

# Workshop TechINF

## Natuurlijke Taalverwerking {NLP} met Grote Taalmodellen

**PROGRAMMA  
AI & ETHIEK**



[hr.nl/ai](http://hr.nl/ai)



HOGESCHOOL  
ROTTERDAM

# Wat moetje weten over ChatGPT als TechINF docent?

*Kans of bedreiging?*



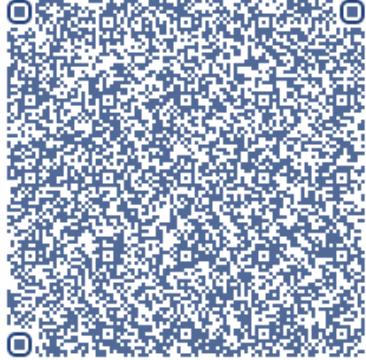
Tech-lead  
Rob van der Willigen



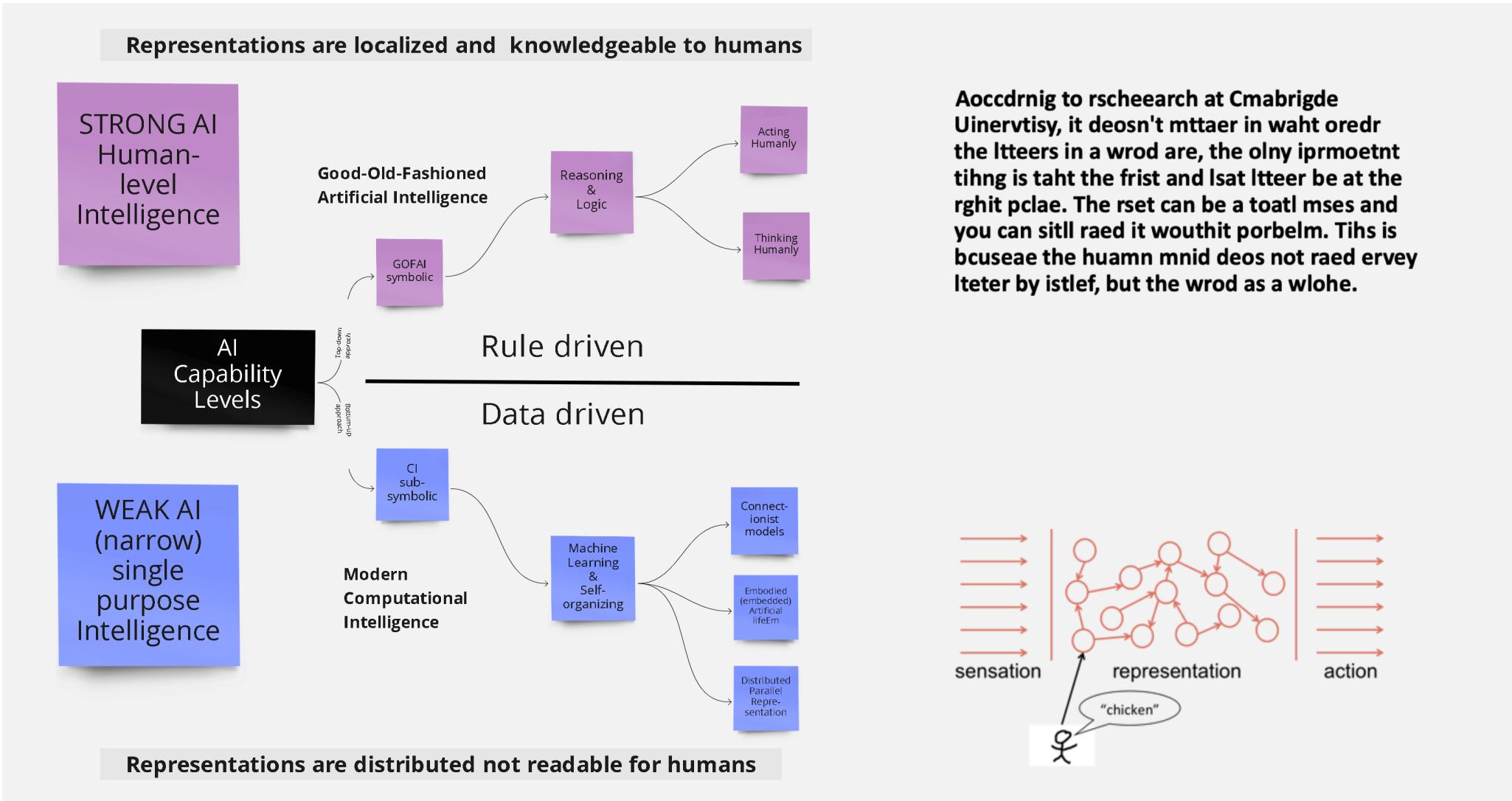
*Artificial intelligence {AI}*

**“Kunstmatige Intelligentie”**  
*Wat is dat eigenlijk?*

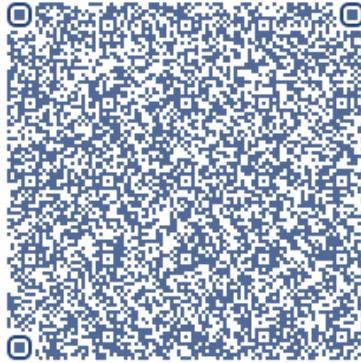
# AI-taxonomie is complex



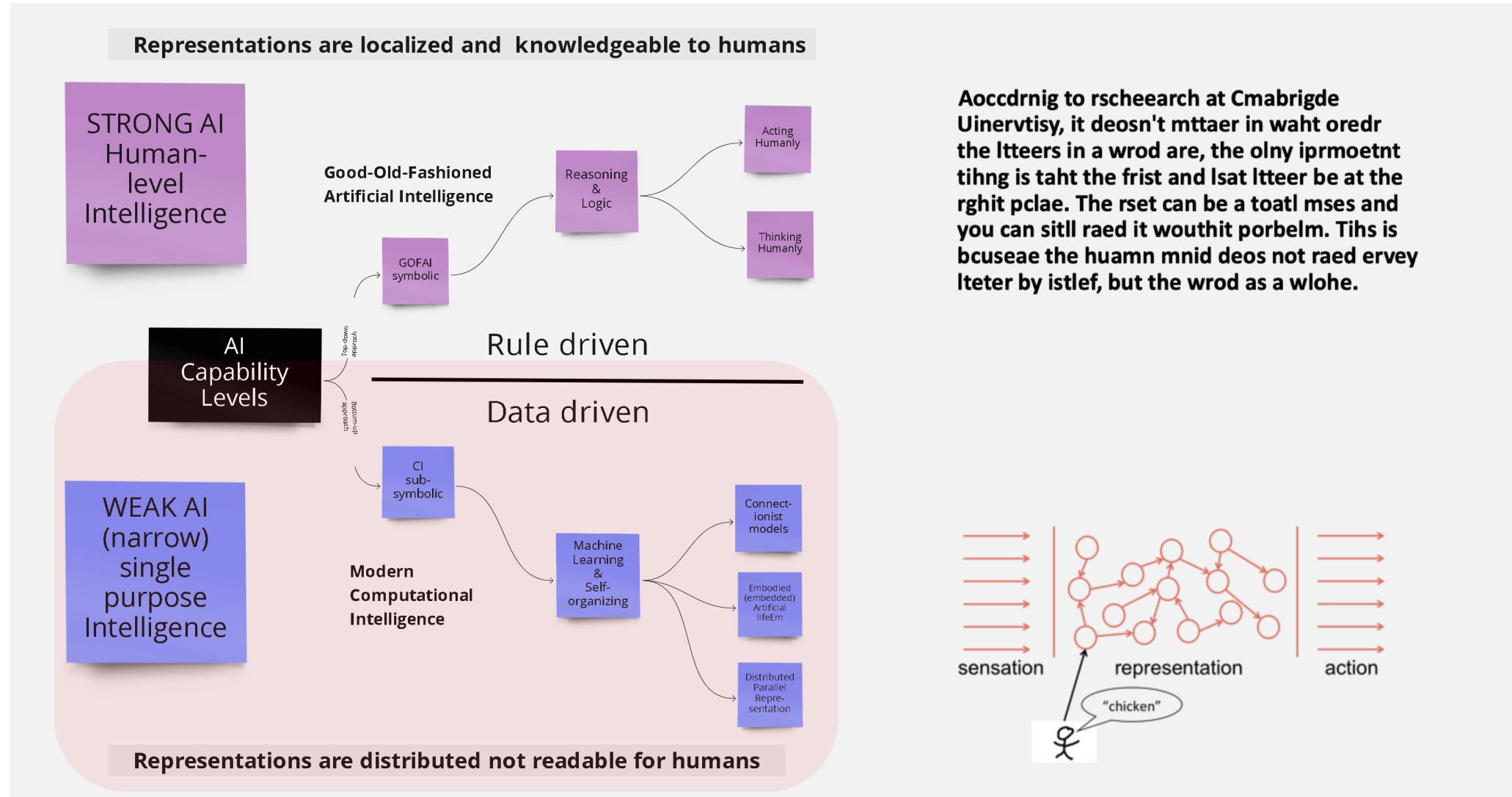
[https://www.researchgate.net/publication/359424818\\_Designing\\_Neural\\_Networks\\_Through\\_Sensory\\_Ecology\\_Biology\\_to\\_the\\_rescue\\_of\\_AI\\_Produced\\_by\\_Living-Lab\\_AiRA\\_Hub\\_voor\\_Data\\_Responsible\\_AI\\_Hogeschool\\_Rotterdam\\_Lunch-Lezing\\_Creating-010\\_FEB\\_2022](https://www.researchgate.net/publication/359424818_Designing_Neural_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)



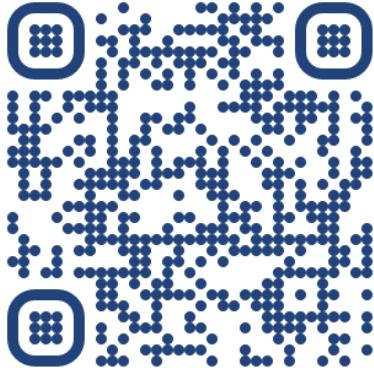
# State-of-the-Art [SotA] AI= Neurale Netwerken



[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](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)

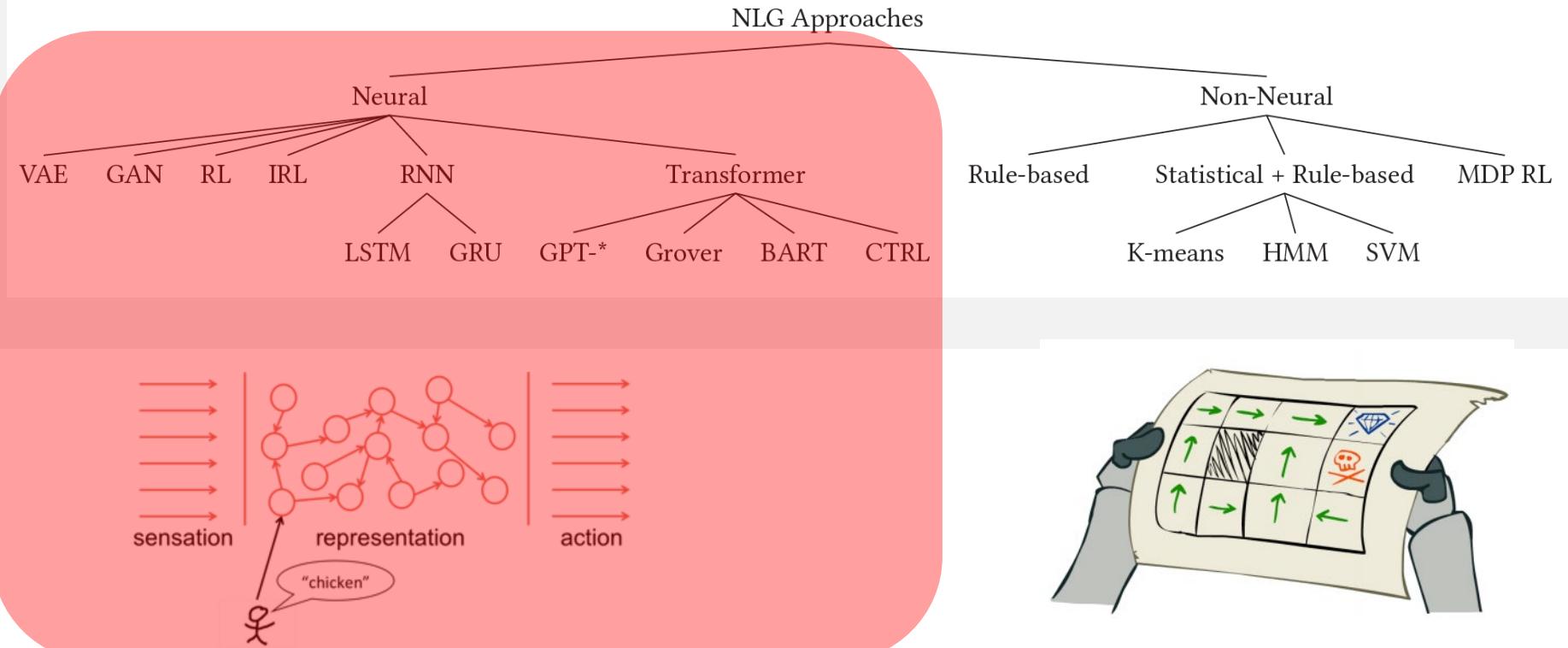


# AI-taxonomie is complex

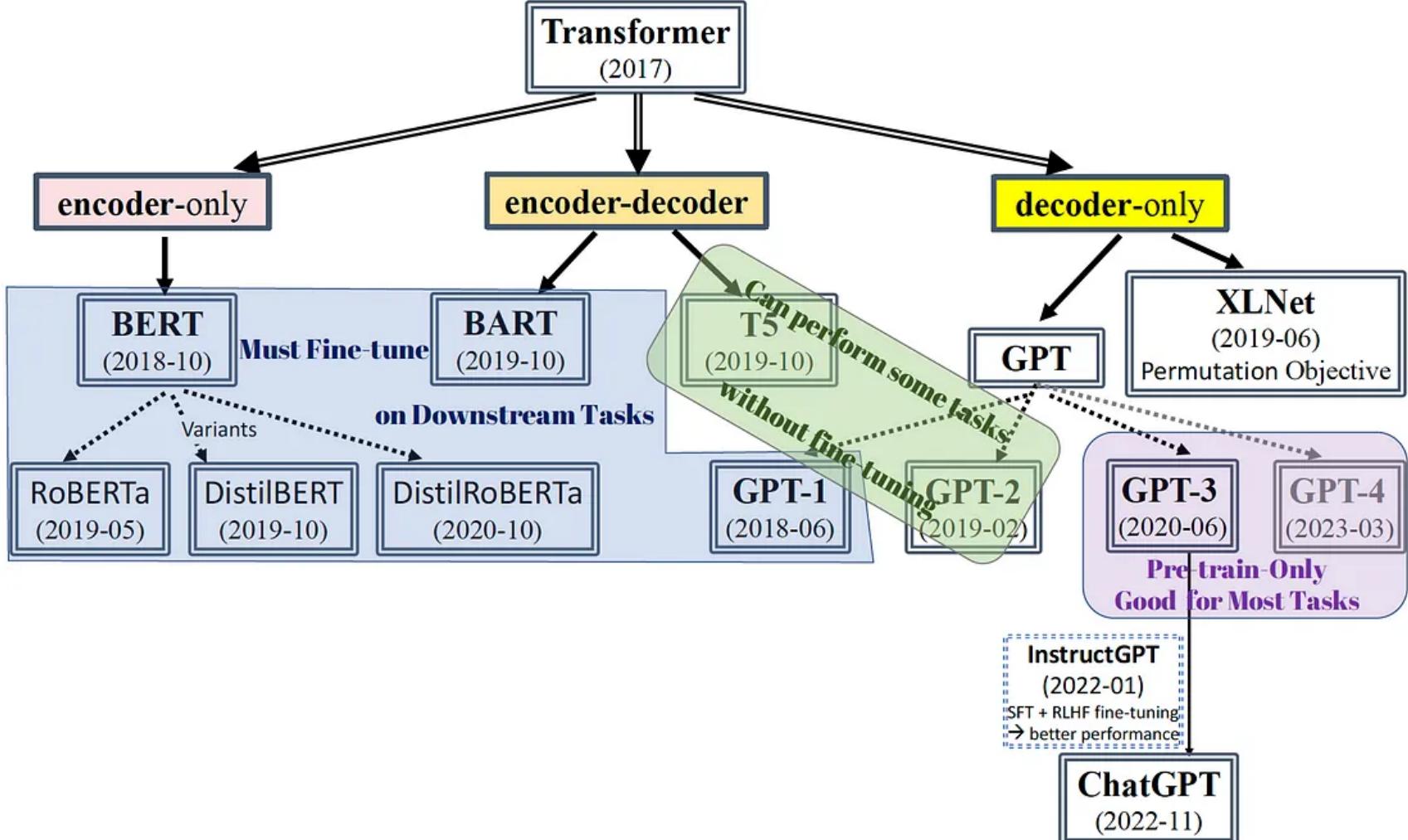


Crothers, E., Japkowicz, N., & Viktor, H. (2022). Machine Generated Text: A Comprehensive Survey of Threat Models and Detection Methods. arXiv preprint  
<https://doi.org/10.48550/arXiv.2210.07321>

Fig. 1. Taxonomy of major NLG approaches



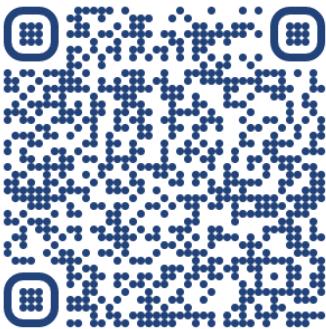
# AI-taxonomie is complex



# {AI=ML=DL}

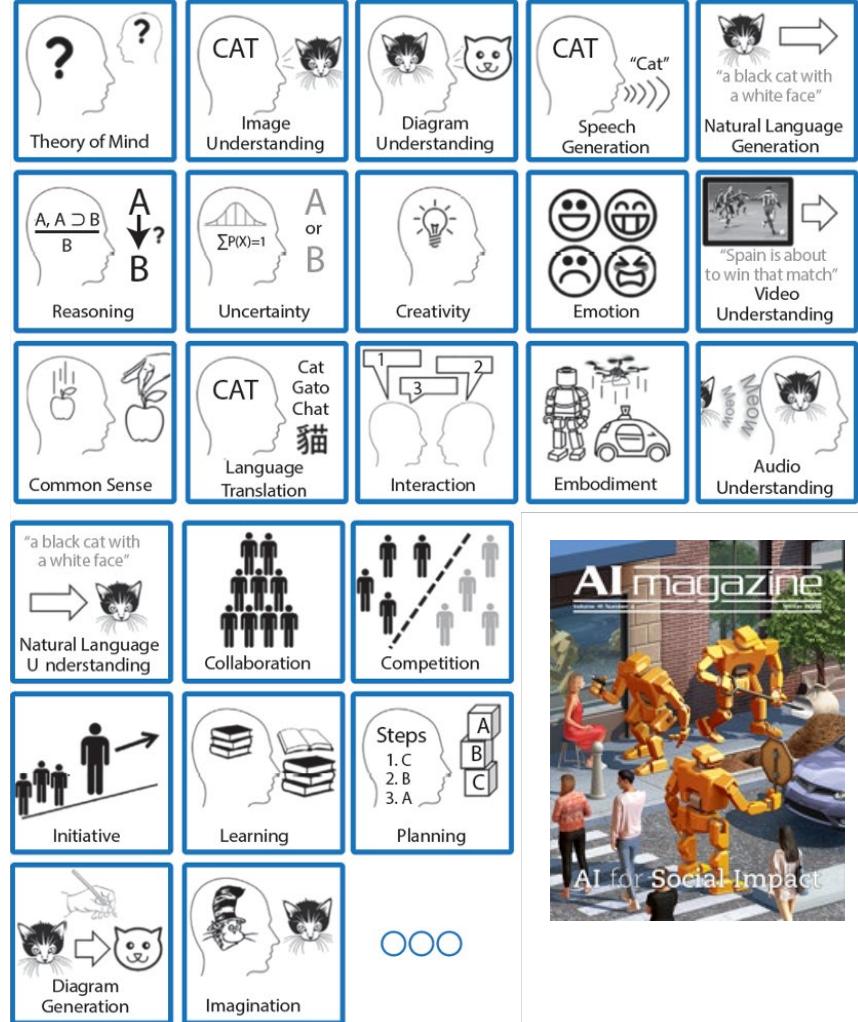
AI enabled through {DL} must be understood as any form of Machine Learning {ML} technology mimicking & automatising tasks which otherwise require

*human perception,  
cognition and/or  
motor skills*

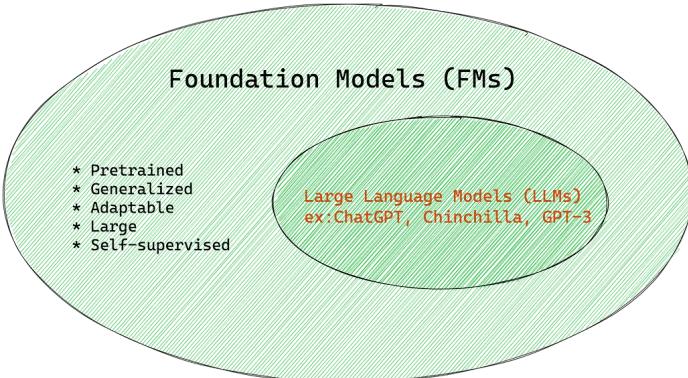


<https://robfvdw.medium.com/the-world-wide-web-ai-safari-b2e4f7f90647>

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



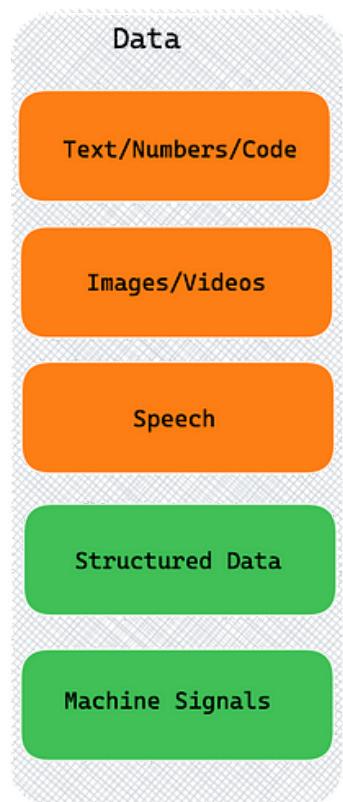
# {Foundation Models}



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>



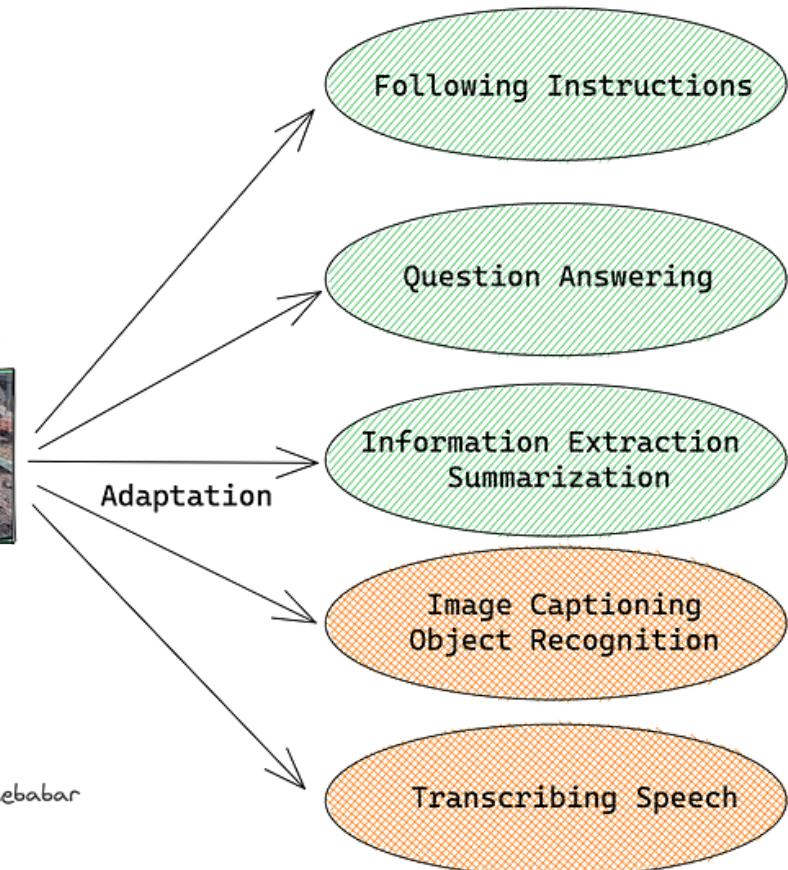
<https://thebabar.medium.com/essential-guide-to-foundation-models-and-large-language-models-27dab58f7404>



Training →



(c) 2023 - Babar Bhatti @thebabar



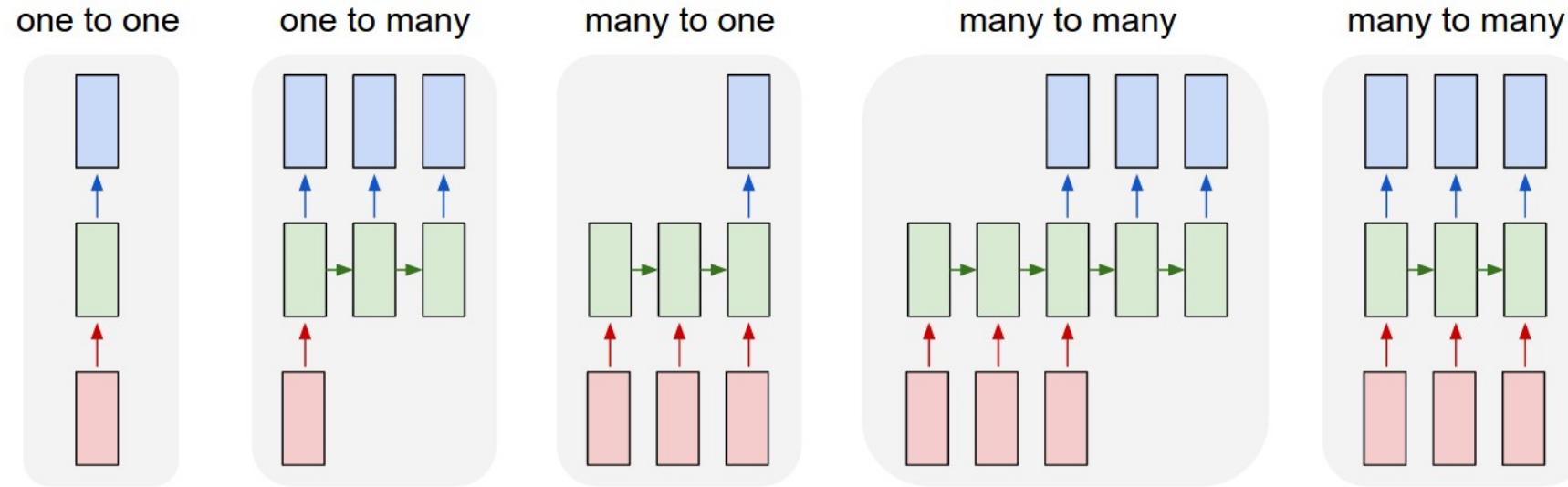
*natural language processing [nlp]*

“natuurlijke  
taalverwerking”

# {Natuurlijke taal vormt een “Sequence to Sequence” Probleem }

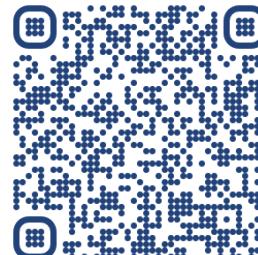
	Input	Output
Machine Translation	“The cat is black”	[“Le”, “chat”, “est”, “noir”] or “Le chat est noir”
Named Entity Recognition	“Sonja works at Apple”	[<PERSON>, <NA>, <NA>, <ORG>]
POS Tagging	“Sonja works at Apple”	[Noun, Verb, Preposition, Noun]
Speech Recognition		“I am the batman”
Video Captioning		“[fire crackles] Not today.”
DNA Analysis	“cacgcaaacctttcaggctcggtcgctt caagctgtccgatgcgcagactacttgtcg”	{promoter:[0,67], exon:[74,103]}

# {Natuurlijke taal vormt een “Sequence to Sequence” Probleem }



- many-to-one:** Sentiment Classification, action prediction (sequence of video -> action class)
- one-to-many:** Image captioning (image -> sequence of words)
- many-to-many:** Video Captioning (Sequence of video frames -> Caption)
- many-to-many:** Video Classification on frame level

<https://github.com/rasbt/python-machine-learning-book-3rd-edition>



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

# Natuurlijke taalverwerking

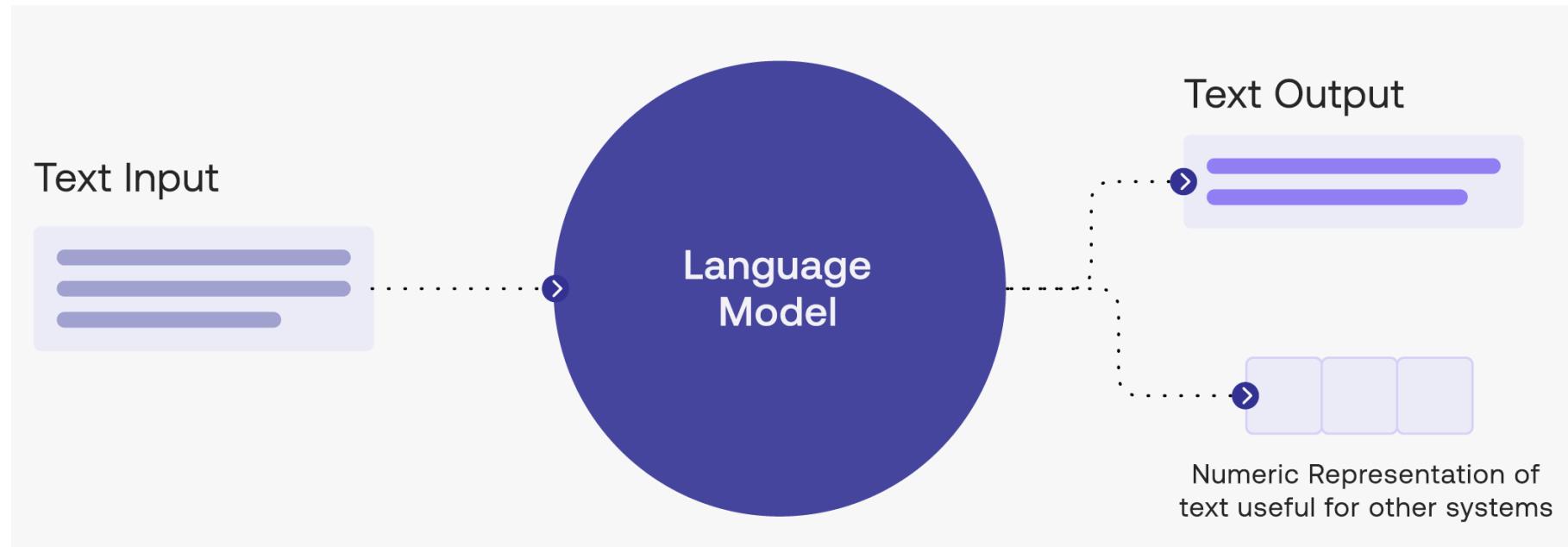
*begrijpen (NLU) + generatie (NLG)*

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

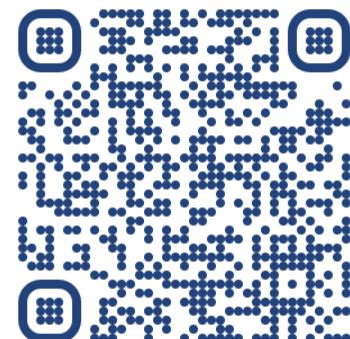
# State-of-the-art [SotA] NLG



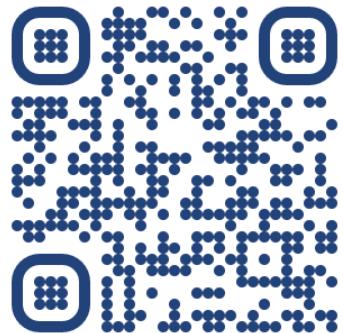
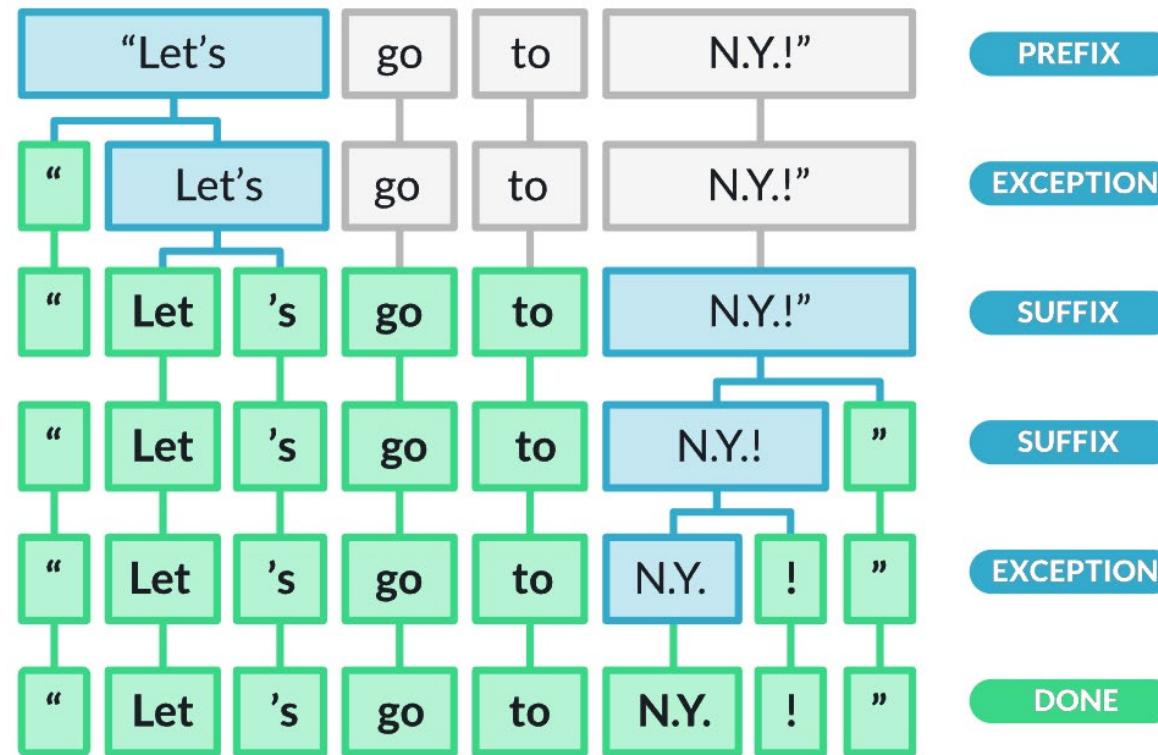
[https://docs.cohere.ai/  
docs/introduction-to-  
large-language-models](https://docs.cohere.ai/docs/introduction-to-large-language-models)



# SotA NLG vereist Tokeniseren van Tekst



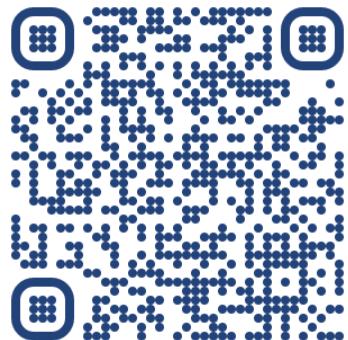
<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#v1g>



<https://spacy.io/usage/spacy-101>

# SotA NLG vereist Tokeniseren van Tekst

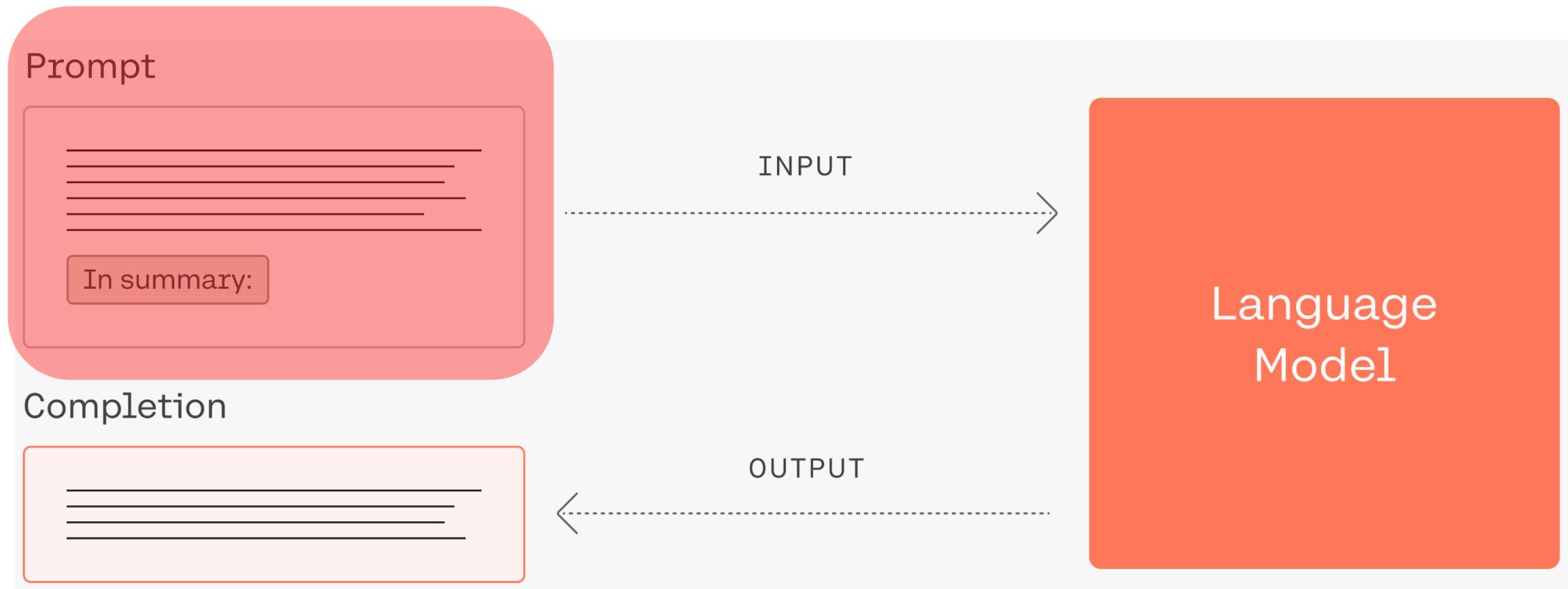
Tokeniseren is het proces waarbij vrije-tekst ---*meestal een tekst corpus*--- wordt omgezet in een lijst van tokens. Een token kan een deel van een woord zijn, een heel woord, of interpunctie ---*leestekens*--- waar een betekenis aan kan worden toegekend.

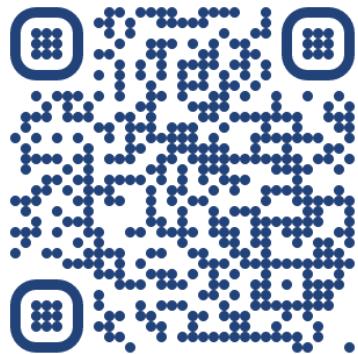


<https://github.com/HR-ChatGPT/ChatGPT-UITGELEGD#v1g>

Tokenisatie is ook gevoelig voor het gebruik van spaties, kleineletters en hoofdletters. Veel voorkomende woorden zoals "water" hebben hun eigen "unieke" tokens. Een langer, minder frequent woord kan worden gecodeerd in 2-3 tokens, bijvoorbeeld "waterval" wordt gecodeerd in twee tokens, één voor "water" en één voor "val".

# SotA NLG vereist PROMPT "ENGINEERING"





<https://bigscience.huggingface.co/blog/t0>

# SotA NLG vereist PROMPT "ENGINEERING"

Original example

```
{"name": "John Doe",  
 "birthdate": "18 april 1352",  
 "birthplace": "Oxford, UK",  
 "occupation": "engineer"}
```

Prompted input

Facts:

- name: John Doe
- birth date: 18 April 1352
- birth place: Oxford, UK
- occupation: engineer

Based on these bullet points, write a short biography describing the life of John Doe.

T0

Output

John Doe (born 18 April 1352) was an English engineer.

# Transformeer Training

President Franklin <M> born <M> January 1882.

Lily couldn't <M>. The waitress had brought the largest <M> of chocolate cake <M> seen.

Our <M> hand-picked and sun-dried <M> orchard in Georgia.

T5

D. Roosevelt was <M> in

believe her eyes <M> piece <M> she had ever

peaches are <M> at our

Pre-training

Fine-tuning

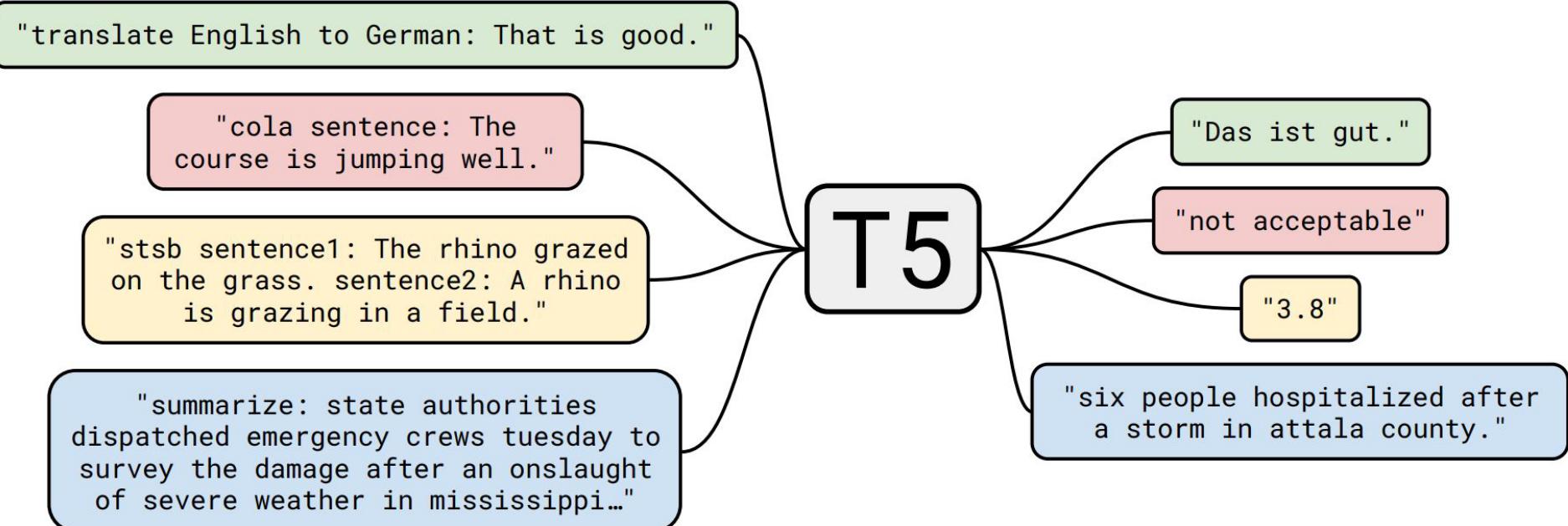
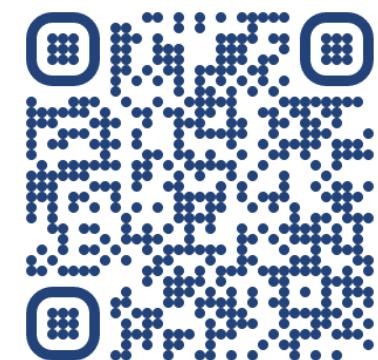
President Franklin D.  
Roosevelt was born  
in January 1882.

When was Franklin D.  
Roosevelt born?

T5

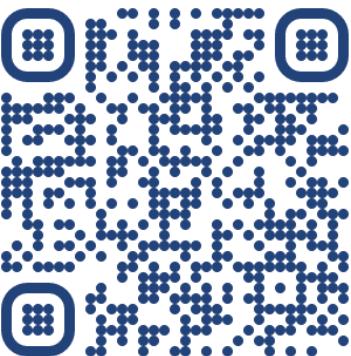
1882

# Transformeren van woorden naar woorden

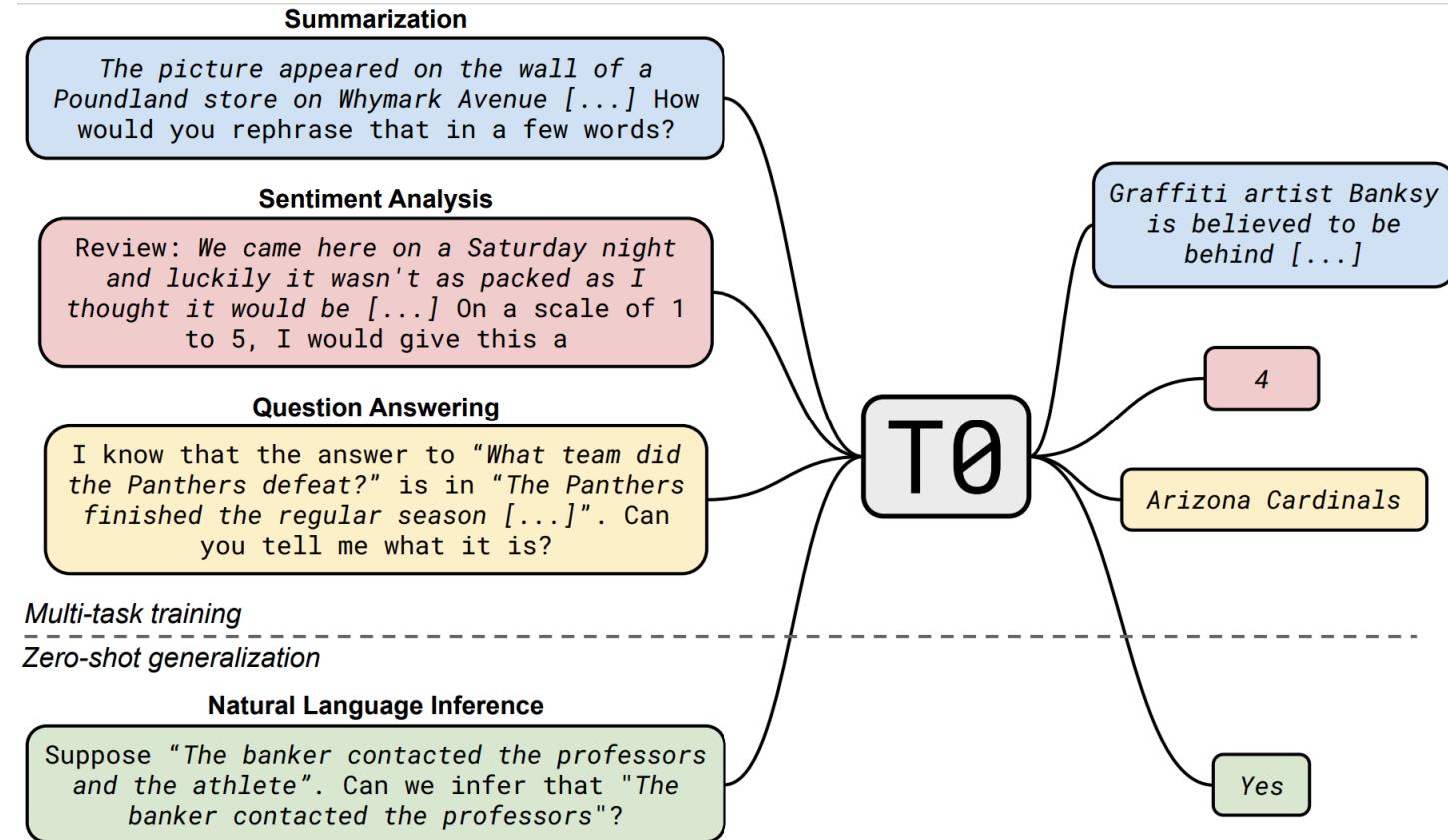


Chung, H. W., Hou, L., Longpre, S., Zoph, B., Tay, Y., Fedus, W., ... & Wei, J. (2022). Scaling instruction-finetuned language models. *arXiv preprint*  
<https://arxiv.org/pdf/2210.11416.pdf>

# Transformeren van woorden naar woorden



Chung, H. W., Hou, L., Longpre, S., Zoph, B., Tay, Y., Fedus, W., ... & Wei, J. (2022). Scaling instruction-finetuned language models. *arXiv preprint*  
<https://arxiv.org/pdf/2210.11416.pdf>



# State-of-the-Art {SotA} NLG

[Nurse] Hi Mr.#name#, you were discharged on #date#. There are some questions i'd like to check with you.

[Patient] Ok, Ok.

[Nurse] Well, have you been experiencing swelling recently?

[Patient] Swelling? It comes and go, comes and go.

[Nurse] Comes and go ... I see .. #repetition#

[Nurse] ... #pause#... When did it start?

[Patient] Let me see, started from three weeks ago.

... ...

[Nurse] Are you experiencing any headache right now as we speak?

[Patient] Umm ... #back-channel#

[Nurse] Let me check, the last time you told me is sometimes at night.

[Patient] Oh, right, only a bit.

... ...

[Nurse] Still feel some chest pain or chest discomfort?

[Patient] Yes, my head is... #false-start# no, the pain is much better.

Still feel headache though ... #topic-drift#

... ...

[Nurse] Any giddiness or palpitation?

[Patient] Palpitation? Do not have-- #interruption#

[Nurse] Well ... Do you-- #interruption#

[Patient] and no giddiness, no, nothing.

... ...

[Nurse] Ok, you need to check your heartrate everyday.

[Nurse] Do you know how to use the device?

[Patient] Yes, yes, no problem.

... ...

Swelling: started from three weeks ago, comes and go.

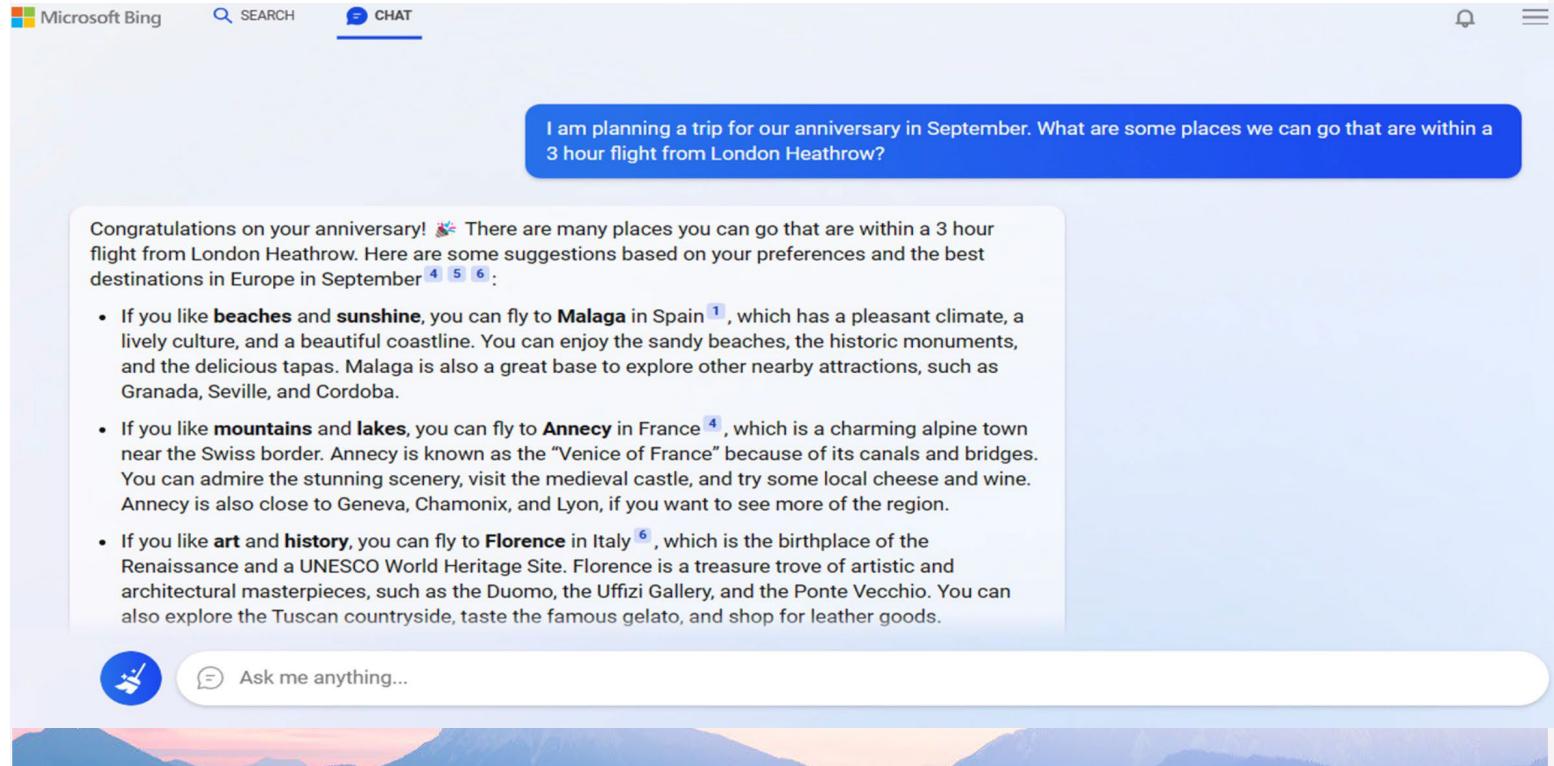
Headache: sometimes, at night, only a bit.

Chest pain: much better.

Dizziness: none.

# State-of-the-art NLG

Reinventing search with a new AI-powered Microsoft Bing and Edge, your copilot for the web

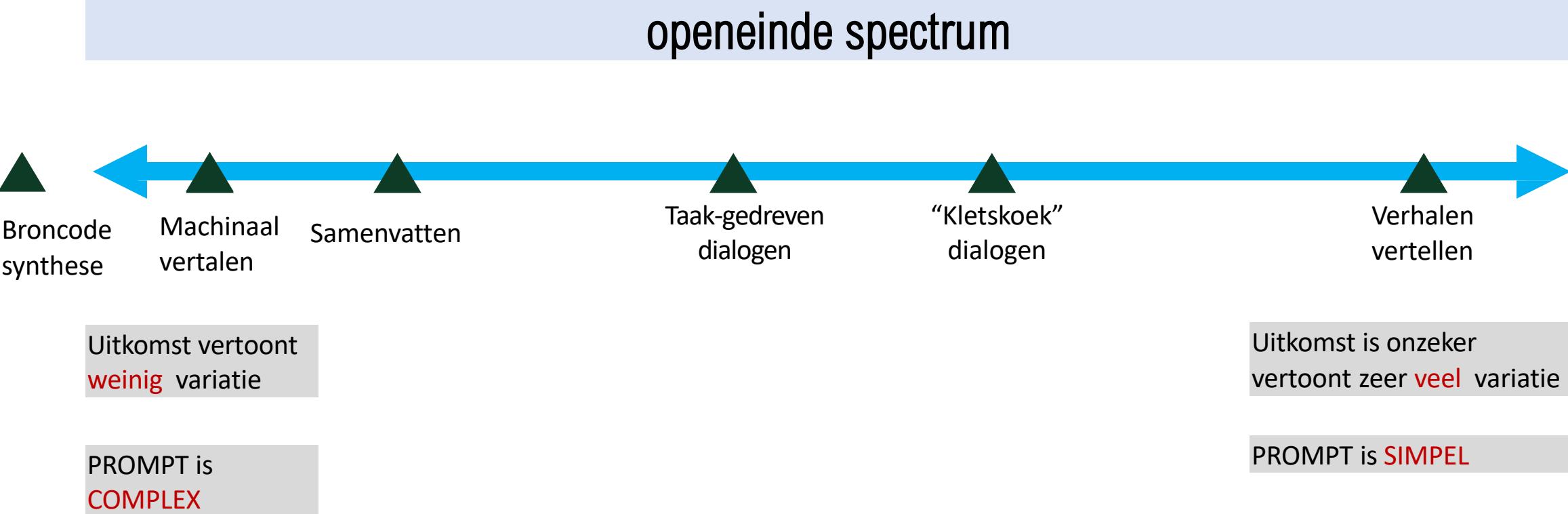


The screenshot shows the Microsoft Bing search interface. At the top, there's a search bar with the placeholder "SEARCH" and a "CHAT" button. Below the search bar, a blue message bubble contains the user's query: "I am planning a trip for our anniversary in September. What are some places we can go that are within a 3 hour flight from London Heathrow?" A response message bubble follows, starting with "Congratulations on your anniversary! 🎉 There are many places you can go that are within a 3 hour flight from London Heathrow. Here are some suggestions based on your preferences and the best destinations in Europe in September [4](#) [5](#) [6](#):

- If you like **beaches** and **sunshine**, you can fly to **Malaga** in Spain [1](#), which has a pleasant climate, a lively culture, and a beautiful coastline. You can enjoy the sandy beaches, the historic monuments, and the delicious tapas. Malaga is also a great base to explore other nearby attractions, such as Granada, Seville, and Cordoba.
- If you like **mountains** and **lakes**, you can fly to **Annecy** in France [4](#), which is a charming alpine town near the Swiss border. Annecy is known as the "Venice of France" because of its canals and bridges. You can admire the stunning scenery, visit the medieval castle, and try some local cheese and wine. Annecy is also close to Geneva, Chamonix, and Lyon, if you want to see more of the region.
- If you like **art** and **history**, you can fly to **Florence** in Italy [6](#), which is the birthplace of the Renaissance and a UNESCO World Heritage Site. Florence is a treasure trove of artistic and architectural masterpieces, such as the Duomo, the Uffizi Gallery, and the Ponte Vecchio. You can also explore the Tuscan countryside, taste the famous gelato, and shop for leather goods.

At the bottom left is a blue icon of a person with a speech bubble, and next to it is the text "Ask me anything...". The background of the interface features a scenic landscape with mountains and a sunset.

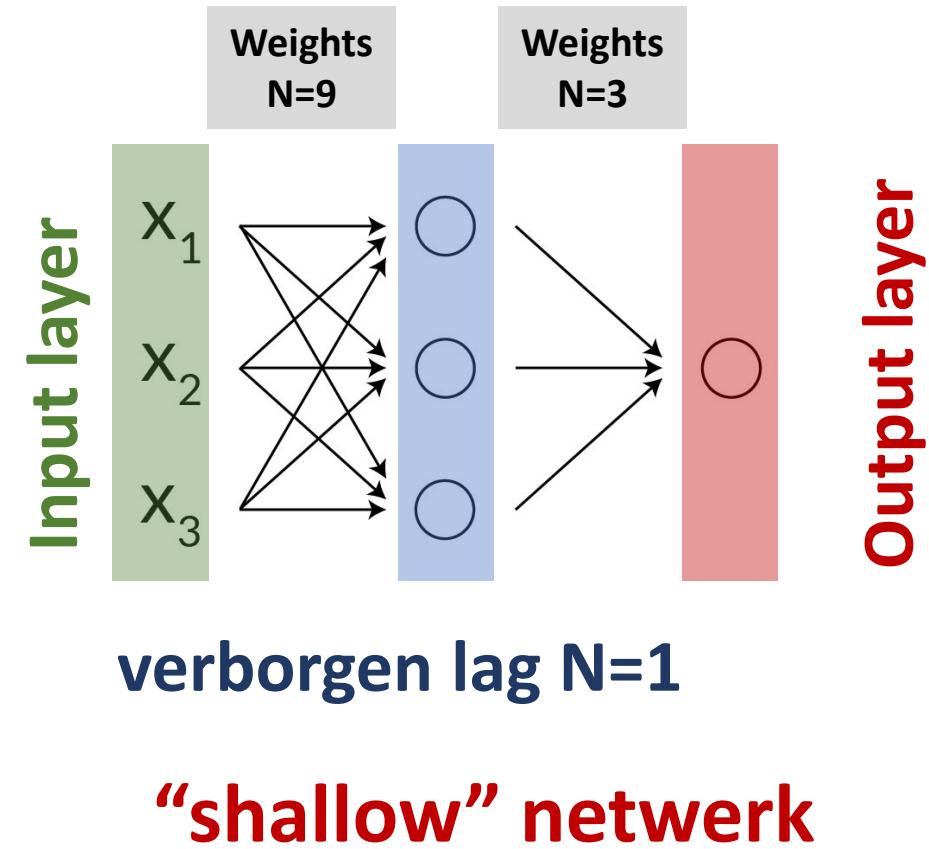
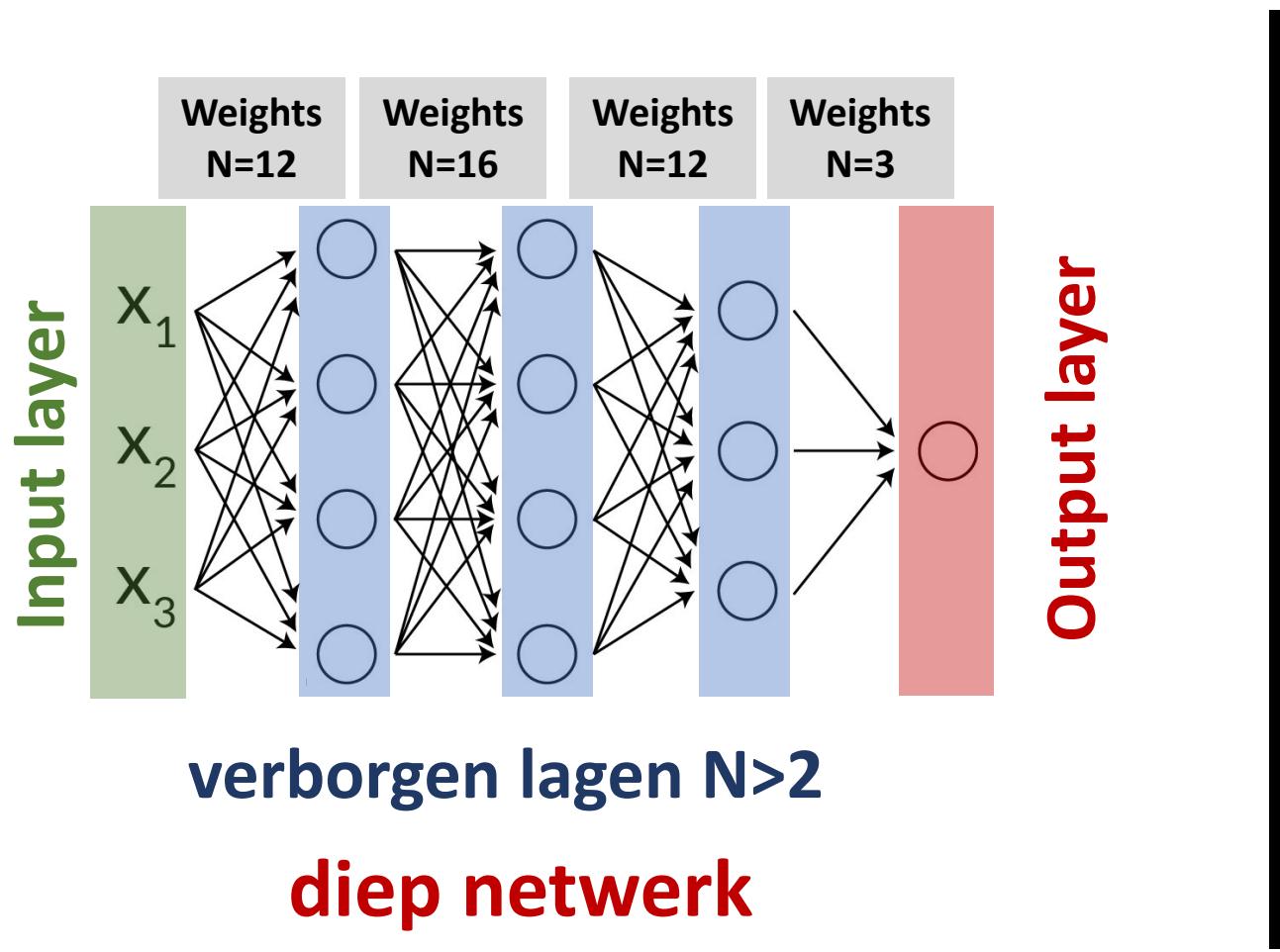
# Categorisering NLG-taken



*---neuraal netwerk ---*

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

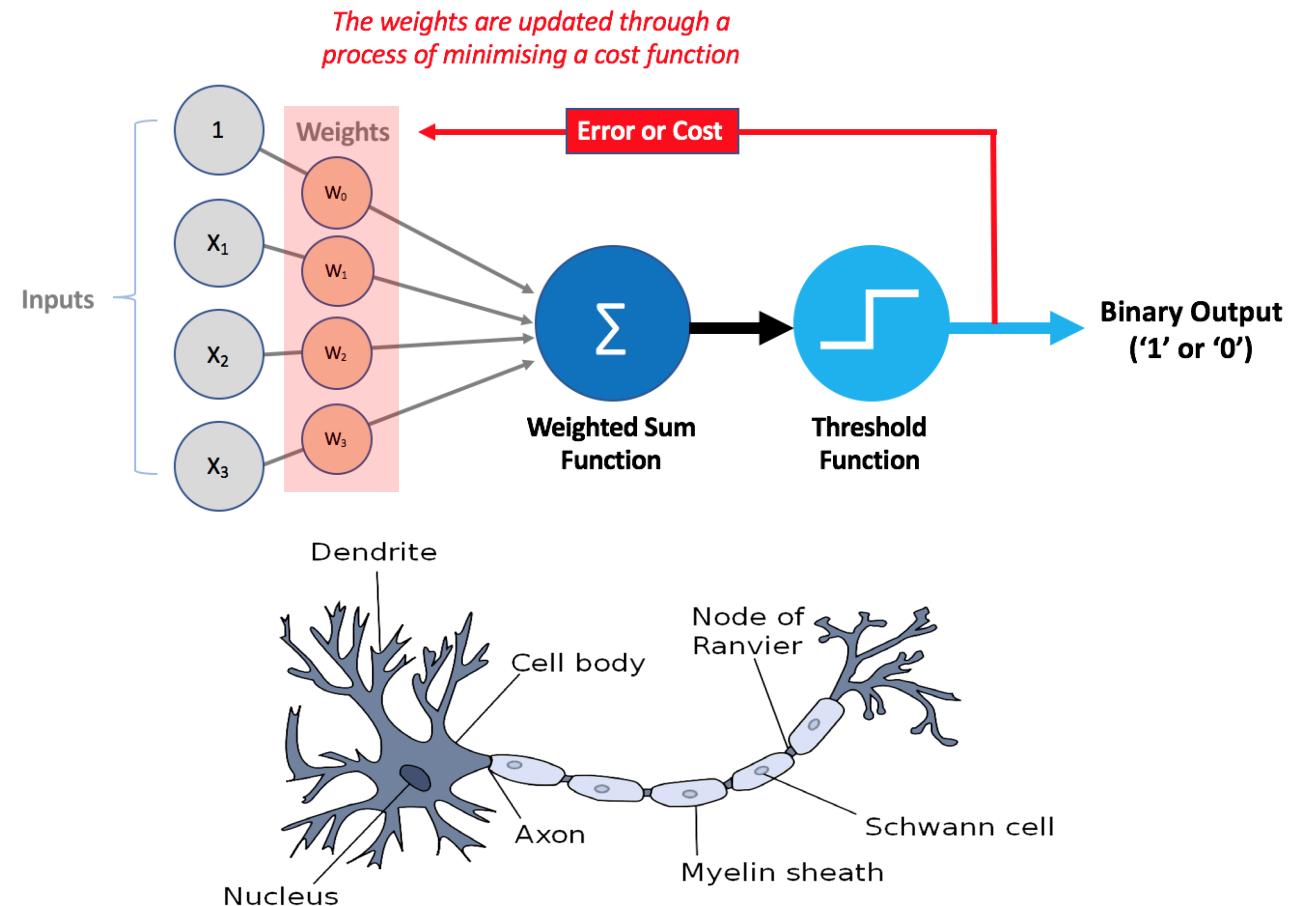
# Neuraal Netwerk modellen



# 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, slugs, snails, and similar-looking objects, like many slug 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



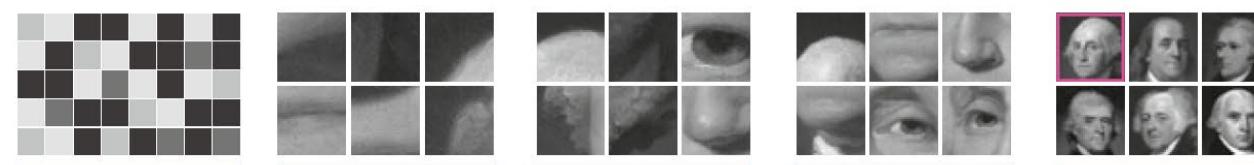
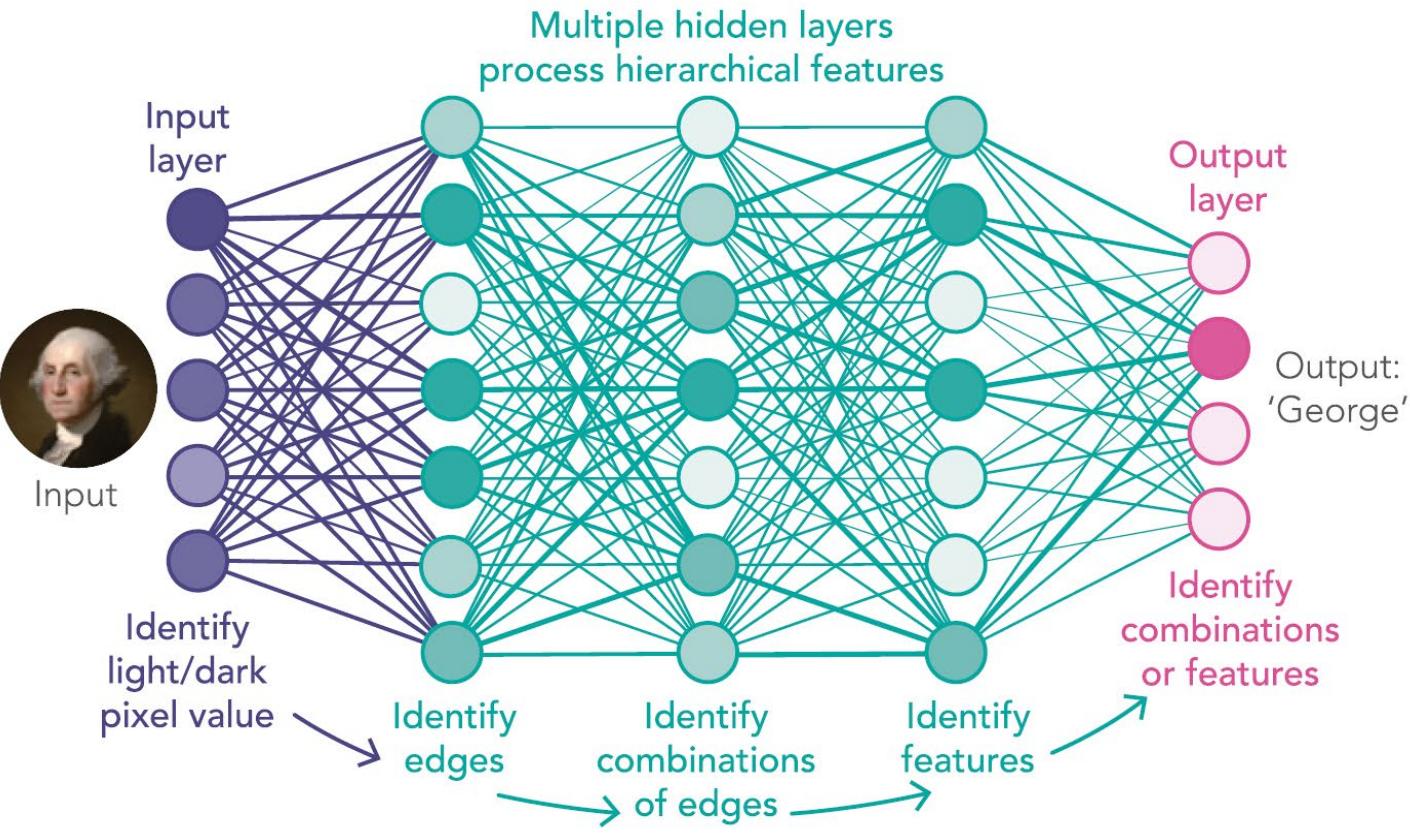
Apparent shortcomings in deep-learning approaches have raised concerns among researchers and the general public about technologies such as driverless cars, which use deep-learning techniques to navigate, get involved in well-publicized mishaps. Image credit: Shutterstock.com/MONOPOQIY919.

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Published under the PNAS license

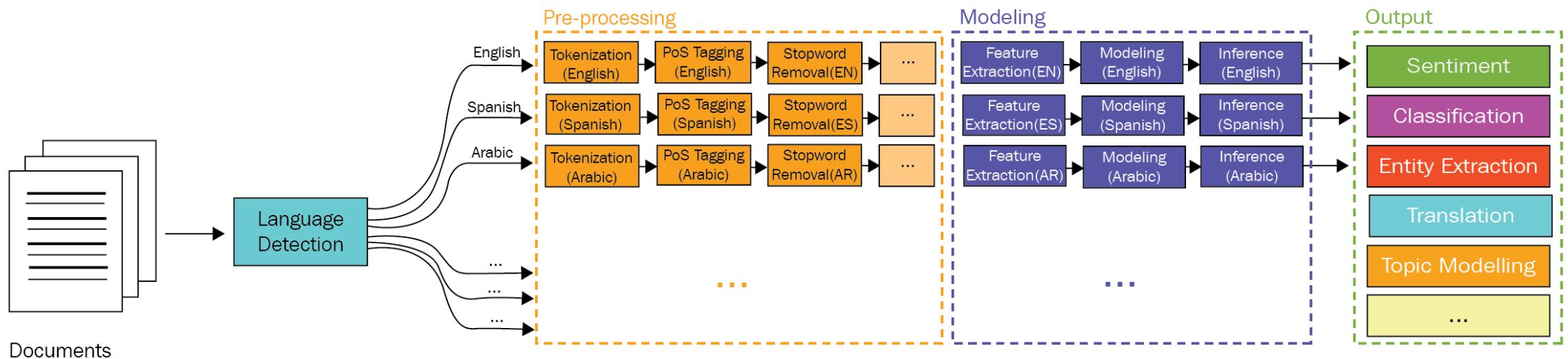
ISSN: 23-3010 | Vol: 116 | Page: 4

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1821594/>



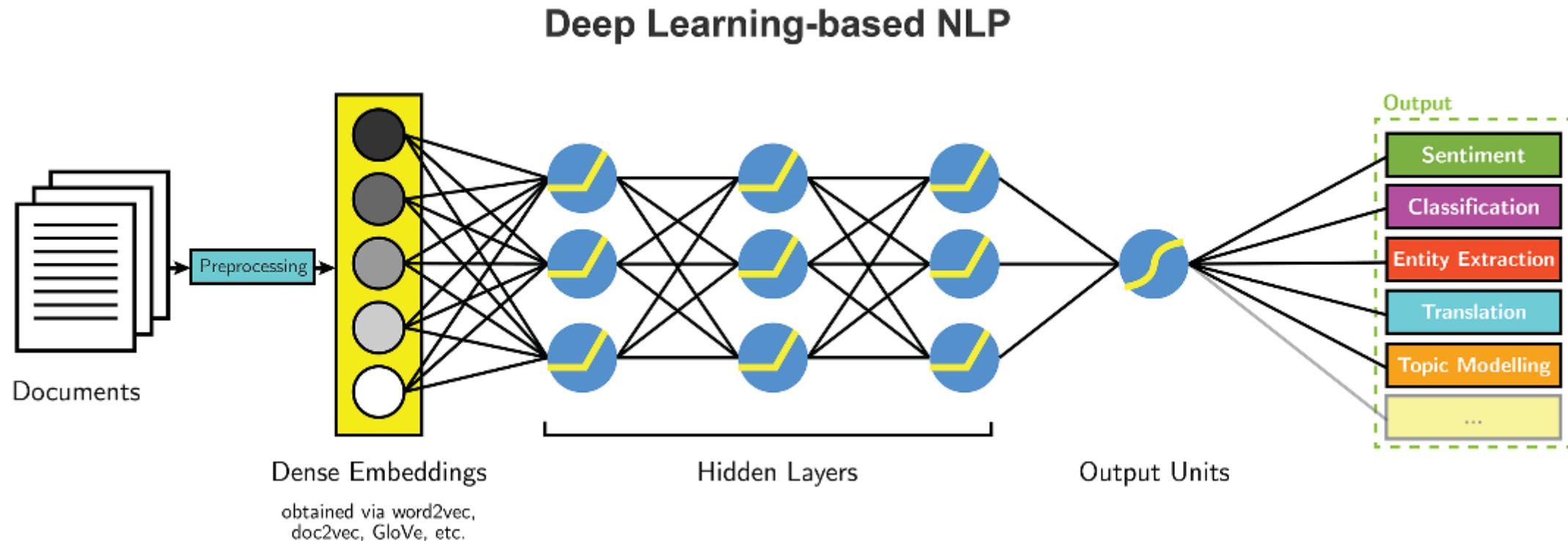
# Diep neuraal netwerk

## Classical NLP



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

# Diep neuraal netwerk



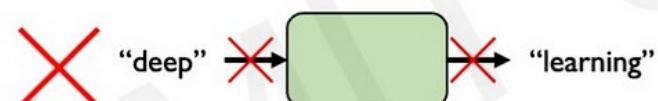
<https://www.oreilly.com/library/view/python-natural-language/9781787121423/6f015f49-58e9-4dd1-8045-b11e7f8bf2c8.xhtml>

# ChatGPT

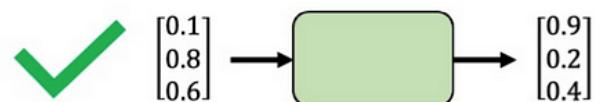
*---[Autoregressive {AR}] Generative Pre-trained  
[neural network] Transformer---*

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



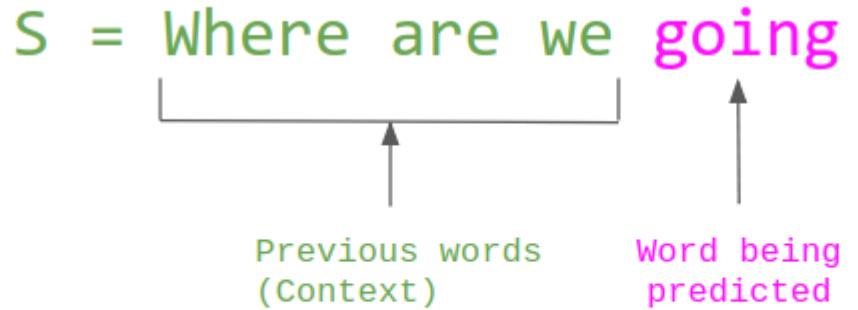
I	→	[0.004, -0.05, ..., 0.3]
Want	→	[-0.1, -0.0072, ..., 0.12]
...	...	...
Free	→	[0.023, 0.31, ..., -0.1606]



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

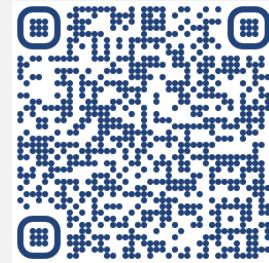
# AutoRegression [AR]

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

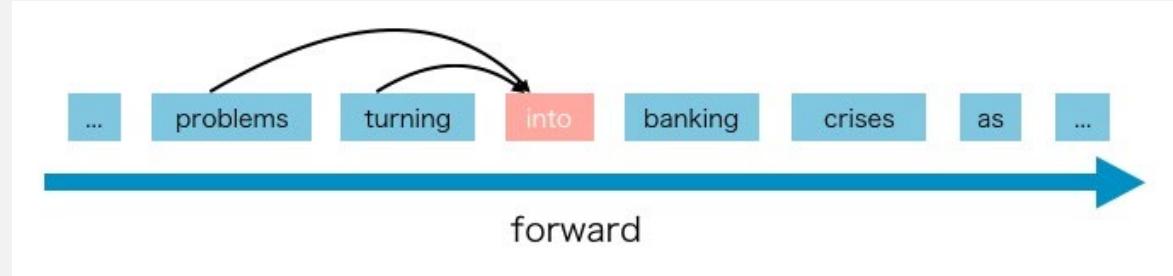


$$P(S) = P(\text{Where}) \times P(\text{are} \mid \text{Where}) \times P(\text{we} \mid \text{Where are}) \times P(\text{going} \mid \text{Where are we})$$

# AutoRegression [AR]

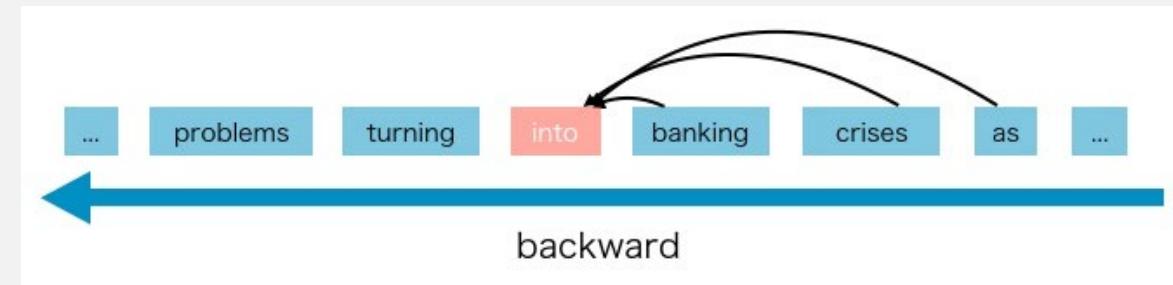


[https://aman.ai/primers  
/ai/autoregressive-vs-  
autoencoder-models/](https://aman.ai/primers/ai/autoregressive-vs-autoencoder-models/)



## PROS:

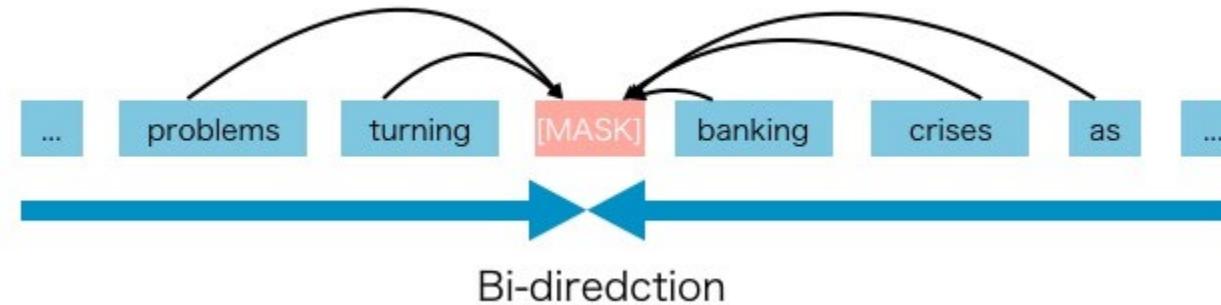
AR language models are good at generative NLP tasks. Since AR models utilize causal attention to predict the next token, they are naturally applicable for generating content. The other advantage of AR models is that generating data for them is relatively easy, since you can simply have the training objective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

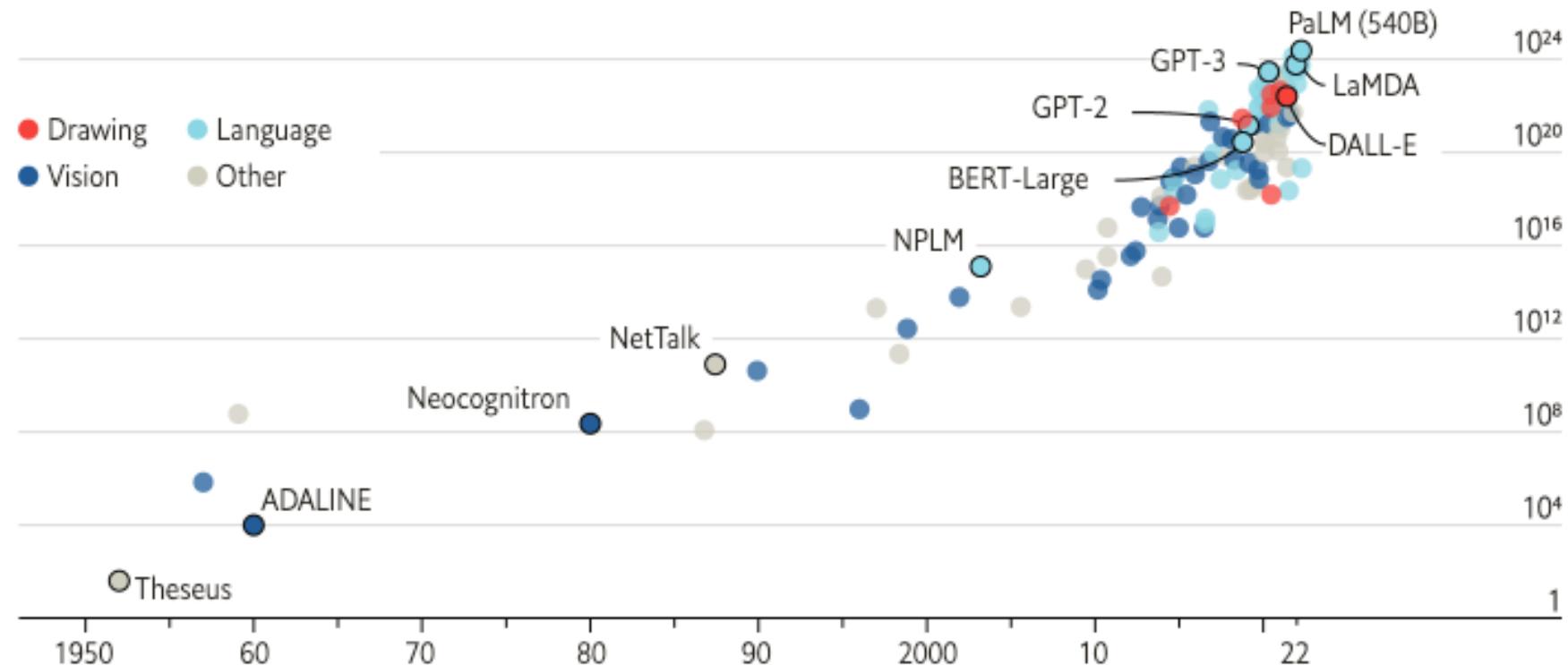
The economist  
Jun 11th 2022



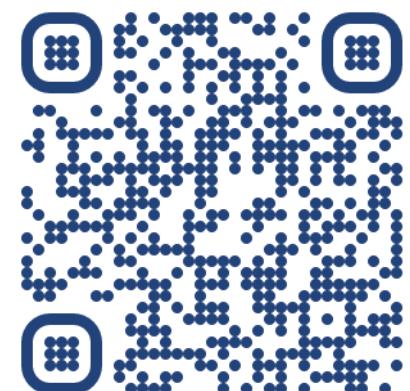
## The blessings of scale

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

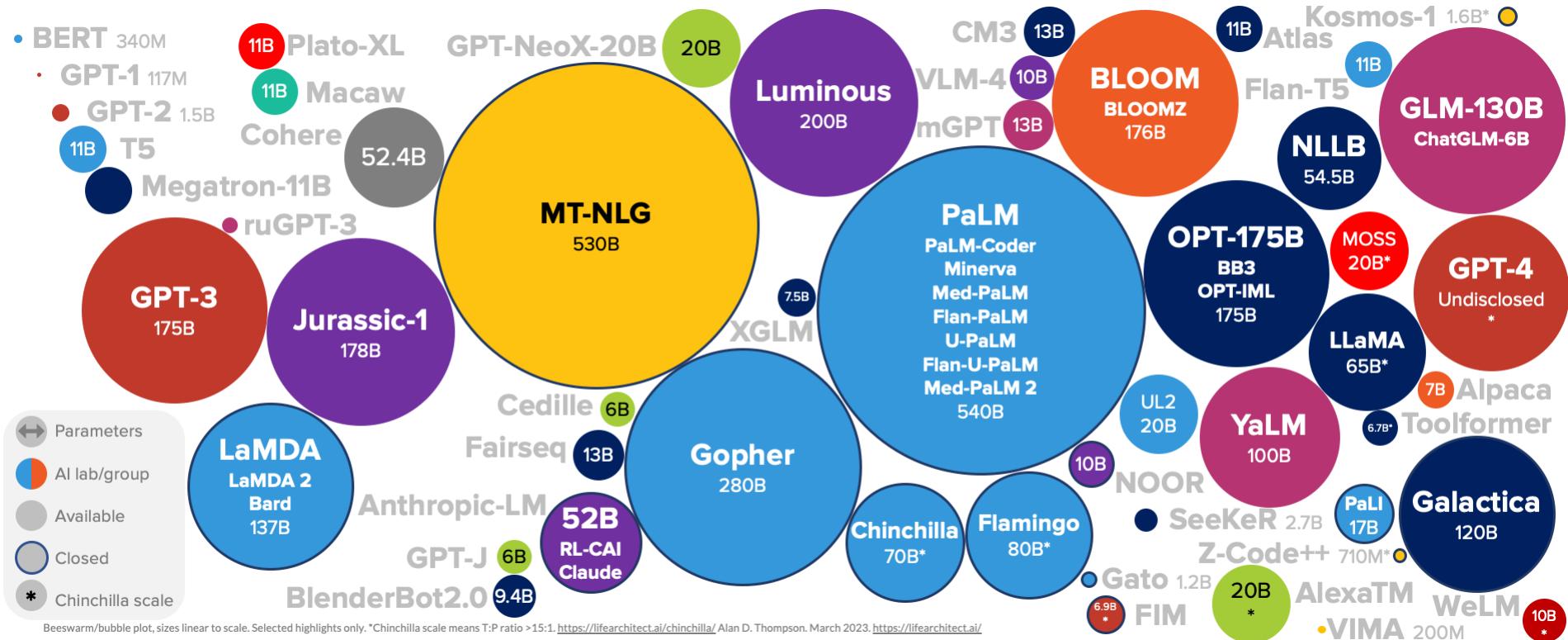


# Large Language Models: Het LLM-Landschap

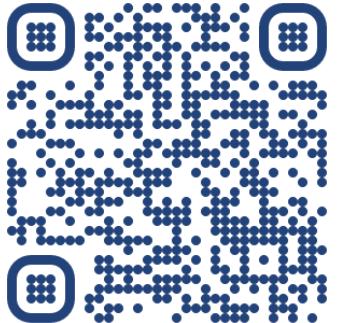
# Large Language Models: Het LLM-Landschap



[https://s10251.pcdn.co/pdf/2023-  
Alan-D-Thompson-AI-Bubbles-Rev-  
7b.pdf](https://s10251.pcdn.co/pdf/2023-Alan-D-Thompson-AI-Bubbles-Rev-7b.pdf)

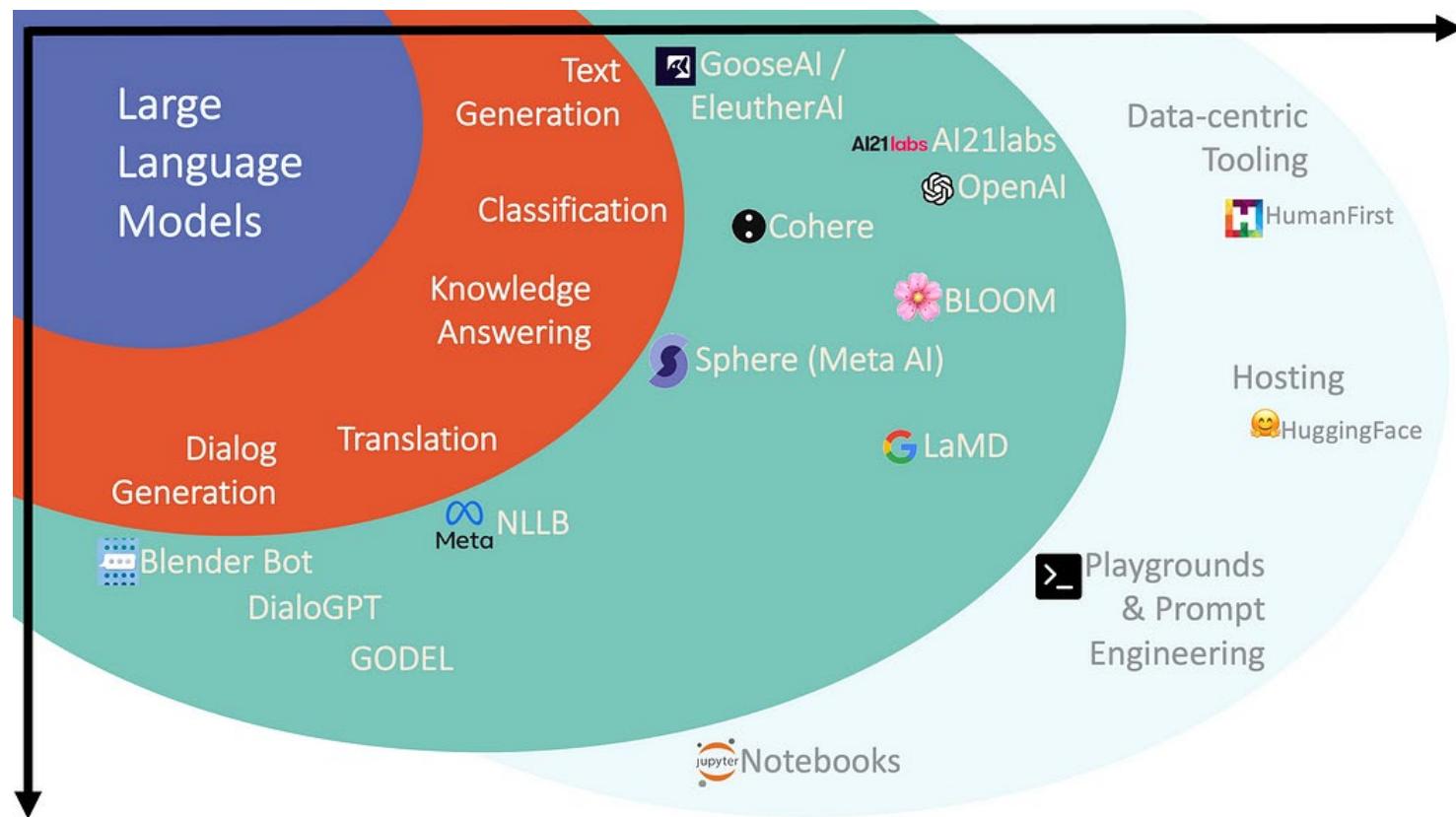


<https://docs.google.com/spreadsheets/d/1O5KVQW1Hx5ZAkcg8AIRjbQLQzx2wVaLIOSqUu-ir9Fs/edit#gid=1158069878>



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

# Large Language Models: Het LLM-Landschap



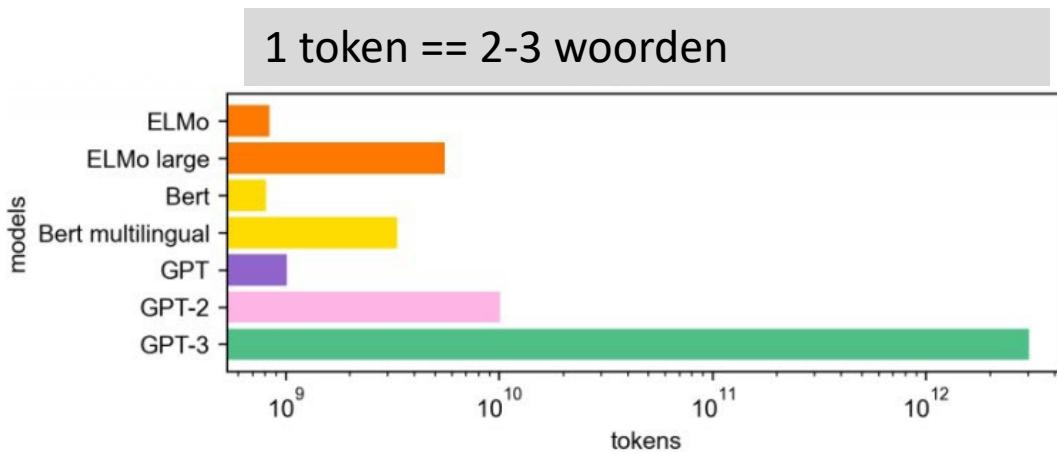
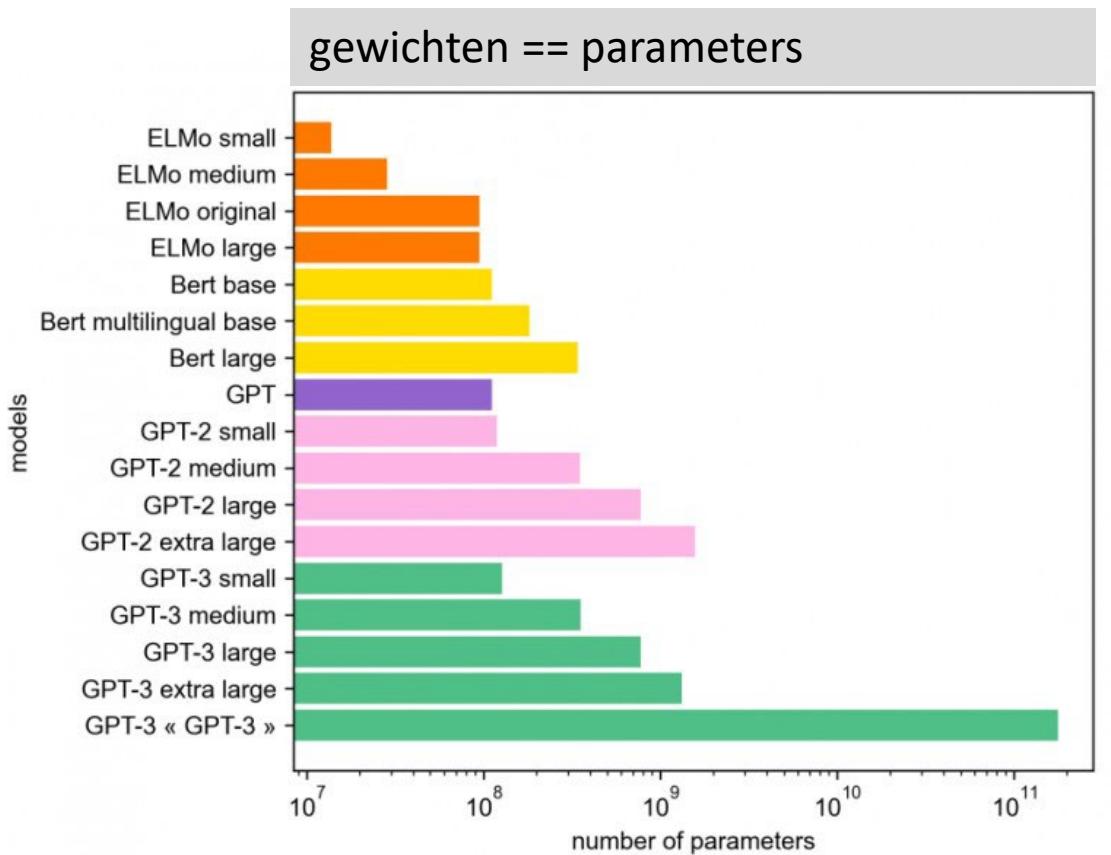
<https://cobusgreyling.medium.com/the-large-language-model-landscape-9da7ee17710b>



HOGESCHOOL  
ROTTERDAM

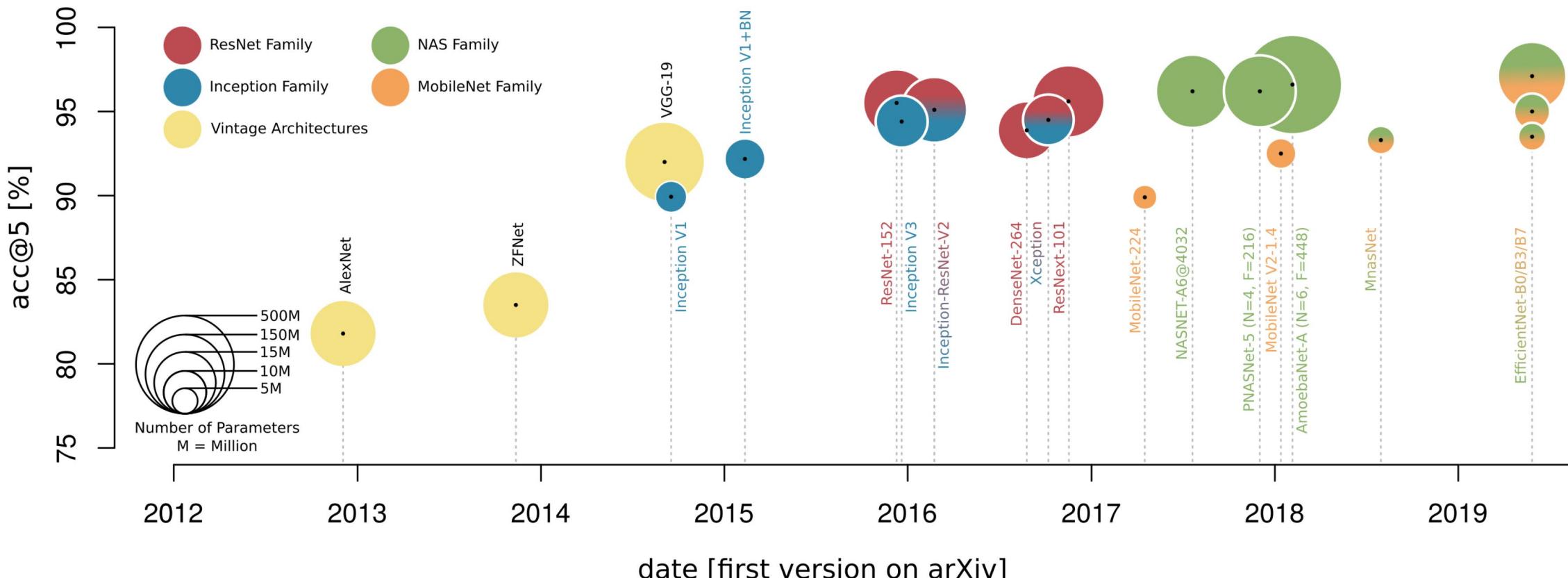
*“waarom zo  
groot?”*

# 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?

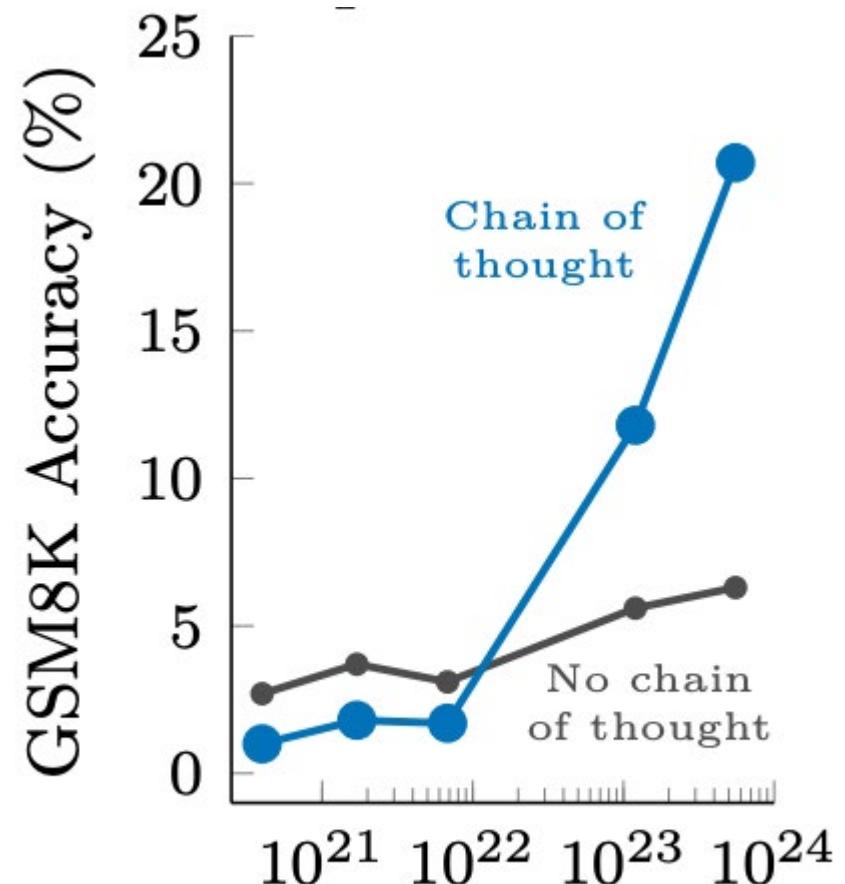
<https://doi.org/10.3390/rs12101667>

# 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>



# *“Prompt Recepten”*

## *Schrijven Uitgelegd*

# PROMPT

Een prompt is een natuurlijke taal instructie gericht aan een **"bevroren" voorgetraind taalmodel** 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?**

Deskresearch / Waarheidsvinding

Effectieve Zoekopdracht

Testen & Evalueren van Chatbots & taalmodellen

Innovatie van taalmodellen, generatieve AI & NLP

# Prompt Recept Structuur

Een prompt is opgebouwd uit de volgende elementen:

Instructie(s)

Context

Invoergegevens

Uitvoer-indicator

*Classificeer de onderstaande tekst als neuraal, negatief of positief*

*Text: Ik vond het eten wel zozo.*

*Sentiment:*

# Prompt-recept versus Takkengerichtheid

Tekst samenvatten

Vraag beantwoorden

Tekstclassificatie

Rollenspel

Code genereren

Redeneren

# Prompt recept schrijf technieken

Few-shot prompts (In Context leren)

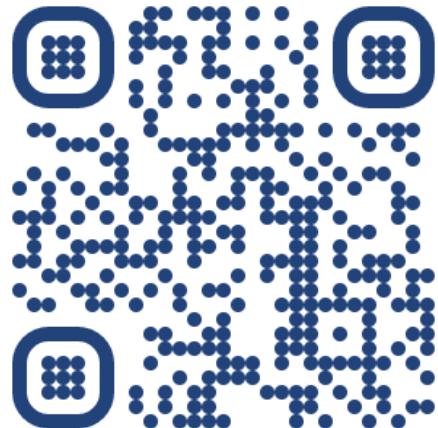
Chain-of-thought (CoT) prompting

Self-Consistency

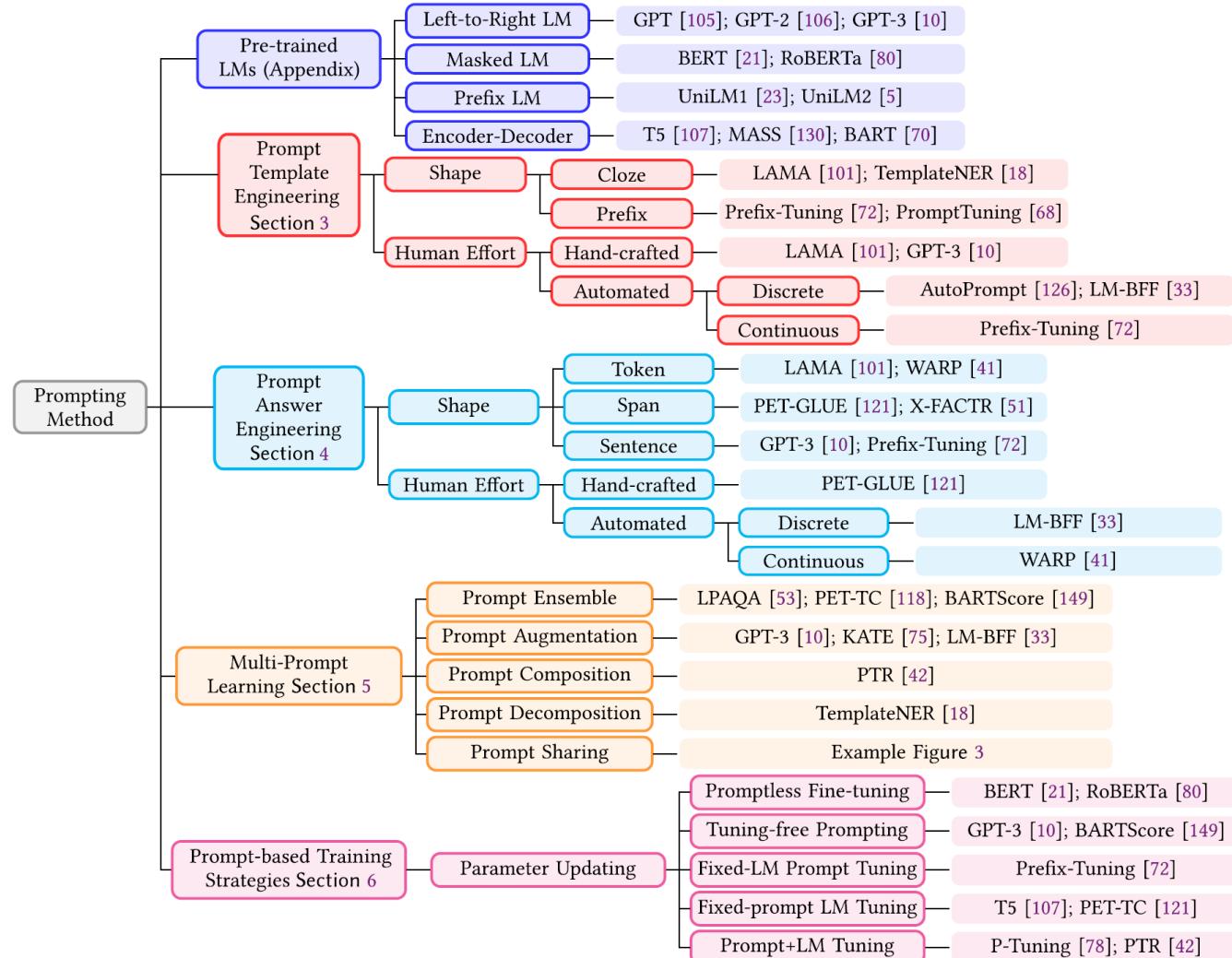
Knowledge Generation Prompting

ReAct

# PROMPT Receptuur Methoden



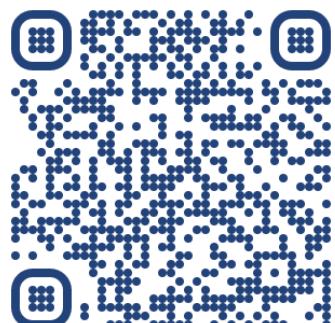
Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., & Neubig, G. (2023). Pre-train, Prompt, and Predict: A Systematic Survey of Prompting Methods in Natural Language Processing. *ACM Comput. Surv.*, 55(9), Article 195.  
<https://doi.org/10.1145/3560815>



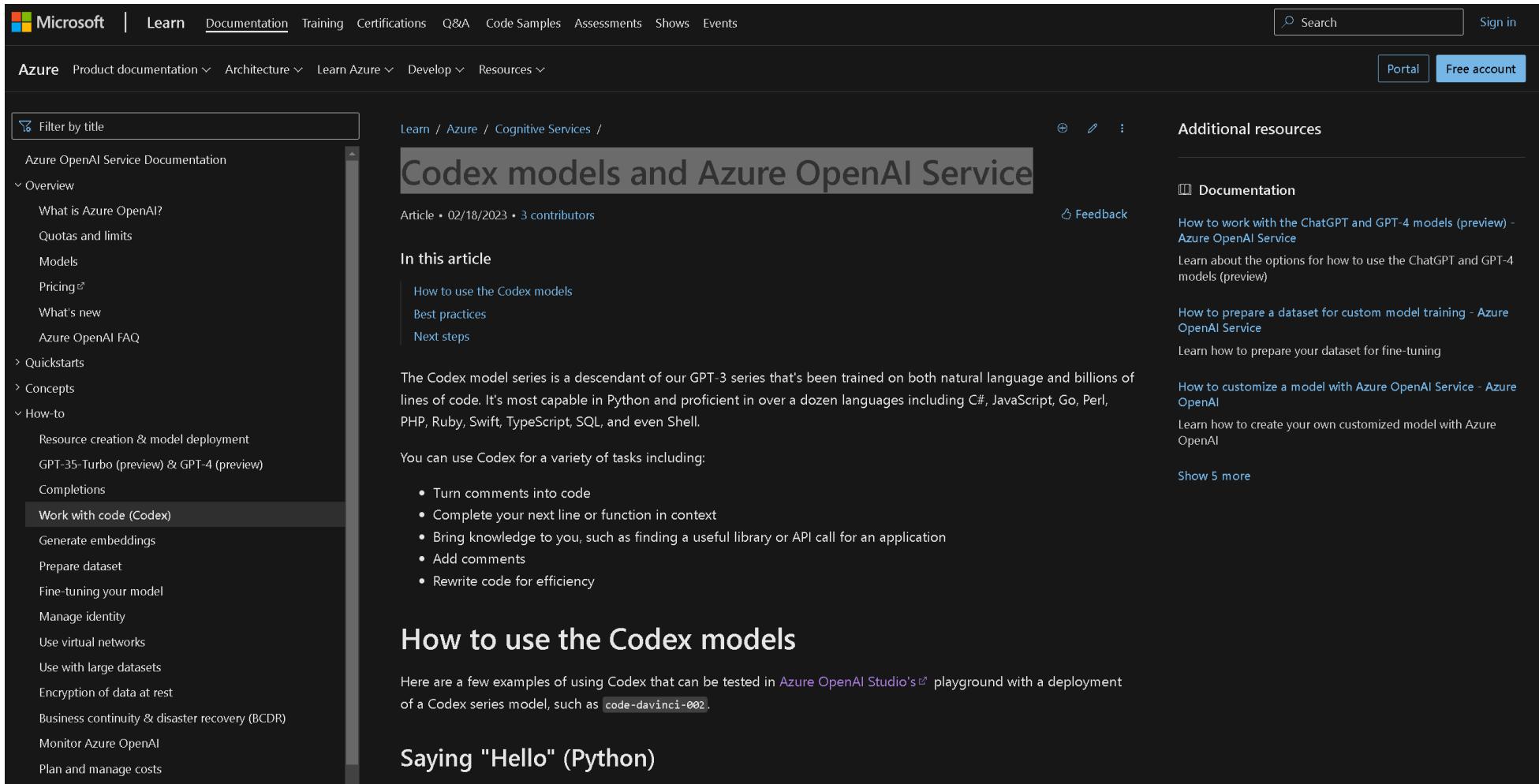
# PROMPT Receptuur Methoden



<https://learn.microsoft.com/en-us/azure/cognitive-services/openai/how-to/work-with-code#how-to-use-the-codex-models>



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



The screenshot shows a Microsoft Learn page for Azure Cognitive Services. The main article is titled "Codex models and Azure OpenAI Service". It discusses the Codex model series, which is trained on billions of lines of code and can handle various languages. Below the article, there's a section titled "How to use the Codex models" with a bulleted list of tasks it can perform, such as turning comments into code and completing functions. At the bottom, there's a section titled "Saying 'Hello' (Python)".

**Microsoft | Learn Documentation Training Certifications Q&A Code Samples Assessments Shows Events**

**Azure Product documentation ▾ Architecture ▾ Learn Azure ▾ Develop ▾ Resources ▾**

**Filter by title**

**Azure OpenAI Service Documentation**

- Overview
  - What is Azure OpenAI?
  - Quotas and limits
  - Models
  - Pricing ↗
  - What's new
  - Azure OpenAI FAQ
- Quickstarts
- Concepts
- How-to
  - Resource creation & model deployment
  - GPT-35-Turbo (preview) & GPT-4 (preview)
  - Completions
- Work with code (Codex)
  - Generate embeddings
  - Prepare dataset
  - Fine-tuning your model
  - Manage identity
  - Use virtual networks
  - Use with large datasets
  - Encryption of data at rest
  - Business continuity & disaster recovery (BCDR)
  - Monitor Azure OpenAI
  - Plan and manage costs

**Codex models and Azure OpenAI Service**

Article • 02/18/2023 • 3 contributors

**In this article**

- How to use the Codex models
- Best practices
- Next steps

The Codex model series is a descendant of our GPT-3 series that's been trained on both natural language and billions of lines of code. It's most capable in Python and proficient in over a dozen languages including C#, JavaScript, Go, Perl, PHP, Ruby, Swift, TypeScript, SQL, and even Shell.

You can use Codex for a variety of tasks including:

- Turn comments into code
- Complete your next line or function in context
- Bring knowledge to you, such as finding a useful library or API call for an application
- Add comments
- Rewrite code for efficiency

**How to use the Codex models**

Here are a few examples of using Codex that can be tested in Azure OpenAI Studio's ↗ playground with a deployment of a Codex series model, such as `code-davinci-002`.

**Saying "Hello" (Python)**

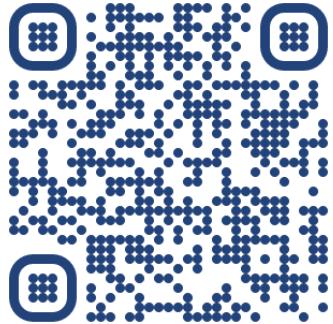
**Additional resources**

**Documentation**

- How to work with the ChatGPT and GPT-4 models (preview) - Azure OpenAI Service
- Learn about the options for how to use the ChatGPT and GPT-4 models (preview)
- How to prepare a dataset for custom model training - Azure OpenAI Service
- Learn how to prepare your dataset for fine-tuning
- How to customize a model with Azure OpenAI Service - Azure OpenAI
- Learn how to create your own customized model with Azure OpenAI

**Show 5 more**

# PROMPT Receptuur Methoden



<https://platform.openai.com/docs/guides/chat>



<https://learn.microsoft.com/en-us/azure/cognitive-services/openai/how-to/chatgpt?pivot=programming-language-chat-completions>

## Chat completions Beta

Using the OpenAI Chat API, you can build your own applications with `gpt-3.5-turbo` and `gpt-4` to do things like:

- Draft an email or other piece of writing
- Write Python code
- Answer questions about a set of documents
- Create conversational agents
- Give your software a natural language interface
- Tutor in a range of subjects
- Translate languages
- Simulate characters for video games and much more

This guide explains how to [make an API call for chat-based language models](#) and shares tips for getting good results. You can also experiment with the new [chat format in the OpenAI Playground](#).

### Introduction

Chat models take a series of messages as input, and return a model-generated message as output.

Although the chat format is designed to make multi-turn conversations easy, it's just as useful for single-turn tasks without any conversations (such as those previously served by instruction following models like `text-davinci-003`).

An example API call looks as follows:

```

1 # Note: you need to be using OpenAI Python v0.27.0 for the code below ⌂ or
2 import openai
3
4 openai.ChatCompletion.create(
5     model="gpt-3.5-turbo",
6     messages=[
7         {"role": "system", "content": "You are a helpful assistant."},
8         {"role": "user", "content": "Who won the world series in 2020?"},
9         {"role": "assistant", "content": "The Los Angeles Dodgers won the World Series in 2020."}
10        {"role": "user", "content": "Where was it played?"}
11    ]
12 )

```

• **Temperature:** What sampling temperature to use, between 0 and 2. Higher values like 0.8 will make the output more random, while lower values like 0.2 will make it more focused and deterministic.

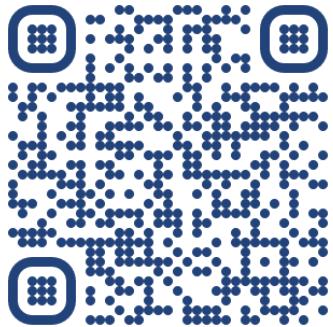
• **Maximum length:** The maximum length of the generated text in tokens (words or subwords).

• **Top P:** The cumulative probability of generating the next token from the model's output distribution. Lower values like 0.9 will make the model more conservative while higher values like 1.0 will make it more creative.

• **Frequency penalty:** Lowering the chances of a word being selected again the more times that word has already been used.

• **Presence penalty:** Lowering the chances of a word being selected if it has already been used in a previous prompt.

# PROMPT Receptuur Methoden



<https://oai.azure.com/portal/playground>

Cognitive Services | Azure OpenAI Studio

Azure OpenAI Studio > Completions playground

## Completions playground

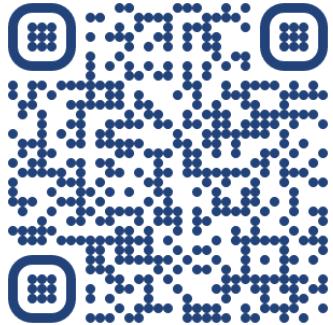
Deployments Examples

AGENT01 Natural Language to SQL

The example Natural Language to SQL, works best with deployment PythonGEN.

```
### Postgres SQL tables, with their properties:  
#  
# Employee(id, name, department_id)  
# Department(id, name, address)  
# Salary_Payments(id, employee_id, amount, date)  
  
### A query to list the names of the departments which employed more than 10 employees in the last 3 months  
  
SELECT d.name  
FROM Department d  
INNER JOIN Employee e ON d.id = e.department_id  
INNER JOIN Salary_Payments sp ON e.id = sp.employee_id  
WHERE sp.date > NOW() - INTERVAL '3 months'  
GROUP BY d.name  
HAVING COUNT(*) > 10
```

# PROMPT Receptuur Methoden



<https://oai.azure.com/portal/playground>

Cognitive Services | Azure OpenAI Studio

Azure OpenAI Studio > Completions playground

## Completions playground

Deployments Examples

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GROUP BY d.name  
HAVING COUNT(*) > 10
```

# Kansen & Gevaren

Model veiligheid

prompt injectie / "lekkage" / "gevangenisuitbraken"

Human-in-the-loop [RLHF]

Toekomstige richtingen

*“In Context Leren*  
**{ICL}**”

# In Context leren {ICL} / Few-shot prompting

In-context-leren is een vorm van machinaal leren waarbij modellen nieuwe taken kunnen leren op basis van enkele voorbeelden.

Dit in tegenstelling tot traditioneel leren onder toezicht, waarbij modellen worden getraind op een grote dataset van gelabelde voorbeelden.

In-context leren is nog een relatief nieuw gebied, maar het heeft het potentieel om de manier waarop we modellen voor machinaal leren trainen te revolutioneren.

Een van de belangrijkste voordelen van in-context-leren is dat het veel efficiënter is dan traditioneel leren met toezicht. Dit komt doordat modellen slechts hoeven te worden getraind op een klein aantal voorbeelden, die veel sneller kunnen worden verzameld dan een grote dataset. Bovendien zijn modellen voor in-context-leren vaak robuuster voor ruis en uitschieters in de gegevens.

Een ander voordeel van in-context-leren is dat het kan worden gebruikt om modellen te trainen voor taken die moeilijk of duur te labelen zijn. Als u bijvoorbeeld een model wilt trainen om afbeeldingen van katten en honden te classificeren, moet u een grote dataset van gelabelde afbeeldingen verzamelen. Als u echter een model wilt trainen om beelden van zeldzame ziekten te classificeren, zou het zeer moeilijk zijn om een voldoende grote dataset van gelabelde beelden te verzamelen. In dit geval kan in-contextleren worden gebruikt om een model te trainen op basis van een klein aantal gelabelde voorbeelden.

In-context-leren is nog in ontwikkeling, maar het heeft het potentieel om een revolutie te weeg te brengen in de manier waarop we modellen voor machinaal leren trainen. Het is een efficiëntere en robuustere benadering van leren, en het kan worden gebruikt om modellen te trainen voor taken die moeilijk of duur zijn om te labelen.

Hier volgen enkele voorbeelden van in-context-leren:

Een model dat tekst kan vertalen van de ene taal naar de andere na het zien van slechts enkele voorbeelden.

Een model dat tekst kan genereren die lijkt op een bepaalde schrijfstijl na het zien van slechts enkele voorbeelden.

Een model dat vragen over een bepaald onderwerp kan beantwoorden na het zien van slechts enkele voorbeelden.

In-context-leren is een krachtig hulpmiddel dat kan worden gebruikt om modellen voor machinaal leren te trainen voor uiteenlopende taken.

# In-Context Leren {ICL}

	No Prompt	Prompt
<b>Zero-shot (os)</b>	speudo = <span style="background-color: #d9e1f2;">pseudo</span>	<b>Ontcijfer de letters tot een woord, en schrijf dat woord:</b> speudo = <span style="background-color: #d9e1f2;">pseudo</span>
<b>1-shot (1s)</b>	soelt = stoel <span style="background-color: #ffff00;">speudo</span> = <span style="background-color: #d9e1f2;">pseudo</span>	<b>Ontcijfer de letters tot een woord, en schrijf dat woord:</b> soelt = stoel speudo = <span style="background-color: #d9e1f2;">pseudo</span>
<b>Few-shot (FS)</b>	soelt = stoel [.] pciinc = picnic speudo = <span style="background-color: #d9e1f2;">pseudo</span>	<b>Ontcijfer de letters tot een woord, en schrijf dat woord:</b> chiar = chair [.] pciinc = picnic skicts = <span style="background-color: #d9e1f2;">sticks</span>

# In-Context Leren {ICL}

## Fine-tuning (FT)

- + hoge betrouwbaarheid
- Voor elke nieuwe taak is een gecureerde en gelabelde dataset nodig
- Niet generaliseerbaar, gebruikte uitvoer indicator is fout gevoelig

vereist veel tijd  
hoog sturend  
taak specifiek

## Few-shot (FS)

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

## One-shot (1S)

- + meest natuurlijke vorm van opdracht tegen
- vereist zeer veel oefening en taalkundigheid

## Zero-shot (oS)

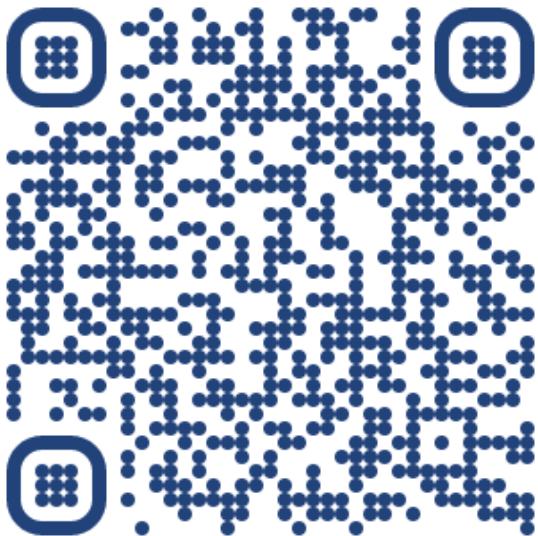
- + vereist nauwelijks extra inspanning
- Antwoorden zijn vaak dubbelzinnig en/of incorrect en/of wartaal



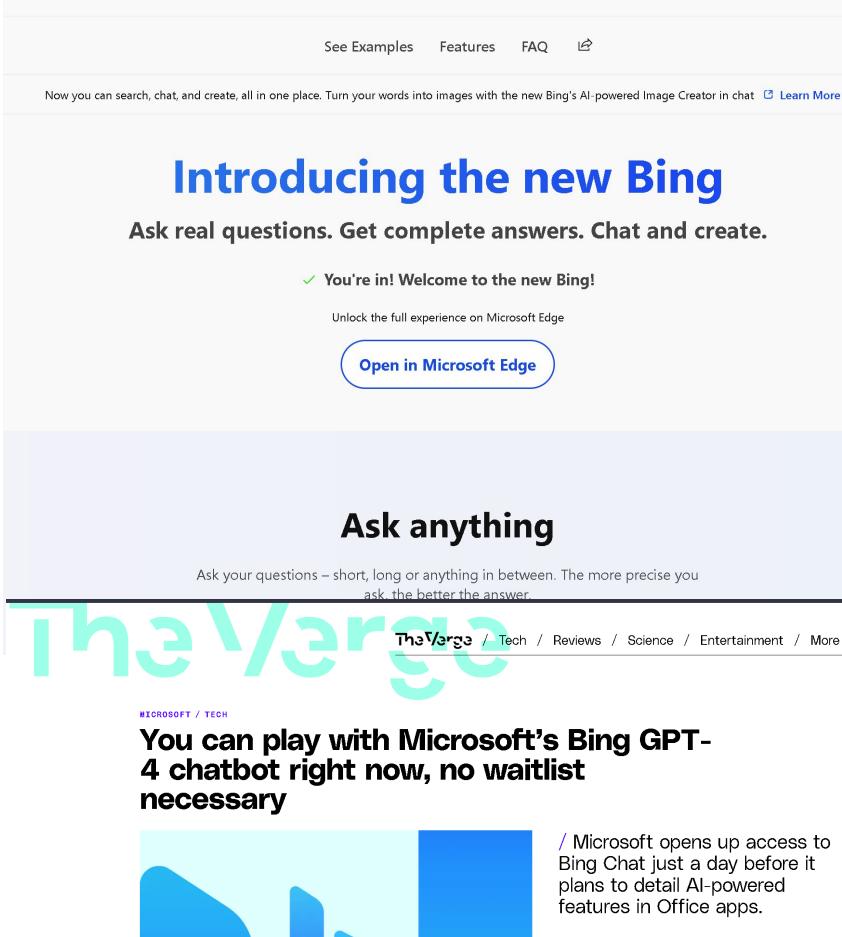
Snel  
generaliserend  
openeinde output

DIY {do it yourself}

# How to get Access to Bing



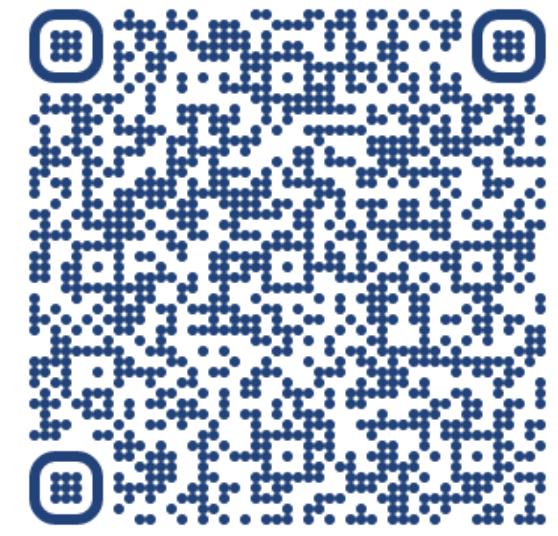
[https://www.bing.com/new?  
form=MY029I&OCID=MY029I](https://www.bing.com/new?form=MY029I&OCID=MY029I)



The screenshot shows the Microsoft Bing homepage. At the top, there are links for "See Examples", "Features", "FAQ", and a search 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." Below this, the main heading "Introducing the new Bing" is displayed in blue, followed by the subtext "Ask real questions. Get complete answers. Chat and create." A green checkmark icon indicates "You're in! Welcome to the new Bing!". A button labeled "Open in Microsoft Edge" is present. The middle section features a large "Ask anything" button with the subtext "Ask your questions – short, long or anything in between. The more precise you ask, the better the answer." The "The Verge" logo is visible at the bottom left, and a news snippet from "MICROSOFT / TECH" discusses the availability of Microsoft's Bing GPT-4 chatbot.

**You can play with Microsoft's Bing GPT-4 chatbot right now, no waitlist necessary**

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)

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 neutral

<sup>1</sup>

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](http://bing.com)
2. [geeksforgeeks.org](http://geeksforgeeks.org)
3. [freecodecamp.org](http://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](https://twitter.com)
- 2. [twitter.com](https://twitter.com)
- 3. [github.com](https://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);

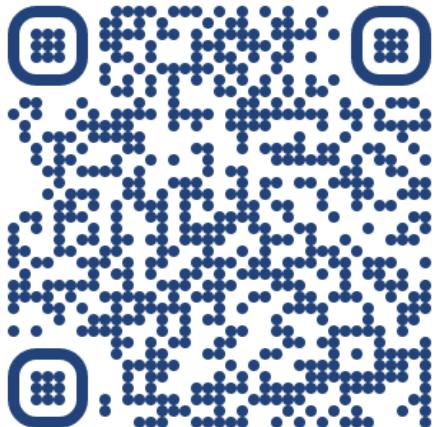
  // Move ball
  ballX += ballSpeedX;
  ballY += ballSpeedY;

  // 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



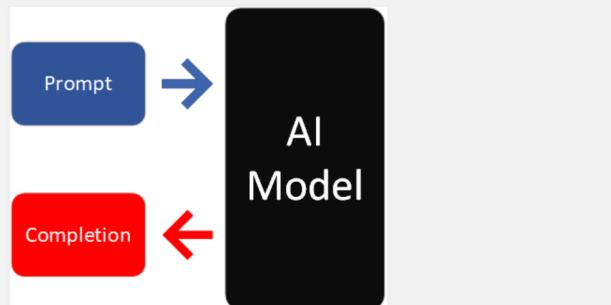
<https://microsoft.github.io/prompt-engineering/>

## 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 Open AI 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()
```

# 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>

# 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]

# 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](#)

# LangChain

*A powerful tool for working with Large Language Models*

## LangChain

Article [Talk](#)

From Wikipedia, the free encyclopedia

**LangChain** is a [software development framework](#) designed to simplify the creation of applications using [large language models](#) (LLMs) such as from [OpenAI](#), [Anthropic](#), or [Hugging Face](#). The framework offers a suite of tools, components, and [interfaces](#) to manage interactions with language models, chain together multiple components, and integrate resources such as [APIs](#), [databases](#), and a wide variety of document types. LangChain provides components for use cases such as [virtual assistants](#), question answering about collections of documents, [chatbots](#), querying tabular data, using APIs, and document extraction and summarization.<sup>[1]</sup>

### Background [\[edit\]](#)

LangChain was launched in October 2022 as an [open source](#) project by Harrison Chase, while working at machine learning startup Robust Intelligence. The project quickly garnered popularity, with improvements from hundreds of contributors on [GitHub](#), trending discussions on Twitter, lively activity on the project's [Discord](#) server, many YouTube tutorials, and meetups in San Francisco and London. The new startup raised over \$20 million in funding at a valuation of at least \$200 million from venture firm [Sequoia Capital](#), a week after announcing a \$10 million seed investment from [Benchmark](#).<sup>[2][3]</sup>

### Use [\[edit\]](#)

LangChain is used in [Python](#) or [Javascript](#) programs, but not [CLI](#) scripts. Developers select from many components and integrations, called modules, such as chat models, agents, document sources, and memory persistence systems. These components are combined to create an application that can run as a [software tool](#) or respond to user inputs. It provides the ability to split up complex tasks into simpler groups of steps called chains that can be connected together.<sup>[1]</sup> LangChain supports use cases like question answering over specific documents,<sup>[4]</sup> LLM-based evaluations of its own results, specialized chatbots, and developing agents that can decide on and take actions, evaluate the results, and repeat recurring tasks.<sup>[1]</sup>



<https://python.langchain.com/en/latest/index.html>

Add languages ▾

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### LangChain



|                        |   |
|------------------------|---|
| <b>Developer(s)</b>    | Harrison Chase  |
| <b>Initial release</b> | October 2022  |
| <b>Repository</b>      | <a href="https://github.com/hwchase17/langchain">github.com/hwchase17/langchain</a> |
| <b>Written in</b>      | Python and JavaScript   |
| <b>Type</b>            | Software framework for large language model application development                 |
| <b>License</b>         | MIT License   |
| <b>Website</b>         | <a href="https://LangChain.com">LangChain.com</a>                                   |

"⚡ Building applications with Large language models (LLMs)"



<https://medium.com/@avra42/getting-started-with-langchain-a-powerful-tool-for-working-with-large-language-models-286419ba0842>

# HuggingFace

develops tools for building applications using [machine learning](#).<sup>[1]</sup> It is most notable for its [transformers library](#) built for [natural language processing](#) applications and its platform that allows users to share machine learning models and [datasets](#).



<https://huggingface.co/course/chapter1/1>



## The AI community building the future.

Build, train and deploy state of the art models powered by the reference open source in machine learning.



94,701

Hugging Face, Inc.



### Hugging Face

|              |  |
|--------------|--|
| Type         | Private  |
| Industry     | Artificial intelligence, machine learning, software development      |
| Founded      | 2016; 7 years ago in <a href="#">New York City</a>                   |
| Headquarters | New York City, U.S.  |
| Area served  | Worldwide  |
| Key people   | Clément Delangue (CEO)<br>Julien Chaumont (CTO)<br>Thomas Wolf (CSO) |
| Products     | Transformers, datasets, spaces                                       |
| Website      | <a href="https://huggingface.co">huggingface.co</a>                  |



[https://en.wikipedia.org/  
wiki/Hugging\\_Face](https://en.wikipedia.org/wiki/Hugging_Face)



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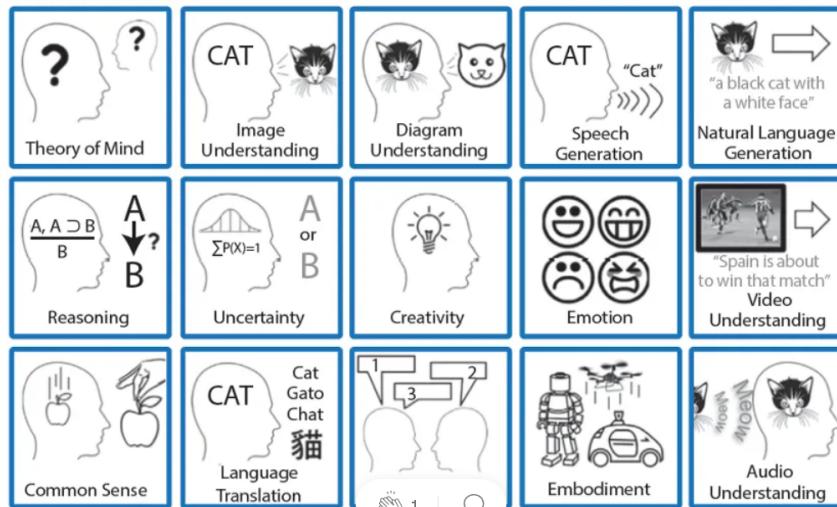


Serengeti Plains. By [Kristin Moger](#)

## 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]).



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# Who AM I?



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PhD

About Publications (48) Network Projects (8)

## 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

Contact

### Current institution

Hogeschool Rotterdam



Instituut voor Communicatie, ...  
Current position  
Data Scientist

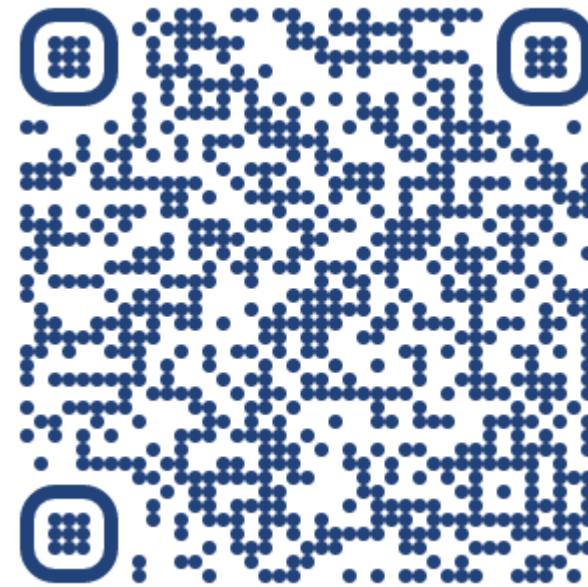
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2023

March 2023

2022

2021

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

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