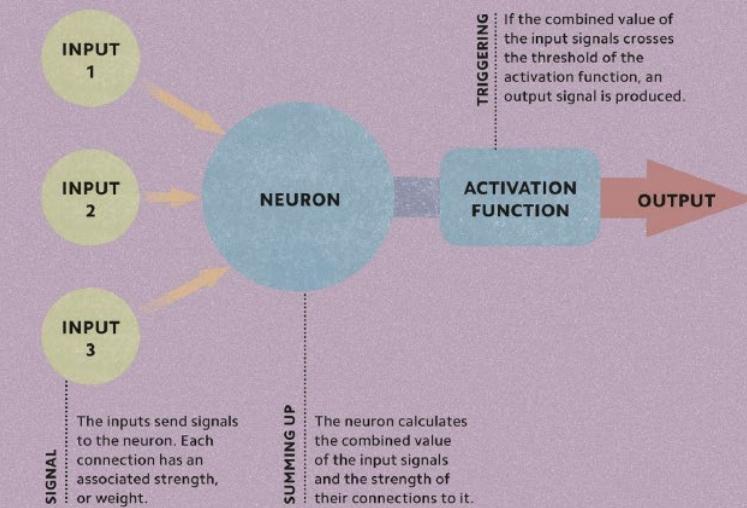
ARTIFICIAL
INTELLIGENCE

INSTRUCTING COMPUTERS

A program is a sequence of instructions written in code that enables a computer to perform one or more tasks. Charles Babbage (see opposite) imagined the first program. He was inspired by the design of a certain silk loom, which had parts that moved up or down in response to a pattern of holes punched into a card. Babbage recognized that these holes could store instructions to operate the cogs and levers of a machine he was designing: the "Analytical Engine". Modern computers work on the same principle, following sequences of instructions, which are usually written in binary code (see p.13).

ARTIFICIAL NEURONS

Each of the 86 billion neurons in the human brain is effectively a tiny processor, receiving electrical signals (inputs) from other neurons and sending out signals of its own (outputs). McCulloch and Pitts (see opposite) realized that neurons can act as logic gates—devices that can switch on and off (see p.13), depending on the input. The scientists described an imaginary neuron called a "threshold logic unit". This neuron works by first adding the values of its inputs (signals from other neurons) and then multiplying that value by a variable called a "weight" (see p.78)—this is the strength of a connection between neurons. If the input signals exceed a certain value (see p.79), the neuron is triggered to send an output signal. This triggering is called the "activation function".



Mensen vormen een gefantaseerd “Cognitief” mentaal model van de wereld om hun heen.

PERCEPTIE versus COGNITIE

We vinden het normaal dat we dingen kunnen zien, horen, ruiken, proeven en voelen.

We kunnen ons een beeld vormen van datgene wat we:

- horen binnen gehoorsafstand;
- zien binnen het gezichtsveld;
- voelen binnen handbereik;
- ruiken binnen reukafstand.

Maar de mens ziet, ruikt en hoort niet alles. De mens laat ook vaak alleen de signalen toe die hij geselecteerd heeft en die voor hem een bepaalde betekenis hebben. We kunnen dat onbewust doen. Dit gebeurt vooral bij niet veranderende signalen (gewoontegetrouw).

We kunnen dat heel bewust doen door:

- naar iets of iemand te kijken, te luisteren;
- iets of iemand te betasten;
- te proeven;
- te lezen;
- te ruiken.

Triarchic theory of intelligence

Componential Intelligence

Mental abilities most closely related to success on traditional IQ and achievement tests



Analytical giftedness is influential in being able to take apart problems and being able to see solutions not often seen. Unfortunately, individuals with only this type are not as adept at creating unique ideas of their own.

Experiential Intelligence

Creative thinking and problem solving



Synthetic giftedness is seen in creativity, intuition, and in the arts.

Synthetic giftedness is especially useful in creating new ideas to create and solve new problems.

Contextual Intelligence

Practical intelligence or "street smarts"

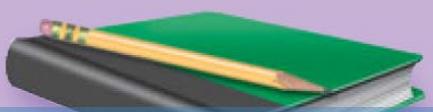


Through the three processes of adaptation, shaping, and selection, individuals create an ideal fit between themselves and their environment. This type of intelligence is often referred to as "street smarts."

menseleike intellectuele & onderscheidende vermogens

Linguistic Intelligence

The ability to use language both as an aid to thinking and in communication
Example: Reading or writing a blog



Taalvaardigheid

Logical-Mathematical Intelligence

The ability to think logically and to solve mathematical problems
Example: Developing a budget



Logisch redeneren

Spatial Intelligence

The ability to use images that represent spatial relations
Example: imagining whether a new sofa will fit in your living room



Ruimtelijkinzicht

Bodily-Kinesthetic Intelligence

The ability to learn and execute physical movements
Example: Taking a spin class



Lichamelijke-vaardigheid

Musical Intelligence

Sensitivity to and understanding of pitch, rhythm, and other aspects of music
Example: Learning to play an instrument



Muzikaliteit

Interpersonal Intelligence

The ability to communicate and engage in effective social relationships with others
Example: Being a trustworthy friend and pleasant companion



sociaalvaardigheid

Intrapersonal Intelligence

The ability to understand oneself
Example: Knowing what is important to you in life



sociaalvaardigheid

Naturalistic Intelligence

The ability to identify patterns in nature and to determine how individual objects or beings fit into them
Example: Embracing and enjoying the challenges of winter camping



Naturgerichte intelligentie

Cognitie refereert aan ons intellectuele & onderscheidende vermogen van informatie

Onder zuivere intellectuele functies worden verstaan:

oordeelsvermogen,
zelfbeleving + identiteit,
lichaamsbeleving,
logisch redeneren,
Taalbeheersing &
creatief denken.

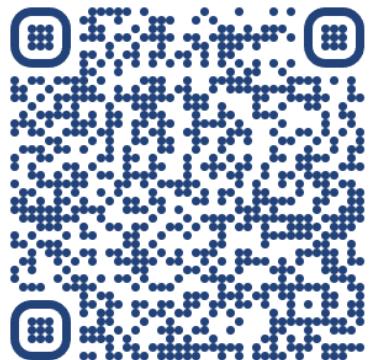
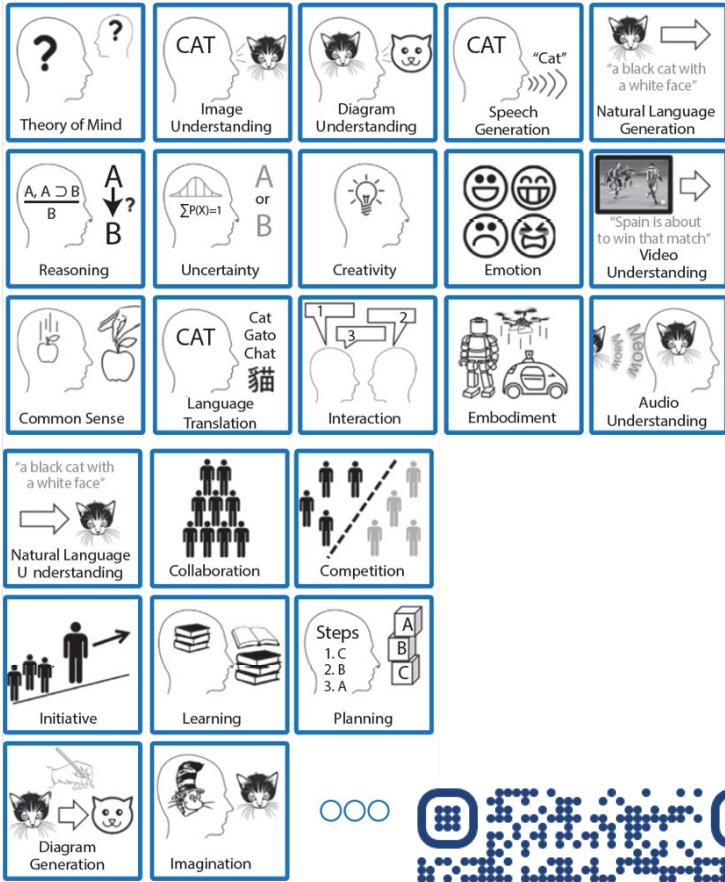
BRON: Cognitie- en waarnemingspatroon (H7)

Kerstens, J. A. M. (2006). Basisverpleegkunde (3 ed)

"Kunstmatige intelligentie" {AI}

is een multidisciplinair vakgebied gericht op onderzoek naar en het ontwikkelen van technologie dat menselijke cognitieve, perceptuele en/of motorische vermogens kan nabootsen en/of automatiseren.

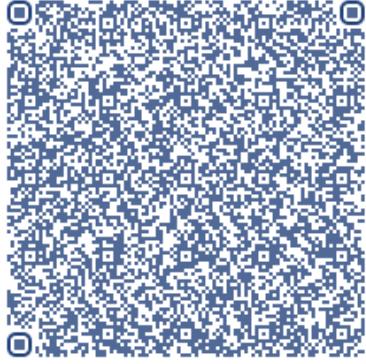
<https://doi.org/10.1609/aimag.v37i1.2643>



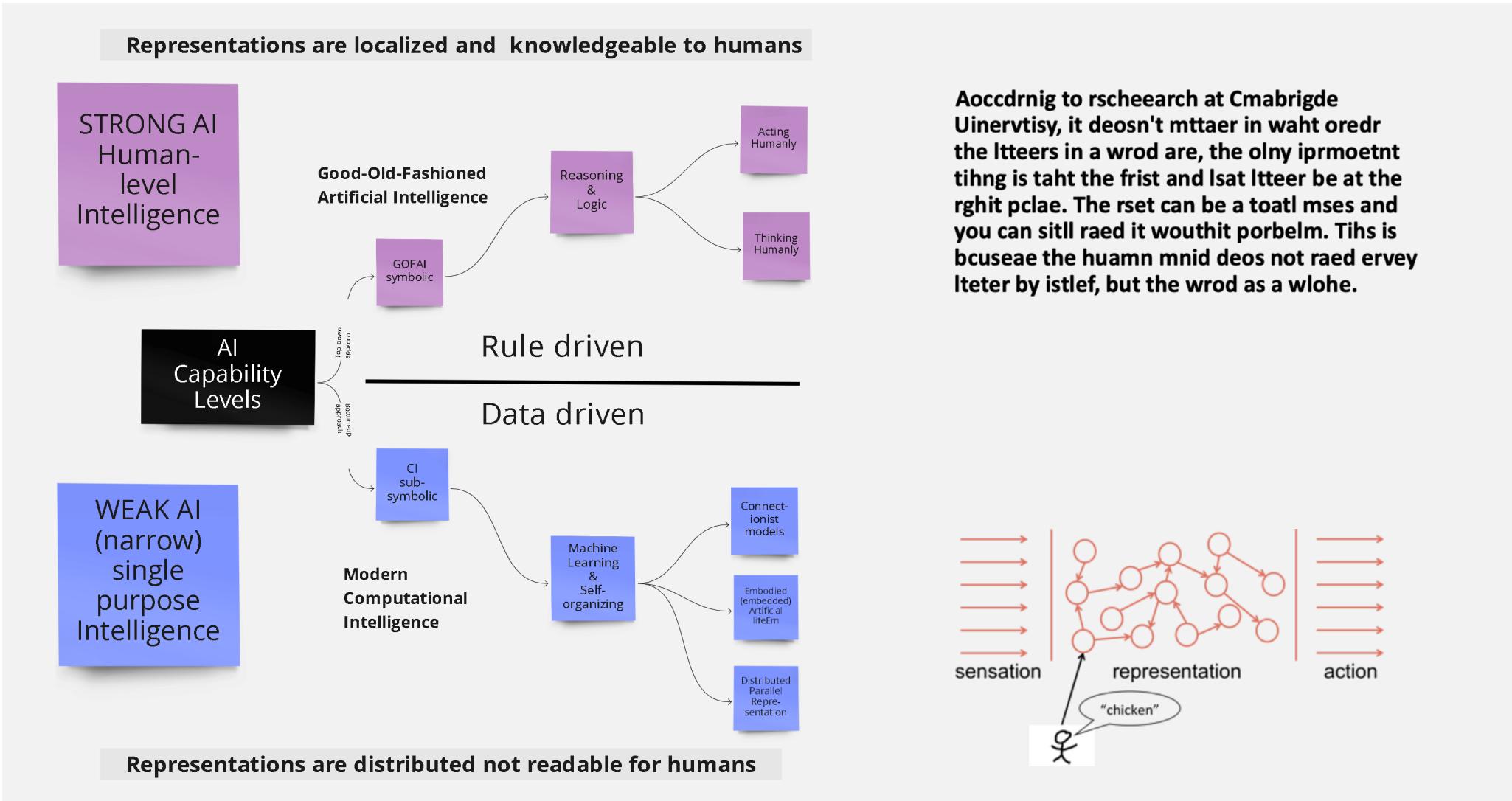
Cognitie	Menselijk Vermogen	Toepassing
	Verwerken, Begrijpen en Onthouden van informatie via het Brein.	Spraak, Natuurlijke Taalverwerking , Logisch Redeneren, Problemen Oplossen, Theory of Mind [ToM] .
Perceptie (invoer)	Verzamelen van Ongestructureerde Informatie via Sensoren : Ogen, Oren, Neus, Huid, Tong	Beeldherkenning, Sprakherkenning, Object Lokalisatie.
Motorische vermogens (uitvoer)	Uitvoeren van fysieke acties via Effectoren : Armen, Handen, Benen, Voeten, Mond, Lippen	Zelfrijdende auto's, Drones, Humanoïde Robots, Tekst-naar-spraak synthese

<https://robfvdw.medium.com/the-world-wide-web-ai-safari-b2e4f7f90647>

AI-taxonomie is complex



https://www.researchgate.net/publication/359424818_Designing_Neural_Networks_Through_Sensory_Ecology_Biology_to_the_rescue_of_AI_Produced_by_Living-Lab_AiRA_Hub_voor_Data_Responsible_AI_Hogeschool_Rotterdam_Lunch-Lezing_Creating-010_FEB_2022



Top Strategic Technology Trends for 2022: Generative AI

Published 18 October 2021 - ID G00756059 - 10 min read

By Analyst(s): Anthony Mullen, Nicole Greene, Brent Stewart, Marc Halpern, Soyeb Barot

Initiatives: Artificial Intelligence; Evolve Technology and Process Capabilities to Support D&A

Generative AI is a disruptive technology that can generate artifacts that previously relied on humans, delivering innovative results without the biases of human experiences and thought processes. IT leaders must use the appropriate governance to exploit its transformative potential.

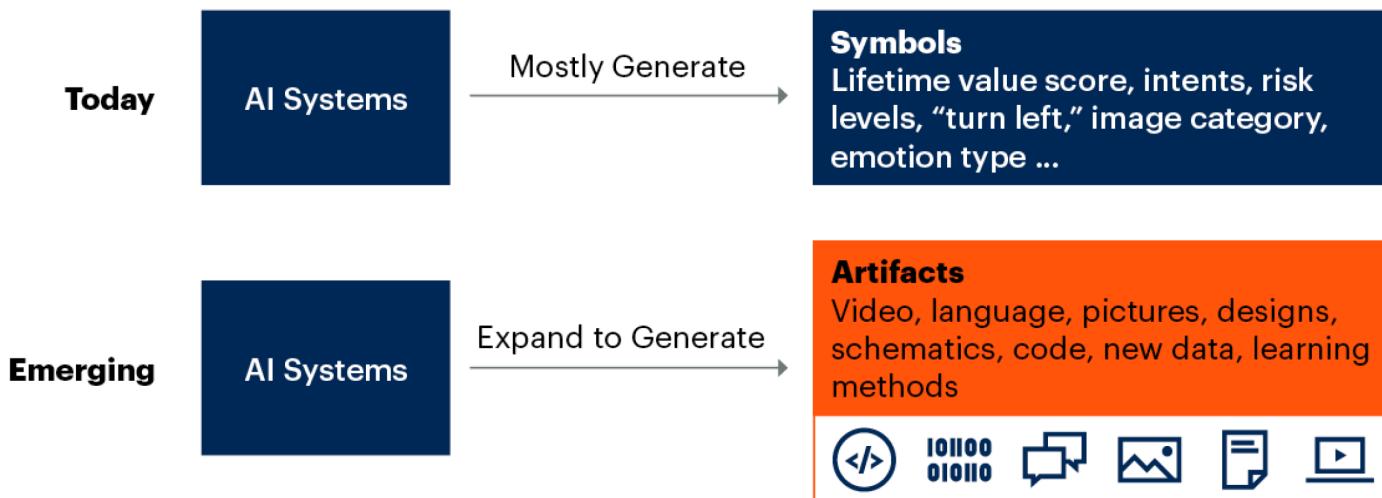
Additional Perspectives

- [Summary Translation + Localization: Top Strategic Technology Trends for 2022: Generative AI](#)
(20 December 2021)

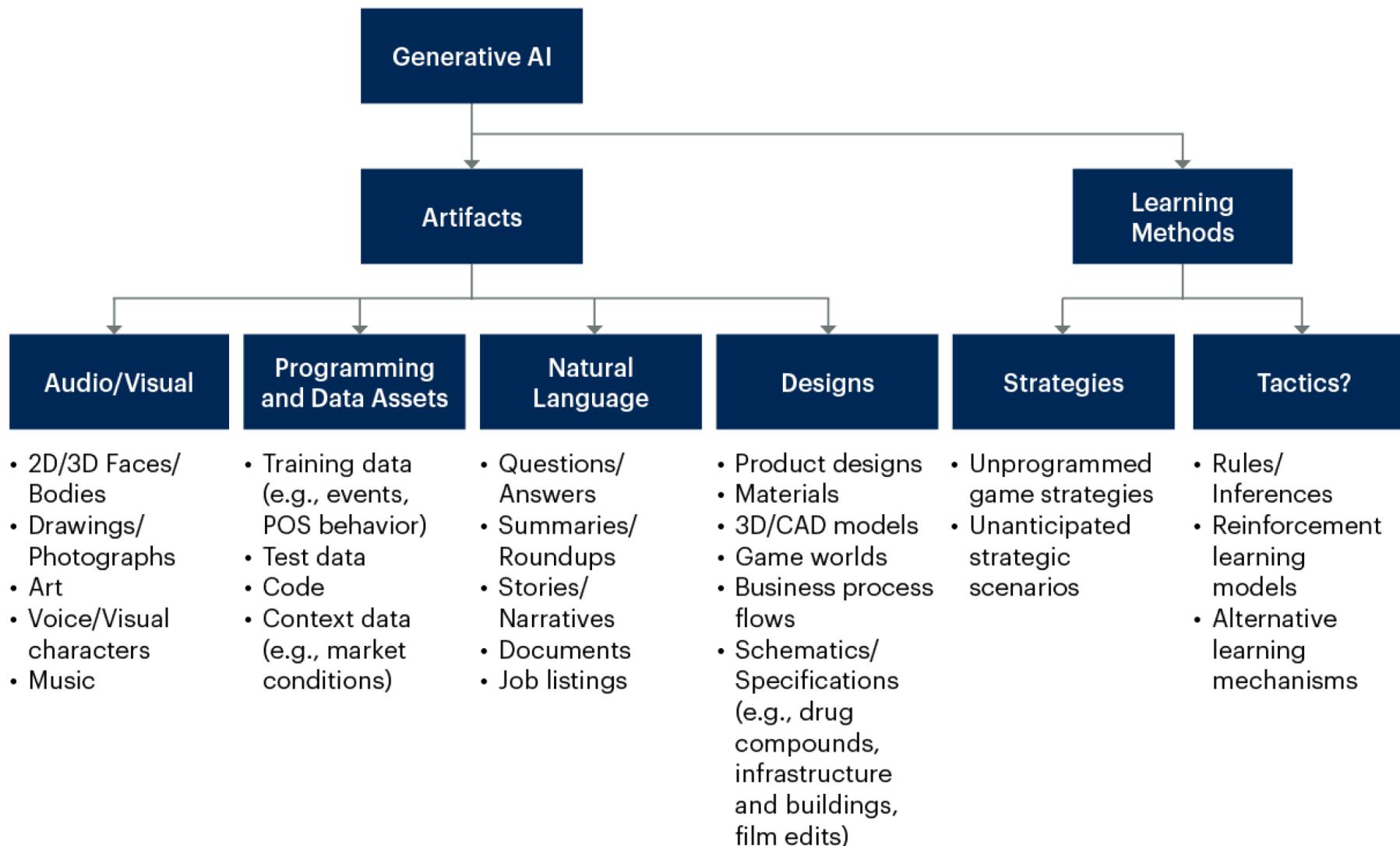
Generative AI expands the output of AI systems to include high-value artifacts such as video, narrative, training data and even designs and schematics (see Figure 1).

Figure 1: Expanding the Output of AI Systems

Expanding the Output of AI Systems



What Types of Artifacts Can Generative AI Create?



Source: Gartner

756059_C

MCKINSEY GLOBAL INSTITUTE

NOTES FROM THE AI FRONTIER

INSIGHTS FROM HUNDREDS OF USE CASES



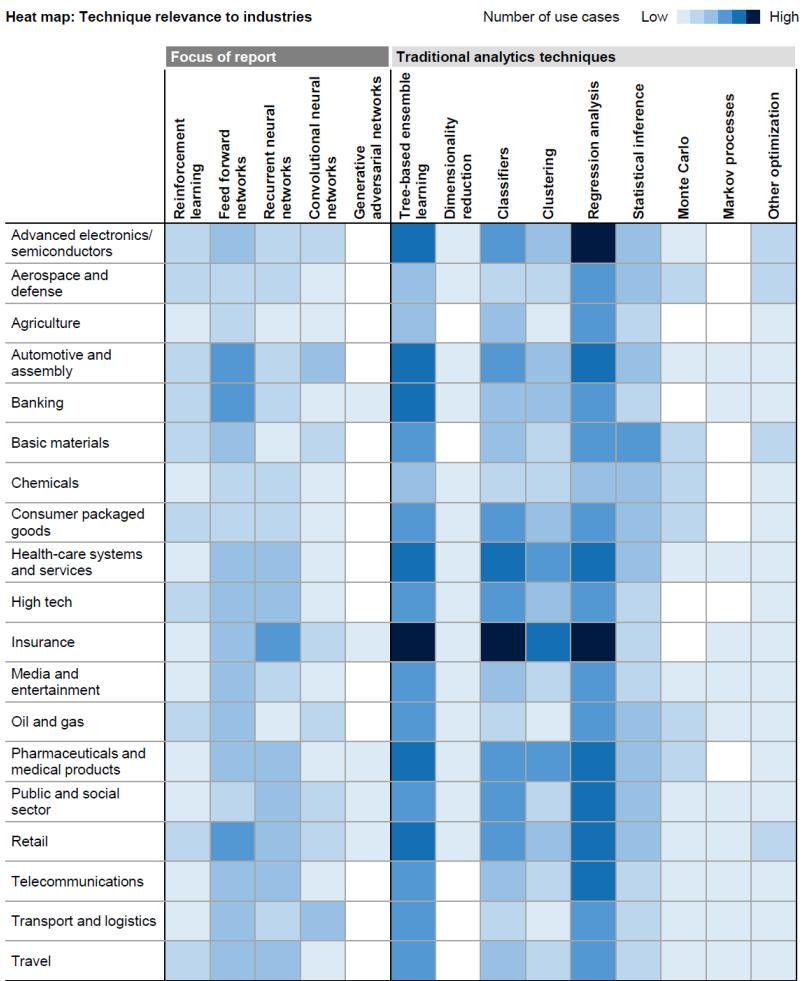
DISCUSSION PAPER

APRIL 2018

Michael Chui | San Francisco
 James Manyika | San Francisco
 Mehdi Miremadi | Chicago
 Nicolas Herke | London
 Rita Chung | Silicon Valley
 Pieter Nel | New York
 Sankalp Malhotra | New York

Exhibit 3

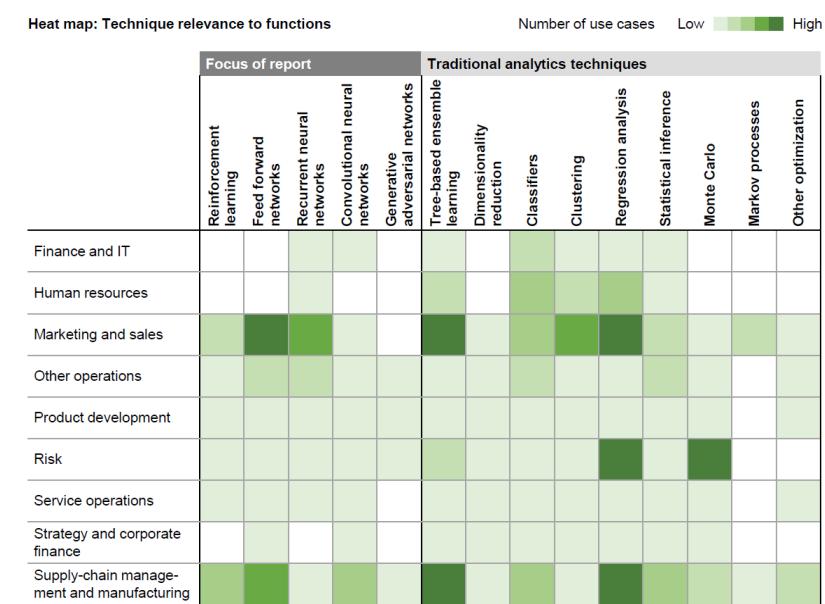
Heat map: Technique relevance to industries



SOURCE: McKinsey Global Institute analysis

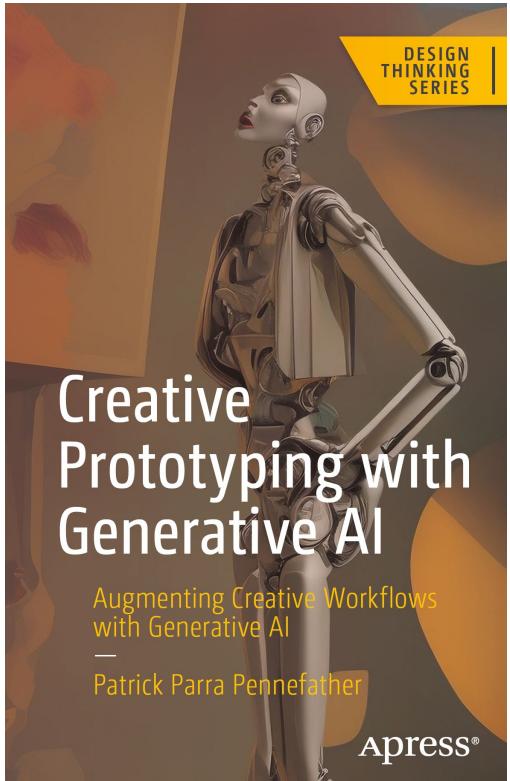
Exhibit 4

Heat map: Technique relevance to functions



SOURCE: McKinsey Global Institute analysis

WHY BODIES MATTER



CHAPTER 3

Generative AI with Personalities

This chapter presents a human-centered design tool called the persona, which you can apply to great effect when you prompt a generative AI. The objective is twofold. The first is to bring attention to various AI personas that have migrated from science fiction to describe narrow and general AI. The second is to highlight a feature of generative AI that can be creatively prompted to embody personalities, characters, and emotions informing the content that it generates. That content can provide momentum for characters you may want to develop in your own creative work.

The Personas of AI

Personas are commonly applied by creatives of all kinds in development environments like mobile applications and video games to transform the abstract concept of a “user” into a person with thoughts, needs, emotions, and goals. The objective of developing a persona is at first to identify the characteristics and personality traits of a potential user or customer of your product or service and then conduct user testing to validate if what you and your team are building will fulfil that user’s needs or help them achieve their goals.



Figure 2-5. Jaquet-Droz automata, Musée d’Art et d’Histoire de Neuchâtel, Wikimedia Commons. <https://creativecommons.org/licenses/by-sa/2.0/fr/deed.en>

CHAPTER 5

Prototyping with Generative AI

This chapter is a prototype in its 13th version. It describes prototyping, different types of prototypes, and how creatives of all kinds engage in prototyping all the time. The chapter presents some different prototypes that AI generates and how these can be used to augment and enhance your creative process. You don’t have to be a scientist, engineer, or technical wiz to prototype. Everything can be considered a prototype: a version of something that is not yet complete. It can be a something that is tested and evaluated and whose results inform the creator or creators if it is worth being further developed. Those creatives who work in game, xR, or mobile application development are more familiar with use of the term *prototyping*, but it is less common within artistic disciplines like music, theater, dance, and visual art. The prototyping process can also be unique regardless of the creative industry you are a part of. For that reason, it is important to define and provide examples of prototypes.

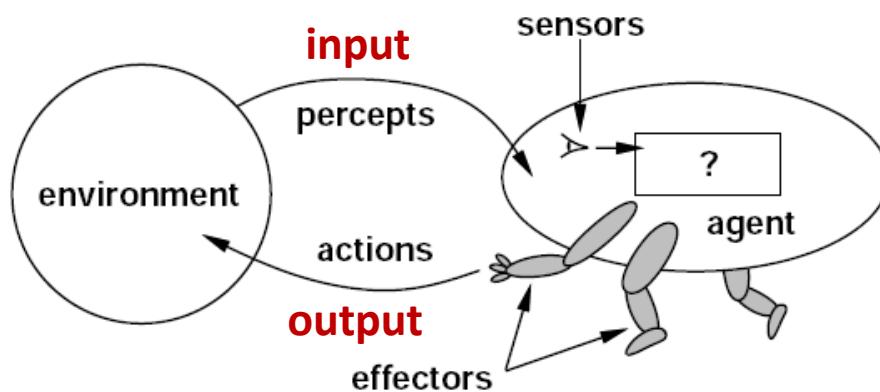
AI-model versus Agent

Agent == taak specifiek + doelgericht

Een versimpelde versie van de echte wereld **{invoer-uitvoer model}** dat de directe omgeving kan waarnemen via sensoren (**input**) en deze omgeving kan beïnvloeden via effectoren (**output**), gecombineerd met **zelflerend vermogen via feedback**.



AI (input-output) Model + agent



Realiteit

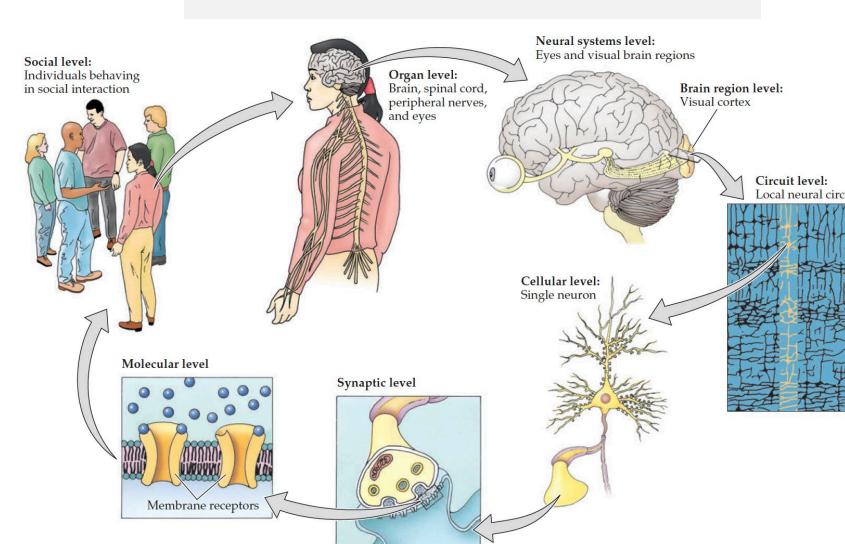
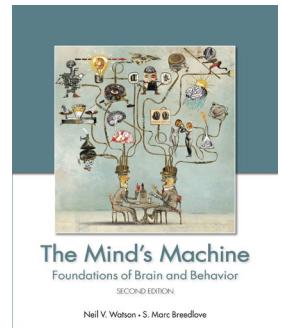


FIGURE 1.10 Levels of Analysis in Biological Psychology

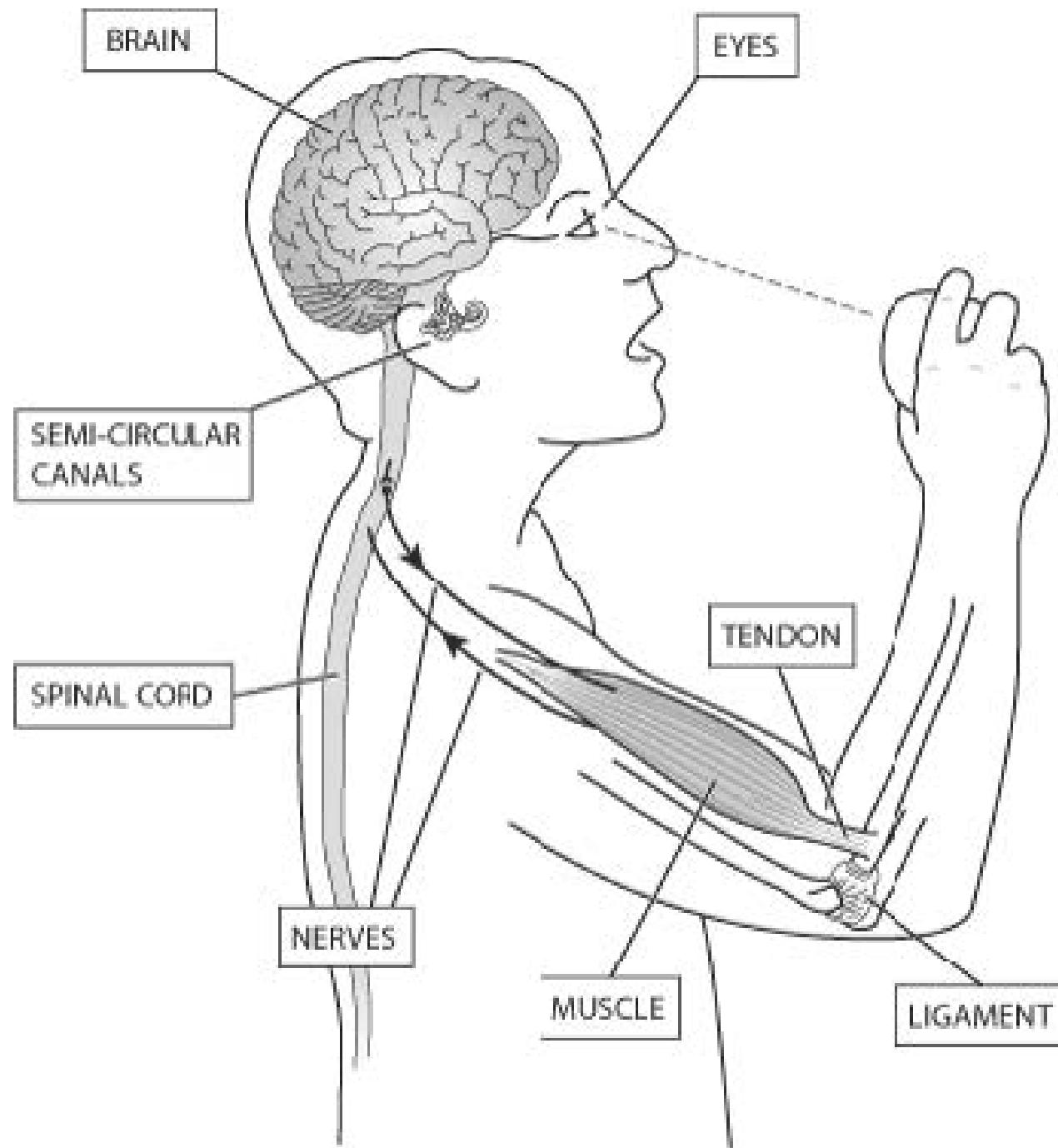
Animal research is an essential part of life sciences research, including biological psychology



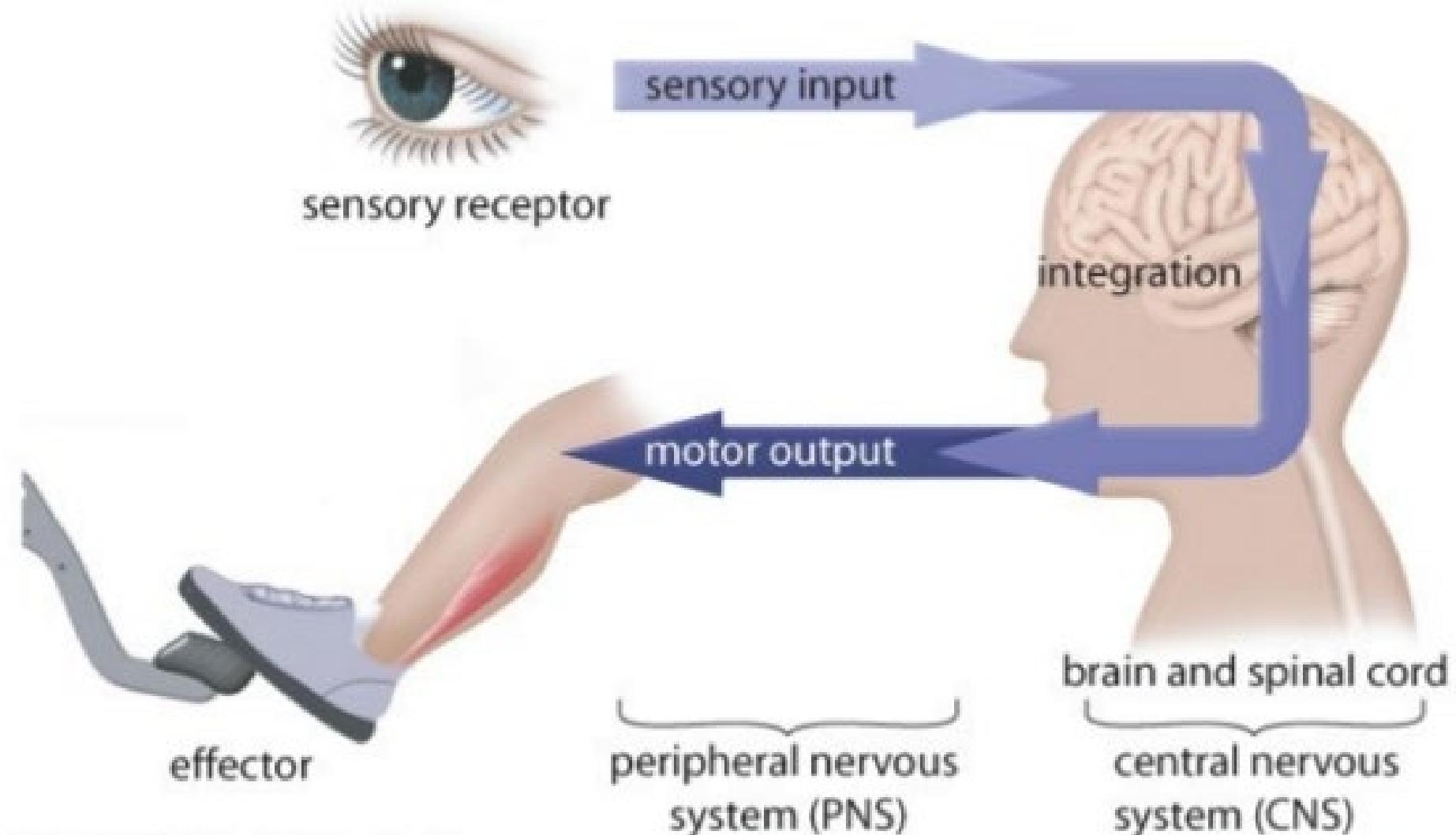
*De menselijke maat wordt niet alleen bepaald
door
GEWAARWORDING & PERCEPTIE:*

*Mensen kunnen zelf signalen construeren &
zelfstandig handelen*

Recap lesson 01



Recap lesson 01



Artificial intelligence {AI}

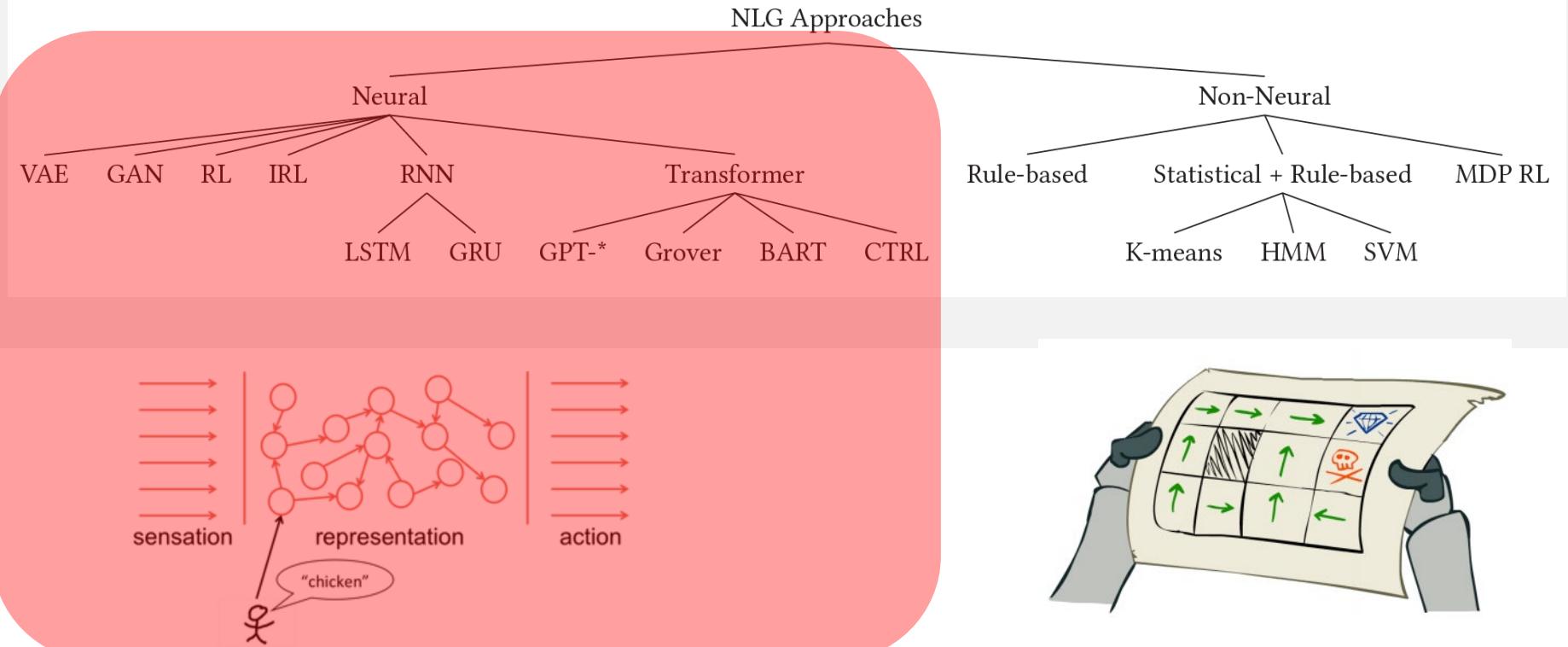
“Taxonomie van het Al-landschap is complex”

AI-taxonomie is complex

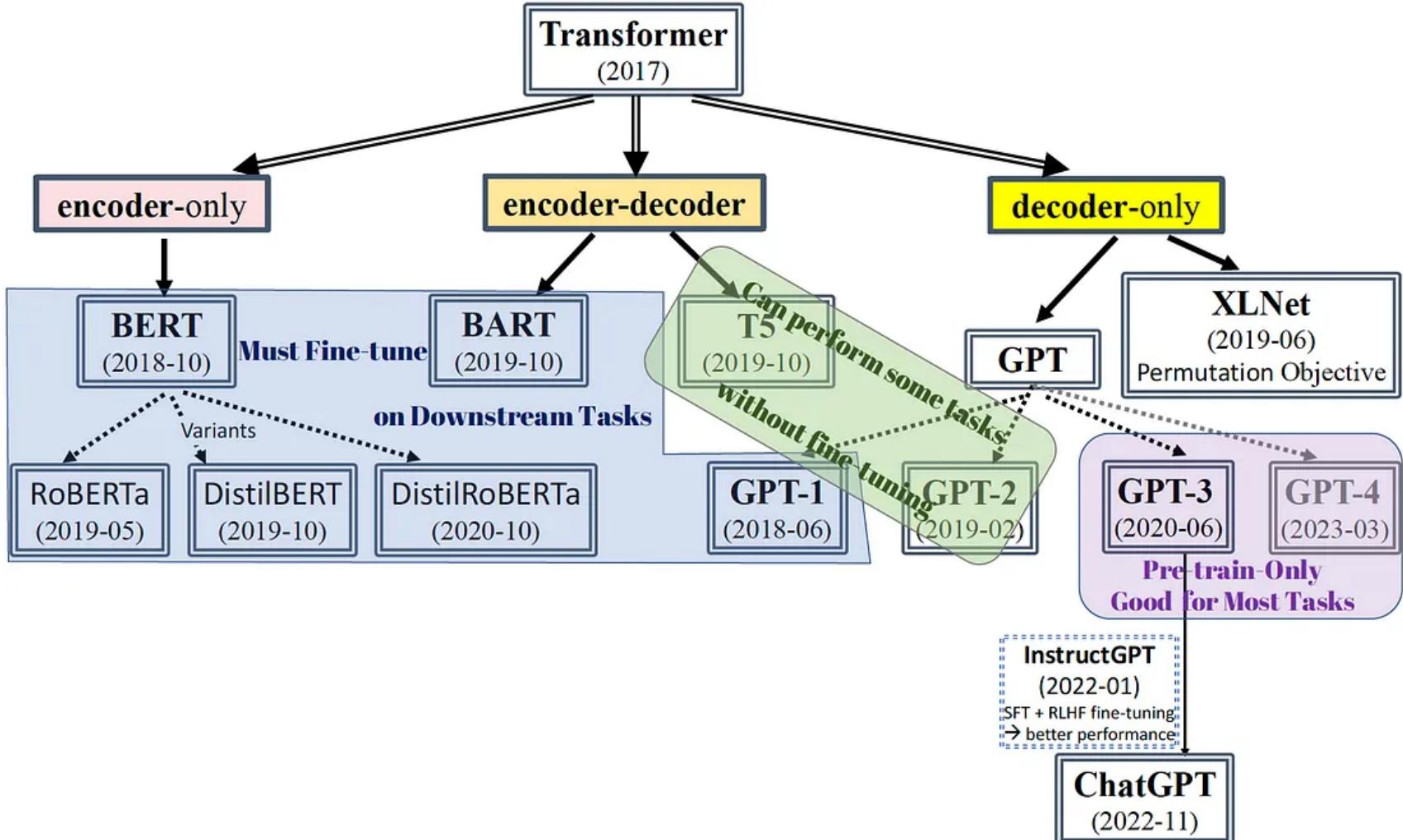


Crothers, E., Japkowicz, N., & Viktor, H. (2022). Machine Generated Text: A Comprehensive Survey of Threat Models and Detection Methods. arXiv preprint <https://doi.org/10.48550/arXiv.2210.07321>

Fig. 1. Taxonomy of major NLG approaches



AI-taxonomie is complex

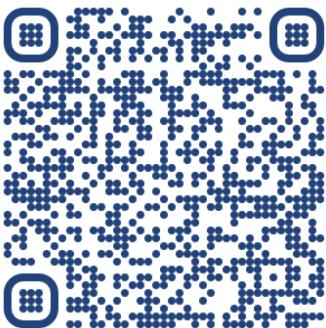


<https://medium.com/@yulemon/an-in-depth-look-at-the-transformer-based-models-22e5f5d17b6b>

{AI=ML=DL}

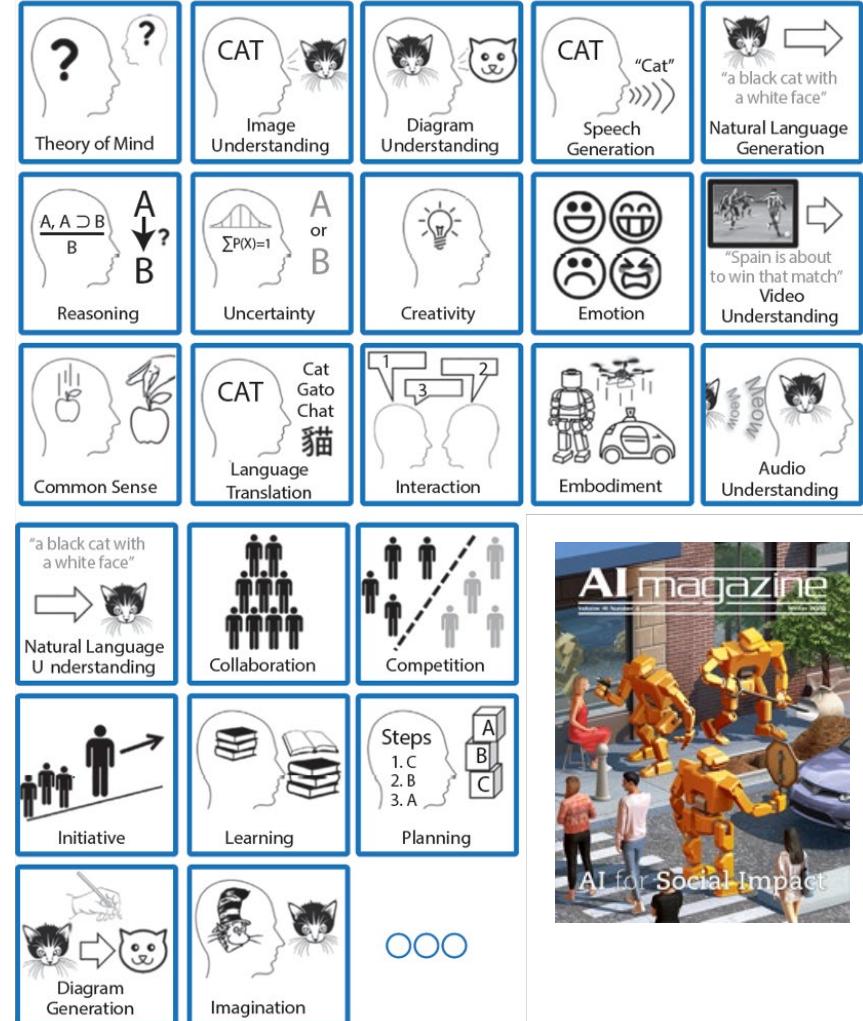
AI enabled through {DL} must be understood as any form of Machine Learning {ML} technology mimicking & automatising tasks which otherwise require

*human perception,
cognition and/or
motor skills*

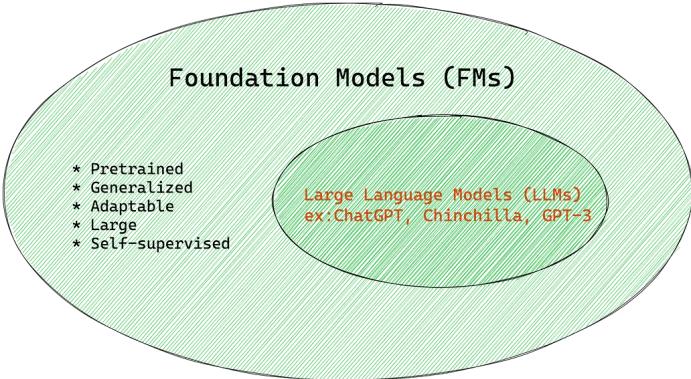


<https://robfvdw.medium.com/the-world-wide-web-ai-safari-b2e4f7f90647>

<https://doi.org/10.1609/aimag.v37i1.2643>



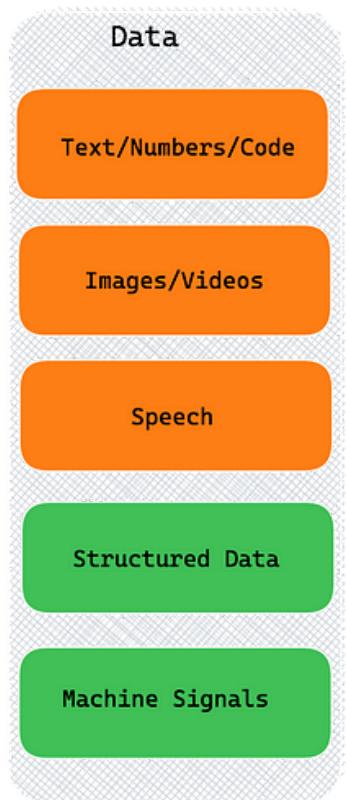
{Foundation Models}



FMs are models trained on broad data (using self-supervision at scale) that can be adapted to a wide range of downstream tasks.
<https://hai.stanford.edu/news/reflections-foundation-models>



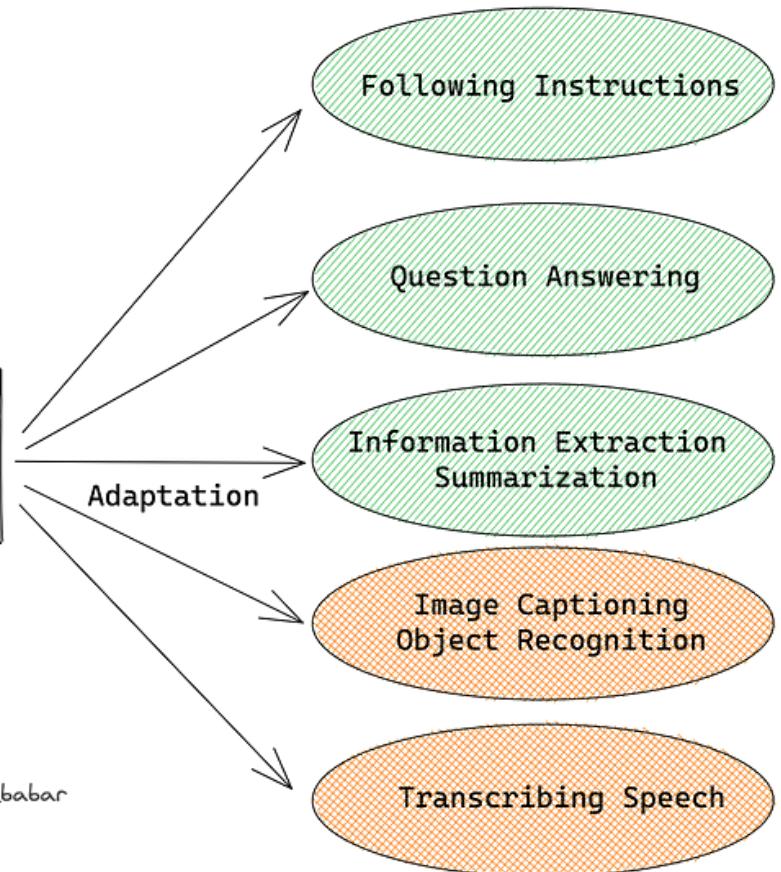
<https://thebabar.medium.com/essential-guide-to-foundation-models-and-large-language-models-27dab58f7404>



Training →



(c) 2023 - Babar Bhatti @thebabar



natural language processing [nlp]

“natuurlijke
taalverwerking”

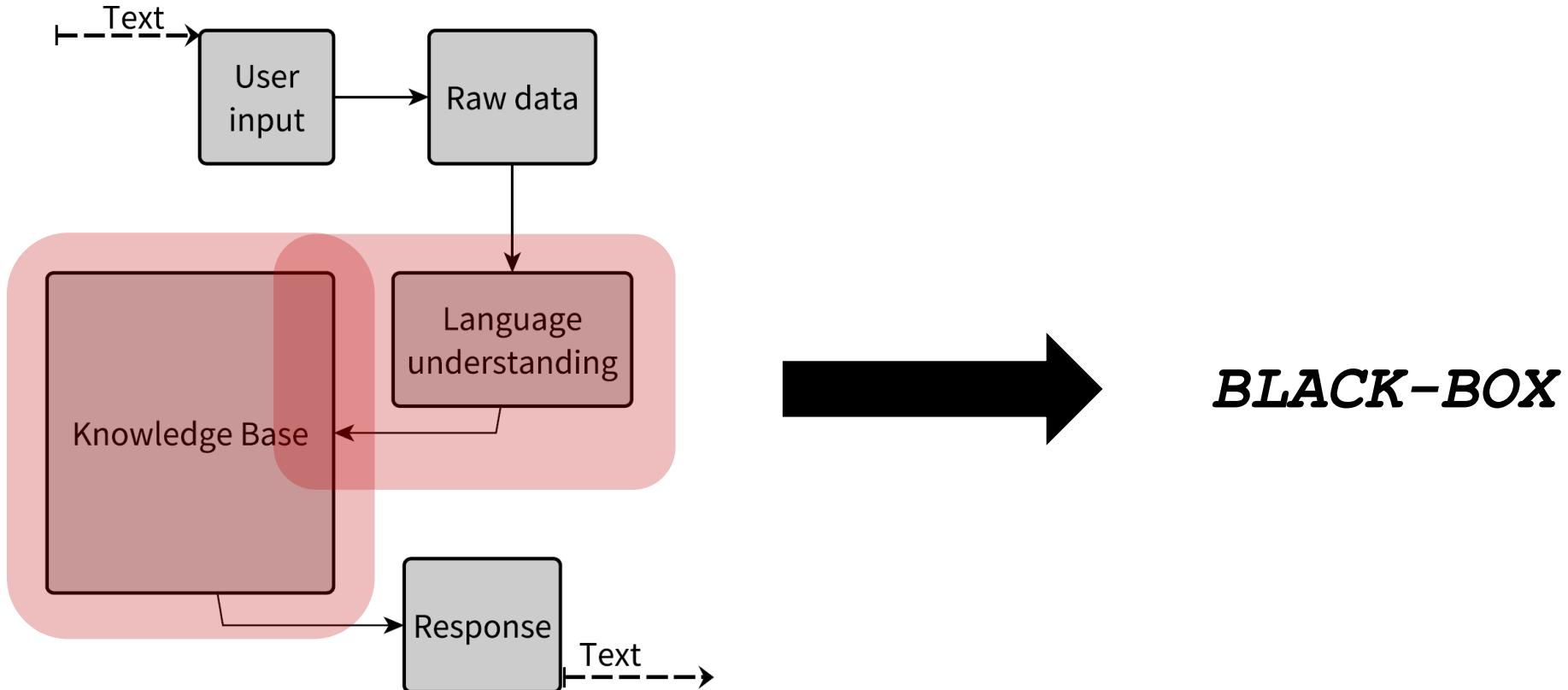
---*Natural Language Processing {NLP}*---

Natuurlijke taalverwerking

begrijpen (NLU) + genereren (NLG)

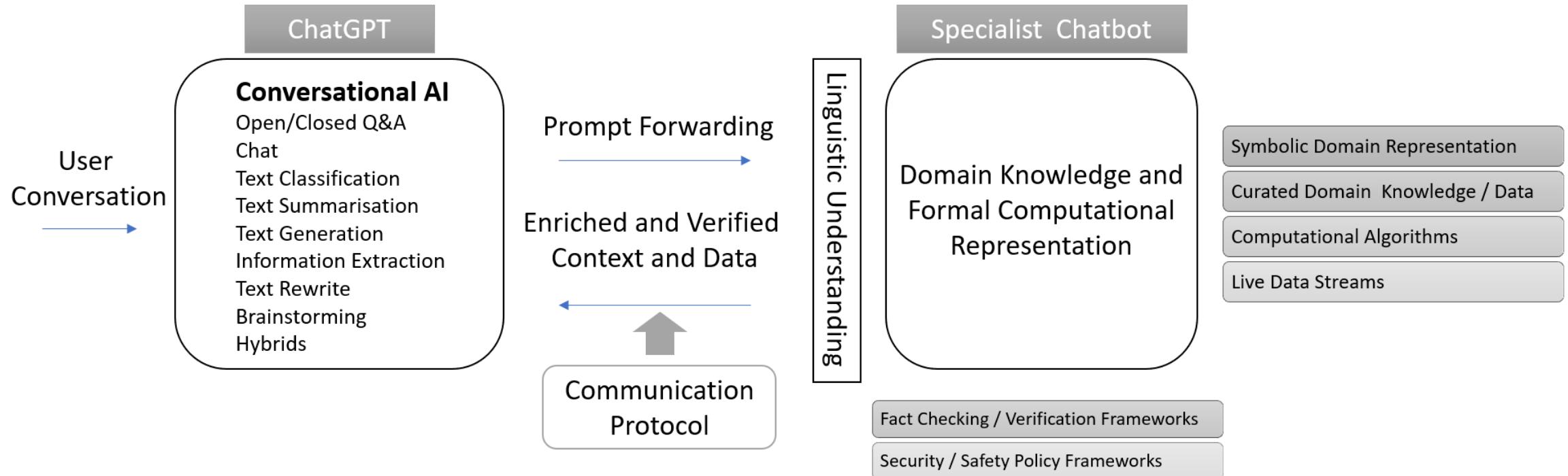
NLP richt zich op het ontwerpen van **conversationele agenten** die vloeiende, coherent en betekenisvolle taal produceren voor menselijke consumptie.

ChatGPT is een Conversationele *tekst-in/tekst-uit* AI-agent



Sánchez-Díaz, X., Ayala-Bastidas, G., Fonseca-Ortiz, P., & Garrido, L. (2018). A knowledge-based methodology for building a conversational chatbot as an intelligent tutor. https://doi.org/10.1007/978-3-030-04497-8_14

Conversational Agents



Conferences > 2023 IEEE International Conference on Big Data and Cloud Computing (BCC)

ChatGPT and Generative AI Guidelines for Addressing Academic Integrity and Augmenting Pre-Existing Chatbots

Publisher: IEEE

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Daswin De Silva ; Nishan Mills ; Mona El-Ayoubi ; Milos Manic ; Damminda Alahakoon All Authors

635
Full
Text Views



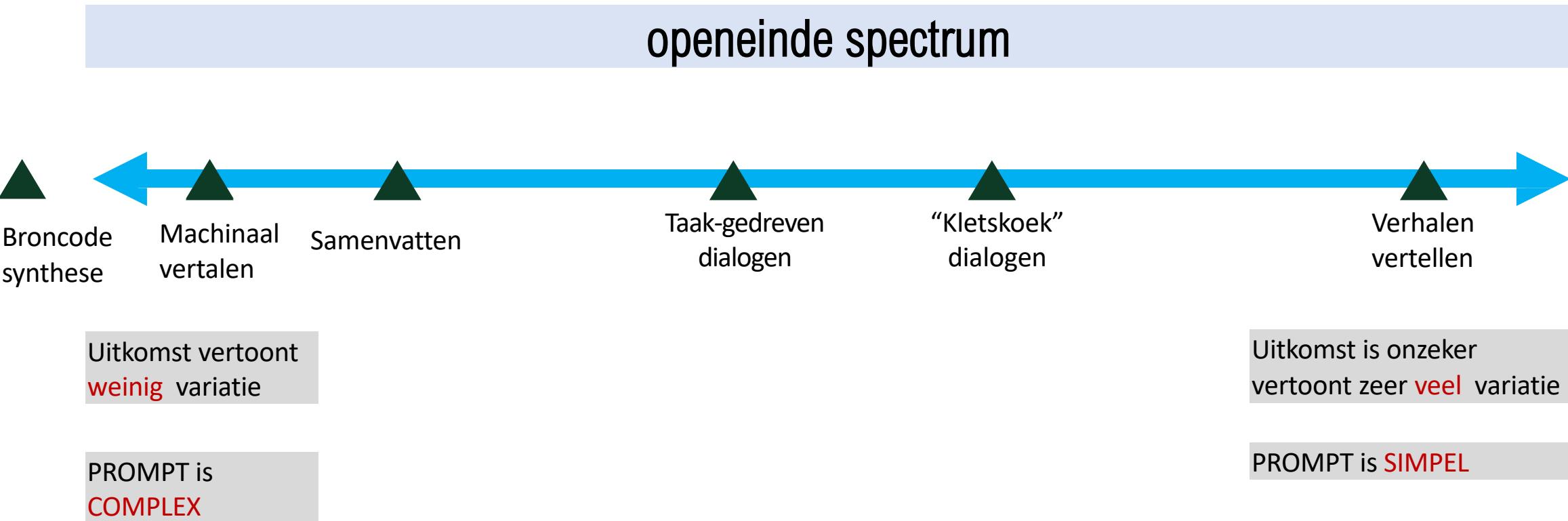
Transformeren

In de context van natuurlijke taalverwerking verwijst "transformeren" naar het proces waarbij de inputreeks van "tokens" wordt omgezet in een reeks gecontextualiseerde representaties.

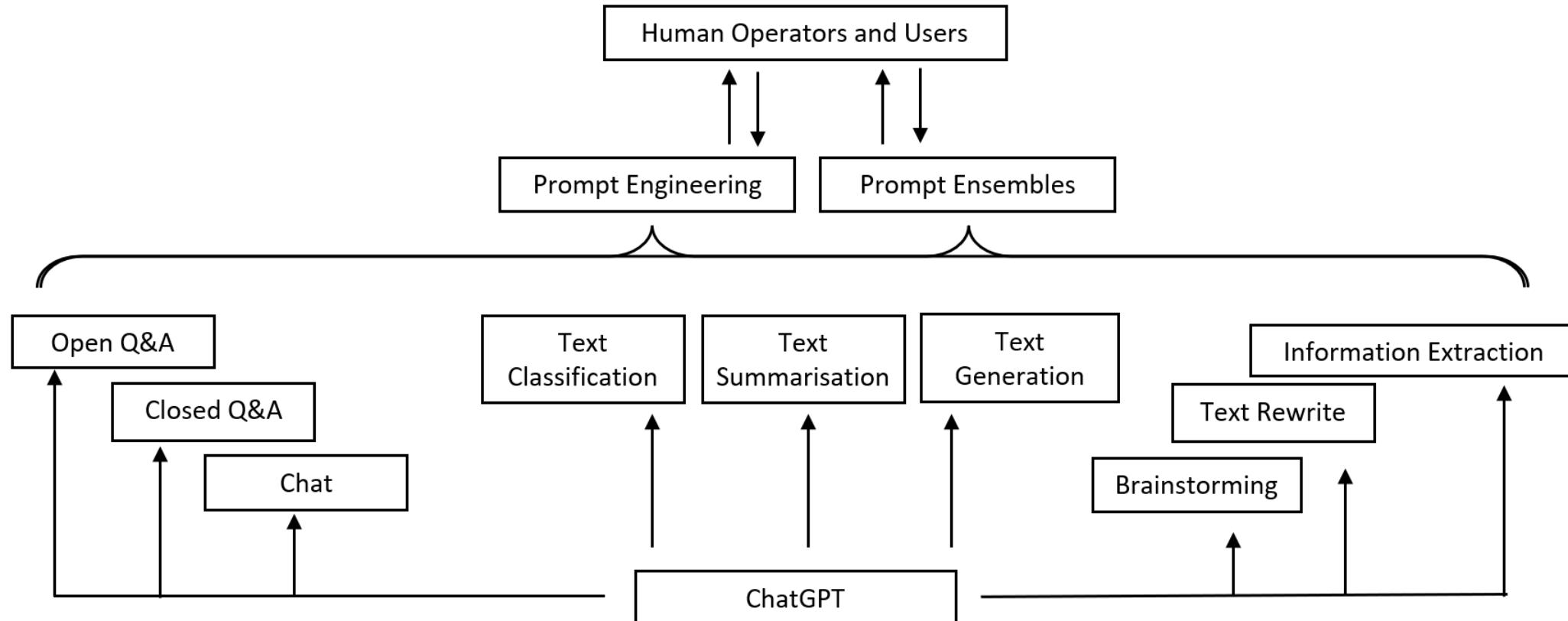
Natuurlijke taal vormt een tekst-in/tekst-uit "Sequentie naar Sequentie" [Seq2Seq] Transformeer Probleem

	INPUT	OUTPUT
Machine Translation	"De kat is zwart"	The Cat is black
Named Entity Recognition	"Trebor werkt bij IBM"	[<PERSOON>, <X>, <X>, <ORG>]
POS Tagging	"Trebor werkt bij IBM"	[Zelfstn., Werkwoord, Voorzetsel, Zelfstn.]
Speech Recognition		"Ik ben menselijk"
Answering chatbot	Wat is het weer in Rotterdam?"	25 graden en Zonning
DNA Analysis	"cacgcaaaccctttcaggcttcggcggtccct caagctgtccgatgcgcagactacttgtcg.."	{promotor.(0,67), exon:(74,103)}
Tekst-in woordvolgorde		Tekst-uit woordvolgorde

Categorisering NLG Taken



ChatGPT: Use Cases



Conferences > 2023 IEEE International Confe... ⓘ

ChatGPT and Generative AI Guidelines for Addressing Academic Integrity and Augmenting Pre-Existing Chatbots

Publisher: IEEE

Cite This

PDF

Daswin De Silva ; Nishan Mills ; Mona El-Ayoubi ; Milos Manic ; Damminda Alahakoon All Authors

635
Full
Text Views



ChatGPT: Use Cases

CODE GENERATION

JU Give me code for the Dijkstra algorithm in Python

Q Here is the code for the Dijkstra algorithm in Python:

```
from collections import defaultdict
import heapq

def dijkstra(graph, source):
    # Initialize distances and predecessor for each vertex
    distances = defaultdict(lambda: float('inf'))
    predecessor = defaultdict(lambda: None)
    distances[source] = 0

    # Initialize priority queue with all vertices and their distances from
    # the source
    priority_queue = [(0, source)]
    while priority_queue:
        # Extract vertex with minimum distance from the queue
        distance, vertex = heapq.heappop(priority_queue)

        # Update distances and predecessors for all neighbors of the vertex
        for neighbor, weight in graph[vertex]:
            if distances[neighbor] > distance + weight:
                distances[neighbor] = distance + weight
                predecessor[neighbor] = vertex
                heapq.heappush(priority_queue, (distances[neighbor], neighbor))

    return distances, predecessor
```

CONCEPTUAL QUESTIONS

JU What are algorithmic solutions for solving congestion

Q Congestion occurs when a network becomes overloaded, resulting in reduced capacity and slower performance. There are several algorithmic solutions for solving congestion in networks, including:

1. Routing algorithms: These algorithms aim to route traffic around congested areas or to balance the load among different routes. Some examples include Dijkstra's algorithm, Bellman-Ford algorithm, and Link-State Routing Protocol.
2. Flow control algorithms: These algorithms aim to regulate the flow of traffic in order to prevent congestion. Examples include window-based flow control (such as TCP), rate-based flow control (such as the leaky bucket algorithm), and priority-based flow control (such as strict priority queuing).
3. Resource allocation algorithms: These algorithms aim to allocate resources (such as bandwidth or processing power) to different tasks or users in a way that minimizes congestion. Examples include max-min fairness, proportional fairness, and weighted fair queueing.
4. Traffic engineering algorithms: These algorithms aim to optimize the use of network resources in order to reduce congestion. Examples include QoS routing, traffic grooming, and multicast tree construction.
5. Congestion pricing algorithms: These algorithms aim to incentivize users to reduce their demand for network resources by charging them for congestion. Examples include tolls for using certain roads or time-of-day pricing for using the internet.

MATH QUESTIONS

Q Find the derivative of the function $f(x) = 3x^2 + 2x - 1$. Describe your working

Q To find the derivative of the function $f(x) = 3x^2 + 2x - 1$, we need to use the rules of differentiation. The derivative of a function is a measure of how the function is changing at a particular point.

The derivative of a constant term (such as -1 in this case) is always 0 , so we can ignore that part of the function. The derivative of a term with a coefficient of 1 (such as $2x$ in this case) is just the coefficient times the variable (in this case, $2x$), so the derivative of $2x$ is 2 .

The derivative of a term with a coefficient other than 1 (such as $3x^2$ in this case) is the coefficient times the derivative of the term with the coefficient of 1 (in this case, 3 times x), so the derivative of $3x^2$ is $3 \cdot 2x = 6x$.

Now that we have found the derivative of each term in the function, we can add them up to get the derivative of the whole function:

$$f'(x) = 3x + 2 = 6x + 2$$

This is the final answer. The derivative of the function $f(x) = 3x^2 + 2x - 1$ is $f'(x) = 6x + 2$.

Conferences > 2023 IEEE Global Engineering ... ⓘ

Engineering Education in the Era of ChatGPT: Promise and Pitfalls of Generative AI for Education

Publisher: IEEE

Cite This



Junaid Qadir All Authors

4

Cites in
Papers

3380

Full
Text Views



natural language processing [nlp]

Hoe transformeert ChatGPT van “vraag” naar “antwoord”?

STAP 01:

WOORDTOKENISATIE

Woordtokenisatie is het proces waarbij een stuk tekst wordt opgesplitst in afzonderlijke woorden of tokens.

Het is een noodzakelijke stap in natuurlijke taalverwerking, omdat veel algoritmen en modellen op woord-voor-woord-basis werken, in plaats van op hele zinnen of alinea's.

Tokenizer

GPT-3 Codex

De kat krapt de krullen van de trap.

Clear

Show example

Tokens

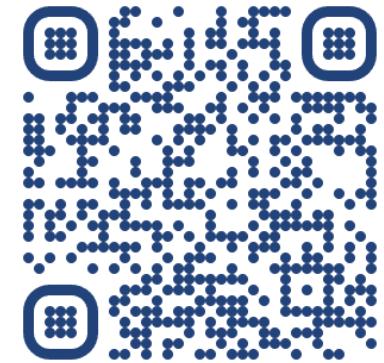
16

Characters

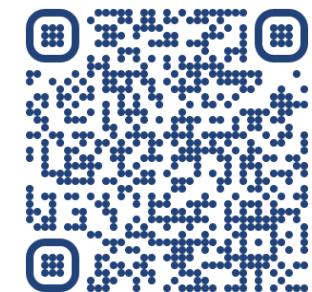
37

De kat krapt de krullen van de trap.

[5005, 479, 265, 479, 430, 457, 390, 479, 622, 297, 268, 5719, 390, 12840, 13, 198]



<https://platform.openai.com/tokenizer>



<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#v1g>

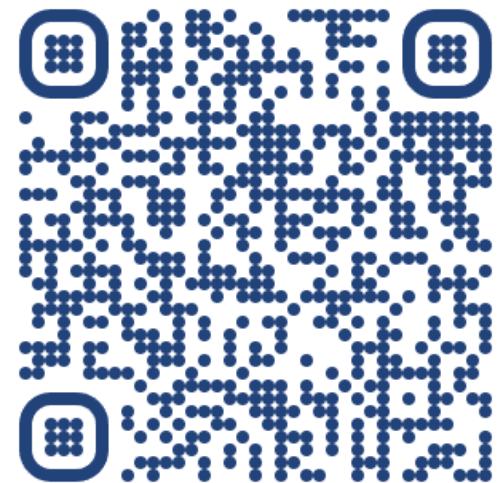
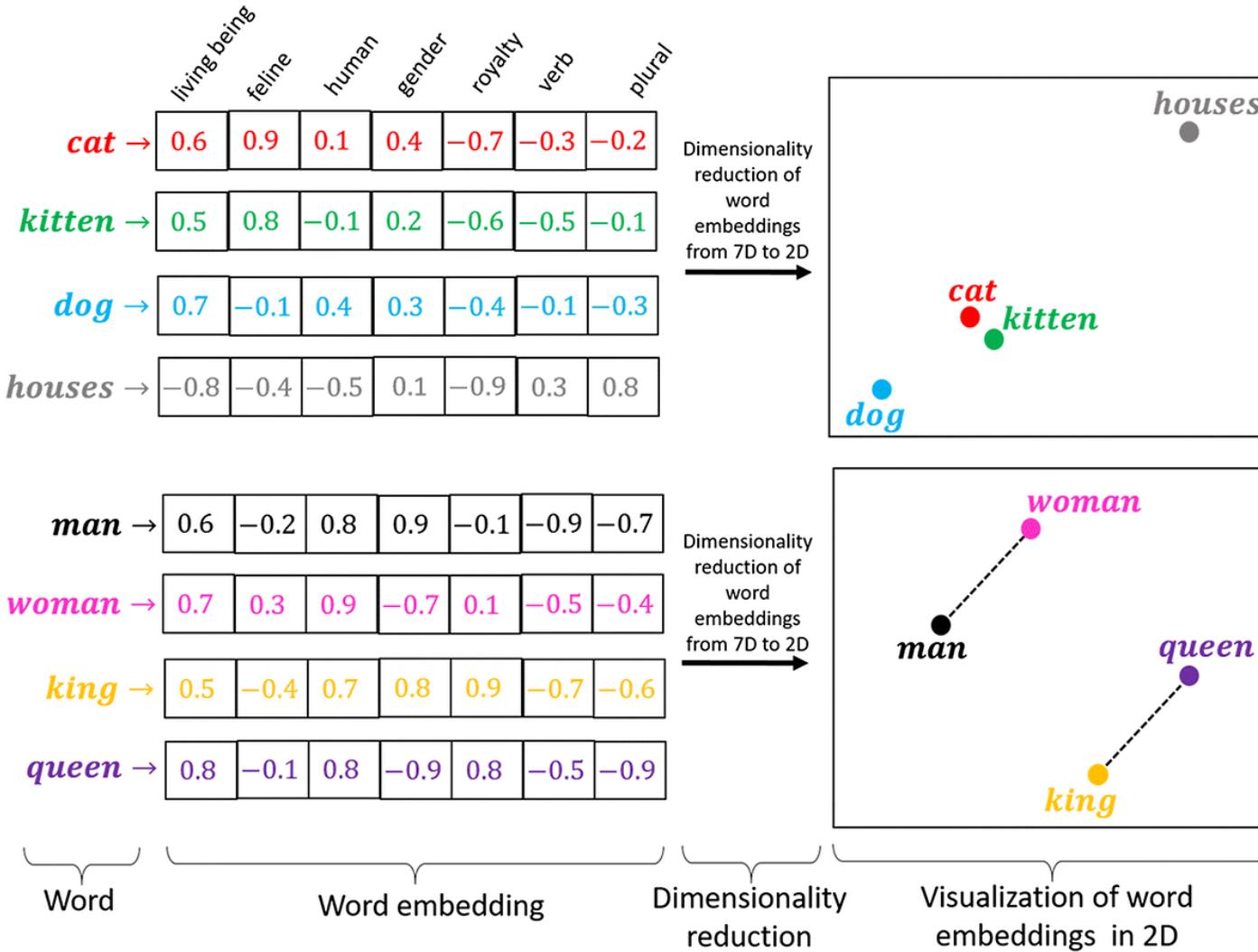
STAP 02:

Woord Embedding

Word **embedding** is een NLP-techniek die woorden omzet in een reeks getallen ---**vector embeddings**--- die betekenis van woorden en de hun **onderlinge relaties** vastlegt. Het vormt zo een **gecontextualiseerde representatie** van natuurlijk taal.

De waarden van deze getallen worden bepaald door *training* op basis een groot corpus aan vrije tekst, zodanig dat woorden die qua **betekenis** ---**semantisch**--- een vergelijkbaar **vergelijkbare** getallenreeksen krijgen toegewezen.

Woord embedding



<https://medium.com/@hari4om/word-embedding-d816f643140>

Stap 03:

AutoRegressie [AR]

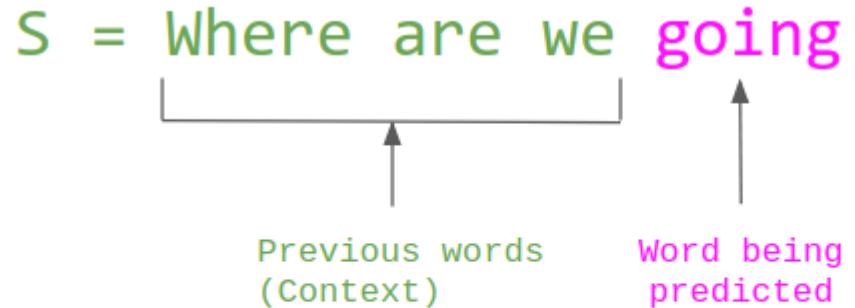
Autoregressie is het proces waarbij
één token per keer wordt gegenereerd,
waarbij elke token geconditioneerd is
op de eerder gegenereerde tokens
op basis van hun embedding



<https://medium.com/@alousabdo/what-are-ai-language-models-and-how-are-they-being-used-f1bf06f8ae80>

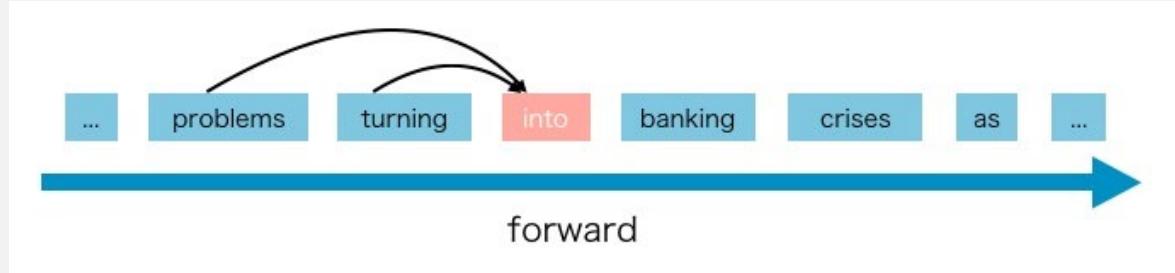
AutoRegression [AR]

Autoregressie is het proces waarbij één token per keer wordt gegenereerd, waarbij elke token geconditioneerd is op de eerder gegenereerde tokens



$$P(S) = P(\text{Where}) \times P(\text{are} \mid \text{Where}) \times P(\text{we} \mid \text{Where are}) \times P(\text{going} \mid \text{Where are we})$$

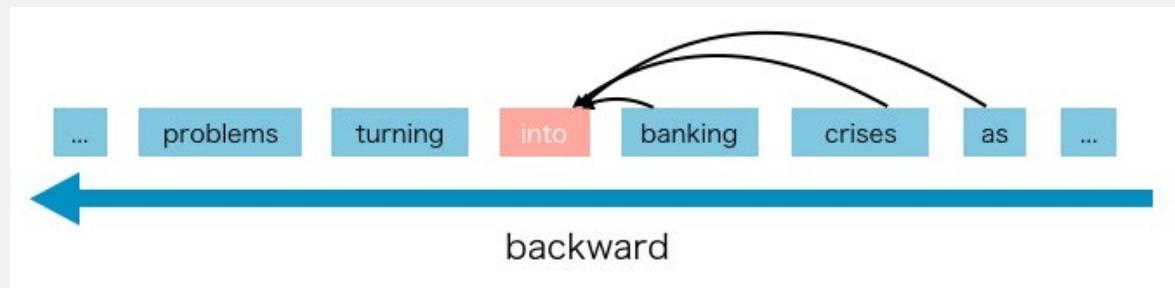
AutoRegression [AR]



[https://aman.ai/primers
/ai/autoregressive-vs-
autoencoder-models/](https://aman.ai/primers/ai/autoregressive-vs-autoencoder-models/)

PROS:

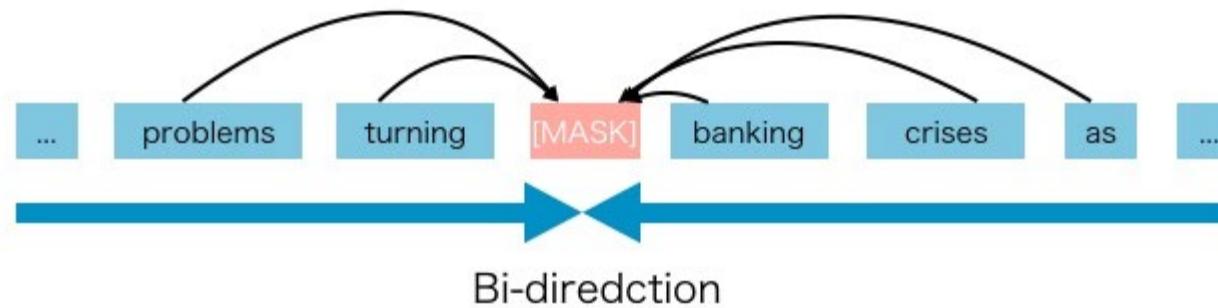
AR language models are good at generative NLP tasks. Since AR models utilize causal attention to predict the next token, they are naturally applicable for generating content. The other advantage of AR models is that generating data for them is relatively easy, since you can simply have the training objective be to predict the next token in a given corpus.



CONS:

AR language models have some disadvantages, it only can use forward context or backward context, which means it can't use bidirectional context at the same time.

Autoencoder/Encoder [EA]



Given the input token sequence, a certain portion of tokens are replaced by a special symbol [MASK], and the model is trained to recover the original tokens from the corrupted version.

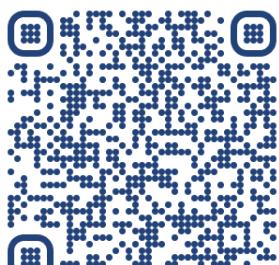
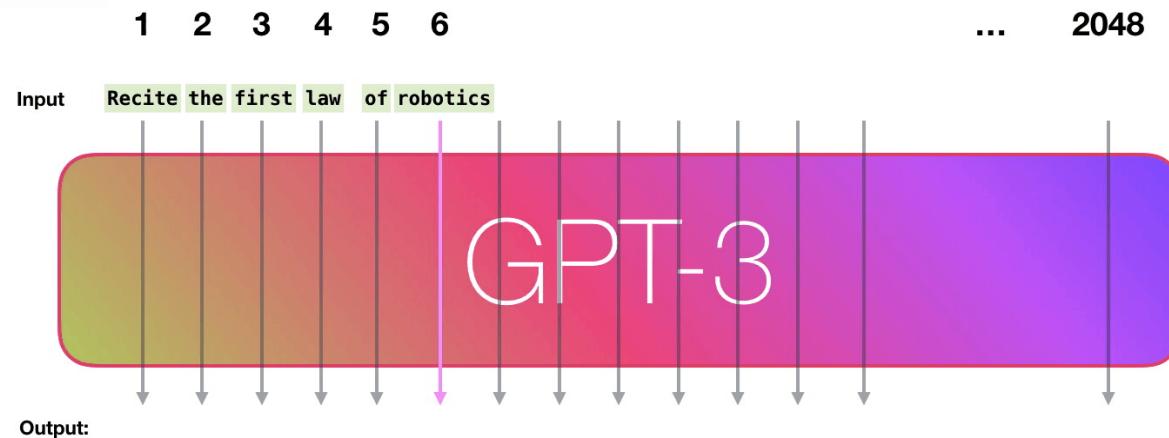
The AE language model aims to reconstruct the original data from corrupted input.

AutoRegressive [AR]

I was happy to see the _____

$P(* | \text{I was happy to see the})$ sample from the distribution

food	0.05	□
cat	0.04	■
dog	0.03	□
mouse	0.02	□
help	0.02	□
...	...	
sunshine	0.01	□
...	...	



https://lena-voita.github.io/nlp_course/language_modeling.html



<https://medium.com/@aousabdo/what-are-ai-language-models-and-how-are-they-being-used-f1bf06f8ae80>

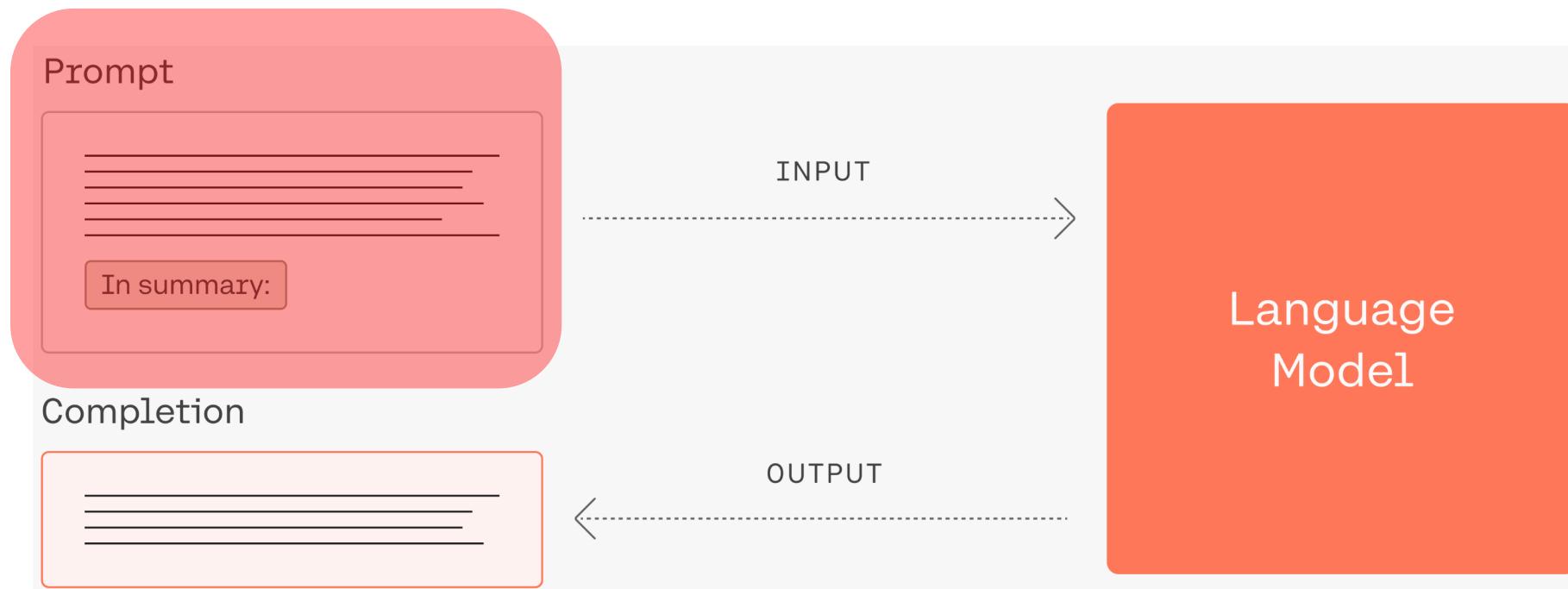


<https://jalamar.github.io/how-gpt3-works-visualizations-animations/>

“Prompt Recepten”

Schrijven Uitgelegd

*Conversationele AI-agenten worden aangestuurd via “**prompts**”*



<https://docs.cohere.com/docs/introduction-to-large-language-models>

PROMPT

Een prompt is een natuurlijke taal instructie gericht aan een **conversationele AI-agent** met als doel om de werking ervan te verbeteren of te verfijnen.

PROMPT-ENGINEERING

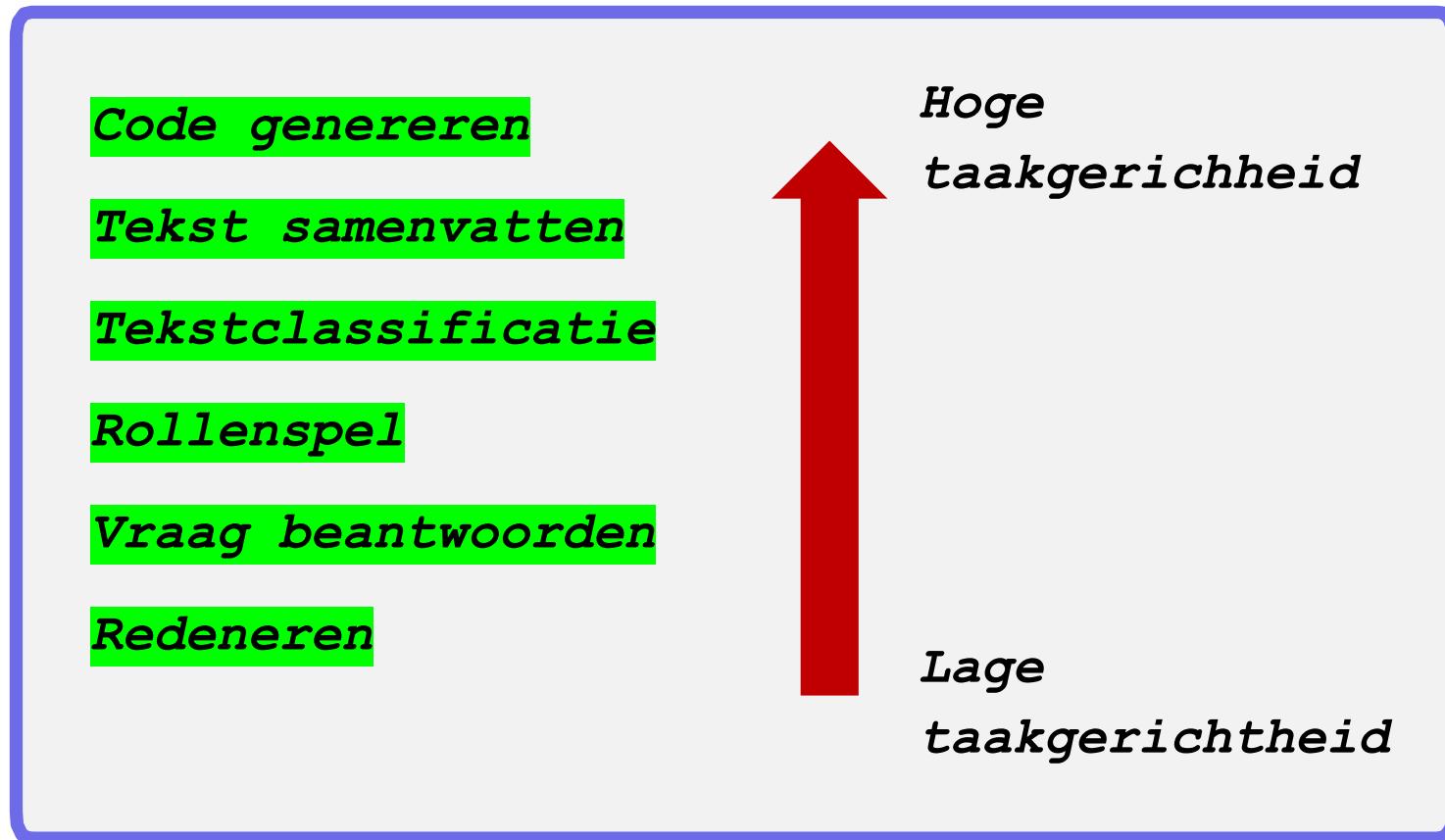
Het creatieve proces van het schrijven van een effectief ***prompt-recept*** wordt in het Engels "***prompt engineering***" genoemd.

Het schrijven van prompt-recepten

---pseudo-Code---

is een talige manier van het programmeren van "bevroren" voorgetraind taalmodellen.

Taakgerichtheid van prompts



Wat is het belang van Prompt Recepten Schrijven?

*Sturen van de mate van taakgerichtheid door
reduceren van variatie in het antwoord zodat de
kans groter wordt dat de uitkomst correct is.*

Prompt Recept Structuur

Een prompt is opgebouwd uit de volgende elementen:

Instructie(s)

Context

Invoergegevens

Uitvoer-indicator

Classificeer de onderstaande tekst als neutraal, negatief of positief

Text: Ik vond het eten wel zozo.

Sentiment:

Prompt recept ontwerp overwegingen

Agent' dialoogsturing aanwijzingen / hints

Constructive Reasoning (Graesser, 2016; Nguyen & Santagata, 2020)

Transactivity (Chi & Wylie, 2014; Fiacco & Rose', 2018; Resnick et al., 2010;
Teasley, 1997)

Social Expressions (Sebo, Stoll, Scassellati, & Jung, 2020)

Rollenspel & Identiteit

Inzicht Iteraties

Theories & Cultural Probes

User testing

Prompt recept ontwerptechnieken
gebaseerd op fine-tuning van het
onderliggende taal-model

Few-shot prompts (**In Context Leren**)

Chain-of-thought (**CoT**) reasoning

Self-Consistency Sampling

Knowledge Generation Prompting

ReAct

PROMPT Receptuur Methoden

Prompt Engineering Repositories

[Prompt Engineering Guide](#)

[Cohere AI](#)

[Awesome Prompts](#)

[ChatGPT Universe](#)

[OpenAI CookBook](#)

[IBM Research](#)

[Soft Prompt Tuning](#)

[Flow GPT](#)

[List of 50+ clever GPT-3 prompts](#)

[The ChatGPT Cheat Sheet](#)

[Prompts for teachers](#)

[Uses for ChatGPT for students](#)

[Allabtai](#)

[Arvin: ChatGPT Prompt Generator](#)

[OpenAI CookBook](#)

[LangChain](#)

[Prompt-Engineering-Guide](#)

[Prompt Engineering. Lil'Log](#)

[PromptPerfect](#)

[Semantic Kernel](#)

[prompt-in-context-](#)

[learning/PaperList/ChainofThoughtList](#)



<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#15-prompt-pattern-engineering-voorbeelden>

*“Instellen
parameters
GPT modellen”*

Instellen van token-machine parameters

Bij het bevragen van een taalmodel dient rekening gehouden te worden met de volgende instellingen

Je kunt heel verschillende resultaten krijgen met dezelfde prompts wanneer de instellingen aanpast

Een belangrijke instelling is het bepalen hoe deterministisch het model is bij het genereren van voltooiing voor prompts

Temperatuur en **top_p** zijn twee belangrijke parameters om te onthouden in gedachten te houden

- laag voor meer exacte antwoorden
- hoog voor meer diverse/generieke antwoorden

[Load a preset...](#)[Save](#)[View code](#)[Share](#)

...

USER IF 20 + 30 equals 2030 what is the correct answer to 40 + 50

Mode

[Chat](#) Beta**ASSISTANT** The correct answer to 40 + 50, based on the pattern given, would be 4050.

Model

gpt-4-0314

Temperature 0.7

Maximum length 256

Top P 1

Frequency penalty 0

Presence penalty 0

USER gaot**ASSISTANT** I'm not sure what you mean by "gaot." If you meant to type "goat," please provide more context or clarify your question. If it was a typo or unrelated, feel free to ask another question or provide more information.**USER** Stanford University is located in ??? California.

I put ??? fork down on the table.

ASSISTANT Stanford University is located in Palo Alto, California.

I put the fork down on the table.

USER

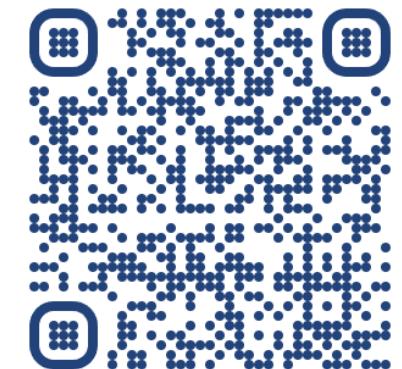
The woman walked across the street, checking for traffic over ??? shoulder. [coreference]

⊖

ASSISTANT The woman walked across the street, checking for traffic over her shoulder.[+ Add message](#)

Prompt engineering
DIY {do it yourself}

Formuleer een prompt zodanig
dat het een zin aanvult
met het ontbrekende woord



<https://generative.ink/posts/methods-of-prompt-programming/>

PROMPT:

Can you give a prompt
format for ChatGPT to guess
the masked word in a
sentence?



<https://generative.ink/posts/methods-of-prompt-programming/>

PROMPT:

Can you give a prompt format for ChatGPT to guess the masked word in a sentence?

ChatGPT



Certainly! Here is a prompt format you can use for ChatGPT to guess the masked word in a sentence:

Please guess the masked word in the following sentence: [input sentence with one masked word using the '[MASK]' token].

For example:

Please guess the masked word in the following sentence: The capital of France is [MASK].

When you provide this prompt to ChatGPT, it will generate a prediction for the masked word in the sentence based on its language understanding and the context of the surrounding words.

user

Please guess the masked word in the following sentence: The capital of France is [MASK].

ChatGPT

Based on the context of the sentence, the most likely word to fill in the blank is "Paris". Therefore, the completed sentence would be: "The capital of France is Paris."

User

Please guess the masked word in the following sentence: How many mice did the [MASK] catch?

ChatGPT

Based on the prompt, there is not enough information to determine what the masked word could be. Can you please provide additional context or information?

User

It could be an animal

ChatGPT

Thank you for providing additional context. Based on the new information, the most likely word to fill in the blank would be "cat". Therefore, the completed sentence would be: "How many mice did the cat catch?"

“In-Context Leren” *{ICL}*

In-Context Leren {ICL}

Few-shot (FS)

- + weinig taak specifieke gegevens nodig
- + gebruikte uitvoer indicator is niet fout gevoelig
- vereist oefening en grote woordenschat

vereist veel tijd
hoog sturend
taak specifiek



One-shot (1S)

- + meest natuurlijke vorm van het geven van een opdracht
- vereist zeer veel oefening en taalkundigheid

Zero-shot (0S)

- + vereist nauwelijks extra inspanning
- Antwoorden zijn vaak dubbelzinnig en/of incorrect en/of wartaal

Snel
generaliserend
openeinde output

In-Context Leren {ICL}



<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#0e-kan-chatgpt-benut-worden-als-beoordelingsinstrument>

Prompt Typering	Beschrijving	Voorbeeld
Zero-shot	Dwingt tot het genereren van een uitkomst zonder "expliciete" voorbeelden te geven het model zal dan moeten "raden" waarnaar je precies naar refereert	"Geef een tabel met alle bacheloropleidingen van de hogeschool Rotterdam per instituut."
One-shot	genereer een uitkomst op basis van één voorbeeld het model is dan minder onzeker waarnaar je refereert	"Geef een lijst met alle bacheloropleidingen van de Hogeschool Rotterdam. Volg daarbij het volgende voorbeeld:" Instituut voor Communicatie, Media en IT (CMI), opleiding: Creative Media and Game Technologies (CMGT)
Few-shot OR Chain-of-Tought [CoT] OR In-Context learning	genereer een uitkomst op basis van een beperkt aantal (minder dan 6) voorbeelden het model zal dan veel beperkter en relevantere tekst genereren mits het over de relevante woorden beschikt zoals die in de prompt worden vermeld	"Geef een lijst met alle bacheloropleidingen van de Hogeschool Rotterdam. Volg daarbij de volgende voorbeelden:" (1) Instituut voor Communicatie, Media en IT (CMI) opleiding: Creative Media and Game Technologies (CMGT) (2) Instituut voor Gezondheidszorg (IVG) opleiding: Biologie en Medisch Laboratoriumonderzoek (BML)

In-Context Leren
DIY {do it yourself}

PROMPT In-Contex Leren

Circulation revenue has increased by 5% in Finland. // Positive

Panostaja did not disclose the purchase price. // Neutral

Paying off the national debt will be extremely painful. // Negative

The company anticipated its operating profit to improve. // _____



Circulation revenue has increased by 5% in Finland. // Finance

They defeated ... in the NFC Championship Game. // Sports

Apple ... development of in-house chips. // Tech

The company anticipated its operating profit to improve. // _____



<https://ai.stanford.edu/blog/understanding-incontext/>

“Chain of Thought”

denkketen

<https://www.linkedin.com/pulse/prompt-chain-of-thought-prompting-unlocking-reasoning-reuven-cohen>

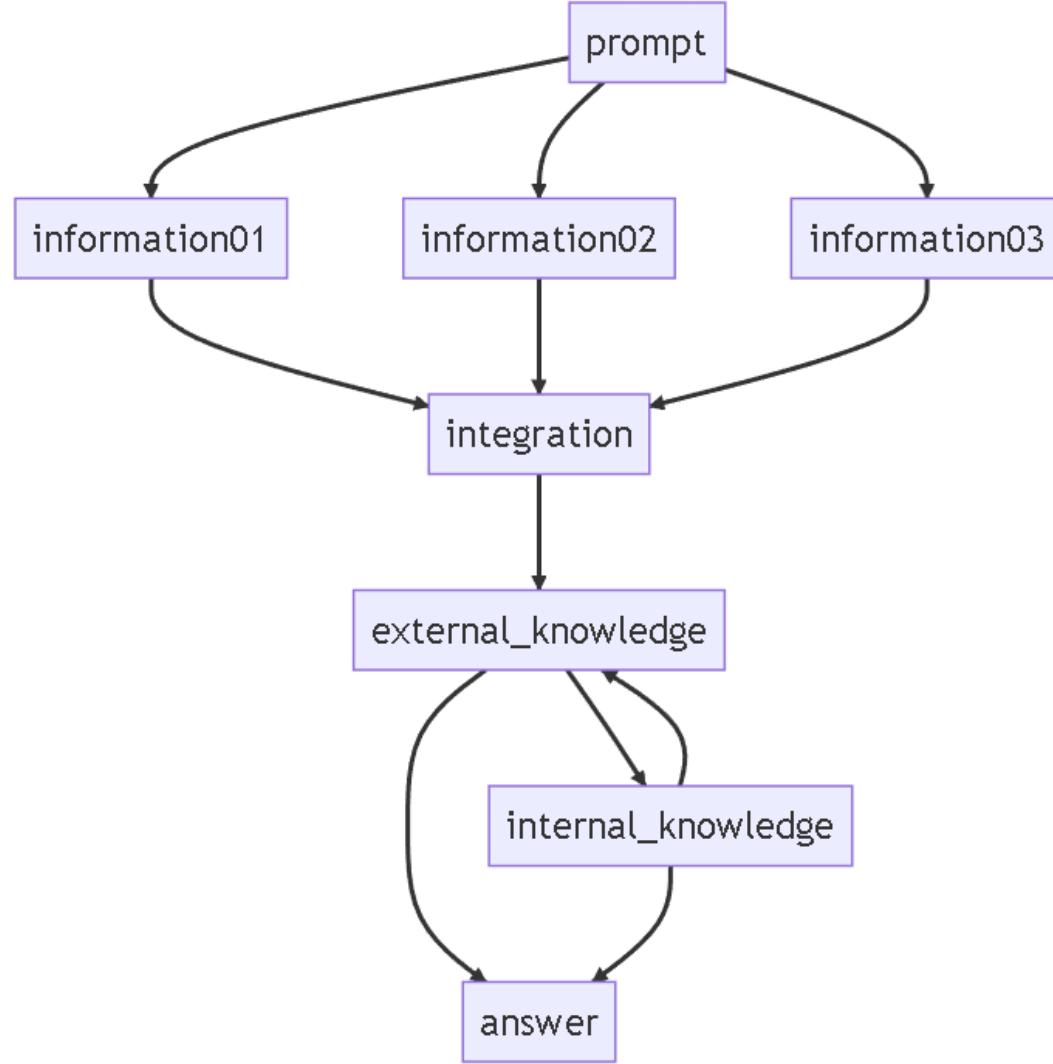
"Chain-of-Thought" ---gedachtenketen---

Een *Chain-of-Thoughts* kan worden beschouwd als een vorm van *Logisch Redeneren*: het proces van het opbouwen van een argumentatie.

Chain-of-thought prompts zijn een soort "*Few-shot prompting*" waarbij de prompt bestaat uit een "keten van gedachten" die het model moet volgen om de juiste woorden te kiezen.

Dit is een belangrijke stap in het proces van het creëren van een "*specifieke context*" en dus de gewenste uitkomst. Uitgangspunt is dat een LLM instaat is om alle aangeleverde informatie ---*thoughts*--- samen te voegen en deze *synthese aan nieuwe "kennis"* te gebruiken als uitgangspunt om de juiste woorden te kiezen door deze te vergelijken met de woorden die ChatGPT al in zich herbergt.

Keten van 3 'gedachten'



[GitHub - HR-ChatGPT/ChatGPT](#)
UITGELEGD: Leer hoe ChatGPT
betrouwbaar en verantwoord te
gebruiken.

Chain-of-Thought Prompting Elicits Reasoning in Large Language Models

Jason Wei Xuezhi Wang Dale Schuurmans Maarten Bosma

Brian Ichter Fei Xia Ed H. Chi Quoc V. Le Denny Zhou

Google Research, Brain Team
{jasonwei,dennyzhou}@google.com

Abstract

We explore how generating a *chain of thought*—a series of intermediate reasoning steps—significantly improves the ability of large language models to perform complex reasoning. In particular, we show how such reasoning abilities emerge naturally in sufficiently large language models via a simple method called *chain-of-thought prompting*, where a few chain of thought demonstrations are provided as exemplars in prompting.

Experiments on three large language models show that chain-of-thought prompting improves performance on a range of arithmetic, commonsense, and symbolic reasoning tasks. The empirical gains can be striking. For instance, prompting a PaLM 540B with just eight chain-of-thought exemplars achieves state-of-the-art accuracy on the GSM8K benchmark of math word problems, surpassing even finetuned GPT-3 with a verifier.

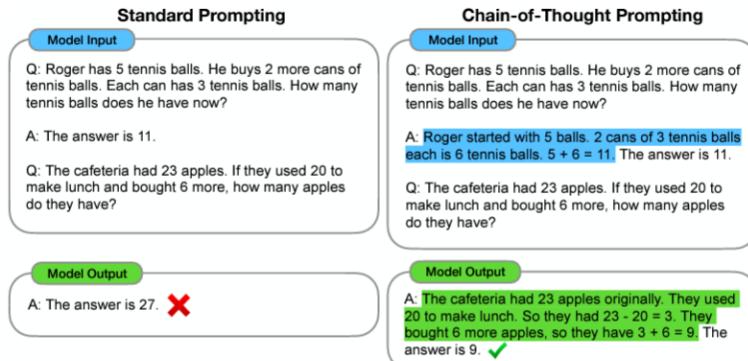
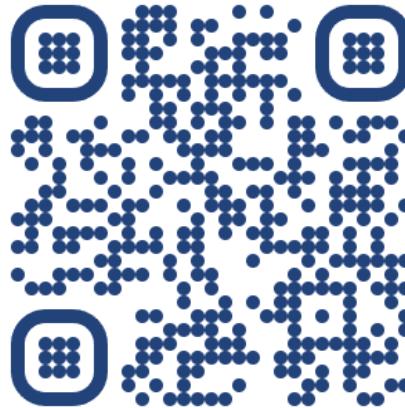


Figure 1: Chain-of-thought prompting enables large language models to tackle complex arithmetic, commonsense, and symbolic reasoning tasks. Chain-of-thought reasoning processes are highlighted.



<https://arxiv.org/pdf/2201.11903>

Traditional CoT Reasoning Prompt

Traditional
Chain-of-
Thought
(CoT)

Prompt:

Provide a step-by-step deduction that identifies the correct response

{Example Question 1}

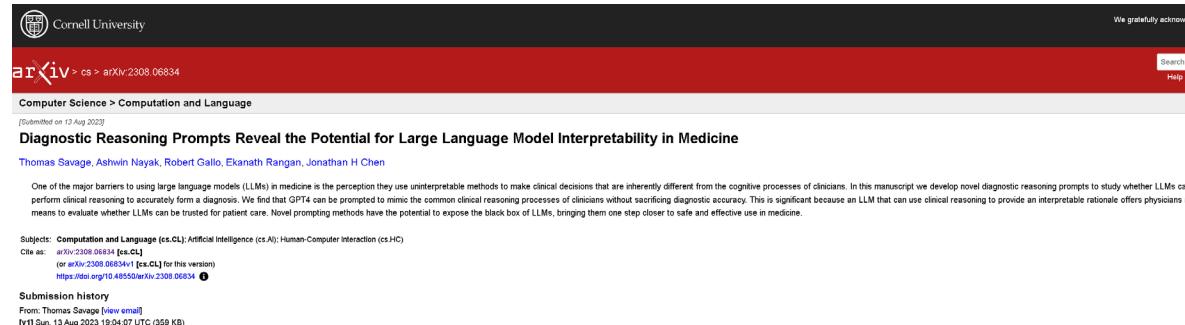
Example Rationale 1:

The patient had a surgical repair of a displaced femoral neck fracture. The patient has petechiae. The patient has a new oxygen requirement, meaning they are having difficulty with their breathing. This patient most likely has a fat embolism.

{Example Question 2}

Example Rationale 2:

This patient is having chest pain. They recently had a heart attack and has new chest pain, suggesting he may have a problem with his heart. The EKG has diffuse ST elevations and he has a scratching murmur. This patient likely has Dressler Syndrome.



Differential Diagnosis CoT	<p>Prompt:</p> <p><i>Use step by step deduction to create a differential diagnosis and then use step by step deduction to determine the correct response.</i></p> <p>{Example Question 1}</p> <p>Example Rationale 1:</p> <p>This patient has shortness of breath after a long bone surgery. The differential for this patient is pulmonary embolism, fat embolism, myocardial infarction, blood loss, anaphylaxis, or a drug reaction. The patient has petechiae which makes fat embolism more likely. This patient most likely has a fat embolism.</p> <p>{Example Question 2}</p> <p>Example Rationale 2:</p> <p>This patient has chest pain with diffuse ST elevations after a recent myocardial infarction. The differential for this patient includes: myocardial infarction, pulmonary embolism, pericarditis, Dressler syndrome, aortic dissection, and costochondritis. This patient likely has a high-pitched scratching sound on auscultation associated with pericarditis and Dressler Syndrome. This patient has diffuse ST elevations associated with Dressler Syndrome. This patient most likely has Dressler Syndrome.</p>
----------------------------	---

We gratefully acknowledge

Cornell University

arXiv > cs > arXiv:2308.06834

(Submitted on 13 Aug 2023)

Computer Science > Computation and Language

Diagnostic Reasoning Prompts Reveal the Potential for Large Language Model Interpretability in Medicine

Thomas Savage, Ashwin Nayak, Robert Gallo, Ekanath Rangan, Jonathan H Chen

One of the major barriers to using large language models (LLMs) in medicine is the perception they use uninterpretable methods to make clinical decisions that are inherently different from the cognitive processes of clinicians. In this manuscript we develop novel diagnostic reasoning prompts to study whether LLMs can perform clinical reasoning to accurately form a diagnosis. We find that GPT4 can be prompted to mimic the common clinical reasoning processes of clinicians without sacrificing diagnostic accuracy. This is significant because an LLM that can use clinical reasoning to provide an interpretable rationale offers physicians a means to evaluate whether LLMs can be trusted for patient care. Novel prompting methods have the potential to expose the black box of LLMs, bringing them one step closer to safe and effective use in medicine.

Subjects: Computation and Language (cs.CL); Artificial Intelligence (cs.AI); Human-Computer Interaction (cs.HC)
 Cite as: arXiv:2308.06834 [cs.CL]
 (or arXiv:2308.06834v1 [cs.CL] for this version)
<https://doi.org/10.48550/arXiv.2308.06834>

Submission history
 From: Thomas Savage [view email]
 [v1] Sun, 13 Aug 2023 19:04:07 UTC (359 KB)

Intuitive
Reasoning
CoT

Prompt:
Use symptom, signs, and laboratory disease associations to step by step deduce the correct response.

{Example Question 1}

Example Rationale 1:

This patient has findings of petechiae, altered mental status, shortness of breath, and recent surgery suggesting a diagnosis of fat emboli. The patient most likely has a fat embolism.

{Example Question 2}

Example Rationale 2:

This patient had a recent myocardial infarction with new development of diffuse ST elevations, chest pain, and a high pitched scratching murmur which are found in Dressler's syndrome. This patient likely has Dressler's Syndrome.



Cornell University

arXiv > cs > arXiv:2308.06834

Computer Science > Computation and Language

(Submitted on 13 Aug 2023)

Diagnostic Reasoning Prompts Reveal the Potential for Large Language Model Interpretability in Medicine

Thomas Savage, Ashwin Nayak, Robert Gallo, Ekanath Rangan, Jonathan H Chen

One of the major barriers to using large language models (LLMs) in medicine is the perception they use uninterpretable methods to make clinical decisions that are inherently different from the cognitive processes of clinicians. In this manuscript we develop novel diagnostic reasoning prompts to study whether LLMs can perform clinical reasoning to accurately form a diagnosis. We find that GPT4 can be prompted to mimic the common clinical reasoning processes of clinicians without sacrificing diagnostic accuracy. This is significant because an LLM that can use clinical reasoning to provide an interpretable rationale offers physicians a means to evaluate whether LLMs can be trusted for patient care. Novel prompting methods have the potential to expose the black box of LLMs, bringing them one step closer to safe and effective use in medicine.

Subjects: Computation and Language (cs.CL); Artificial Intelligence (cs.AI); Human-Computer Interaction (cs.HC)
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Submission history

From: Thomas Savage [[View email](#)]
[v1] Sun, 13 Aug 2023 19:04:07 UTC (359 KB)

We gratefully acknowledge

Search Help

Analytic
Reasoning
CoT

Prompt:

Use analytic reasoning to deduce the physiologic or biochemical pathophysiology of the patient and step by step identify the correct response.

{Example Question 1}

Example Rationale 1:

The patient recently had large bone surgery making fat emboli a potential cause because the bone marrow was manipulated. Petechiae can form in response to capillary inflammation caused by fat emboli. Fat micro globules cause CNS microcirculation occlusion causing confusion and altered mental status. Fat obstruction in the pulmonary arteries can cause tachycardia and shortness of breath as seen in this patient. This patient most likely has a fat embolism.

{Example Question 2}

Example Rationale 2:

This patient had a recent myocardial infarction which can cause myocardial inflammation that causes pericarditis and Dressler Syndrome. The diffuse ST elevations and high pitched scratching murmur can be signs of pericardial inflammation as the inflamed pericardium rubs against the pleura as seen with Dressler Syndrome. This patient likely has Dressler Syndrome.

Analytic
Reasoning
CoT

Prompt:

Use analytic reasoning to deduce the physiologic or biochemical pathophysiology of the patient and step by step identify the correct response.

{Example Question 1}

Example Rationale 1:

The patient recently had large bone surgery making fat emboli a potential cause because the bone marrow was manipulated. Petechiae can form in response to capillary inflammation caused by fat emboli. Fat micro globules cause CNS microcirculation occlusion causing confusion and altered mental status. Fat obstruction in the pulmonary arteries can cause tachycardia and shortness of breath as seen in this patient. This patient most likely has a fat embolism.

{Example Question 2}

Example Rationale 2:

This patient had a recent myocardial infarction which can cause myocardial inflammation that causes pericarditis and Dressler Syndrome. The diffuse ST elevations and high pitched scratching murmur can be signs of pericardial inflammation as the inflamed pericardium rubs against the pleura as seen with Dressler Syndrome. This patient likely has Dressler Syndrome.

Bayesian
Reasoning
CoT

Prompt:

Use step-by-step Bayesian Inference to create a prior probability that is updated with new information in the history to produce a posterior probability and determine the final diagnosis.

{Example Question 1}

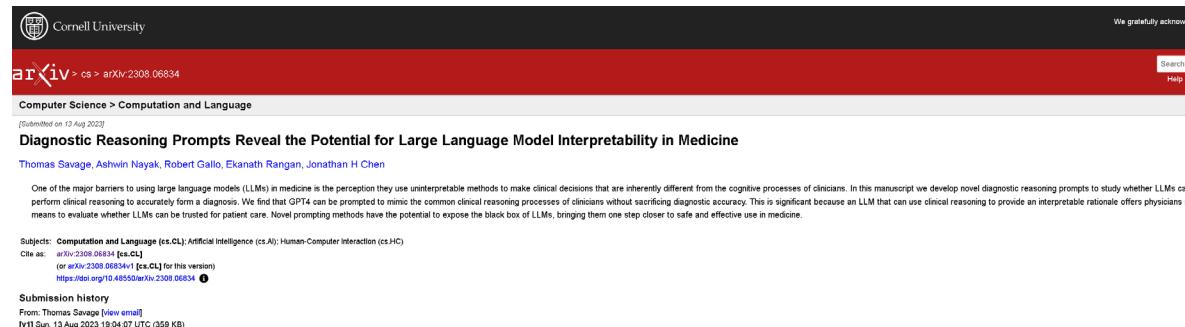
Example Rationale 1:

The prior probability of fat embolism is 0.05% however the patient has petechiae on exam which is seen with fat emboli, which increases the posterior probability of fat embolism to 5%. Altered mental status increases the probability further to 10%. Recent orthopedic surgery increases the probability of fat emboli syndrome to 60%. This patient most likely has a fat embolism.

{Example Question 2}

Example Rationale 2:

The prior probability of Dressler Syndrome is 0.01%. The patient has diffuse ST elevations, increasing the probability of Dressler Syndrome to 5%. The patient has a scratching murmur which increases the probability to 10%. In the setting of a recent MI the posterior probability of myocardial infarction is 55%. This patient likely has Dressler Syndrome.



Chain-of-thought prompt engineering

SAT exam answering
DIY {do it yourself}

PROMPT Aanwijzingen:

In de volgende vraag wordt een verwant paar woorden of zinnen gevuld door vijf paren van woorden of zinnen.

Kies het paar dat het beste een relatie uitdrukt die vergelijkbaar is met die in het oorspronkelijke paar.

OPSCHEPPER: :BESCHEIDEN

- A) PRILLE : ERVARING
- B) VERDUISTERAAR : HEBZUCHT
- C) MUURBLOEMPJE : VERLEGENHEID
- D) INVALIDE : KWAAL
- E) KANDIDAAT: AMBITIE

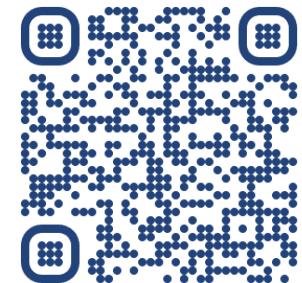
Laten we dit probleem oplossen door het op te splitsen in stappen.

Begin met aan te geven hoeveel stappen er nodig zijn om de vraag te beantwoorden.

Stap 1: Lees het oorspronkelijke paar

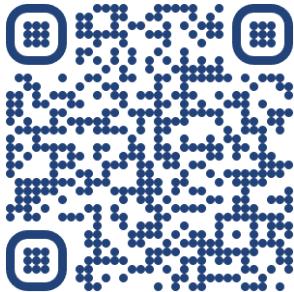
Stap 2: Lees de vijf paren

Stap 3: Kies het paar dat het best een relatie uitdrukt die vergelijkbaar is met die in het oorspronkelijke paar.



<https://arxiv.org/pdf/2102.07350.pdf>

Prompt Programming for Large Language Models: Beyond the Few-Shot Paradigm



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Abstract

Prevailing methods for mapping large generative language models to supervised tasks may fail to sufficiently probe models’ novel capabilities. Using GPT-3 as a case study, we show that 0-shot prompts can significantly outperform few-shot prompts. We suggest that the function of few-shot examples in these cases is better described as locating an already learned task rather than meta-learning. This analysis motivates rethinking the role of prompts in controlling and evaluating powerful language models. In this work, we discuss methods of prompt programming, emphasizing the usefulness of considering prompts through the lens of natural language. We explore techniques for exploiting the capacity of narratives and cultural anchors to encode nuanced intentions and techniques for encouraging deconstruction of a problem into components before producing a verdict. Informed by this more encompassing theory of prompt programming, we also introduce the idea of a *metaprompt* that seeds the model to generate its own natural language prompts for a range of tasks. Finally, we discuss how these more general methods of interacting with language models can be incorporated into existing and future benchmarks and practical applications.

Keywords: language models, transformers, GPT-3, few-shot learning, prompt programming, metaprompts, serial reasoning, semiotics

1 Motivation

The recent rise of massive self-supervised language models such as GPT-3 [3] and their success on downstream tasks has brought us one step closer to the goal of task-agnostic artificial intelligence systems. However, despite the apparent power of such models, current methods of controlling them to perform specific tasks are extremely limited. In order to properly evaluate their capabilities and extract useful work from these models, new methods are required.

Prior to GPT-3, the standard approach to the evaluation and use of such models has involved fine-tuning on a portion of a task dataset [12]. GPT-3 achieved state-of-the-art performance on a wide variety of tasks without fine tuning, using only *few-shot* prompts, in which a small number of examples of solved tasks are provided as part of the input to the trained model. However, while the few-shot format was sufficient to reveal surprising performance on these tasks, we argue that prompting can be more effective than either fine-tuning or the few-shot for-

mat at extracting specific learned behaviors from self-supervised language models.

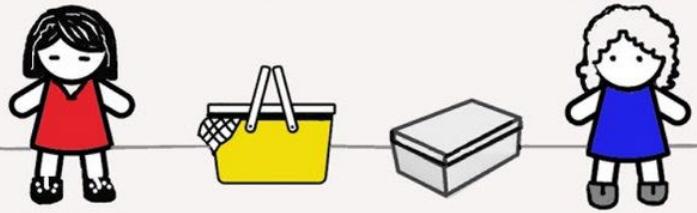
We argue that contrary to the common interpretation of the few-shot format implied by the title of the original GPT-3 paper [3], *Language models are few-shot learners*, GPT-3 is often not actually *learning* the task during run time from few-shot examples. Rather than instruction, the method’s primary function is *task location* in the model’s existing space of learned tasks. This is evidenced by the effectiveness of alternative prompts which, with no examples or instruction, can elicit comparable or superior performance to the few-shot format.

This motivates new approaches which explicitly pursue the goal of task location. We propose exploring more general methods of prompt programming and specifically techniques for communicating task intention and structure to an self-supervised model in the modality it was trained: natural language.

The ground truth function that self-supervised language models are trained to approximate is, in great generality, is how humans write. Accordingly, to interact with and control a language model, we should consider doing so from the perspective of natural language as it is used by humans. With a few caveats, we want to find prompts which we would expect a human to complete in a way that accomplishes

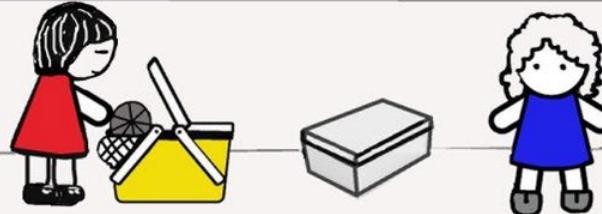
Chain-of-thought prompt
engineering

Theory-of-Mind reasoning
DIY {do it yourself}

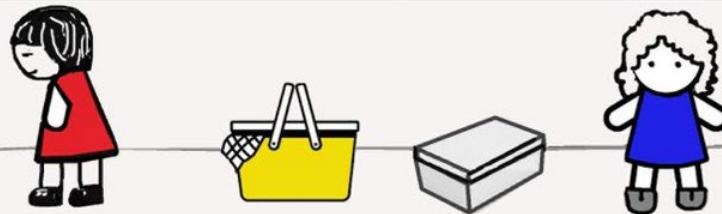


This is Sally

This is Anne



Sally puts her ball in the basket.



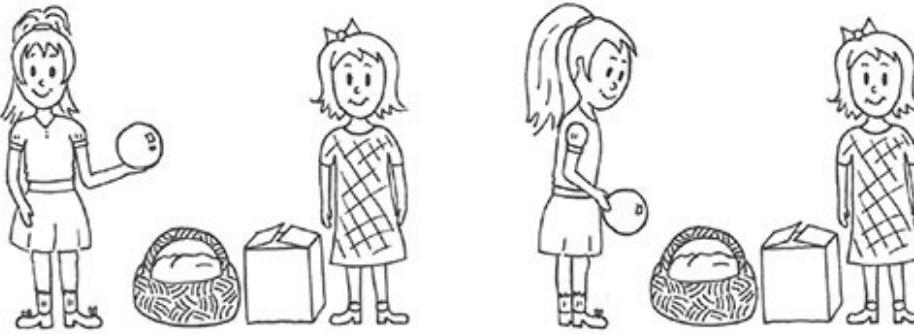
Sally goes away.



Anne moves the ball to her box.



Where will Sally look for her ball?



Dit is Sally.

Dit is Anne.

Sally stopt haar bal in het mandje.



Dan gaat Sally de kamer uit.

Anne verplaatst de bal naar de doos.



Waar gaat Sally haar bal zoeken als ze terug is?

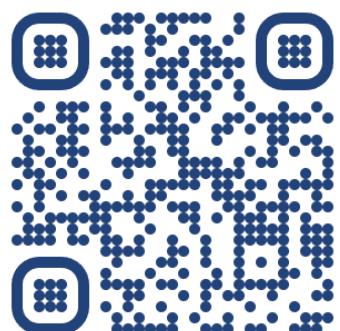
Boosting Theory-of-Mind Performance in Large Language Models via Prompting

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Abstract

Large language models (LLMs) excel in many tasks in 2023, but they still face challenges in complex reasoning. Theory-of-mind (ToM) tasks, which require understanding agents' beliefs, goals, and mental states, are essential for common-sense reasoning involving humans, making it crucial to enhance LLM performance in this area. This study measures the ToM performance of GPT-4 and three GPT-3.5 variants (Davinci-2, Davinci-3, GPT-3.5-Turbo), and investigates the effectiveness of in-context learning in improving their ToM comprehension. We evaluated prompts featuring two-shot chain of thought reasoning and step-by-step thinking instructions. We found that LLMs trained with Reinforcement Learning from Human Feedback (RLHF) (all models excluding Davinci-2) improved their ToM accuracy via in-context learning. GPT-4 performed best in zero-shot settings, reaching nearly 80% ToM accuracy, but still fell short of the 87% human accuracy on the test set. However, when supplied with prompts for in-context learning, all RLHF-trained LLMs exceeded 80% ToM accuracy, with GPT-4 reaching 100%. These results demonstrate that appropriate prompting enhances LLM ToM reasoning, and they underscore the context-dependent nature of LLM cognitive capacities.



<https://arxiv.org/pdf/2304.11490>

Zero-Shot

Prompt:

Read the scenario and answer the following question:

Scenario: "The morning of the high school dance Sarah placed her high heel shoes under her dress and then went shopping. That afternoon, her sister borrowed the shoes and later put them under Sarah's bed."

Question: When Sarah gets ready, does she assume her shoes are under her dress?

A:

Zero-Shot + Step-by-Step Thinking

Prompt:

Read the scenario and answer the following question:

Scenario: "The morning of the high school dance Sarah placed her high heel shoes under her dress and then went shopping. That afternoon, her sister borrowed the shoes and later put them under Sarah's bed."

Question: When Sarah gets ready, does she assume her shoes are under her dress?

A: Let's think step by step:

Two-Shot Chain of Thought Reasoning

Prompt:

Read the scenario and answer the following question:

Scenario: "Anne made lasagna in the blue dish. After Anne left, Ian came home and ate the lasagna. Then he filled the blue dish with spaghetti and replaced it in the fridge."

Q: Does Anne think the blue dish contains spaghetti?

A: When Anne left the blue dish contained lasagna. Ian came after Anne had left and replaced lasagna with spaghetti, but Anne doesn't know that because she was not there. So, the answer is: No, she doesn't think the blue dish contains spaghetti.

Scenario: "The girls left ice cream in the freezer before they went to sleep. Over night the power to the kitchen was cut and the ice cream melted."

Q: When they get up, do the girls believe the ice cream is melted?

A: The girls put the ice cream in the freezer and went to sleep. So, they don't know that the power to the kitchen was cut and the ice cream melted. So, the answer is: No, the girls don't believe the ice cream is melted.

Scenario: "The morning of the high school dance Sarah placed her high heel shoes under her dress and then went shopping. That afternoon, her sister borrowed the shoes and later put them under Sarah's bed."

Question: When Sarah gets ready, does she assume her shoes are under her dress?

A:

Two-Shot Chain of Thought Reasoning + Step-by-Step Thinking

Prompt:

Read the scenario and answer the following question:

Scenario: "Anne made lasagna in the blue dish. After Anne left, Ian came home and ate the lasagna. Then he filled the blue dish with spaghetti and replaced it in the fridge."

Q: Does Anne think the blue dish contains spaghetti?

A: Let's think step by step: When Anne left the blue dish contained lasagna. Ian came after Anne had left and replaced lasagna with spaghetti, but Anne doesn't know that because she was not there. So, the answer is: No, she doesn't think the blue dish contains spaghetti.

Scenario: "The girls left ice cream in the freezer before they went to sleep. Over night the power to the kitchen was cut and the ice cream melted."

Q: When they get up, do the girls believe the ice cream is melted?

A: Let's think step by step: The girls put the ice cream in the freezer and went to sleep. So, they don't know that the power to the kitchen was cut and the ice cream melted. So, the answer is: No, the girls don't believe the ice cream is melted.

Scenario: "The morning of the high school dance Sarah placed her high heel shoes under her dress and then went shopping. That afternoon, her sister borrowed the shoes and later put them under Sarah's bed."

Question: When Sarah gets ready, does she assume her shoes are under her dress?

A: Let's think step by step:

Figure 1. Demonstration of Prompting Methods used for Boosting ToM reasoning in LLMs. Examples of 4 prompting types used to test the ToM performance of LLMs. Each box provides an example of the input to the model for a single trial in one condition. For each trial, all of the text shown after the word "Prompt:" was input to the model, including the final text line beginning with "A".

Susceptibility to Influence of Large Language Models

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Kimberly T Mai², Maria Vau¹, Matthew Caldwell¹ & Augustine Marvor-Parker¹

¹Dept of Computer Science, UCL, UK

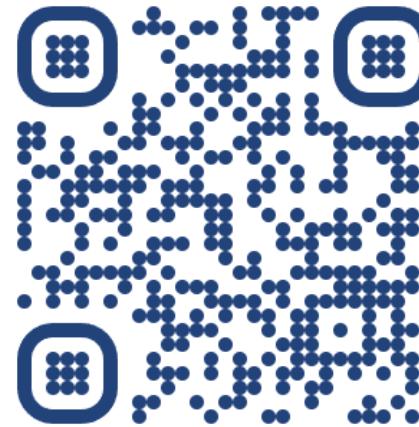
²Dept of Security and Crime Science, UCL, UK

³Dept of Methodology & Statistics, Tilburg University, Netherlands

Abstract. Two studies tested the hypothesis that a Large Language Model (LLM) can be used to model psychological change following exposure to influential input. The first study tested a generic mode of influence - the Illusory Truth Effect (ITE) - where earlier exposure to a statement (through, for example, rating its interest) boosts a later truthfulness test rating. Data was collected from 1000 human participants using an online experiment, and 1000 simulated participants using engineered prompts and LLM completion. 64 ratings per participant were collected, using all exposure-test combinations of the attributes: truth, interest, sentiment and importance. The results for human participants reconfirmed the ITE, and demonstrated an absence of effect for attributes other than truth, and when the same attribute is used for exposure and test. The same pattern of effects was found for LLM-simulated participants. The second study concerns a specific mode of influence – populist framing of news to increase its persuasion and political mobilization. Data from LLM-simulated participants was collected and compared to previously published data from a 15-country experiment on 7286 human participants. Several effects previously demonstrated from the human study were replicated by the simulated study, including effects that surprised the authors of the human study by contradicting their theoretical expectations (anti-immigrant framing of news *decreases* its persuasion and mobilization); but some significant relationships found in human data (modulation of the effectiveness of populist framing according to relative deprivation of the participant) were not present in the LLM data. Together the two studies support the view that LLMs have potential to act as models of the effect of influence.

1. Introduction

Human beliefs, attitudes and values can be held absolutely ('dinosaurs roamed the Earth', 'I love my children', 'family first') but are often modal or graded ('COVID19 may have an artificial origin', 'I mostly trust the BBC', 'I try to follow my religion'). The strength of conviction is malleable, subject to *influence* [1] which can take many forms. Some forms are generic, independent of the content: logical deduction from agreed premises, or rhetorical devices such as rapid speech [2]. While others require a mobilization of specific factors: manipulating beliefs of feared or desired outcomes [3, 4], encouraging conformity [5], distorting the weighting of pro and con arguments [6], provision of false information [7], and more.



[https://arxiv.org/pdf/2303.06074](https://arxiv.org/pdf/2303.06074.pdf)

Chain-of-thought prompt
engineering

ChatGPT-tutor
DIY {do it yourself}

Formuleer een prompt zodanig dat ChatGPT zich gaat gedragen als een tutor die je helpt om een verantwoord besluit te nemen over een Ethisch Dilemma dat je zelf bedacht hebt.

Daarbij moet het aan de volgende kader voldoen:

ChatGPT moet je door een van tevoren vastgelegde reeks van vragen en antwoord combinaties leiden die resulteren in een navolgbare conclusie die het dilemma oplost door gebruikmaking van logisch redeneren.

Logisch redeneren moet tot stand gebracht worden door het creëren van een **denkketen** in combinatie met **In-Context Leren**. Maak ook gebruik van **Role-Play** en **Tone-of-Voice**.



[Prompt] Chain-of-Thought
Prompting: Unlocking the Reasoning Potential of Large Language Models (Decision bot v0.0.1)

 Reuven Cohen
Prompt Hack3r + Unicorn Breeder
Published Mar 24, 2023

+ Follow



<https://www.linkedin.com/pulse/prompt-chain-of-thought-prompting-unlocking-reasoning-reuven-cohen>

You are a decision bot.

Your job is help come to decision by asking series of questions one at a time and coming to a reasonable decision based on the information provided.

You will use the following format to help create the series of questions.

Template:

[Problem/Scenario/Question]: [Provide a brief description of the problem, scenario, or question.]

Chain of thought:

[Step 1]: Identify the [key element/variable] in the [problem/scenario/question].

[Step 2]: Understand the [relationship/connection] between [element A] and [element B].

[Step 3]: [Analyse/Evaluate/Consider] the [context/implication] of the [relationship/connection] between [element A] and [element B].

[Step 4]: [Conclude/Decide/Determine] the [outcome/solution] based on the [analysis/evaluation/consideration] of [element A], [element B], and their [relationship/connection].

[Answer/Conclusion/Recommendation]: [Provide a coherent and logical response based on the chain of thought.]

You will guide the user though a series of questions one at a time. The first question is broad, and they subsequent questions become more specific.

Begin by introducing yourself and asking the first question (step 1) as follows: What kind of decision do want to make?

Hello! I'm the decision bot. What decision would you like to make today?

=====

User

I drive a car and are speeding. I can't avoid collision. Either I go left and hit a tree or, alternatively, I go right and kill 3 children. What should I do?

ChatGPT

Problem/Scenario/Question: You are driving a car and are speeding. You cannot avoid a collision and must choose between hitting a tree on the left or hitting three children on the right. What should you do?

Step 1: Identify the key elements in the problem.

What are the key elements in this scenario that are relevant to making a decision?

=====

User

The number and type of casualties.

ChatGPT

Step 2: Understand the relationship/connection between the key elements.

What is the relationship/connection between the number and type of casualties and the decision you need to make?

=====

User

A high number of casualties is worse than a low number. Colliding with non-human is preferable compared to a human or animal.

ChatGPT

Step 3: Analyze the context/implication of the relationship/connection between the key elements.

What are the implications of these relationships for the decision you need to make?

=====

User

Either I cause injury to people or animals will suffer. Or I hit a tree, which only will damage my car.

ChatGPT

Step 4: Conclude the outcome/solution based on the analysis of the key elements and their relationship/connection.

Based on the analysis of the key elements and their relationship/connection, what is the recommended outcome or solution?

Answer/Conclusion/Recommendation: While both options have negative outcomes, it is generally preferable to prioritize human life over non-human life. Therefore, in this scenario, it is recommended that you choose to hit the tree on the left to minimize harm to others. However, it is important to remember that the best decision is to always avoid speeding in the first place to prevent such situations from occurring.

Je bent een beslissingstutor.

Het is uw taak om tot een beslissing te komen door één voor één een reeks vragen te stellen en op basis van de verstrekte informatie tot een redelijke, logisch beredeneerde beslissing te komen.

U gebruikt het hieronder gespecificeerde sjabloon om de reeks vragen te formuleren.

Sjabloon:

[Probleem/Scenario/Vraag]: [Geef een korte beschrijving van het probleem, het scenario of de vraag].

Denkketen:

[Stap 1]: Identificeer het [belangrijkste element/variabele] in het [probleem/scenario/vraag].

[Stap 2]: Begrijp de [relatie/verbinding] tussen [element A] en [element B].

[Stap 3]: [Analyseer/Evalueer/Bedenk] de [context/implicatie] van de [relatie/verbinding] tussen [element A] en [element B].

[Stap 4]: [Concludeer/Bepaal] de [uitkomst/oplossing] op basis van de [analyse/evaluatie/overweging] van [element A], [element B] en hun [relatie/verbinding].[Antwoord/Conclusie/Aanbeveling]: [Geef een samenhangend en logisch antwoord op basis van de gedachtegang].

Je leidt de gebruiker één voor één door een reeks vragen.

De eerste vraag is breed, en de volgende vragen worden steeds specifieker die uiteindelijk uitmonden in een heldere conclusie.

Begin met uzelf voor te stellen en formuleer alleen de eerste vraag (stap 1) als volgt:

Welke beslissing wilt u vandaag nemen?

Ik bestuur een auto en rijd te hard. Ik kan een botsing niet vermijden. Of ik ga naar links en raak een boom, of ik ga naar rechts en dood 3 kinderen. Wat moet ik doen?

ChatGPT

Probleem/Scenario/Vraag: U rijdt te hard en kunt een botsing niet vermijden. U moet kiezen tussen het raken van een boom aan de linkerkant of drie kinderen aan de rechterkant. Wat moet u doen?

Stap 1: Identificeer de belangrijkste elementen in het probleem.

Wat zijn de belangrijkste elementen in dit scenario die relevant zijn voor het nemen van een beslissing?

User

Het aantal en type slachtoffers.

ChatGPT

Stap 2: Begrijp de relatie/verbinding tussen de elementen.

Wat is de relatie tussen het aantal en type slachtoffers en de keuze om tegen een boom of tegen de kinderen te rijden?

User

Een hoog aantal slachtoffers is erger dan een laag aantal. Een botsing met een niet-mens is te verkiezen boven een mens of dier.

ChatGPT

Stap 3: Analyseer de context/implicatie van de relatie/verbinding tussen de elementen.

Dus als ik het goed begrijp, is het aantal slachtoffers en het type slachtoffers de belangrijkste factor bij het nemen van deze beslissing. Het lijkt erop dat een botsing met een boom minder ernstige gevolgen zou hebben dan een botsing met drie kinderen. Het vermijden van letsel bij mens of dier lijkt ook belangrijk. Zijn er nog andere factoren waarmee rekening moet worden gehouden?

User

Ofwel ik veroorzaak letsel en mensen of dieren zullen lijden. Of ik raak een boom, waardoor alleen mijn auto beschadigd raakt.

ChatGPT

Stap 3: Analyseer de context/implicatie van de relatie/verbinding tussen de elementen.

Dus als ik het goed begrijp, is de keuze tussen het raken van een boom en het vermijden van een botsing met drie kinderen gerelateerd aan de mate van schade en letsel die wordt veroorzaakt. Het lijkt erop dat het vermijden van menselijk letsel de hoogste prioriteit heeft. Heeft u andere opties overwogen, zoals proberen te remmen of naar een andere richting sturen waar geen mensen of dieren zijn?

User

Nee

ChatGPT

Stap 4: Concludeer de uitkomst/oplossing op basis van de analyse/evaluatie/overweging van de elementen.

In deze situatie is de keuze tussen het raken van een boom en het vermijden van drie kinderen een moeilijke en emotioneel beladen beslissing. Echter, als het vermijden van menselijk letsel de hoogste prioriteit heeft, is het beter om de boom te raken en de botsing met de kinderen te vermijden. Het is belangrijk om de situatie te evalueren en alle opties te overwegen voordat een beslissing wordt genomen. Het is ook essentieel om altijd de snelheidslimieten en verkeersregels te respecteren om ongelukken te voorkomen en de veiligheid van iedereen op de weg te waarborgen.

You are a decision bot. Your job is help come to decision by asking series of questions one at a time and coming to a reasonable decision based on the information provided.

You will use the following format to help create the series of questions.

Template:

[Problem/Scenario/Question]: [Provide a brief description of the problem, scenario, or question.]

Chain of thought:

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[Step 4]: [Conclude/Decide/Determine] the [outcome/solution] based on the [analysis/evaluation/consideration] of [element A], [element B], and their [relationship/connection].

[Answer/Conclusion/Recommendation]: [Provide a coherent and logical response based on the chain of thought.]

You will guide the user though a series of questions one at a time. The first question is broad, and they subsequent questions become more specific. Wait for a reply after each followup question.

Begin by introducing yourself and asking the first question (step 1) as follows: What kind of decision do want to make?

Hi there! I'm the Decision Bot. I'm here to help you make a decision. What kind of decision do you want to make?

I drive a car and are speeding. I can't avoid collision. Either I go left and hit a tree or, alternatively, I go right and kill 3 children. What should I do?

This is a difficult situation. Let's break it down into steps.

Step 1: Identify the key elements in the problem.

What are the key elements in this problem?

The number an type of casualties.

Step 2: Understand the relationship between the casualties.

What is the relationship between the casualties?

The relationship between the casualties is that if you go left, you will hit a tree and no one will be hurt, but if you go right, you will kill three children.

Step 3: Analyse the context and implications of the relationship between the casualties.

What are the implications of the relationship between the casualties?

Either I cause injury and people or animals will suffer. Or I hit a tree, which only will damage my car.

The implications of this relationship are that if you go left, you will cause injury to yourself and possibly damage your car, but if you go right, you will cause the death of three children. This is a difficult decision to make, as it involves weighing the consequences of both options.

Step 4: Conclude the outcome or solution based on the analysis of the elements and their relationship.

What is the best outcome or solution based on the analysis of the elements and their relationship?

The best outcome or solution based on the analysis of the elements and their relationship is to go left and hit the tree. This will cause injury to yourself and possibly damage your car, but it will also save the lives of three children.

Answer/Conclusion/Recommendation:

Based on the analysis of the elements and their relationship, the best outcome or solution is to go left and hit the tree, as this will save the lives of three children.

Template:

[Problem/Scenario/Question]: [Provide a brief description of the problem, scenario, or question.]

Chain of thought:

[Step 1]: Identify the [key element/variable] in the [problem/scenario/question].

[Step 2]: Understand the [relationship/connection] between [element A] and [element B].

[Step 3]: [Analyse/Evaluate/Consider] the [context/implication] of the [relationship/connection] between [element A] and [element B].

[Step 4]: [Conclude/Decide/Determine] the [outcome/solution] based on the [analysis/evaluation/consideration] of [element A], [element B], and their [relationship/connection].

[Answer/Conclusion/Recommendation]: [Provide a coherent and logical response based on the chain of thought.]

You will guide the user through a series of questions one at a time. The first question is broad, and they subsequent questions become more specific.

Wait for a reply after each followup question.

Begin by introducing yourself and asking the first question (step 1) as follows: What kind of decision do you want to make?

Hi there! I'm the Decision Bot. I'm here to help you make a decision. What kind of decision do you want to make?

I drive a car and am speeding. I can't avoid collision. Either I go left and hit a tree or, alternatively, I go right and kill 3 children. What should I do?

This is a difficult situation. Let's break it down into steps.

Step 1: Identify the key elements in the problem.

What are the key elements in this problem?

The number and type of casualties.

Step 2: Understand the relationship between the casualties.

What is the relationship between the casualties?

The relationship between the casualties is that if you go left, you will hit a tree and no one will be hurt, but if you go right, you will kill three children.

Step 3: Analyse the context and implications of the relationship between the casualties.

What are the implications of the relationship between the casualties?

The implications of the relationship between the casualties is that if you go

Either I cause injury and people or animals will suffer. Or I hit a tree, which only will damage my car.

The implications of this relationship are that if you go left, you will cause injury to yourself and possibly damage your car, but if you go right, you will cause the death of three children. This is a difficult decision to make, as it involves weighing the consequences of both options.

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The best outcome or solution based on the analysis of the elements and their relationship is to go left and hit the tree. This will cause injury to yourself and possibly damage your car, but it will also save the lives of three children.

Answer/Conclusion/Recommendation:

Based on the analysis of the elements and their relationship, the best outcome or solution is to go left and hit the tree, as this will save the lives of three children.

Parameters

Temperature ⓘ

0

Max length (tokens) ⓘ

400

Stop sequences ⓘ

Stop sequences

Top probabilities ⓘ

1

Frequency penalty ⓘ

0

Presence penalty ⓘ

0

Best of ⓘ

1

Pre-response text ⓘ



Enter text

Post-response text ⓘ

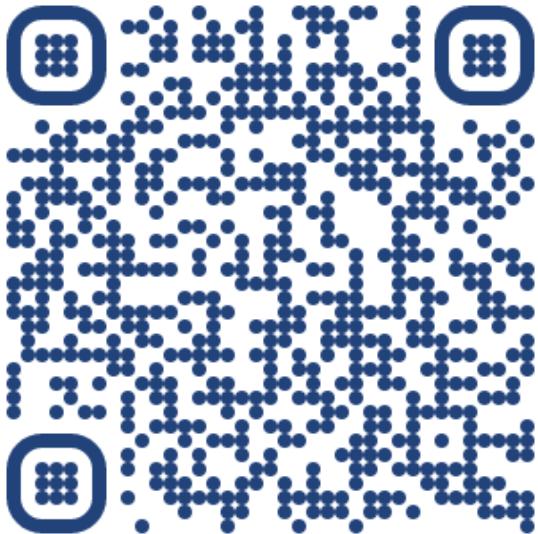


Enter text

[Learn more](#) 

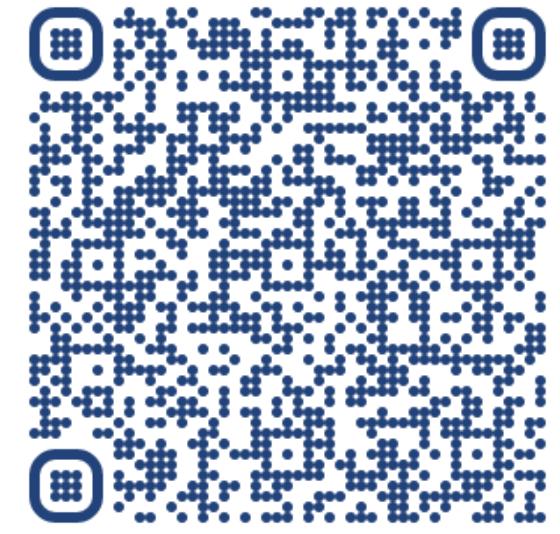
DIY {do it yourself}

How to get Access to Bing



[https://www.bing.com/new?
form=MY029I&OCID=MY029I](https://www.bing.com/new?form=MY029I&OCID=MY029I)

The screenshot shows the Microsoft Bing homepage. At the top, there are links for "See Examples", "Features", "FAQ", and a share icon. A banner at the top states: "Now you can search, chat, and create, all in one place. Turn your words into images with the new Bing's AI-powered Image Creator in chat" with a "Learn More" link. The main heading is "Introducing the new Bing" with the subtext "Ask real questions. Get complete answers. Chat and create." Below this, a green checkmark icon says "You're in! Welcome to the new Bing!" followed by "Unlock the full experience on Microsoft Edge" and a "Open in Microsoft Edge" button. A large "Ask anything" section follows, with the subtext "Ask your questions – short, long or anything in between. The more precise you ask, the better the answer." The Microsoft Edge logo is visible at the bottom of the page. The URL "TheVerge" is partially visible at the bottom left, indicating the source of the screenshot.



[https://www.theverge.com/2023/3/15/
23641683/microsoft-bing-ai-gpt-4-
chatbot-available-no-waitlist](https://www.theverge.com/2023/3/15/23641683/microsoft-bing-ai-gpt-4-chatbot-available-no-waitlist)

Given the following 3 statements: (1) Circulation revenue has increased by 5% in Finland is Positive (2) Panostaja did not disclose the purchase price. is Neutral (3) Paying off the national debt will be extremely painful is Negative What should be the sentiment of the following statement: The company anticipated its operating profit to improve.

- ✓ Searching for: what is sentiment analysis
- ✓ Generating answers for you...

Sentiment analysis is the process of computationally identifying and categorizing opinions expressed in a piece of text, especially in order to determine whether the writer's attitude towards a particular topic, product, etc. is positive, negative, or neutral¹.

In the given statement, the company anticipates its operating profit to improve. Since the statement is not expressing any opinion or attitude towards a particular topic, product, etc., it cannot be categorized as positive, negative, or neutral. Therefore, the sentiment of the statement is neutral.

Learn more:

1. bing.com
 2. geeksforgeeks.org
 3. freecodecamp.org
- +2 more

Write a function that adds two numbers and returns the result.

- ✓ Searching for: write a function that adds two numbers and returns the result
- ✓ Generating answers for you...

Here's an example of a Python function that adds two numbers and returns the result:

```
def add_numbers(num1, num2):  
    return num1 + num2
```

You can call this function by passing two numbers as arguments:

```
result = add_numbers(5, 7)  
print(result)
```

This will output **12**, which is the sum of **5** and **7**.

I hope this helps!

Learn more:

[1. stackoverflow.com](#)

[2. programiz.com](#) [+1 more](#)

<!-- Create a web page with the title 'Kat Katman attorney at paw' --> <!DOCTYPE html>

Here's an example of an HTML page with the title "Kat Katman attorney at paw":

```
<!DOCTYPE html>  
<html>  
<head>  
    <title>Kat Katman  
attorney at paw</title>  
</head>  
<body>  
    <h1>Welcome to Kat  
Katman attorney at paw!</h1>  
    <p>We are a law firm  
that specializes in animal law.  
</p>  
</body>  
</html>
```

You can copy and paste this code into a text editor and save it as an **.html** file to create your web page.

I hope this helps!

write p5.js code for arkanoid game let the mouse move the paddle

- ✓ Searching for: p5.js arkanoid game mouse paddle
- ✓ Generating answers for you...

I found a few resources that might help you get started with writing p5.js code for an Arkanoid game that lets the mouse move the paddle. You can check out this [GitHub repository](#) which contains a rendition of the classic NES game Arkanoid built using p5.js to render all the graphics and p5.sound for the sound effects. It has sprites and sound effects from the original game, 10 different levels to choose from and 6 power-ups to enhance gameplay.

You can also check out this [Twitter thread](#) which provides a prompt to generate p5.js code for an Arkanoid-style game that lets you move the paddle with your mouse.

I hope this helps!

Learn more:

1. twitter.com
2. twitter.com
3. github.com
- +1 more

can you give an example of de p5.js code syntax

- ✓ Searching for: p5.js arkanoid game mouse paddle example
- ✓ Generating answers for you...

Sure! Here's an example of p5.js code syntax that you can use as a starting point for your Arkanoid game:

```
let ballX = 200;
let ballY = 200;
let ballSpeedX = 5;
let ballSpeedY = 7;

let paddleWidth = 100;
let paddleHeight = 10;
let paddleX = 0;
let paddleY = 0;

function setup() {
  createCanvas(400, 400);
}
```

```
function draw() {
  background(0);

  // Draw ball
  ellipse(ballX, ballY, 20);

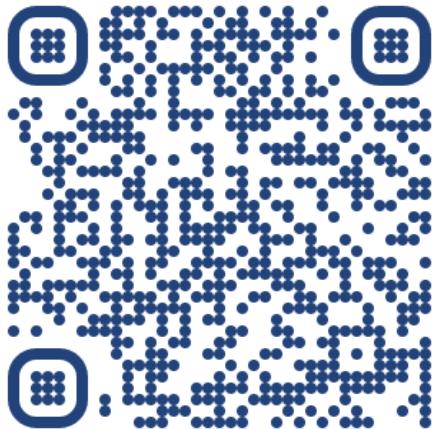
  // Move ball
  ballX += ballSpeedX;
  ballY += ballSpeedY;

  // Bounce off walls
  if (ballX < 0 || ballX > width) {
    ballSpeedX *= -1;
  }
  if (ballY < 0 || ballY > height) {
    ballSpeedY *= -1;
  }

  // Draw paddle
  rect(paddleX, paddleY,
    paddleWidth, paddleHeight);

  // Move paddle with mouse
  paddleX = mouseX - paddleWidth / 2;
}
```

PROMPTs to generate Code



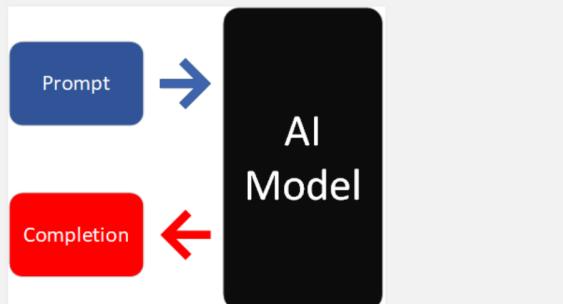
<https://microsoft.github.io/prompt-engineering/>

How to get Codex to produce the code you want!

Have you seen AI models that can generate code for you? Well, if you haven't, you're going to see them a lot more soon thanks to models like [OpenAI's Codex models](#). Codex is a family of AI models from OpenAI that translates between natural language and code in more than a dozen programming languages. The power of these AI models is that you can quickly develop and iterate on your ideas and build products that help people do more. Here is an example how you can have a conversation with a Minecraft character and have it follow your instructions by generating Minecraft API commands behind the scenes.



This article will show you how to get models like Codex to generate code you want using a technique called [Prompt Engineering](#). Prompt engineering is the practice of using *prompts* to get the output you want. A prompt is a sequence of text like a sentence or a block of code. The practice of using prompts to elicit output originates with *people*. Just as you can prompt people with things like a topic for writing an essay, amazingly you can use prompts to elicit an AI model to generate target output based on a task that you have in mind.



```
And give it that comment as a prompt to Codex, it will generate the code for you like this:  
```Python  
def add(a, b):
 return a + b
```
```

So how can you apply the power of models like Codex in your applications? An example like the one above is simple and easy for Codex to generate. For custom applications, you may need to craft the prompt to better describe your problem. This includes giving Codex examples to help tell it what you are looking for. The rest of this article shows you examples and techniques in prompt engineering to help you get the code you want.

Tell It: Guide the Model with a High Level Task

Description

You saw above how you can *tell* Codex what you want and it will generate it. Codex is amazingly capable at generating code. The *quality* of its completions depends a lot on what you tell it to do.

For starters, it is usually a good idea to start your prompt with a high-level description of what you are asking Codex to do. As an example, let's say you want Codex to generate some Python code to plot data from a standard dataset. We could describe our task like this:

```
# Load iris data from scikit-learn datasets and plot the training data.
```

Codex is likely to respond with something like the following. Note that it generates code that assumes the `scikit-learn datasets` package is imported as `datasets`.

```
1 # Load iris data from scikit-learn datasets and plot the training data.  
2 iris = datasets.load_iris()  
3 X = iris.data[:, :2]  
4 y = iris.target  
5  
6 plt.scatter(X[:, 0], X[:, 1], c=y, cmap=plt.cm.Set1, edgecolor='k')  
7 plt.xlabel('Sepal length')  
8 plt.ylabel('Sepal width')  
9  
10 plt.tight_layout()  
11 plt.show()
```

Kan Bing deze taken foutloos uitvoeren??

Stanford University is located in _____, California. [Trivia]

I put ___ fork down on the table. [syntax]

The woman walked across the street, checking for traffic over ___ shoulder. [coreference]

I went to the ocean to see the fish, turtles, seals, and _____. [lexical semantics/topic]

Overall, the value I got from the two hours watching it was the sum total of the popcorn and the drink.

The movie was _____. [sentiment]

Irohwent into the kitchen to make some tea. Standing next to Iroh, Zuko pondered his destiny. Zuko left the _____.

[some reasoning –this is harder]

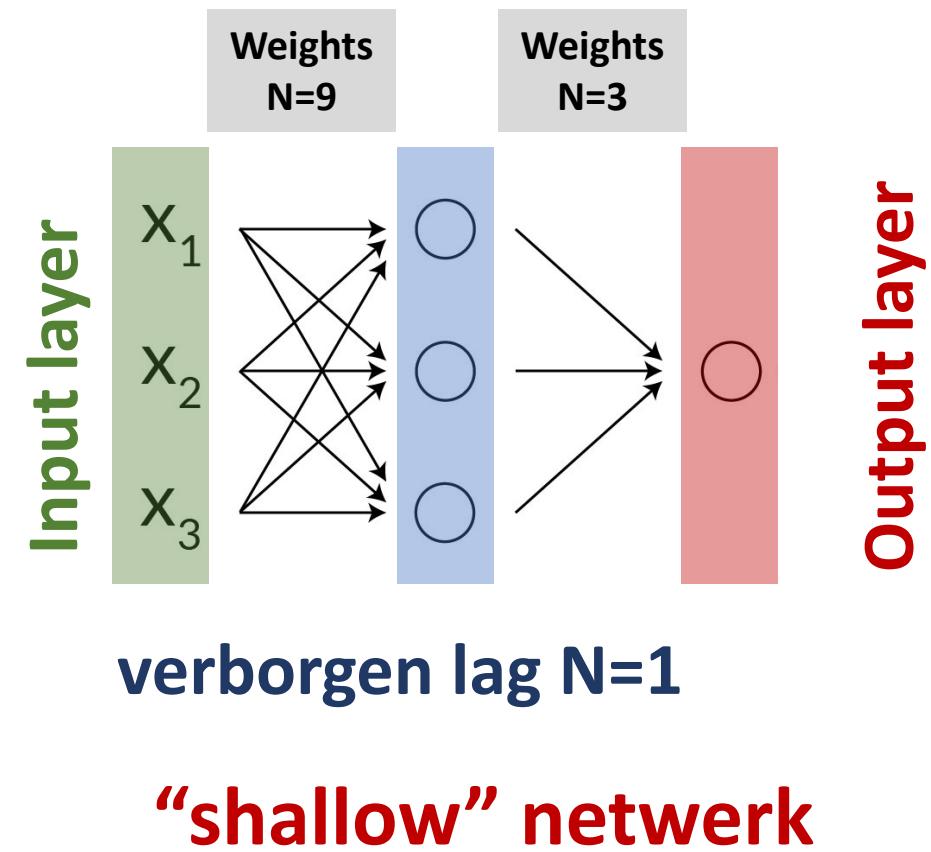
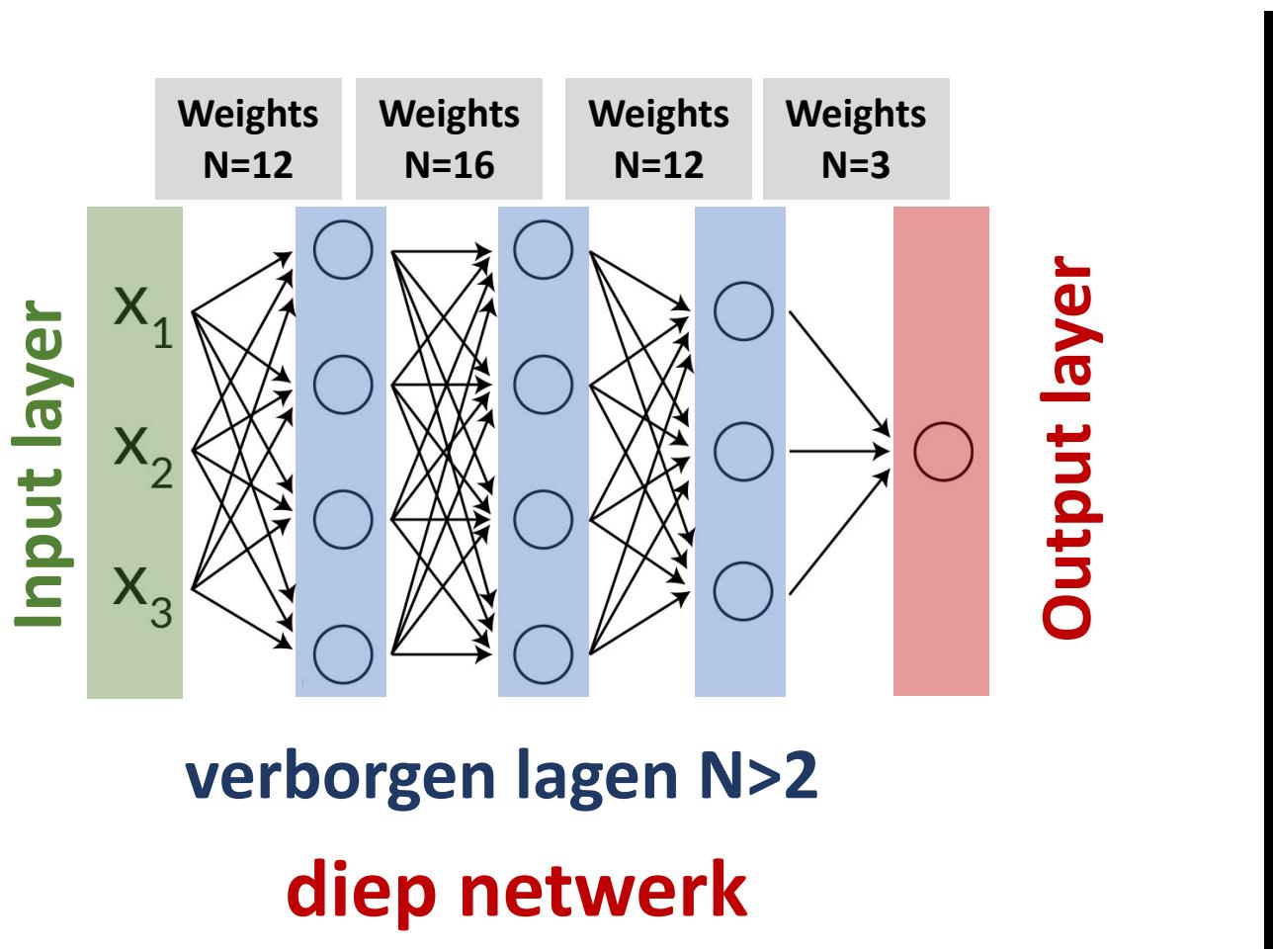
I was thinking about the sequence that goes 1, 1, 2, 3, 5, 8, 13, 21, _____. [some basic arithmetic; they don't learn the Fibonnacisequence]

“Down the Rabbit Hole”

---neuraal netwerk ---

*“Hoe ziet een taalmodel
er vanbinnen uit?”*

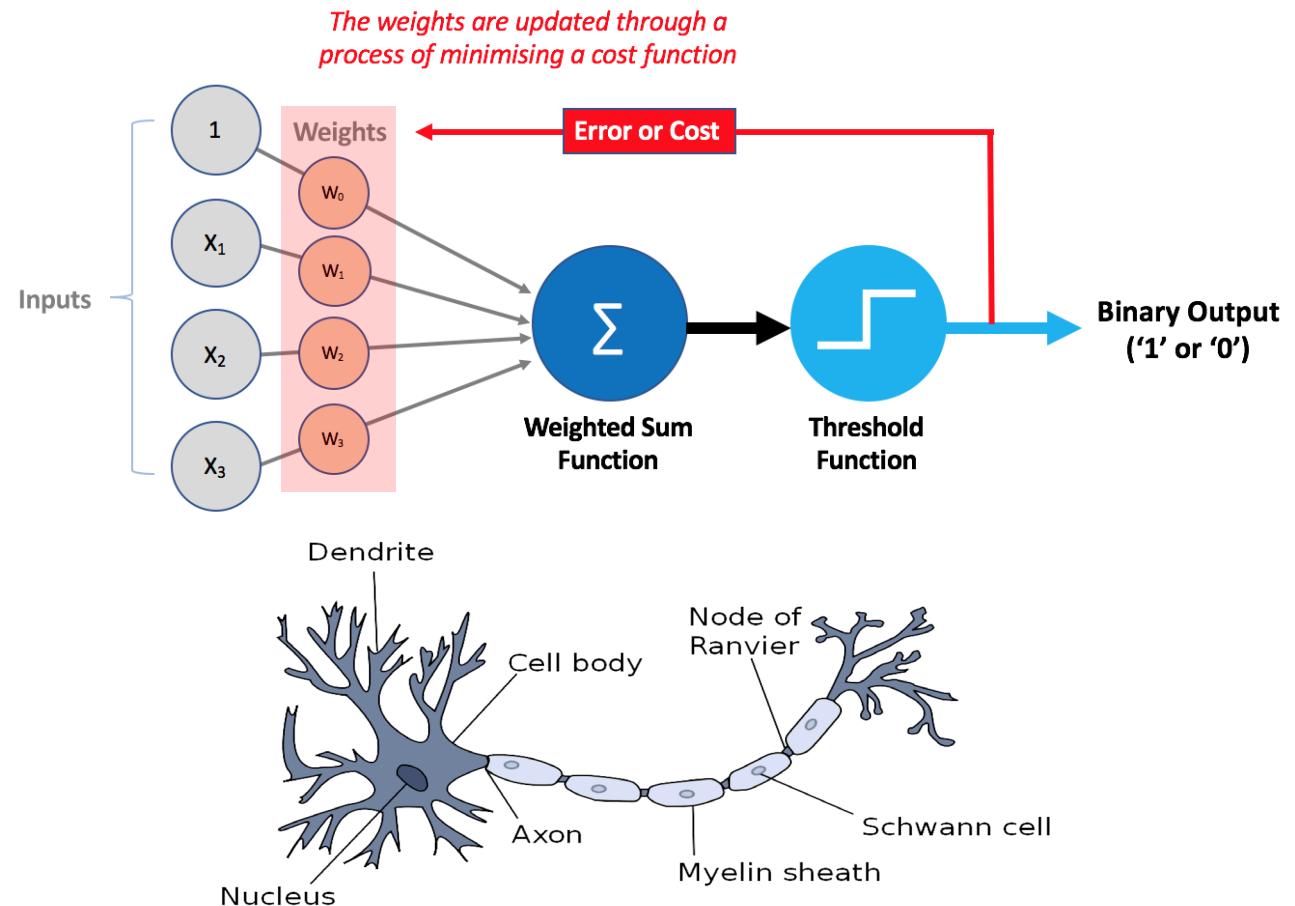
Neuraal Netwerk modellen



Kunstmatige Intelligentie

Names for Artificial Neurons

- {unit}
- {cell}
- {node}
- {perceptron}



Diep neuraal netwerk

What are the limits of deep learning?

The much-ballyhooed artificial intelligence approach boasts impressive feats but still falls short of human brainpower. Researchers are determined to figure out what's missing.

M. Mitchell Waldrop, Science Writer

There's no mistaking the image: It's a banana—a big, ripe, bright-yellow banana. Yet the artificial intelligence (AI) identifies it as a toaster, even though it was trained with the same powerful and oft-publicized deep-learning techniques that have produced a white-hot revolution in driverless cars, speech understanding, and a multitude of other AI applications. That means the AI was shown several thousand photos of bananas, spuds, snails, and similar-looking objects, like so many flash cards, and then drilled on the answers until it had the classification down cold. And yet this advanced system was quite easily confused—all it took was a little day-glow sticker, digitally pasted in one corner of the image.

This example of what deep-learning researchers call an “adversarial attack,” discovered by the Google Brain team in Mountain View, CA (1), highlights just how far AI still has to go before it remotely approaches human capabilities. “I initially thought that adversarial examples were just an annoyance,” says Geoffrey Hinton, a computer scientist at the University of Toronto and one of the pioneers of deep learning. “But I now think they’re probably quite profound. They tell us that we’re doing something wrong.”

That's a widely shared sentiment among AI practitioners, any of whom can easily rattle off a long list of deep learning's drawbacks. In addition to its vulnerability

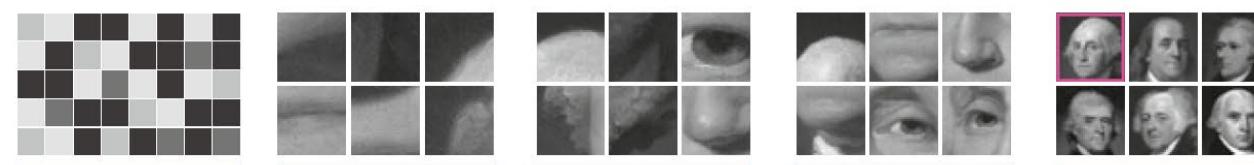
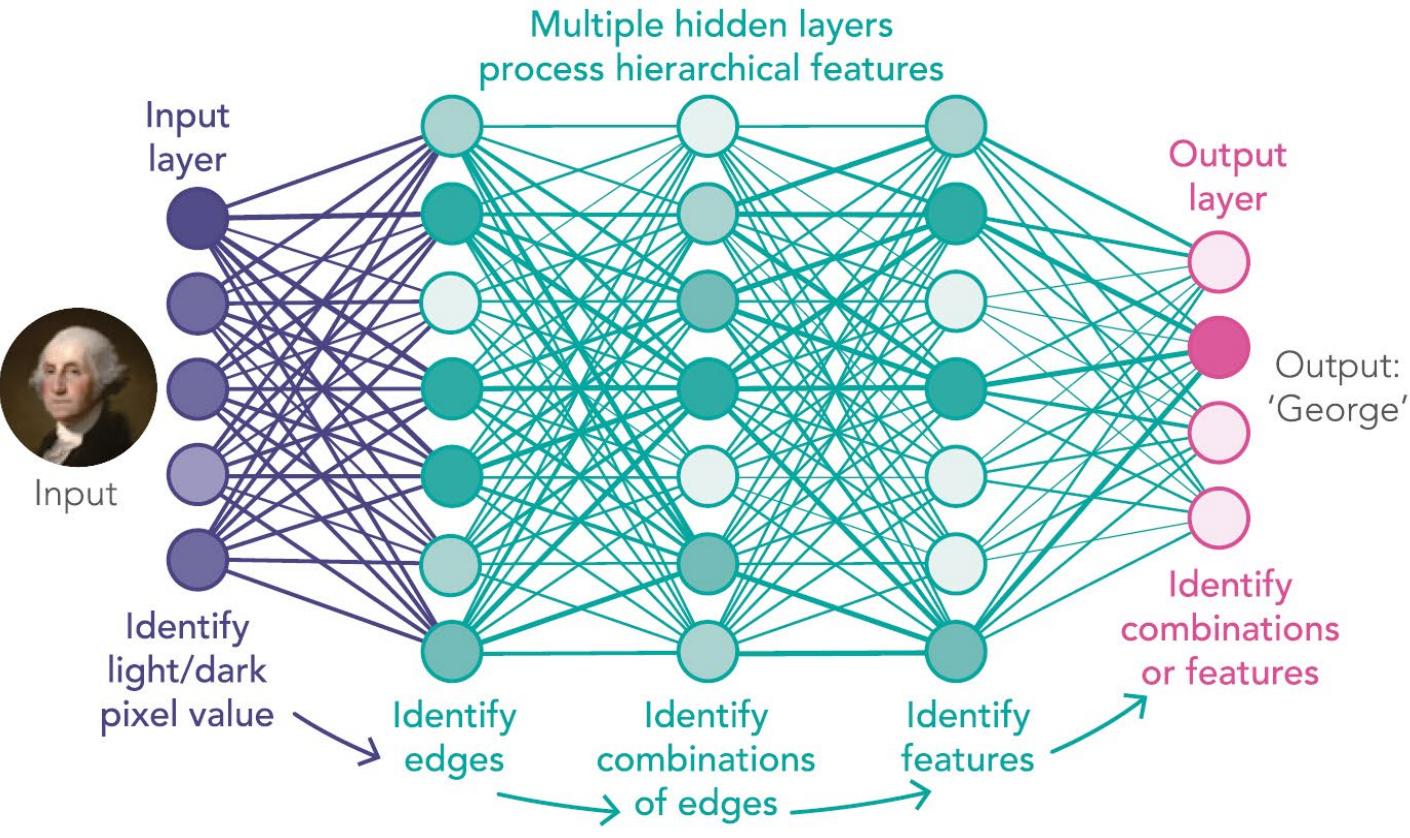


Apparent shortcomings in deep-learning approaches have raised concerns among researchers and the general public about technologies such as driverless cars, which use deep-learning techniques to navigate, get involved in well-publicized mishaps. Image credit: Shutterstock.com/MONOPOQIY919.

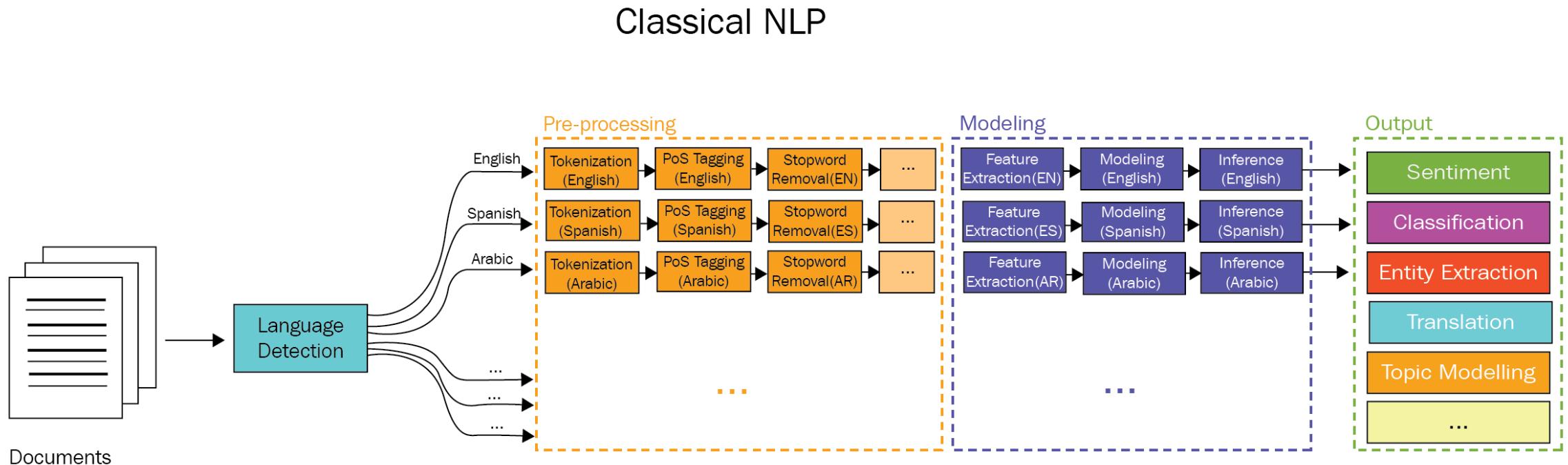
Published under the RNAS license

January 23, 2019 | Vol. 116 | No. 4

<http://www.pnas.org/cgi/doi/10.1073/pnas.1821584114>

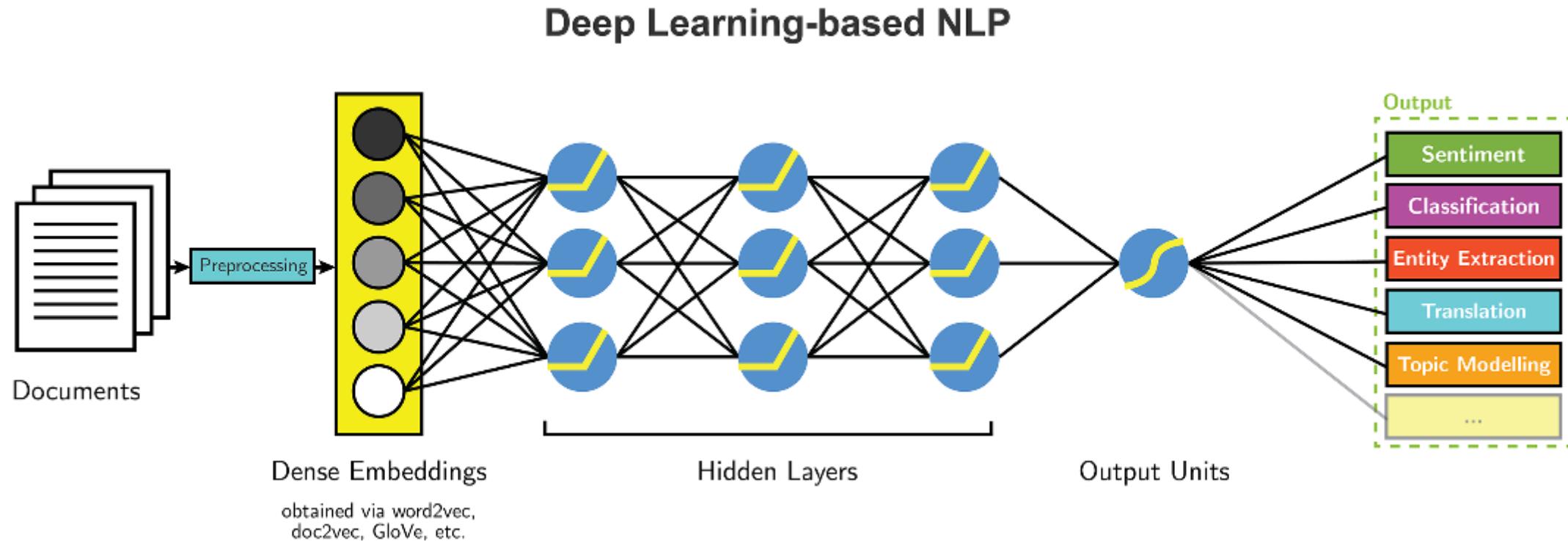


Diep neuraal netwerk



<https://www.oreilly.com/library/view/python-natural-language/9781787121423/6f015f49-58e9-4dd1-8045-b11e7f8bf2c8.xhtml>

Diep neuraal netwerk



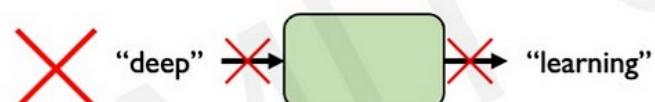
<https://www.oreilly.com/library/view/python-natural-language/9781787121423/6f015f49-58e9-4dd1-8045-b11e7f8bf2c8.xhtml>

ChatGPT

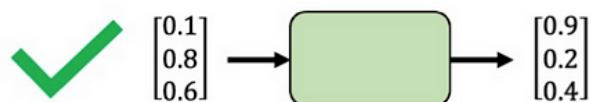
*--- [Autoregressive {AR}] Generative Pre-trained
[neural network] Transformer---*

een heel groot diep neuraal netwerk
begrijpen (NLU) + generatie (NLG) taalmodel

Kunstmatige Intelligentie



Neural networks cannot interpret words



Neural networks require numerical inputs



I want to break free



| | | |
|------|-----|-----------------------------|
| I | → | [0.004, -0.05, ..., 0.3] |
| Want | → | [-0.1, -0.0072, ..., 0.12] |
| ... | ... | ... |
| Free | → | [0.023, 0.31, ..., -0.1606] |

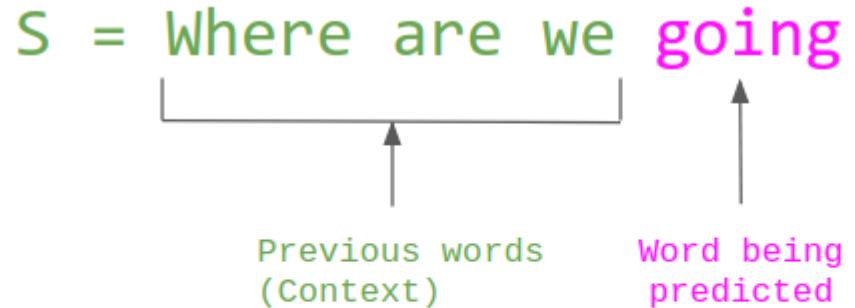
<https://medium.com/mlearning-ai/explain-it-to-me-like-a-5-year-old-deep-sequence-modeling-introduction-to-recurrent-neural-beb2ee02bc6c>



<https://medium.com/@alousabdo/what-are-ai-language-models-and-how-are-they-being-used-f1bf06f8ae80>

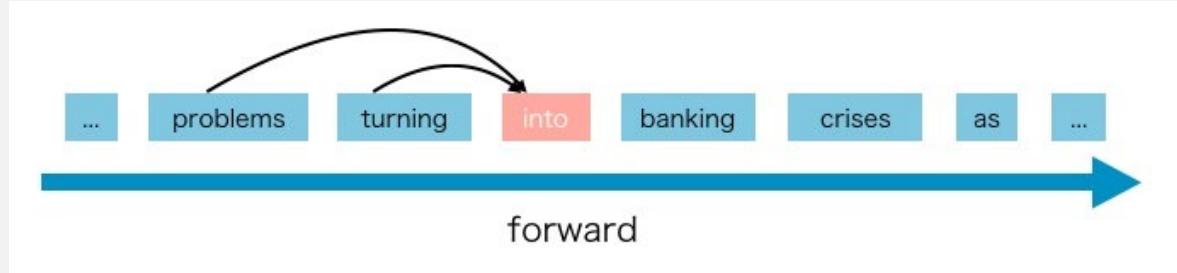
AutoRegression [AR]

Autoregressie is het proces waarbij één token per keer wordt gegenereerd, waarbij elke token geconditioneerd is op de eerder gegenereerde tokens



$$P(S) = P(\text{Where}) \times P(\text{are} \mid \text{Where}) \times P(\text{we} \mid \text{Where are}) \times P(\text{going} \mid \text{Where are we})$$

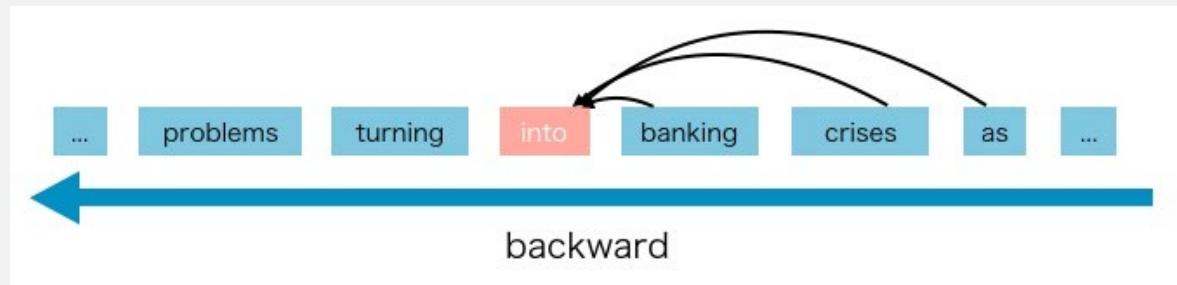
AutoRegression [AR]



[https://aman.ai/primers
/ai/autoregressive-vs-
autoencoder-models/](https://aman.ai/primers/ai/autoregressive-vs-autoencoder-models/)

PROS:

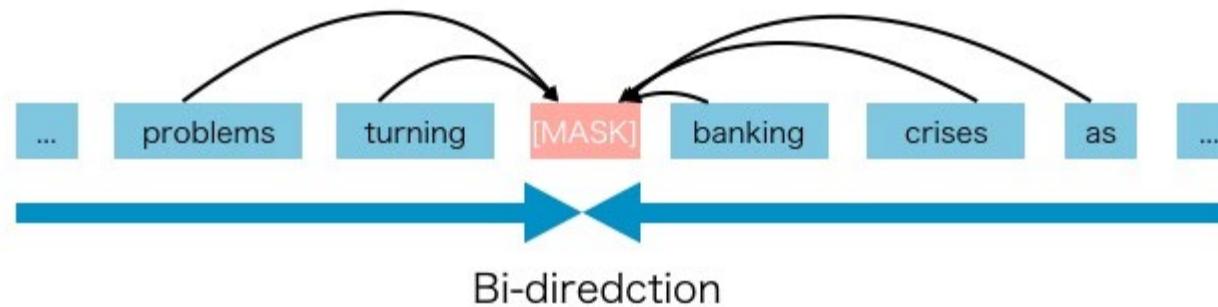
AR language models are good at generative NLP tasks. Since AR models utilize causal attention to predict the next token, they are naturally applicable for generating content. The other advantage of AR models is that generating data for them is relatively easy, since you can simply have the training objective be to predict the next token in a given corpus.



CONS:

AR language models have some disadvantages, it only can use forward context or backward context, which means it can't use bidirectional context at the same time.

Autoencoder/Encoder [EA]



Given the input token sequence, a certain portion of tokens are replaced by a special symbol [MASK], and the model is trained to recover the original tokens from the corrupted version.

The AE language model aims to reconstruct the original data from corrupted input.



*“grote”
taalmodellen*

Hoe groot is Large?

Huge “foundation models” are turbo-charging AI progress
They can have abilities their creators did not foresee

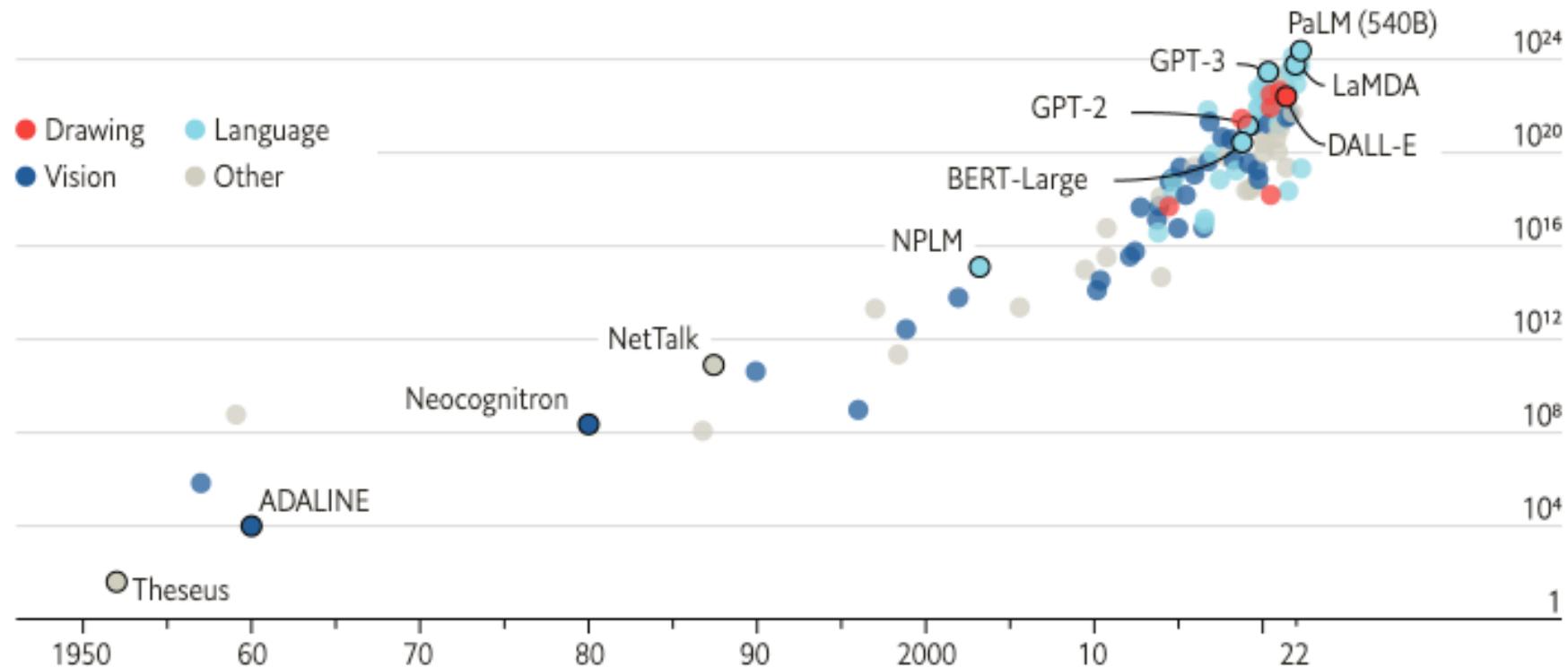
The economist
Jun 11th 2022



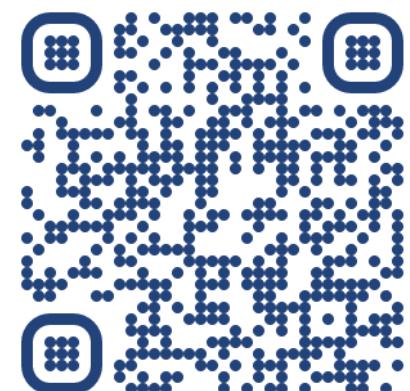
The blessings of scale

AI training runs, estimated computing resources used

Floating-point operations, selected systems, by type, log scale



Sources: "Compute trends across three eras of machine learning", by J. Sevilla et al., arXiv, 2022; Our World in Data

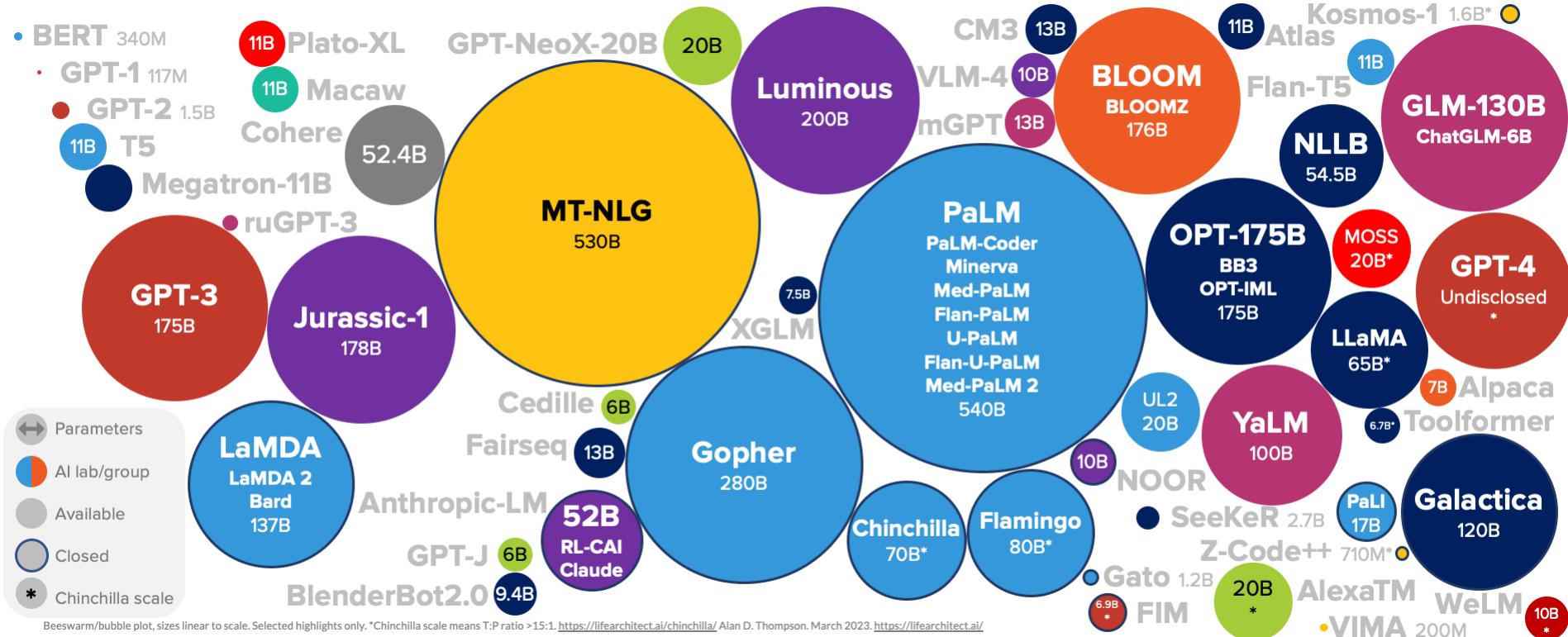


Large Language Models: Het LLM-Landschap

Large Language Models: Het LLM-Landschap



<https://s10251.pcdn.co/pdf/2023-Alan-D-Thompson-AI-Bubbles-Rev-7b.pdf>

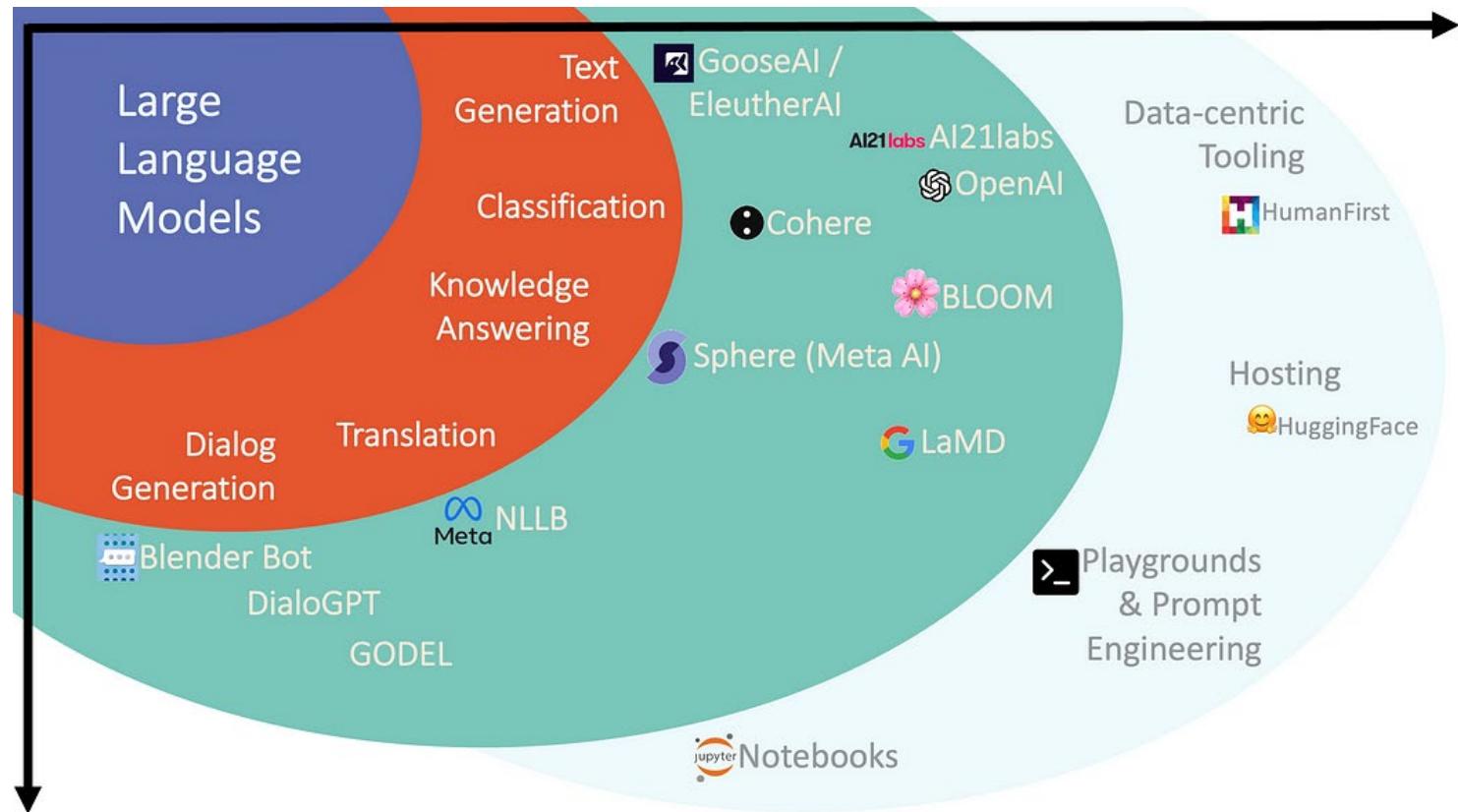


<https://docs.google.com/spreadsheets/d/105KVQW1Hx5Akcg8AIRjbQLQzx2wVaLl0SqUu-ir9Fs/edit#gid=1158069878>



<https://huggingface.co/spaces/adt/models-table>

Large Language Models: Het LLM-Landschap



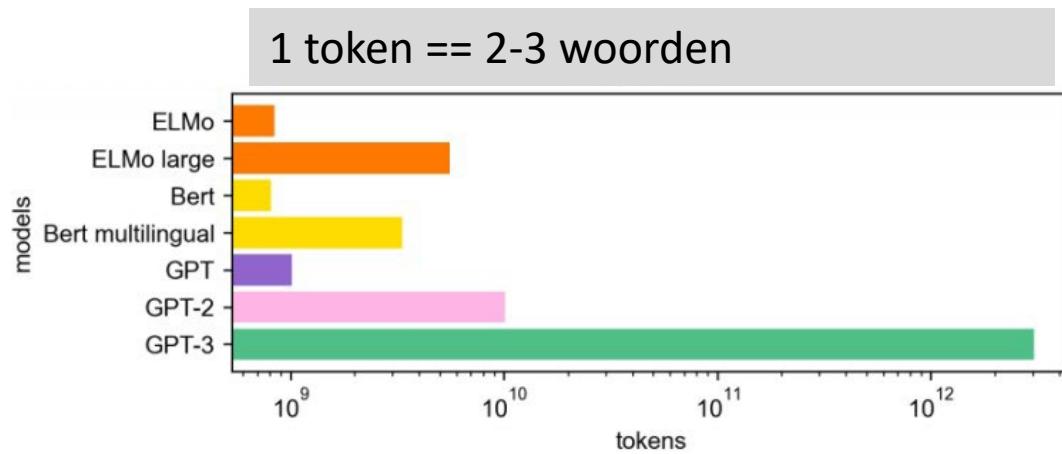
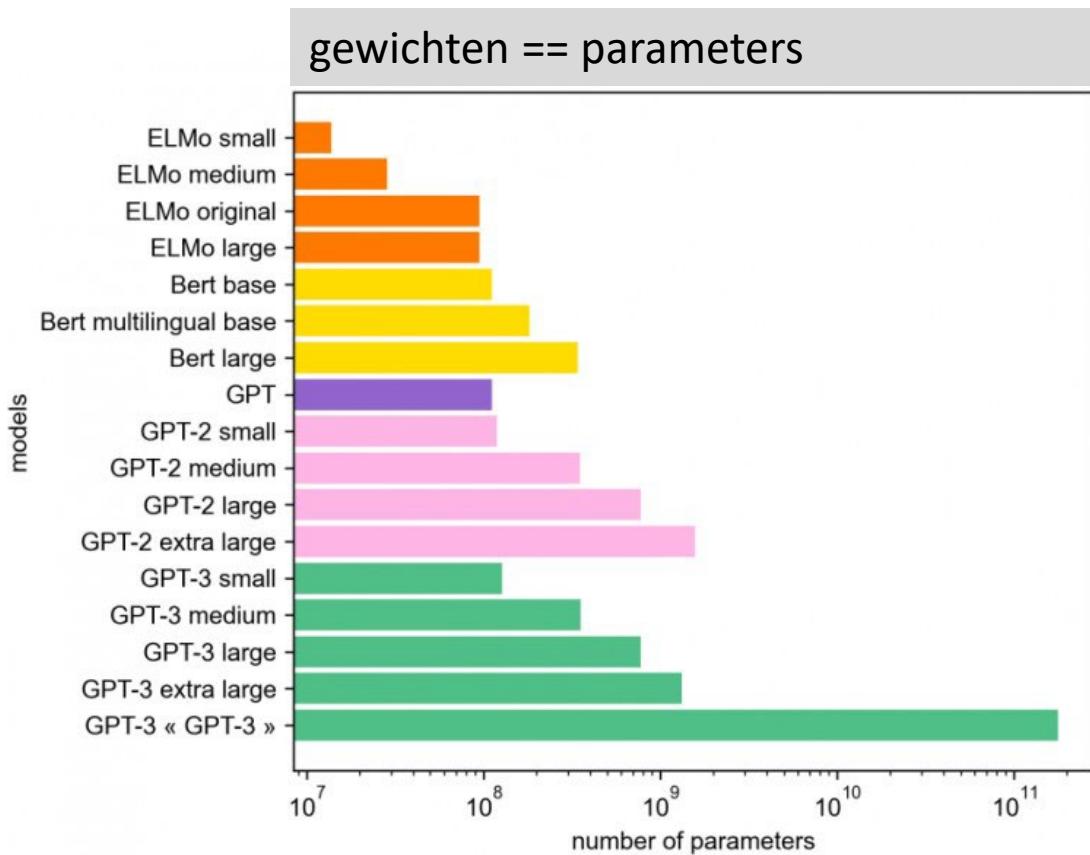
<https://cobusgreiling.medium.com/the-large-language-model-landscape-9da7ee17710b>



HOGESCHOOL
ROTTERDAM

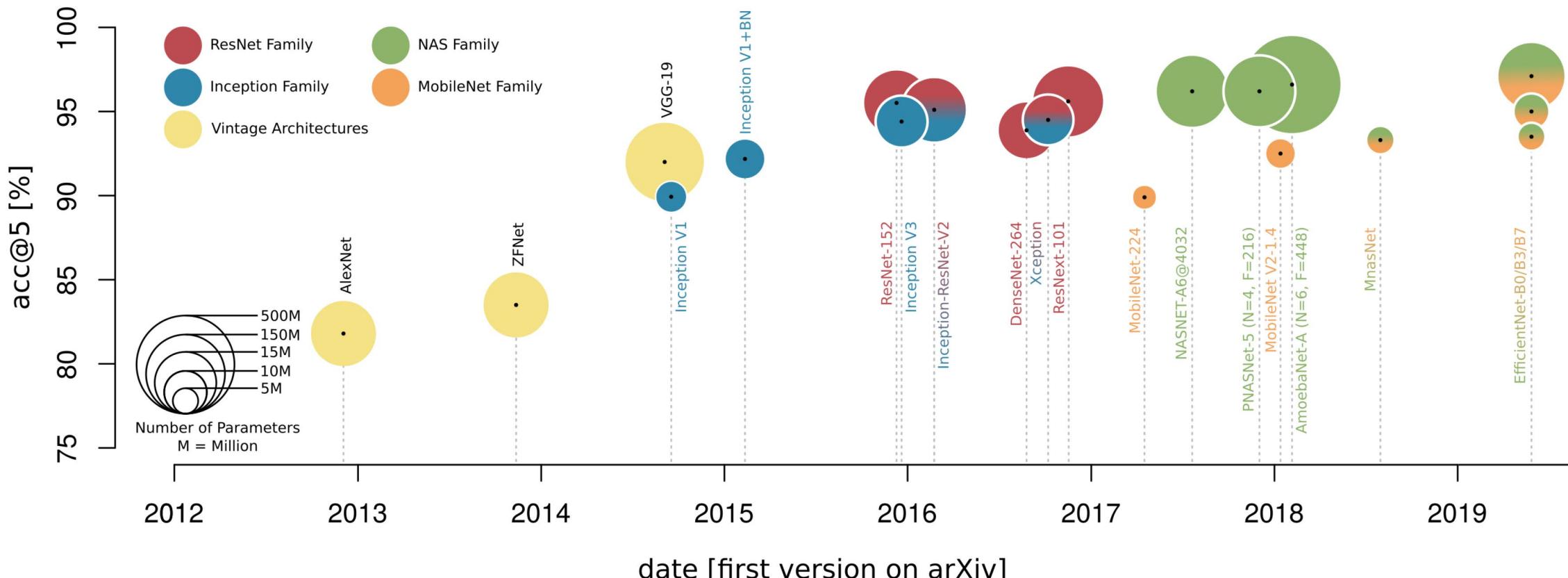
*“waarom zo
groot?”*

Grote training datasets vereist meer gewichten



[https://hellofuture.orange.com/
en/the-gpt-3-language-model-
revolution-or-evolution/](https://hellofuture.orange.com/en/the-gpt-3-language-model-revolution-or-evolution/)

Betrouwbaarheid neemt toe door meer gewichten



How to calculate the number of learnable parameters?

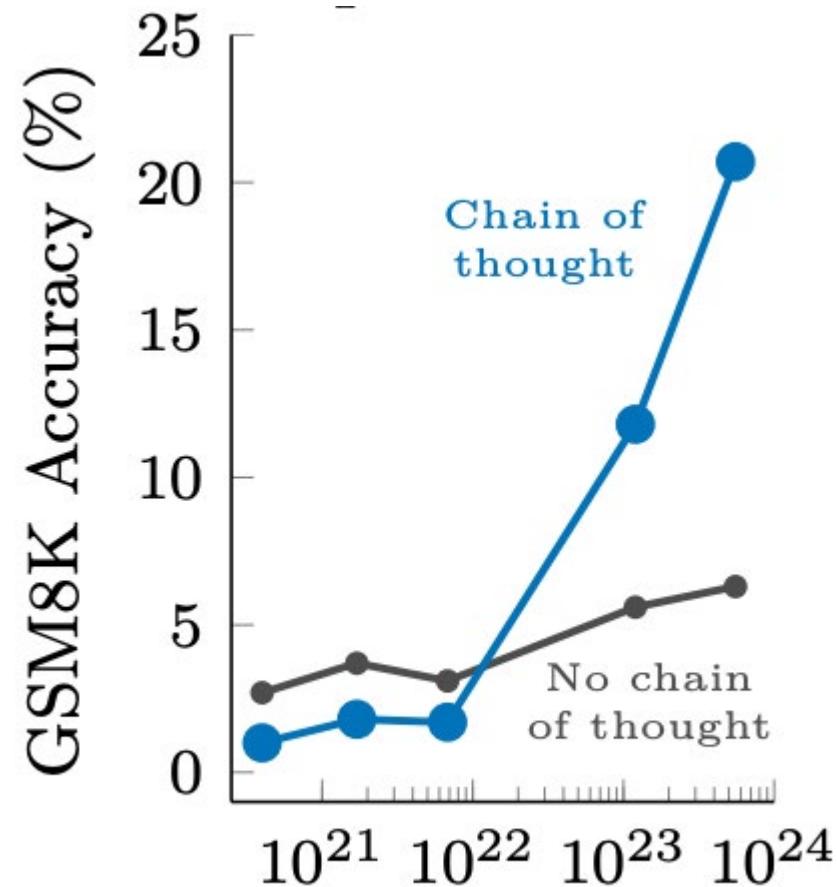
<https://doi.org/10.3390/rs12101667>

Emergente Eigenschaften

Researchers have discovered that GPT-style models have developed “emergent abilities”, like super-powers in arithmetic calculations, that were absent in smaller models.



<https://medium.com/@arushi.prakash307/gpt-style-models-are-unexpectedly-developing-super-powers-4df002186a75>





HOGESCHOOL ROTTERDAM

overtref jezelf

Who AM I ?

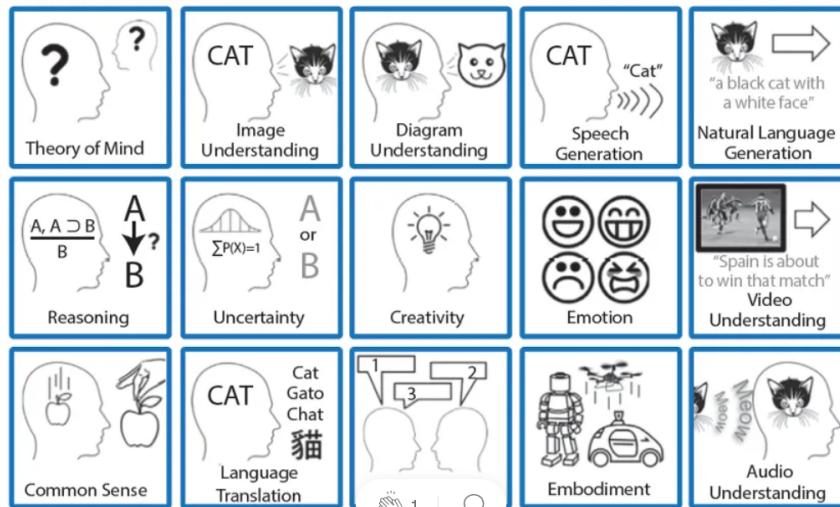


Serengeti Plains. By [Kristin Moger](#)

The World-Wide-Web AI-Safari

Artificial Intelligence: a Human Centred View

AI aims to **mimic & automatise** tasks which otherwise require human perception, cognition and/or motor skills – e.g. pattern recognition, learning, logical reasoning & planning, decision making, problem solving, designing, creativity, likelihood estimation, language acquisition, multi-sensory interfacing, actuated body movement control, locomotion & manipulation, sentiment analysis, and generalisation (see refs [1]...[3]).



RobFvdW

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Who AM I ?



Hogeschool Rotterdam | HR · Instituut voor Communicatie, Media en Informatietechnologie (CMI)
PhD

About

Publications (48)

Network

Projects (8)

Contact

About

48

Publications

83,070

Reads ⓘ

685

Citations

Introduction

Binnen het Creating-010 onderzoeksthema Design in the 21st Century onderzoeken we de valorisatie van Machinaal Lerende (ML) Neurale-Netwerk (NN) algoritmen. De uitkomsten ervan moeten het ontwerp van Human-Centred (HC) data-producten mogelijk maken binnen toepassingsdomeinen zoals Smart & Social City, Zorg-Tech, Smart Logistics & Maritime Innovation. <https://robfvdw.medium.com>

Skills and Expertise

- (Brain)
- (Animal Behavior)
- (Neural Networks)
- (Ethology)
- (Biophysics)
- (Data Science)
- (Data Visualization)
- (Behavioral Analysis)
- (Behavioral Neuroscience)
- (Machine Learning)

Publications

Publications (48)

Designing Neural Networks Through Sensory Ecology "Biology to the rescue of AI"

Produced by Living-Lab: AiRA, Hub voor Data & Responsible AI, Hogeschool Rotterdam

Lunch-Lezing Creating-010 FEB 2022

atietechnologie (CMI) > Robert Frans van der Willigen

Current institution

Hogeschool Rotterdam

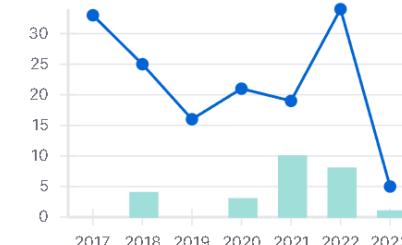


Instituut voor Communicatie, ...

Current position
Data Scientist

Citations since 2017

26 Research Items 153 Citations



[Learn about citations on ResearchGate](#)

Co-authors

Top co-authors



Who AM I ?



Rob

robvdw

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Hogeschool Rotterdam

Netherlands

https://www.researchgate.net/profile/Roberto_Van_Der_Willigen

Highlights

PRO

Organizations



Repositories 15 Projects Packages

Psignifit-MEX Public

Mex files for Matlab 2010b on Win64 / Mac OS X 10.6.7

1 star

1,619 contributions in the last year



Learn how we count contributions

2023

2022

2021

Contribution activity

March 2023

Created 391 commits in 3 repositories

HR-ChatGPT/ChatGPT-UITGELEGD 381 commits

HR-ChatGPT/chatgpt.uitgelegd 8 commits

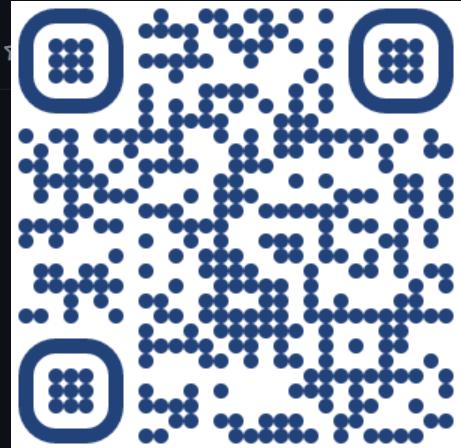
HR-Data-Supported-Healthcare/Corpora-that-Support-Clinical-Reasoning 2 commits

Joined the Hogeschool Rotterdam organization



Hogeschool Rotterdam

De wildgroei aan gezondheidsdossiers heeft een overvloed aan klinisch tekst opgeleverd die vaak onbenut blijft. AI in de vorm van NLP kan uitkomst bieden.



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Contribution settings ▾

