



Les 04

# Demystifying AI in the classroom

**“ChatGPT &  
Prompt Engineering”**



“AI & Ethiek  
*Hogeschool Rotterdam*”



## ChatGPT en taalmodellen



ChatGPT is een taalmodel dat op basis van prompts, geschreven input, een antwoord genereert in de vorm van geschreven teksten. Het gebruik van deze vorm van kunstmatige intelligentie neemt ook onder studenten én medewerkers toe.

Vanzelfsprekend roept dit vragen op. Wat is correct én incorrect gebruik? Hoe beoordeel je een student die een taalmodel gebruikt voor een opdracht? En wat te doen wanneer er sprake is van fraude door onjuist gebruik van een taalmodel? Op deze pagina lees je hier meer over.

Ontwikkelingen rondom kunstmatige intelligentie, waaronder taalmodellen als ChatGPT, volgen elkaar snel op. De informatie en richtlijnen op deze pagina worden daarom regelmatig geactualiseerd. Heb je vragen over? Mail dan naar [toetsen@hr.nl](mailto:toetsen@hr.nl)

Wil je meer weten over het taalmodel achter ChatGPT? [Hier](#) vind je meer informatie.

[Bekijk het stroomschema ChatGPT en Toetsing](#)

[Stroomschema ChatGPT >](#)

## Veelgestelde vragen over ChatGPT en taalmodellen

Wanneer mag een student wel én niet ChatGPT gebruiken?

Dit kan je snel beoordelen aan de hand van [het stroomschema ChatGPT en Toetsing](#).

ChatGPT als schrijfhulp

**Over het stroomschema**

ChatGPT voor inhoudelijke input

Het stroomschema begint bij de beschrijving van de opdracht, kijkt naar hoe ChatGPT is ingezet door een student, en komt uit bij het oordeel 'toegestaan' of 'niet toegestaan'. Het schema is geschreven voor ChatGPT, maar is ook van toepassing op andere taalmodellen.

Hoe weet ik of mijn student ChatGPT gebruikt?

Wil je meer weten over taalmodellen, de beperkingen en ethische dilemma's bij het gebruik? Lees dan de [onderbouwing bij dit stroomschema](#).

Hoe vermeld je het gebruik van ChatGPT in opdrachten?

<https://hint.hr.nl/nl/HR/Over-de-HR/Kwaliteit-en-onderwijs/chatgpt/?ticket=ST-1671563-7punmybYLWGLJ3yjav3yRI7iVdTel0nYg6R-20>

<a href="#">WORKSHOPS</a>	Update Workshop-ChatGPT-DIGITAL_TEACHER_FINsec.pdf	last month
<a href="#">.DS_Store</a>	TECNinf	2 months ago
<a href="#">CHATGPT_HR-UITGELEGD.pdf</a>	Create CHATGPT_HR-UITGELEGD.pdf	3 months ago
<a href="#">CODE_OF_CONDUCT.md</a>	Create CODE_OF_CONDUCT.md	5 months ago
<a href="#">ChatGPT-UITGELEGD_V17.pdf</a>	Create ChatGPT-UITGELEGD_V17.pdf	3 months ago
<a href="#">GPT2-GPT3.png</a>	GPT2-GPT3	4 months ago
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<a href="#">QR-code-ChatGPT-UITGELEGD.png</a>	Create QR-code-ChatGPT-UITGELEGD.png	2 months ago
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<a href="#">QR_CODE_CHATGPT_HR-UITGELEGD....</a>	QR	4 months ago
<a href="#">README.md</a>	Update README.md	2 months ago
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<a href="#">scaling-delusion.jpg</a>	Update scaling-delusion.jpg	4 months ago

## ChatGPT - UITGELEGD voor het hoger onderwijs

### Context & Doelen

#### Leer hoe ChatGPT betrouwbaar te gebruiken

1. Begrijpen wat ChatGPT wel en niet kan
2. Ethische overwegingen bediscussiëren
3. Effectieve prompts schrijven
4. Vervolgvragen schrijven
5. Waarschuwing betrouwbaarheid



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



- [0] Waarom veroorzaakt ChatGPT zoveel onrust?
- [0a] Wat is generatieve kunstmatige intelligentie [Gen-AI]?
- [0b] Is er een kort overzicht van ChatGPT's tekortkomingen?
- [0c] +Moet ik me zorgen maken over ChatGPT technologie?
  
- [0d] +Is er een ChatGPT "code-of-conduct" en/of richtlijn voor hbo docenten?
- [0e] +Kan ChatGPT benut worden als beoordelingsinstrument?
- [0f] +Voldoen Gen-AI ---zoals ChatGPT--- aan Europese AI-Regelgeving?
- [0g] +Hoe FAIR zijn Gen-AI ---zoals ChatGPT--- eigenlijk?
- [0h] +Hoe verschilt chatGPT van "Auto-GPT"?
  
- [1a] Wat moet je weten over ChatGPT en wat kant deze "chatBot"?
- [1b] Wat zijn de functionele mogelijkheden & ---Cyber Security--- beperkingen van ChatGPT?
- [1c] Wat zijn ethische risico's & schaduwkanten van ChatGPT?
- [1d] Maakt ChatGPT "valsspelen" makkelijker en is het te detecteren?
- [1e] Kun je ChatGPT opvoeren als co-auteur?
- [1f] +Kun je ChatGPT citeren als bron?
- [1g] +Wat is Lexicale Tokenisering? / Wat zijn tokens?
- [1h] + Hoe schrijf je een effectief prompt-recept?
- [1i] + Waar vindt ik ChatGPT workshops/cursussen voor hbo docenten?
  
- [2] Hoe geef je een opdracht aan ChatGPT?
- [3] Kan ChatGPT uitleggen hoe het werkt?
- [4] Kan ChatGPT uitleggen hoe het te gebruiken?
- [5] Heeft ChatGPT taalbegrip?
- [6] Kan ChatGPT logisch redeneren?
- [7a] +Kan ChatGPT broncode schrijven?
- [7b] Kan ChatGPT broncode uitleggen?
- [7c] Kan ChatGPT broncode output simuleren?
- [7d] Kan ChatGPT een "Deep Learning" lessenreeks bedenken?
- [7e] Kan ChatGPT broncode beoordelen en/of fouten opsporen?
- [8a] Kan ChatGPT gebruikt worden om bronnen te vermelden?
- [8b] Kan ChatGPT gebruikt worden om bronnen samen te vatten?
- [13] Kun je spreken tegen ChatGPT?
- [15] Prompt "pattern engineering" voorbeelden
- [16] Geraadpleegde Bronnen

## faqs

Overzicht van veel gestelde vragen [ChatGPT FACs]



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

# Dealing with Risks & Fraud

## **Relevante Bronnen:**

<https://edusupport.rug.nl/2429583561>

<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#1c-wat-zijn-ethische-risicos--schaduwkanten-van-chatgpt>

<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#1d-staat-het-gebruik-van-chatgpt-gelijk-aan-valsspelen-en-is-het-te-detecteren>

<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#0d-is-er-een-chatgpt-code-of-conduct-enof-richtlijn-voor-hbo-docenten>

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

<https://citt.ufl.edu/services/learning-innovation--technology/artificial-intelligence/chatgpt/>

<https://www.google.com/search?q=Policies+Related+to+ChatGPT+and+Other+AI+Tools&oq=Policies+Related+to+ChatGPT+and+Other+AI+Tools&aq=s=chrome..69i57.1102j0j1&sourceid=chrome&amp;ie=UTF-8>



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ROTTERDAM

# Wat moetje weten over ChatGPT ?

*Kans of bedreiging?*



Tech-lead  
Rob van der Willigen

## PROGRAMMA OVERZICHT

09:00 – 10.00 uur \_\_\_\_\_

Pauze

10:15 – 11.30 uur \_\_\_\_\_

Pauze

12.00 -13.00 uur \_\_\_\_\_

Welkom

Toegang krijgen tot Bing + ChatGPT

Uitleg hoe werkt **Prompting**

2 ChatGPT prompt voorbeelden uitwerken

door 2 groepen + kort presenteren

[**Use Case ISO handleiding; module jaar 1**]

Course development / Ontwikkelopdracht

Proof-of Concept:

Vanuit een ontwerp opdracht {blauwdruk}

module sociale kwaliteit in de stad

m.b.v. **Prompt Engineering**

te komen tot een **Minimal Viable Product {MVP}**

dat binnen een week door

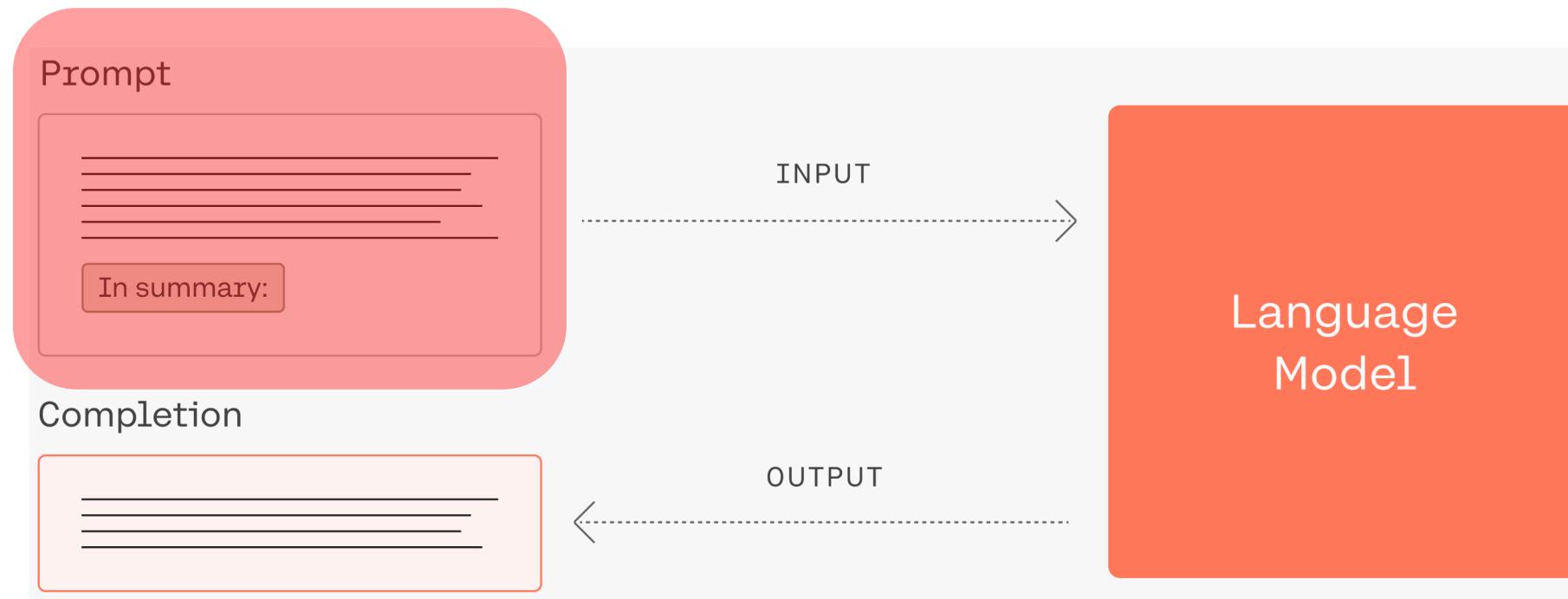
een team van onderwijsontwerpers en docenten

tot een volwaardig product {docenten cursushandleiding}

kan worden uitgewerkt.

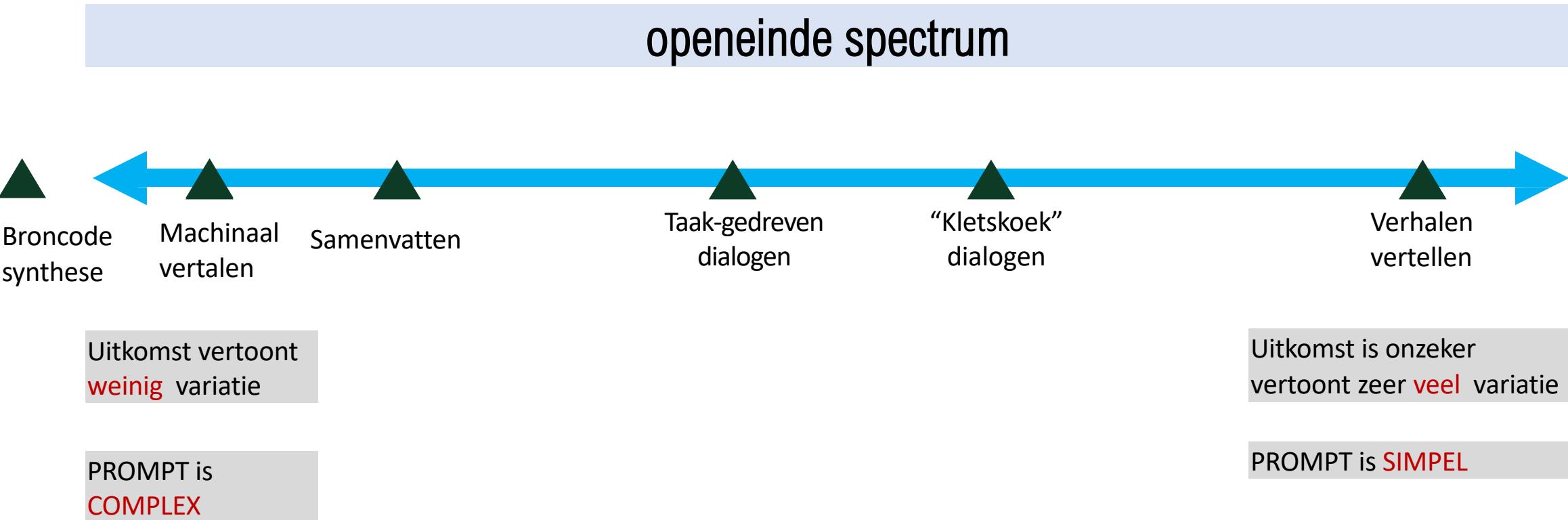
*“Get started  
with writing  
Prompts”*

# *Conversationele AI-agenten zoals ChatGP worden aangestuurd via "prompts"*

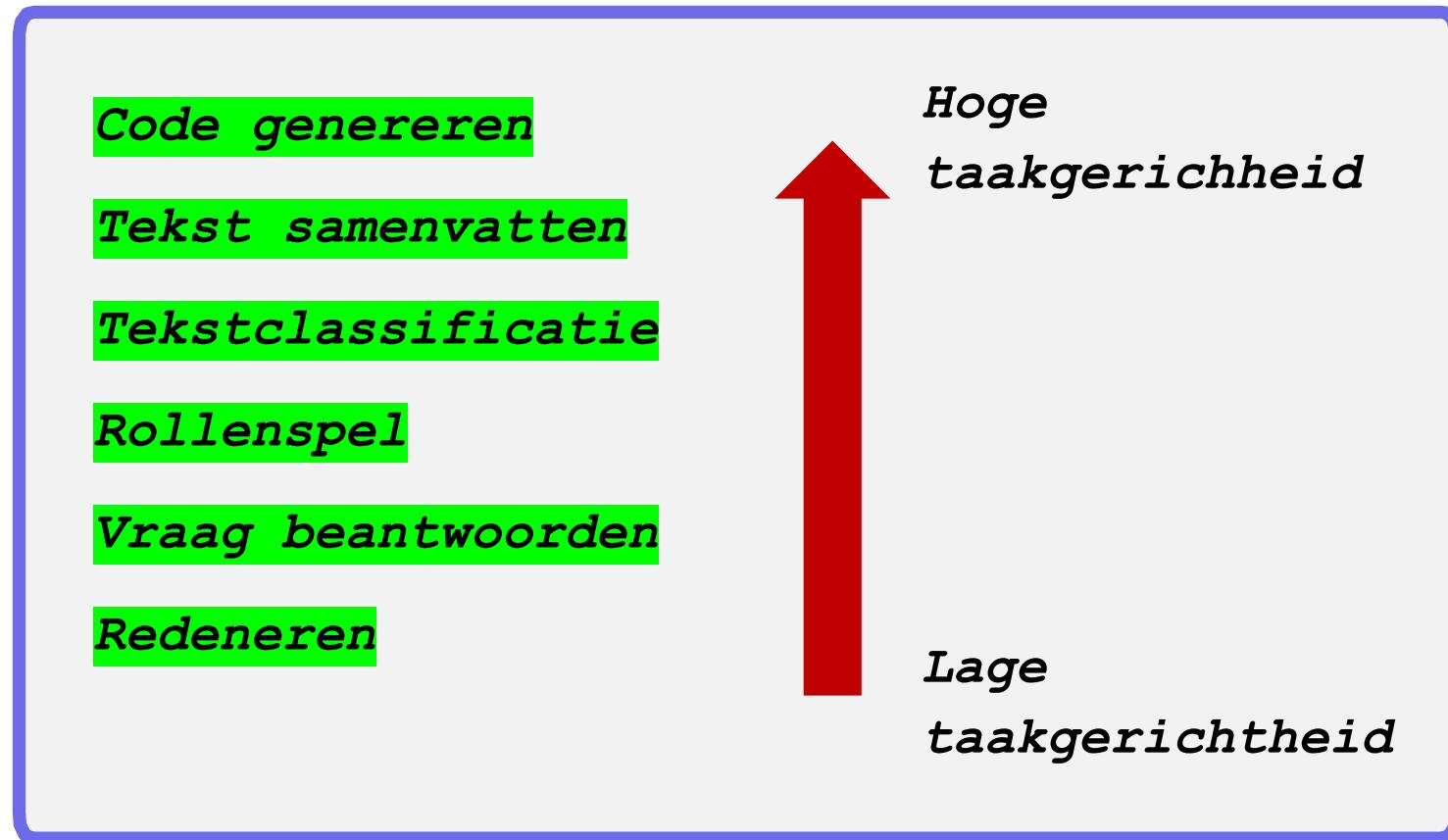


<https://docs.cohere.com/docs/introduction-to-large-language-models>

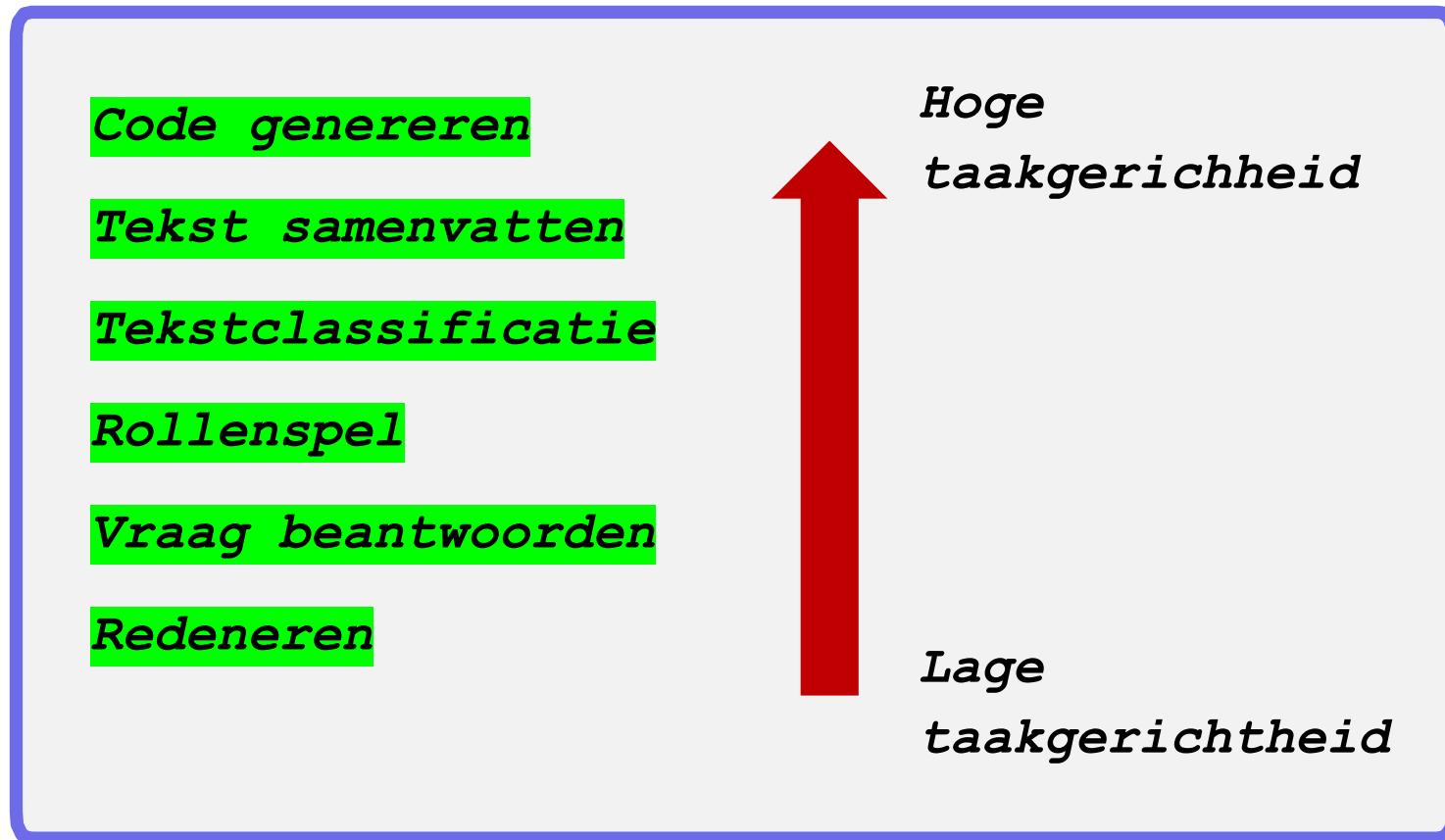
# Prompt Taxonomie



# Taakgerichtheid van prompts



# Taakgerichtheid van prompts



# Ask BING

++++++

*Ask Bing to:*

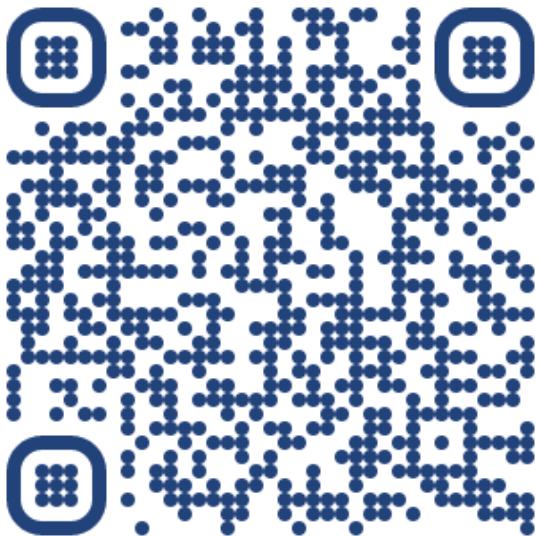
*Provide me with a prompt that I can use in ChatGPT to answer the following question: What are data products and how is it related to AI?*

*This prompt should also provide at least 5 review-papers that are published no later than 2017.*

++++++

<https://chat.openai.com/share/b098e03f-c528-4075-b35e-c0be455e1019>

# 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. Below this, the main heading is "Introducing the new Bing" with the subtext "Ask real questions. Get complete answers. Chat and create." A green checkmark icon followed by the text "You're in! Welcome to the new Bing!" is displayed. Below it, a button says "Open in Microsoft Edge". 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 logo and "MICROSOFT / TECH" are visible. The Verge logo is also present. A headline reads: "You can play with Microsoft's Bing GPT-4 chatbot right now, no waitlist necessary". A small image of a person's head is shown, and a caption states: "Microsoft opens up access to Bing Chat just a day before it plans to detail AI-powered features in Office apps."



[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)



Choose a conversation style Preview

More Creative

More Balanced

More Precise

Give me an example of a prompt for ChatGPT to generate and outline a course on Social Work should be designed for students who are interested in pursuing a career in social work and should provide them with the knowledge and skills necessary to succeed in the field

Searching for: example of a prompt for ChatGPT to generate and outline a course on Social Work

Generating answers for you...

Here is an example of a prompt for ChatGPT to generate and outline a course on Social Work:

"Design a course on Social Work that should be designed for students who are interested in pursuing a career in social work and should provide them with the knowledge and skills necessary to succeed in the field. The course should cover topics such as social welfare policy, human behavior and the social environment, research methods, social work practice, and field education."

I hope this helps! Let me know if you have any other questions.

Learn more:

1. [marble.so](https://www.marble.so)

2. [scribbr.com](https://www.scribbr.com)

+1 more

1 of 30

# Answer BING

++++++

*Here is a prompt that you can use in ChatGPT to answer your question:*

*Q: What are data products and how is it related to AI?*

*A: Data products are the output of data processing pipelines that transform raw data into a form that can be used for analysis or decision-making. They are used in various fields such as finance, healthcare, and marketing. AI is related to data products because it can be used to automate the process of creating data products by using machine learning algorithms to identify patterns in large datasets. Here are some review papers that you can use as references:*

1. "Artificial intelligence and innovation management: A review, framework ..." <sup>1</sup>
2. "Artificial intelligence in marketing: Systematic review and future ..." <sup>2</sup>
3. "Creating and detecting fake reviews of online products" <sup>3</sup>
4. "Artificial intelligence in healthcare: past, present and future" <sup>4</sup>
5. "AI and International Trade"

++++++

# *Hoe krijg je toegang tot ChatGPT?*

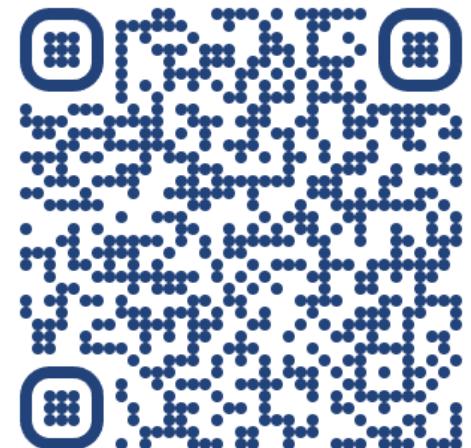


[https://platform.openai.com/  
signup?launch](https://platform.openai.com/signup?launch)

## **Chat GPT gebruiken: zo praat je met de slimme chatbot**

Door [Ward Edema](#) · 15 juni 2023 11:00 · ⓘ 7 min. leestijd 88

Wil je graag Chat GPT gebruiken? Wij leggen je stap voor stap uit hoe de slimme chatbot werkt – en geven je wat handige tips.



[https://apps.apple.com/nl/app/  
openai-chatgpt/id6448311069](https://apps.apple.com/nl/app/openai-chatgpt/id6448311069)

# Ask ChatGPT

+++++

"What are data products and how is it related to AI?

Is a Tesla car a data product. And is so, kan you specify 5 arguments with references in table form?

Can you provide me with an ethical discussion of concerning the dangers and potential missuses in relationship of the European AI-act? Again in table form.

OK but I meant in relation ship with the use and production of Telsa cars.

+++++

<https://chat.openai.com/share/b72d1eb2-5f19-41de-ab5a-b759a2fc7301>

# *“Prompt Recepten”*

## *Leren Schrijven*

# 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.

# 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

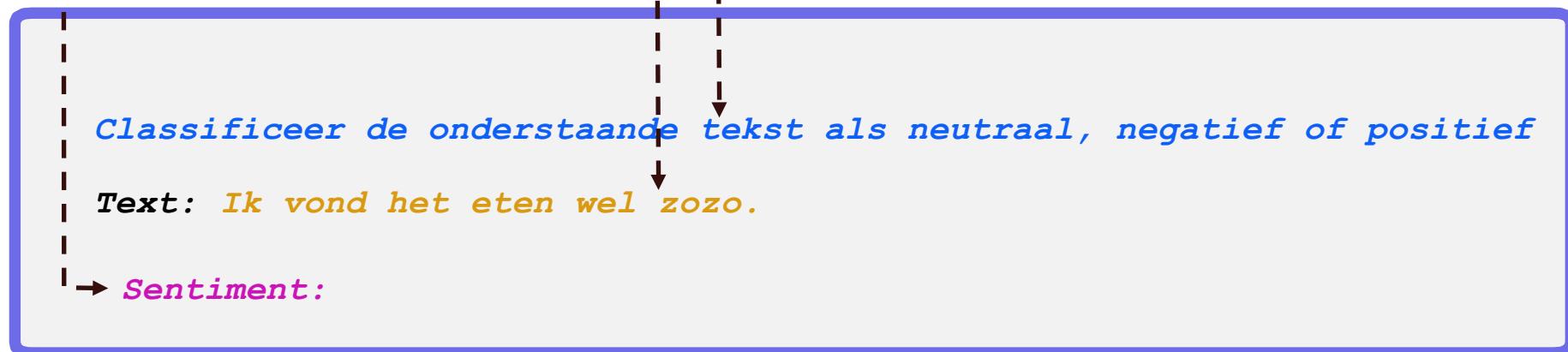
Een prompt is opgebouwd uit de volgende elementen:

Instructie(s)

Context

Invoergegevens

Uitvoer-indicator



# Prompt recept schrijf technieken

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

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

Self-Consistency

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](#)



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



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*“In Context  
Learning”*

# 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

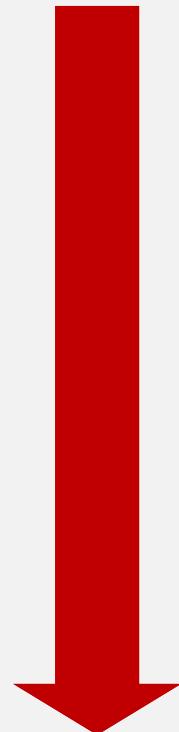
Snel  
generaliserend  
openeinde output

# In-Context Leren {ICL}



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

Snel  
generaliserend  
openeinde output



vereist veel tijd  
hoog sturend  
taak specifiek

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-Thought [CoT]	genereer een uitkomst op basis van een beperkt aantal (minder dan 6) voorbeelden  het model zal dan veel beperkter en relevantere tekst genereren	"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)
OR In-Context learning	mits het over de relevante woorden beschikt zoals die in de prompt worden vermeld	(2) Instituut voor Gezondheidszorg (IVG) opleiding: Biologie en Medisch Laboratoriumonderzoek (BML)

In-Context Leren  
DIY {do it yourself}

# PROMPT In-Context Lernen

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. // \_\_\_\_\_

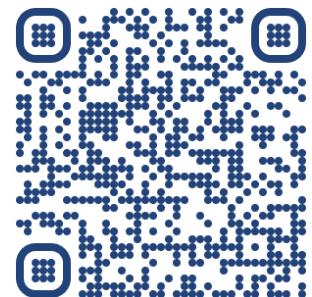


Circulation revenue has increased by 5% in Finland. // Finance

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*

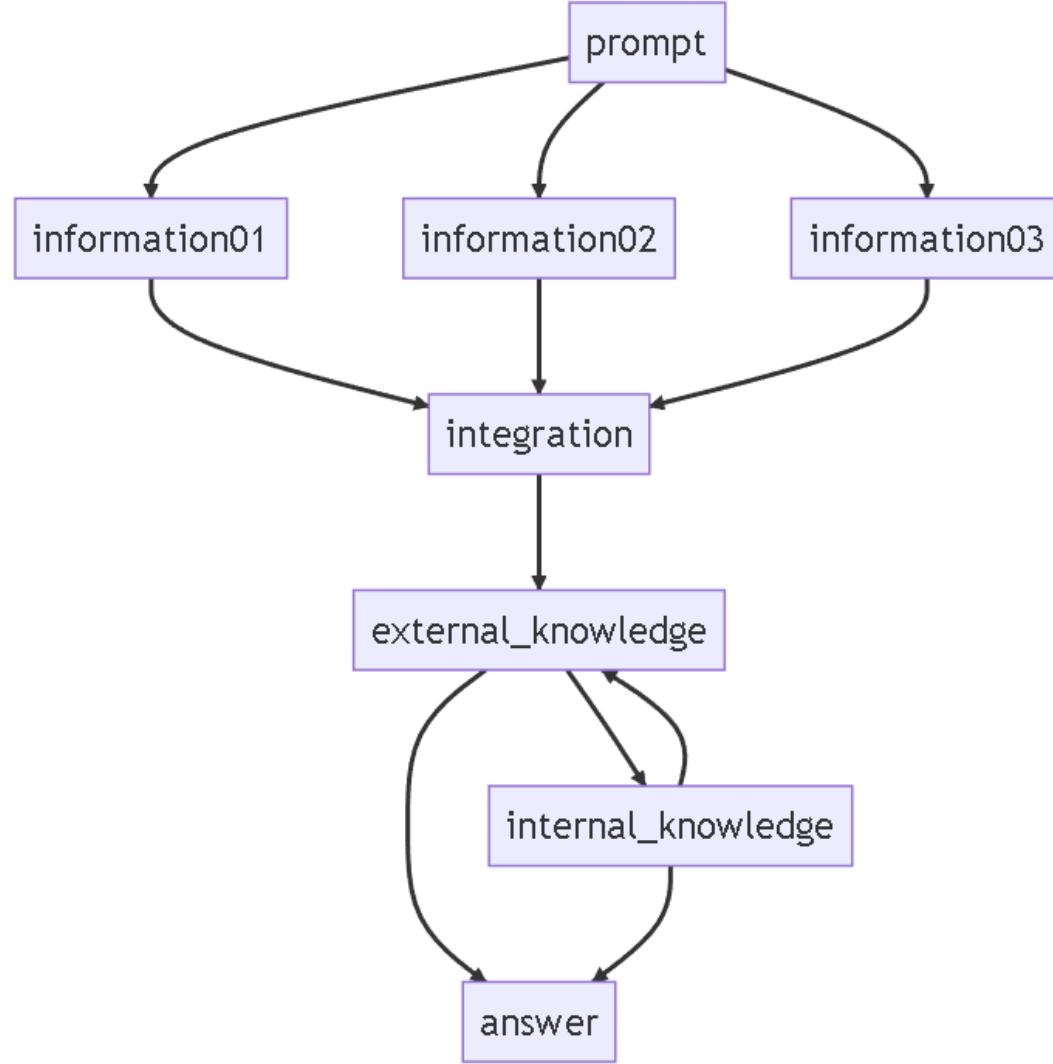
# "Chain-of-Thought" ---gedachtenketen---

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.

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

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Jason Wei Xuezhi Wang Dale Schuurmans Maarten Bosma

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

Google Research, Brain Team  
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## 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.

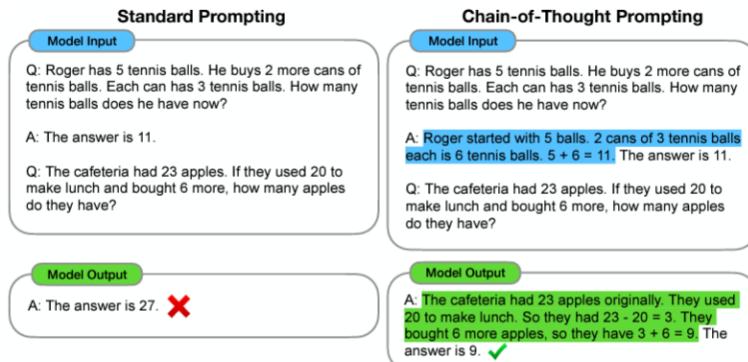
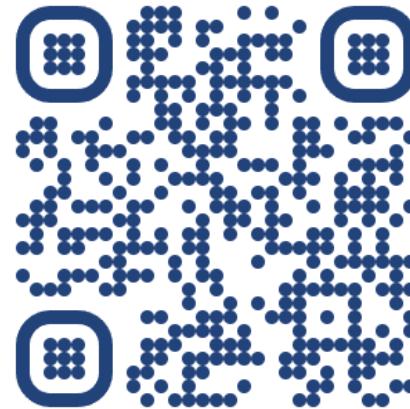


Figure 1: Chain-of-thought prompting enables large language models to tackle complex arithmetic, commonsense, and symbolic reasoning tasks. Chain-of-thought reasoning processes are highlighted.



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

# 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

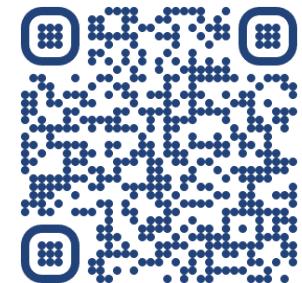
Laten we dit probleem oplossen door het op te splitsen in stappen.

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

Stap 1: Lees het oorspronkelijke paar

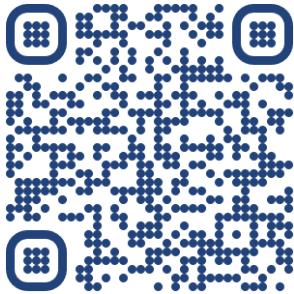
Stap 2: Lees de vijf paren

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



Laria Reynolds  
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Kyle McDonell  
[kyle@knc.ai](mailto:kyle@knc.ai)

## 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.

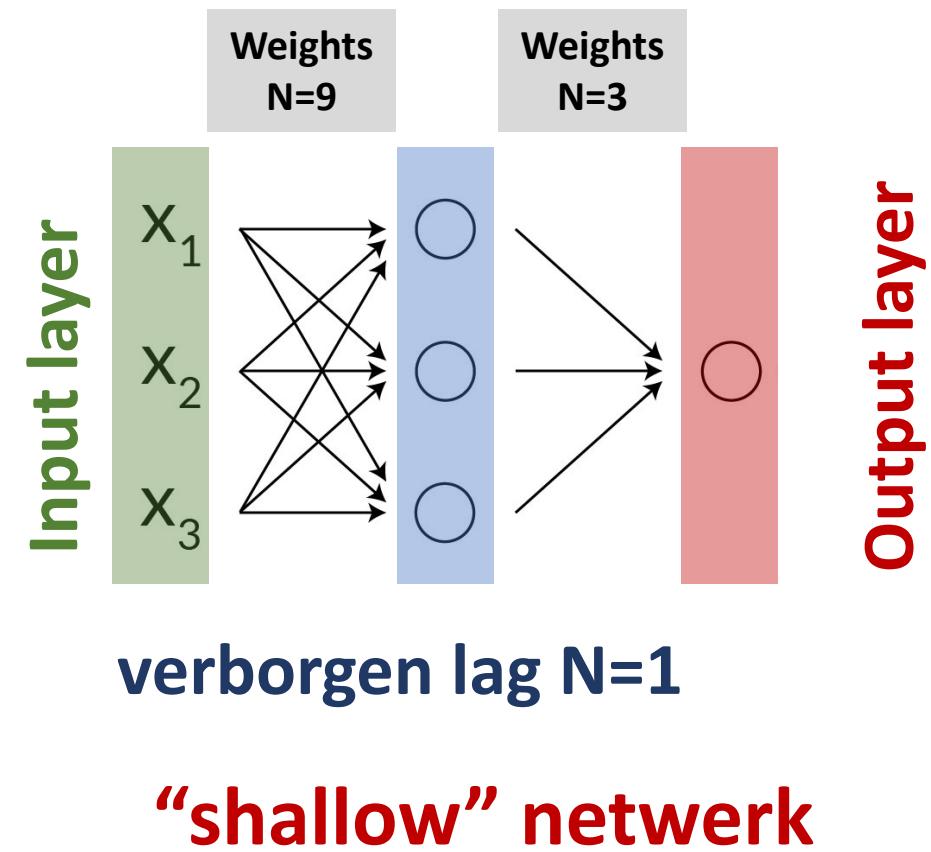
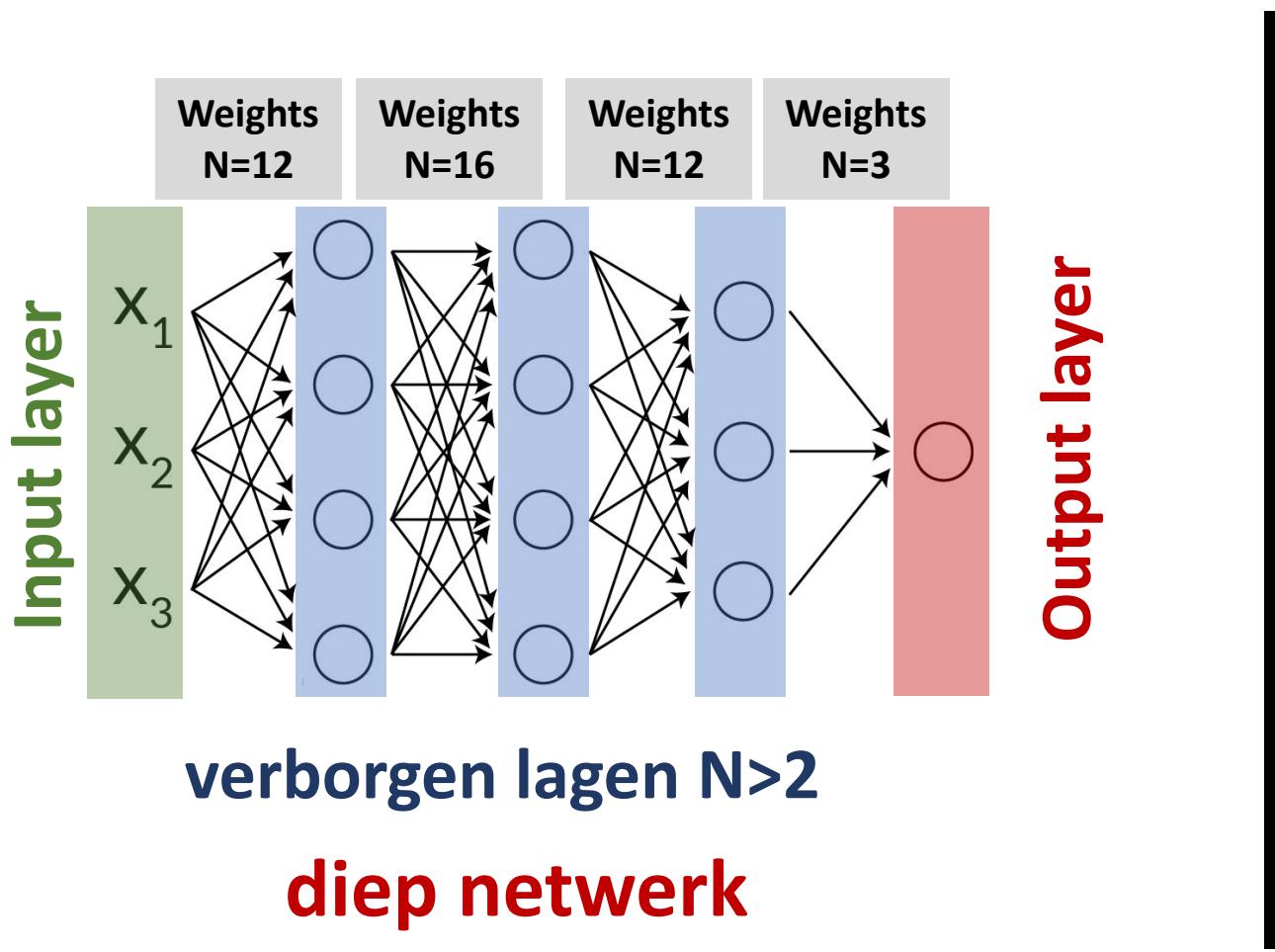
This motivates new approaches which explicitly pursue the goal of task location. We propose exploring more general methods of prompt programming and specifically techniques for communicating task intention and structure to an self-supervised model in the modality it was trained: natural language.

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

*---neuraal netwerk ---*

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

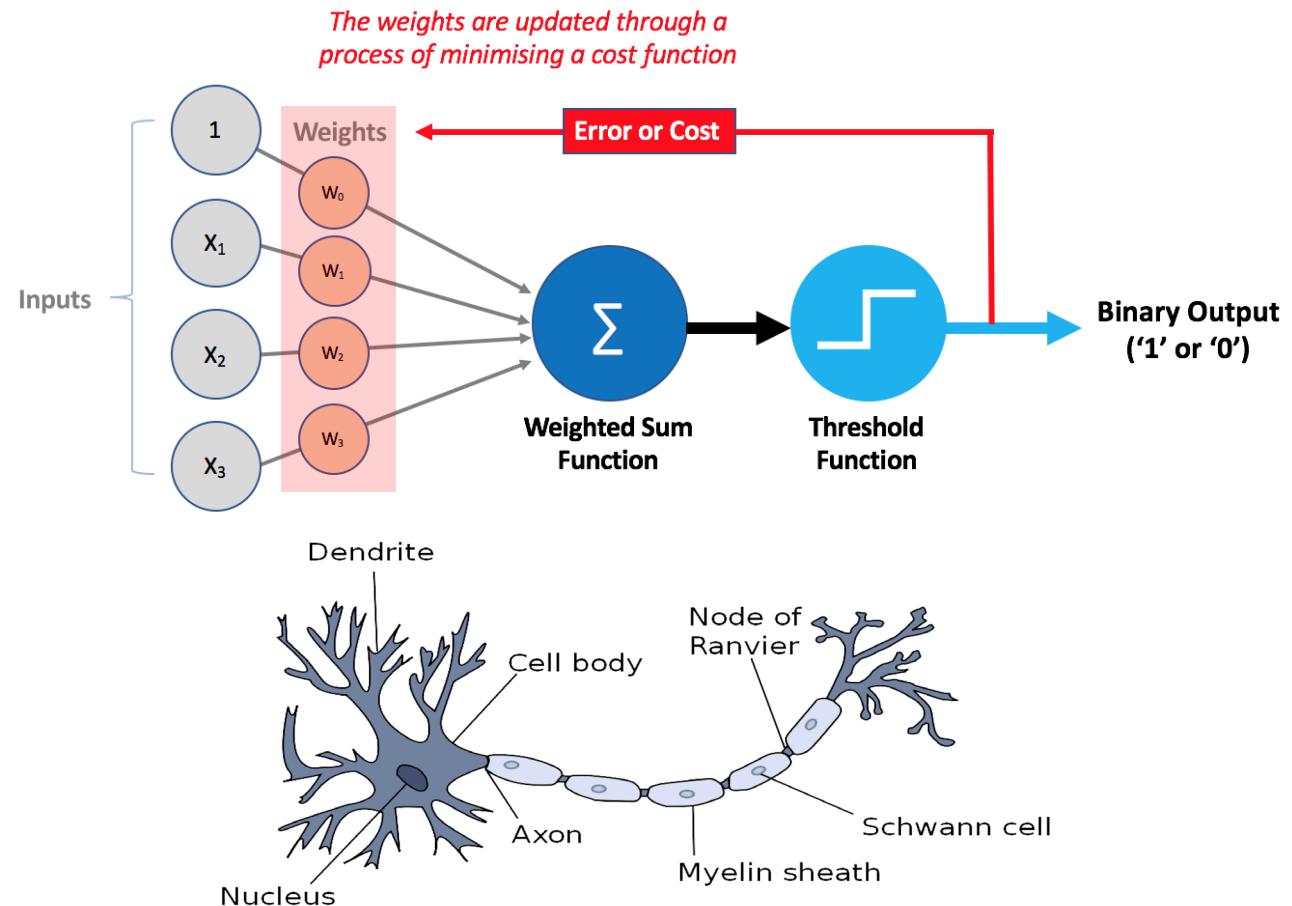
# Neuraal Netwerk modellen



# Kunstmatige Intelligentie

**Names for Artificial Neurons**

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



# Diep neuraal netwerk

## What are the limits of deep learning?

The much-hyped 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, slugs, 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

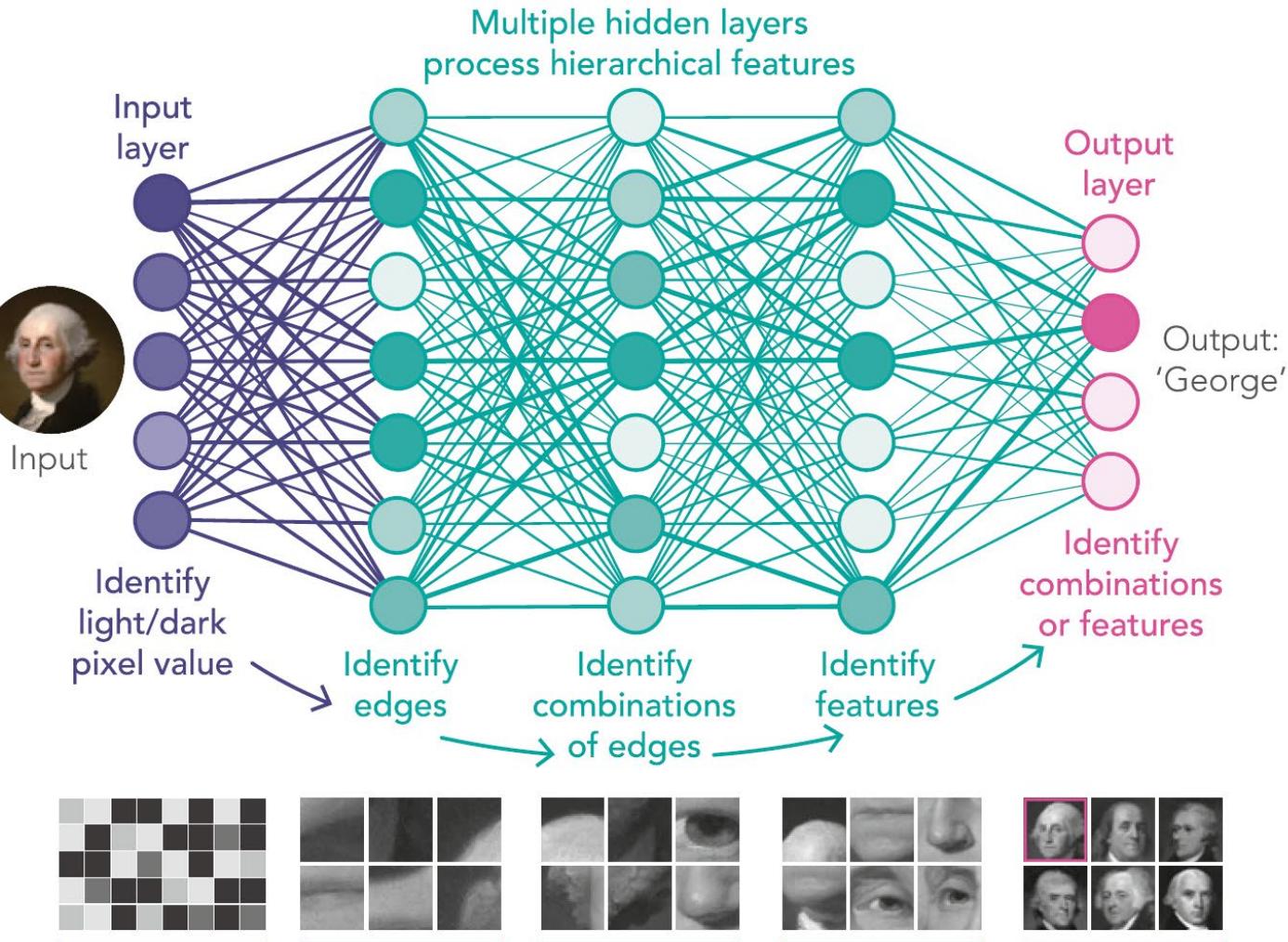


Apparent shortcomings in deep-learning approaches have raised concerns among researchers and the general public as technologies such as driverless cars, which use deep-learning techniques to navigate, get involved in well-publicized mishaps. Image credit: Shutterstock.com/MONOPOLY919.

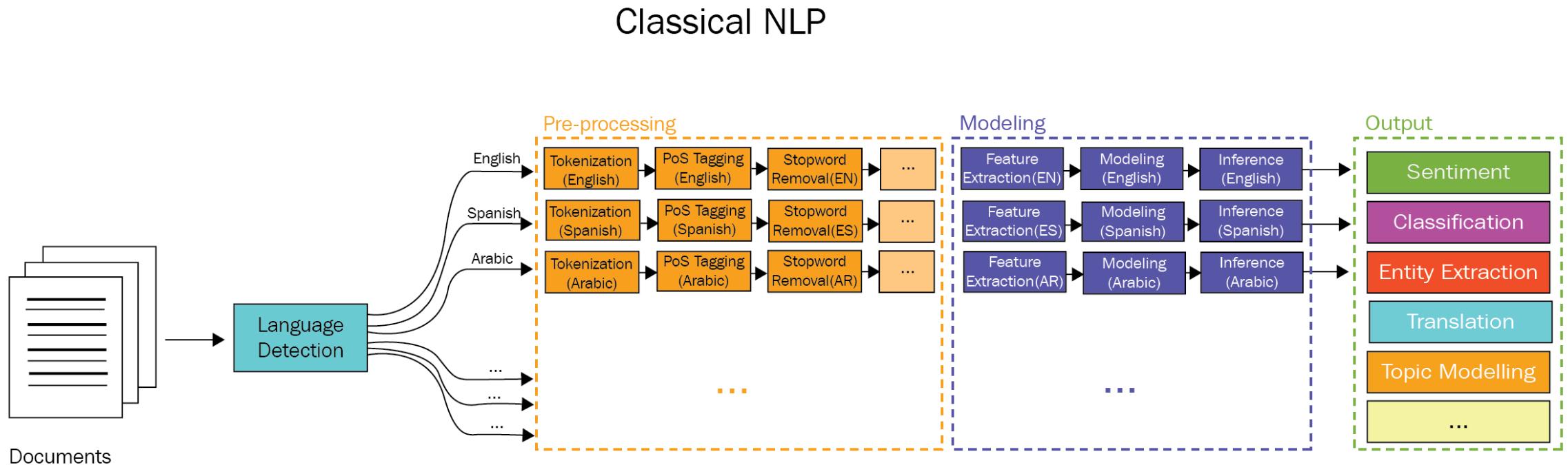
Published under the PNAS license.

January 22, 2019 | vol. 116 | no. 4

[www.pnas.org/cgi/doi/10.1073/pnas.1821594116](http://www.pnas.org/cgi/doi/10.1073/pnas.1821594116)

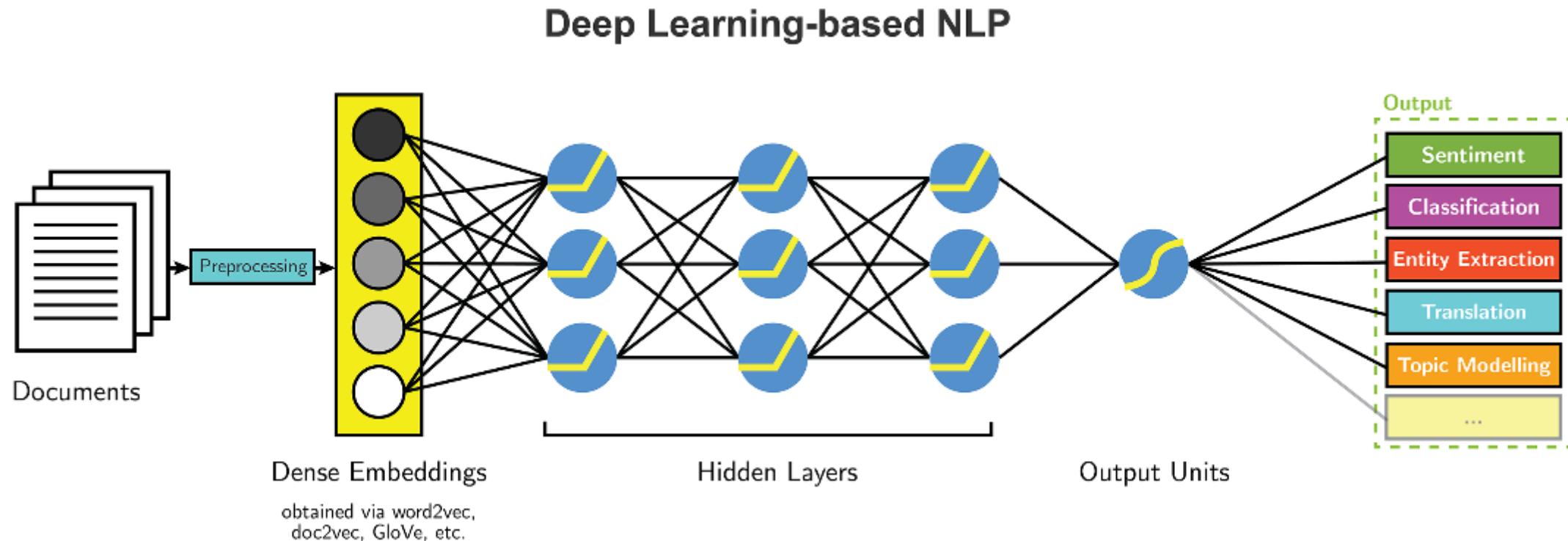


# Diep neuraal netwerk



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

# Diep neuraal netwerk



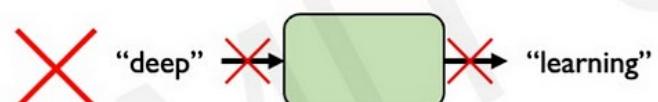
<https://www.oreilly.com/library/view/python-natural-language/9781787121423/6f015f49-58e9-4dd1-8045-b11e7f8bf2c8.xhtml>

# ChatGPT

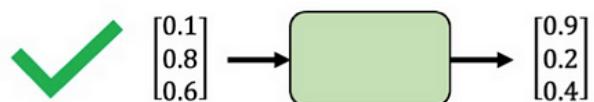
*--- [Autoregressive {AR}] Generative Pre-trained  
[neural network] Transformer---*

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

# Kunstmatige Intelligentie



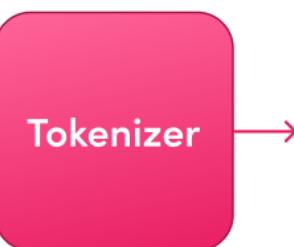
*Neural networks cannot interpret words*



*Neural networks require numerical inputs*



I want to break free



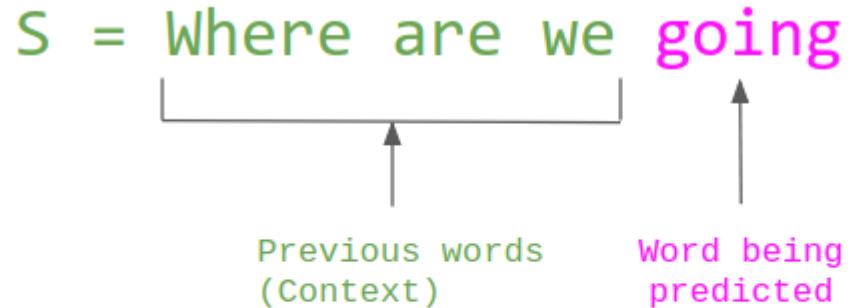
I	→	[0.004, -0.05, ..., 0.3]
Want	→	[-0.1, -0.0072, ..., 0.12]
...	...	...
Free	→	[0.023, 0.31, ..., -0.1606]



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

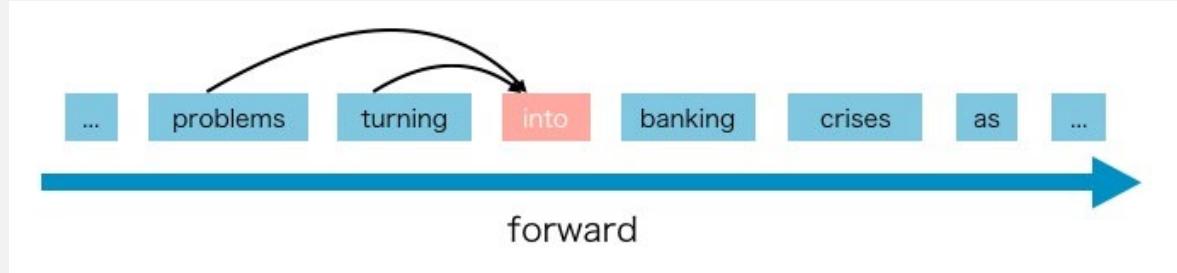
# AutoRegression [AR]

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



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

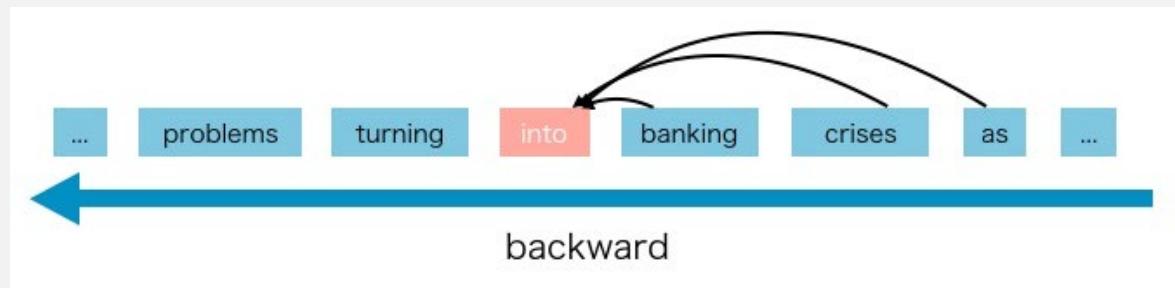
# AutoRegression [AR]



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

## PROS:

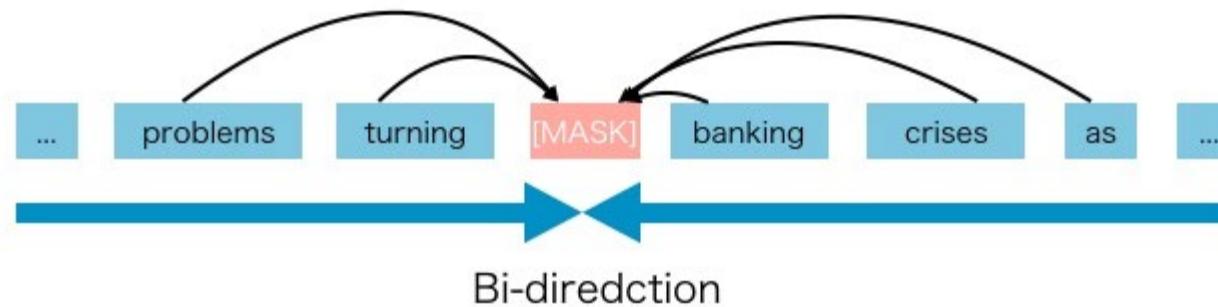
AR language models are good at generative NLP tasks. Since AR models utilize causal attention to predict the next token, they are naturally applicable for generating content. The other advantage of AR models is that generating data for them is relatively easy, since you can simply have the training objective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

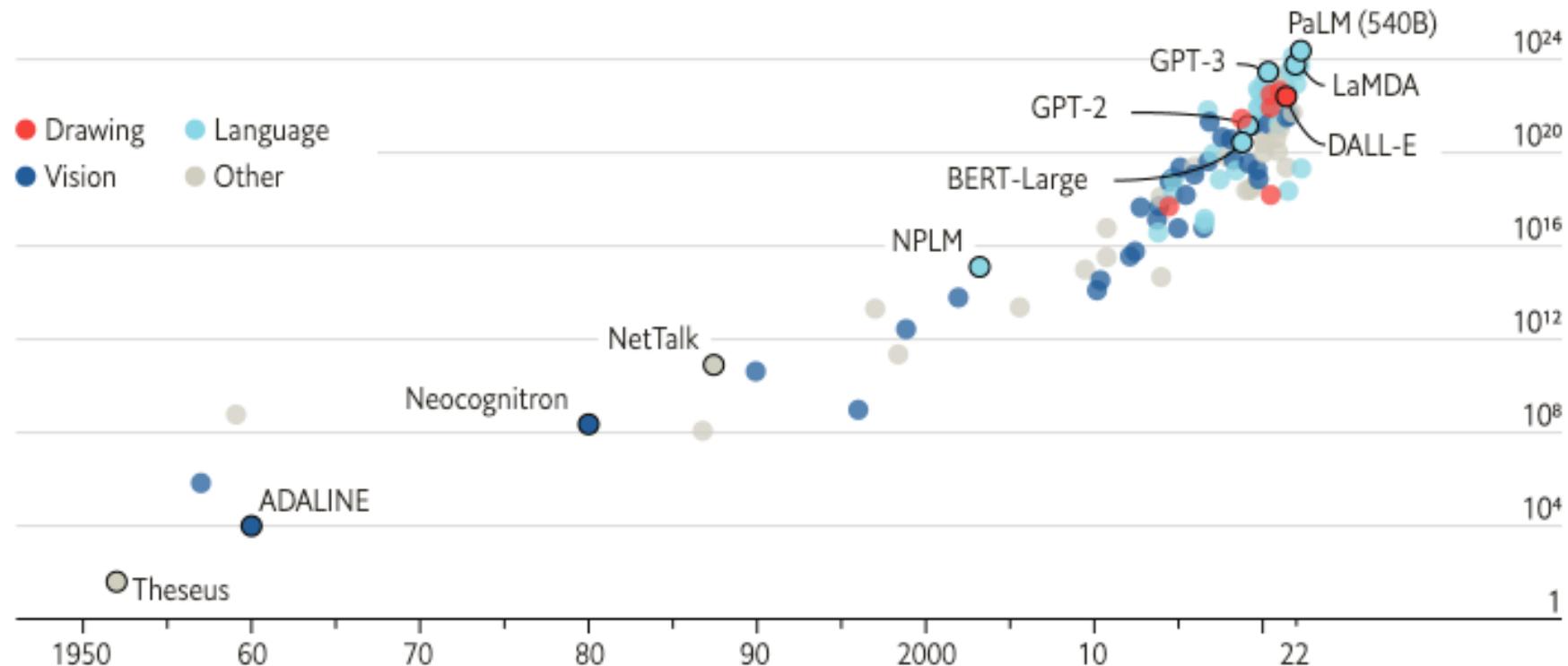
The economist  
Jun 11th 2022



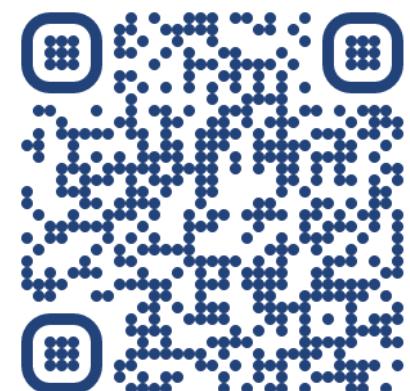
## The blessings of scale

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

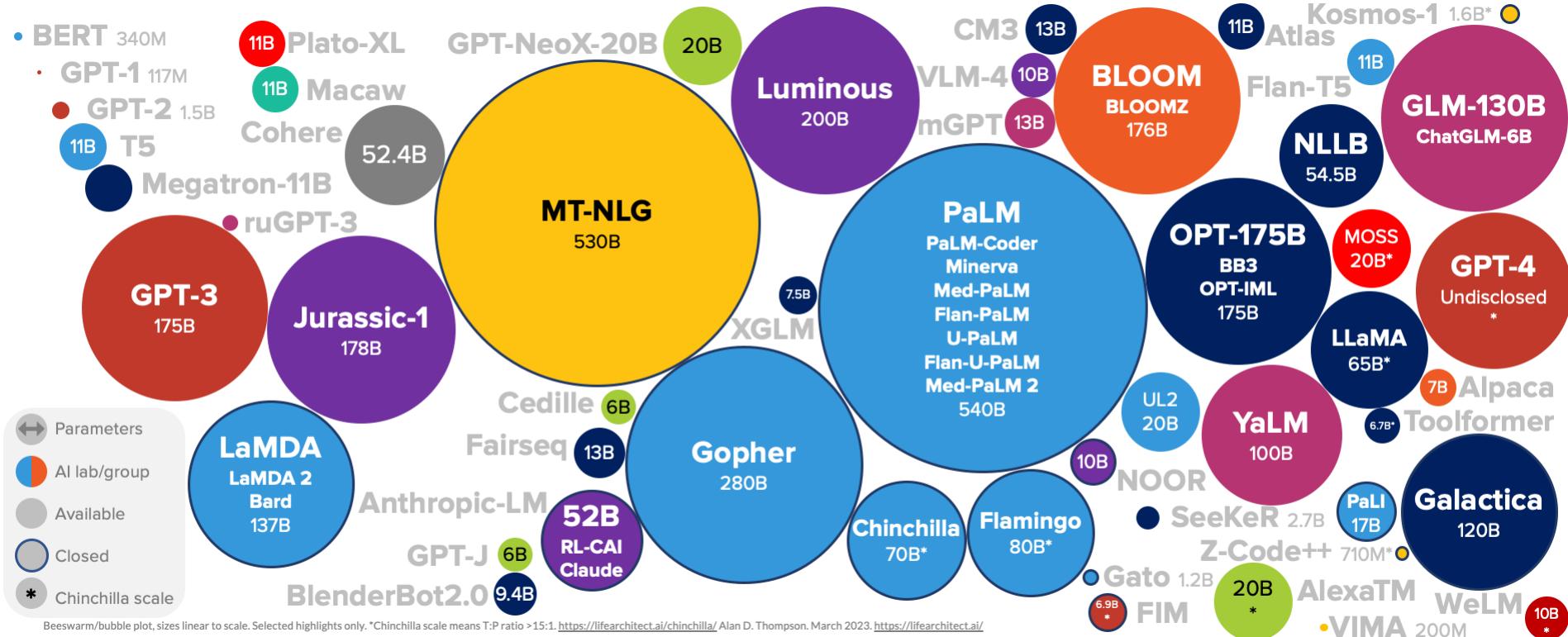


# **Large Language Models: Het LLM-Landschap**

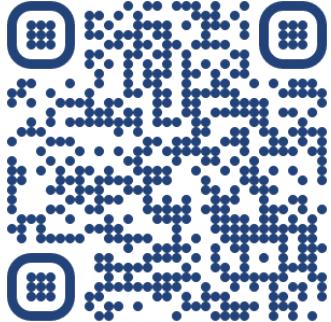
# Large Language Models: Het LLM-Landschap



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

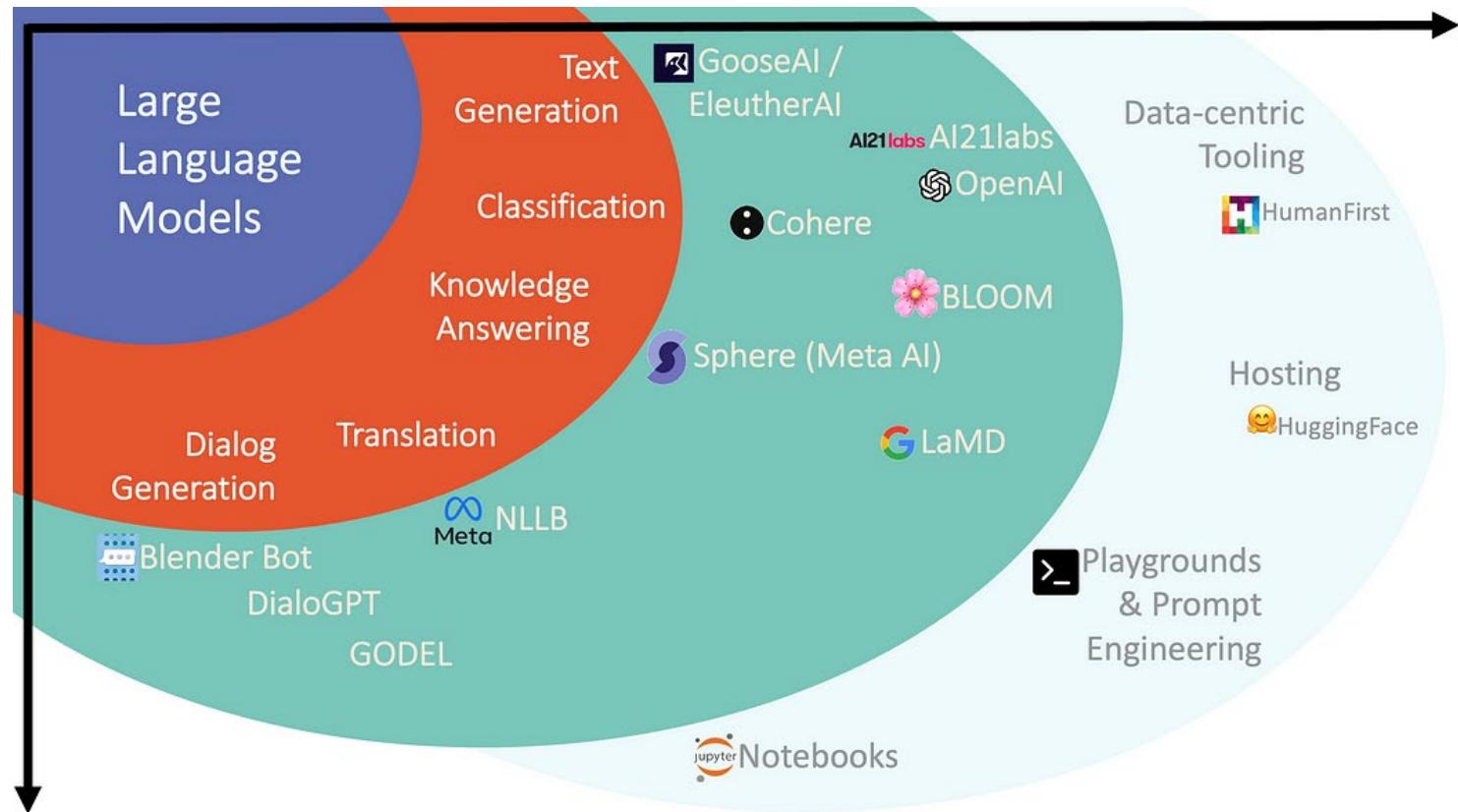


<https://docs.google.com/spreadsheets/d/105KVQW1Hx5Akcg8AIRjbQLQzx2wVaLl0SqUu-ir9Fs/edit#gid=1158069878>



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

# Large Language Models: Het LLM-Landschap



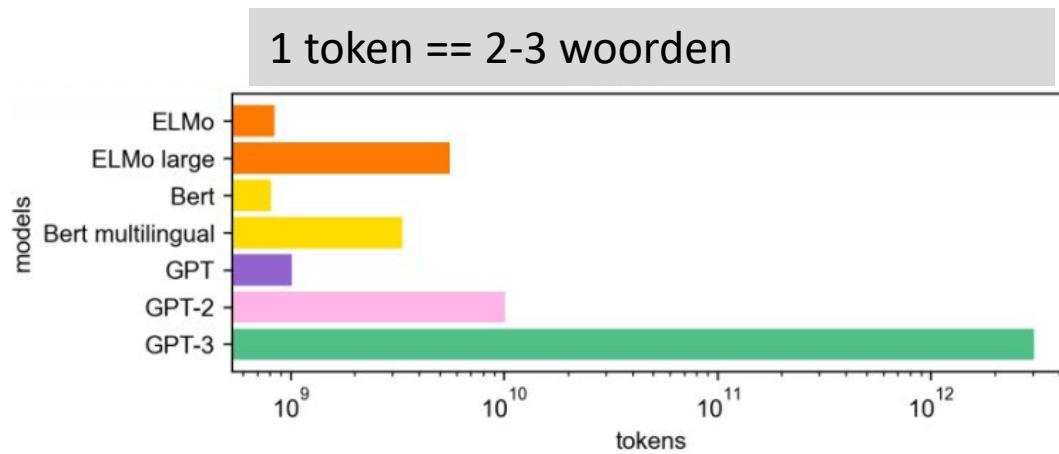
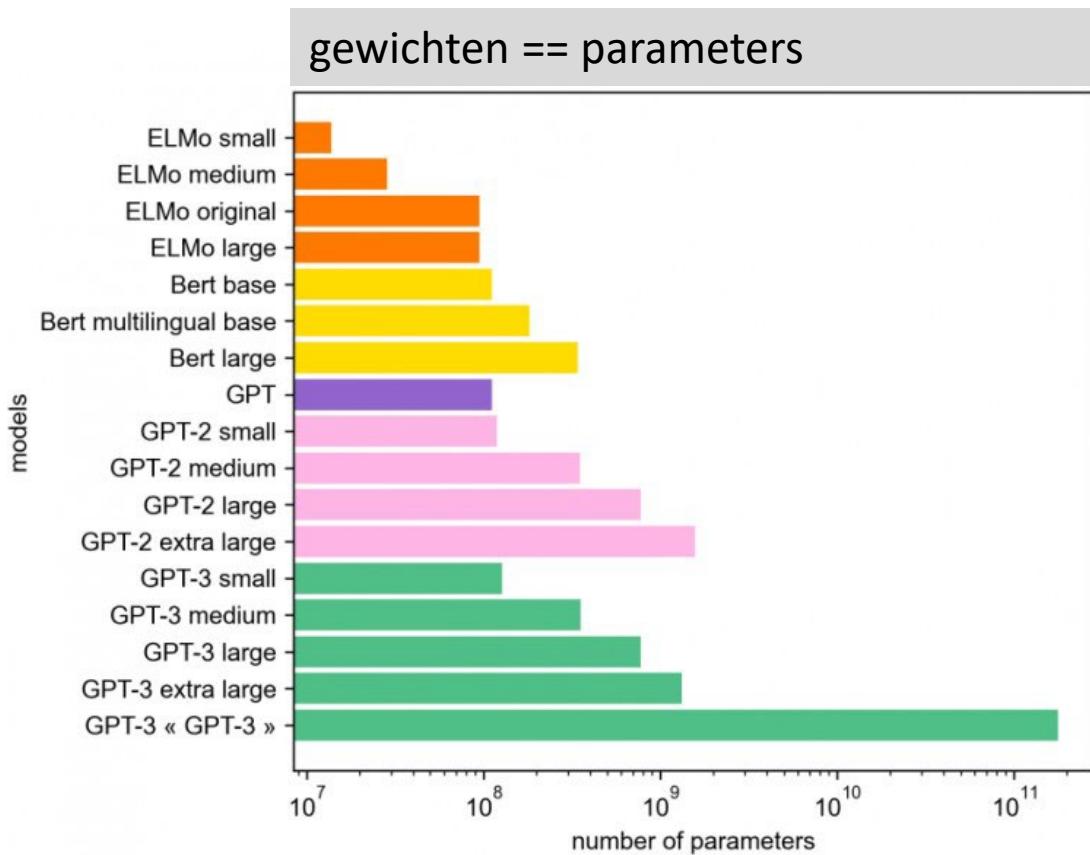
<https://cobusgreiling.medium.com/the-large-language-model-landscape-9da7ee17710b>



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ROTTERDAM

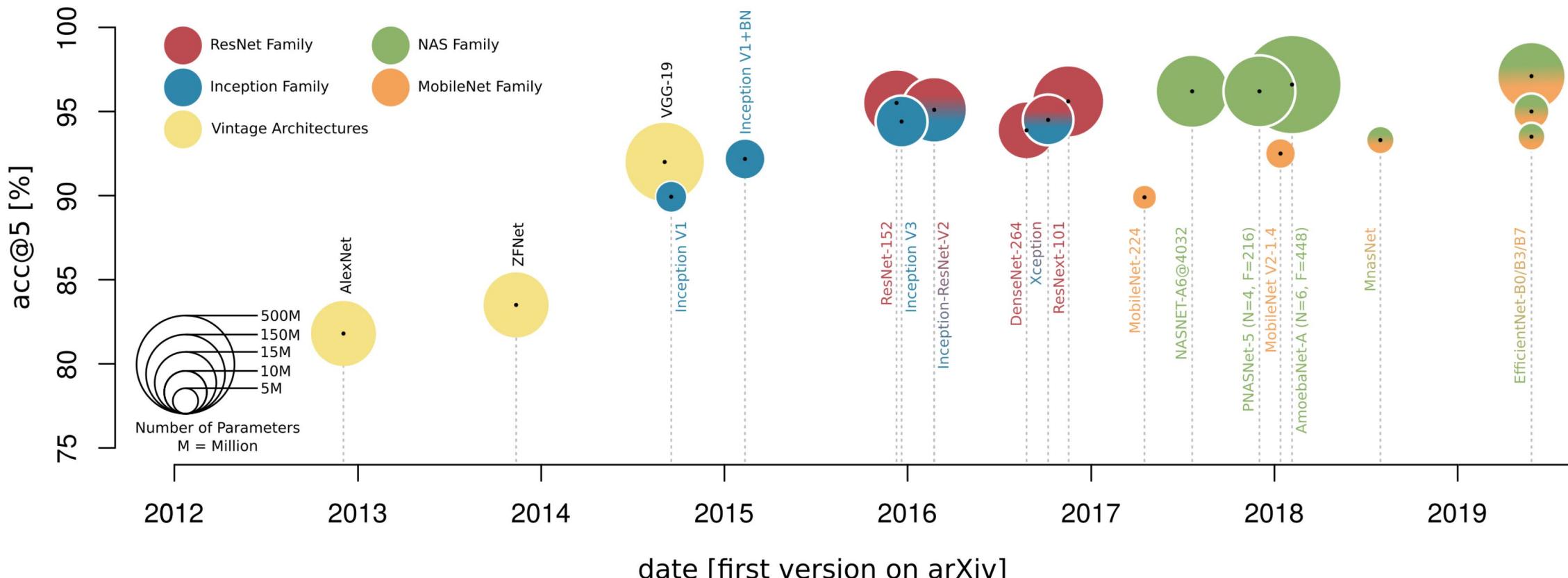
*“waarom zo  
groot?”*

# 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?

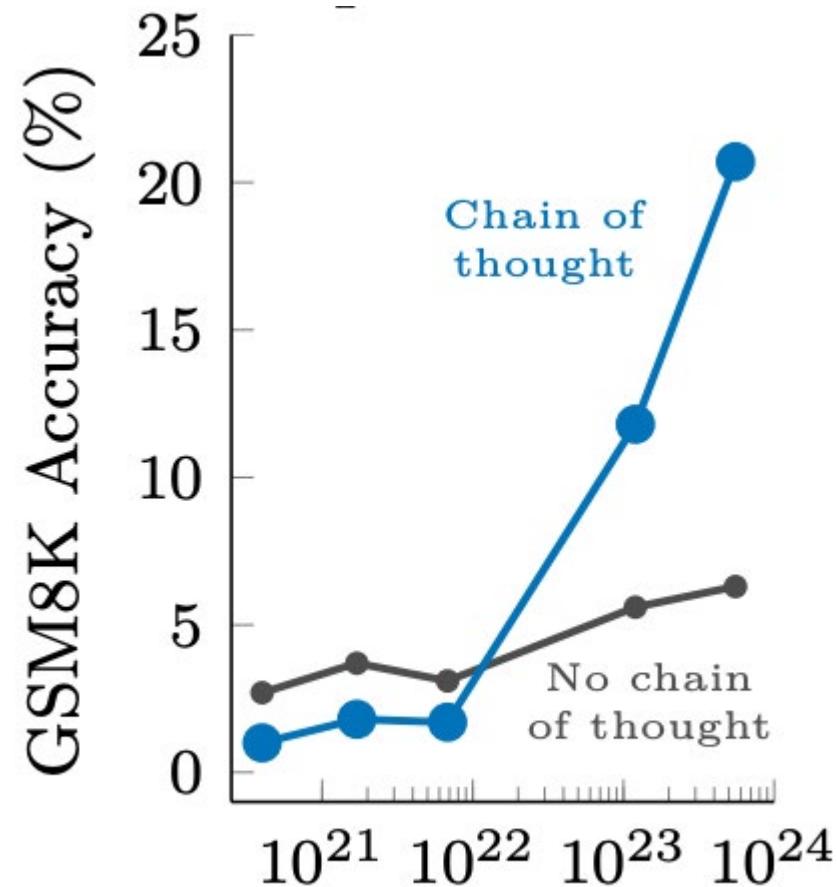
<https://doi.org/10.3390/rs12101667>

# 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>



*“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](#)

DIY {In-Context Learning  
Prompt}

# Do it Yourself

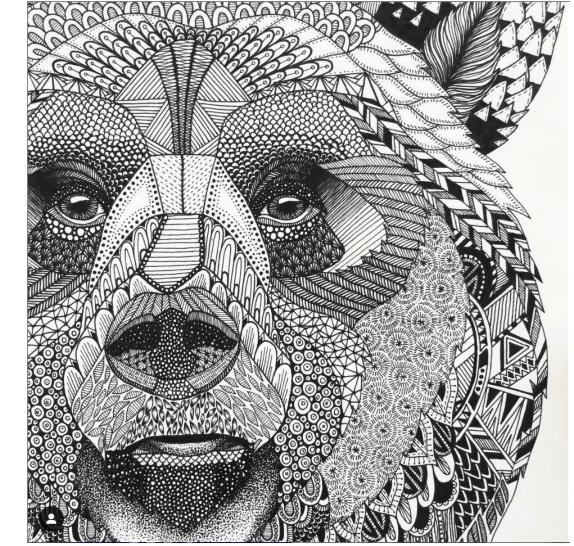
Generate with ChatGPT and/or Bing  
by means of a

**Prompt --- that makes use of In-Context Learning---**

A deliverable that complies with de main-deliverable

**Description of this Course: Demystifying AI & data products**

See <https://github.com/robvdw/Demistifying-AI-Human-Centered-Data-Products>



---Course: *Demystifying AI & Data Products*---

**“Main deliverable”**

# GitHub README: AI-Report structure

## Maak een GitHub Repository aan inclusief een README

Wanneer je onbekend bent met Github volg de aanwijzingen zoals beschreven in de Nederlandstalige tutorial:

GitHub tutorial voor beginners: Begin simpel met GitHub!  
<https://programmeerplaats.nl/github-tutorial-beginners/>

Voor meer gedetailleerde informatie zie: <https://git-scm.com/book/nl/v2/>

*Use of Generative AI [Gen-AI] such as ChatGPT is encouraged.*

*It's important to make sure that other people are aware that these technologies were used.*

*This can be done by including references or citations in the code or documentation, or by making a statement in the README file or other documentation that the project relies on these technologies.*

*Additionally, it's also a good practice to include information about the limitations and potential biases of the technology in the documentation or code comments.*

## PART I

### Problem Selection, Definition & Motivation + Human in the Loop

- Define Artificial Intelligence (in your own words)
- Define the 5 main characteristics (features) of AI
- Defining Artificial Intelligence (in your own words)
- Make your own info graphic/knowledge-map that gives an accurate overview of the state-of-the-art AI (see e.g., <https://www.nesta.org.uk/report/future-minds-and-machines/2-what-artificial-intelligence/>)

## PART II

### AI Data Product Description of ChatGPT

- Defining the Data Product ---ChatGPT--- (in your own words)
- What AI problem/use-case does it solve?
- Designate the Capability Domain & Application Domain
- Description of Data Product Components & Techniques Involved
  - Describe the User-interface
  - Describe the AI-model in terms of its Agency and Architecture
  - Describe the learning algorithm
  - Describe how it is trained
  - Describe the parameters involved

## PART III

### Use Case Description & Application

- Give a short overview of the most popular Chat-GPT use-cases + short description (in your own words)  
see e.g., <https://research.aimultiple.com/chatgpt-use-cases/>
- Find examples of
  - Fact-checking/Truth Finding
  - Question answering
  - Educational Tutoring
  - Theory-of-Mind problem solving
  - APA-style citation
- Describe, demonstrate, and analyse each of use-cases in terms of:
  - Prompt engineering techniques
  - Human-Computer Interaction (HCI) principles
  - Performance level / Accuracy
  - Parameter setting

## PART IV

### Critical Reflection & Ethical Considerations

- Assess popularity / "ground-breaking" aspects
- Evaluate whether the AI data product solves the problem at hand
- Review potential issues & existing documentation in relation to the European AI-act

## Studied Literature

- Select 3 review articles, describe in your own words their relevance
- Provide an APA-style overview of the sources used to write your AI-report



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**overtref jezelf**