



Generative AI

MAX WELLING



Overzicht

- AI Terminologie
- Wat is Generative AI?
- Is er nu een AI Revolutie?
- Kansen en Gevaren
- Gaat AI uw baan afpakken?

Artist Wins Photography Contest After Submitting AI-Generated Image, Then Forfeits Prize

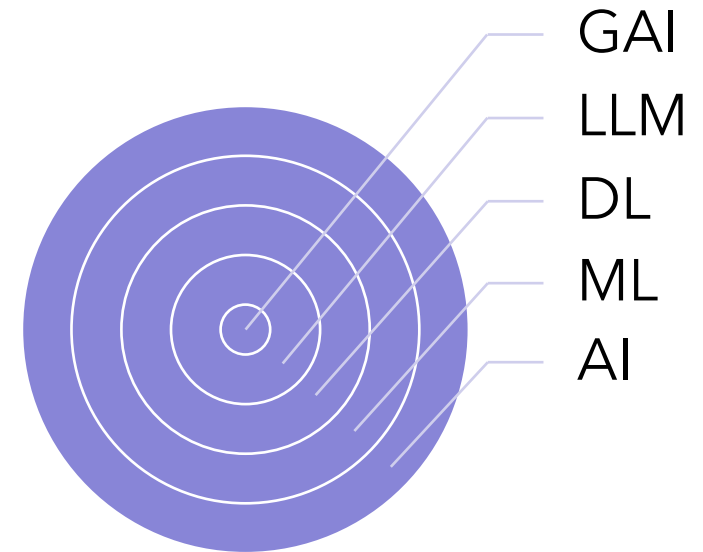


An A.I.-Generated Picture Won an Art Prize. Artists Aren't Happy.



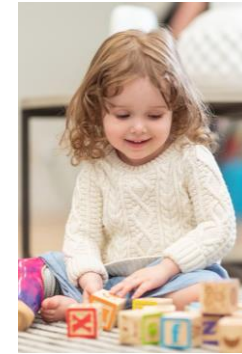
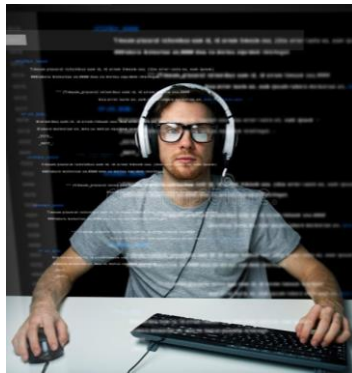
Het ABC van AI

- AI: **Kunstmatige Intelligentie**
 - Het slimmer maken van machines
- ML: **Machine Learning**
 - Machines die leren van observaties/data
- DL: **Deep Learning**
 - Hele grote (diepe) neural netwerken met miljarden parameters.
- LLM: **Large Language Models**
 - Chatbots (bijv. chatGPT) getrained op enorme tekst corpora
 - Vertonen een brede vorm van intelligentie hebben ("AGI")
- GAI: **Generative AI**
 - Enorme modellen getrained op verschillende datasets.
 - Kan van alles genereren: van tekst tot plaatjes en video



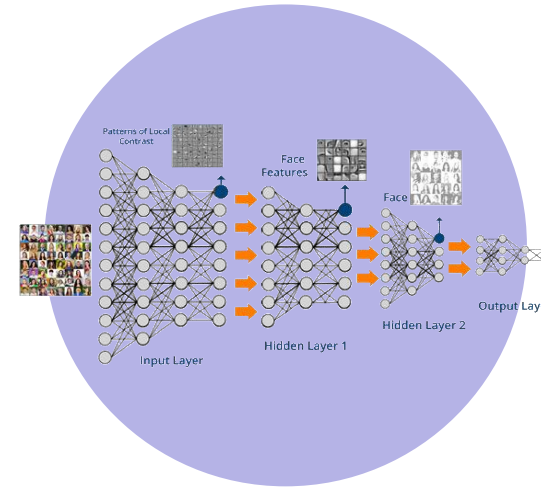
(diep neural netwerk)

ML als zichzelf-programmerende software



```
43 <body <?php body...>
44 <div id="fb-root"></div>
45 <script>(function(d, s, id) {
46   var js, fjs = d.getElementsByTagName(s)[0];
47   if (d.getElementById(id)) return;
48   js = d.createElement(s); js.id = id;
49   js.src = "//connect.facebook.net/en_US/sdk.js#xfbml=1&version=v2.6&appId=390608289548400";
50   fjs.parentNode.insertBefore(js, fjs);
51 })(document, 'script', 'facebook-jssdk');</script>
52 <div id="page" class="site">
53   <a class="skip-link screen-reader-text" href="#content"><?php esc_html_e('Skip to content', 'twentyfour');></a>
54   <header id="masthead" class="site-header" role="banner">
55     <div class="site-branding">
56       <div class="nav-btn pull-left">
57         <?php if(is_home()) $xpanel['homepage-style'] == 1 { ?>
58           <a href="#" id="openMenu"><i class="fa fa-bars fa-3x"></i></a>
59         <?php } else { ?>
60           <a href="#" id="openMenu2"><i class="fa fa-bars fa-3x"></i></a>
61         <?php } ?>
62       </div>
63       <div class="logo pull-left">
64         <a href="<?php echo esc_url(home_url()) ?>">
65           
66         </a>
67     </div>
68     <div class="search-box hidden-xs hidden-sm pull-left ml-10">
69       <?php get_search_form(); ?>
70     </div>
71     <div class="submit-btn hidden-xs hidden-sm pull-left ml-10">
72       <a href="<?php echo get_page_link($xpanel['submit-link']) ?>">
73       </a>
74     </div>
75     <div class="user-info pull-right mr-10">
76       <?php
77       if ( is_user_logged_in() ) {
78         <?php echo get_user();
79       }
80     </div>
81   </div>
82 </div>
83 </body></pre>
```

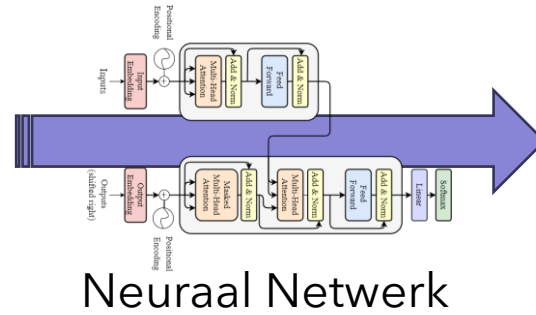
Traditionele software



Zelf-programmerende software

Wat is "Generative AI"?

Input Data



Voorspelling

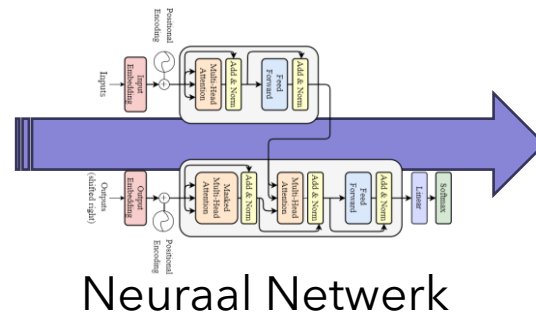


Input (foto)

Voorspelling (wat is waar)

Wat is "Generative AI"?

Input Data



Voorspelling

"Maak een leuke grap over Robbert Dijkgraaf"



< 2 / 2 >  Maak een leuke grap over Robbert Dijkgraaf

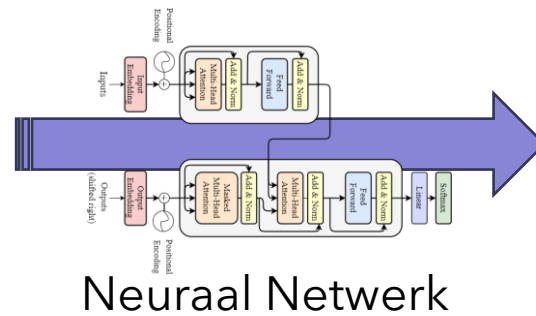
 Natuurlijk! Hier is een grap over Robbert Dijkgraaf:
Waarom houdt Robbert Dijkgraaf zo van de snaartheorie?
Omdat hij er altijd in slaagt om de juiste "toon" te raken!

Input (tekst prompt)

Output (tekst = "leuke grap")

Wat is "Generative AI"?

Input Data



Voorspelling

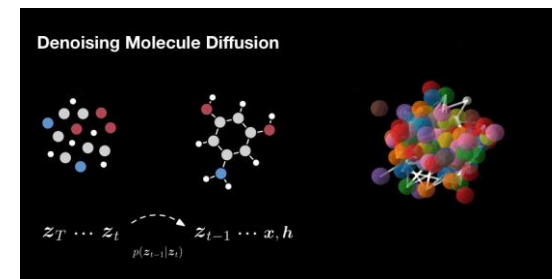
"Maak een plaatje van Mark Rutte met hoed en zonnebril:"



Output (plaatje)

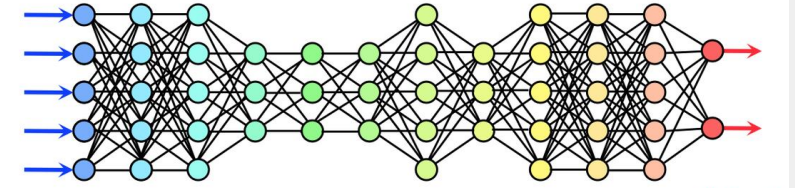
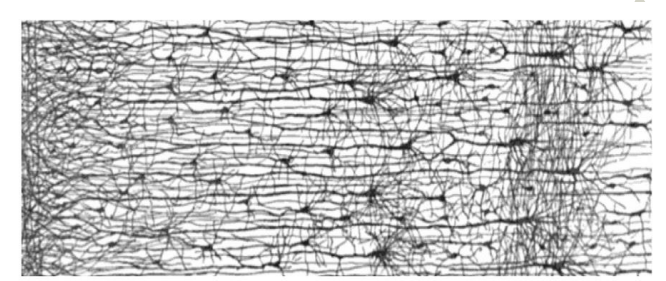
Input (tekst prompt)

"Genereer een molecuul met eigenschap ...:"

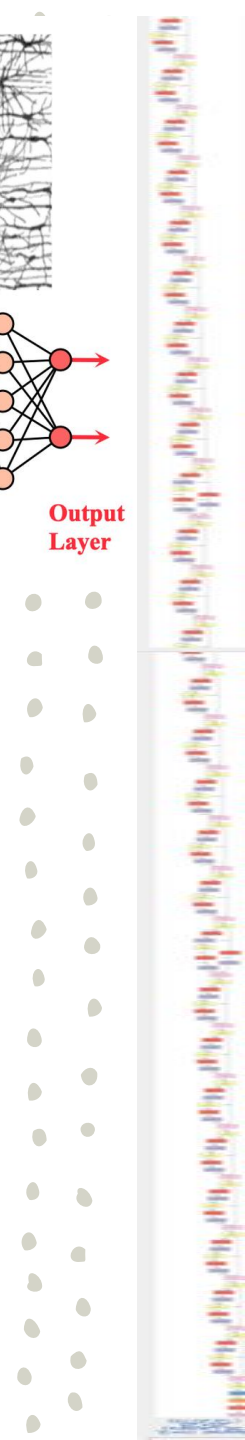
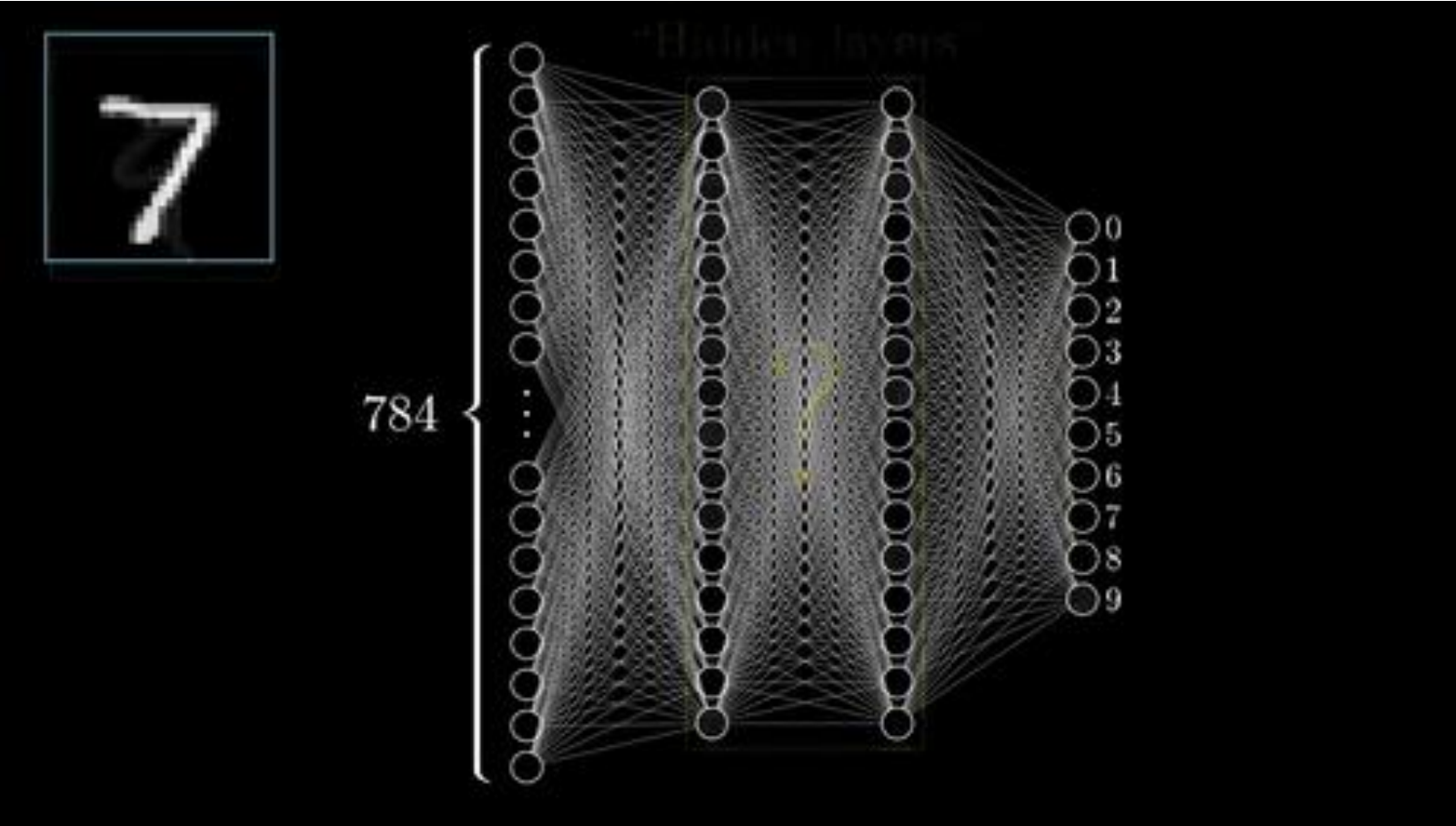


Output (molecuul)

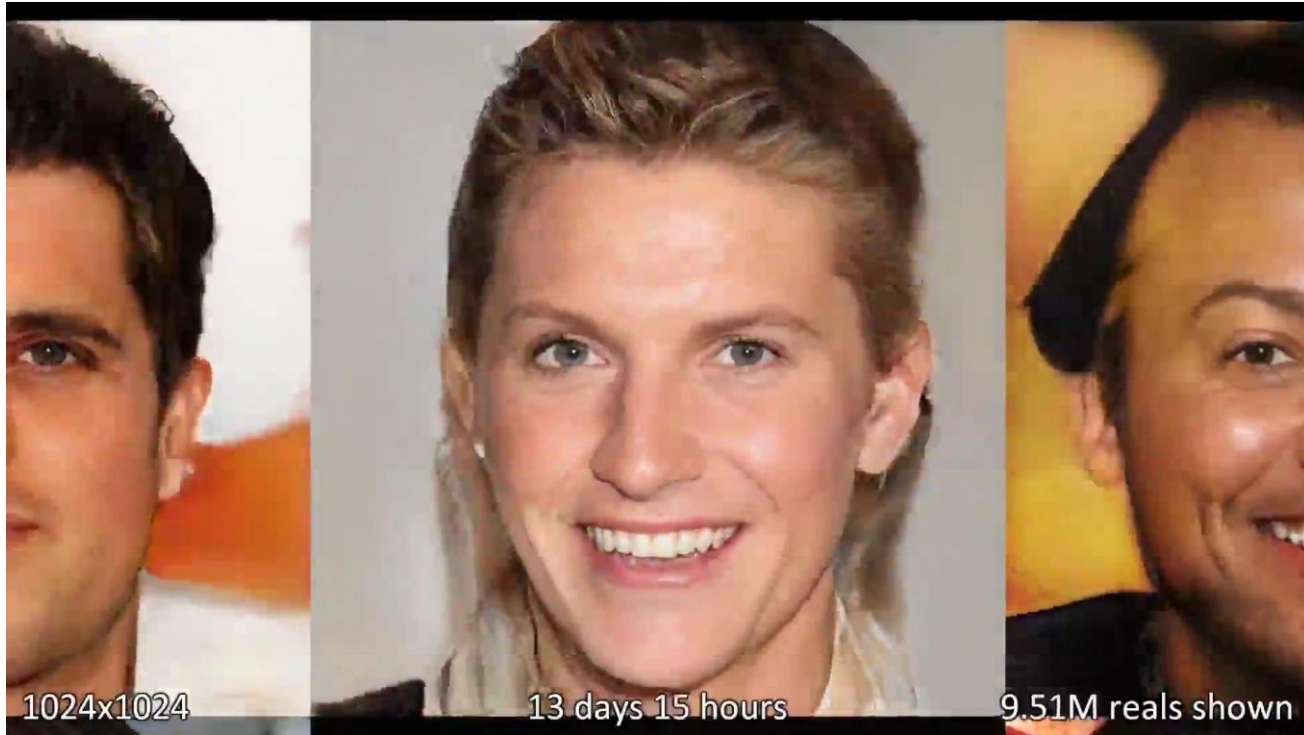
Neuraal Netwerk



Input Layer Hidden Layers Output Layer



Unsupervised Learning




NVIDIA's Progressive Growing of GANs



<https://thispersondoesnotexist.com/>

Thispersondoesnotexist.com is face-generating AI at its creepiest

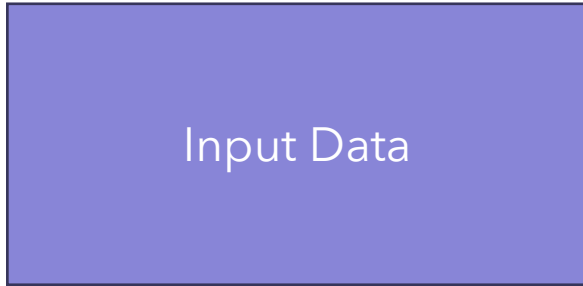
February 13, 2019 - 11:32 pm



Popular articles

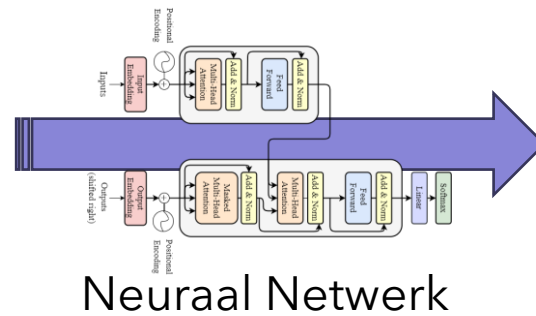
- 1 Cultivated meat is a 'promising' space food for astronauts, ESA says
- 2 Meta begrudgingly launches €9.99 ad-free subscription for Facebook and Instagram
- 3 Secure your Mac like a rockstar — 5 easy life hacks to stay safe online
- 4 EU backs new project that combines solar power with agriculture
- 5 UK police urged to double down on facial recognition

Reinforcement Learning



Input: observaties

Input: waar ben ik?



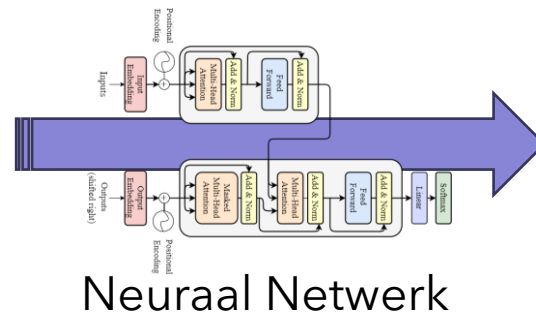
Output: serie beslissingen

Output: links, rechts, rechtdoor, ...
(tot de kaas)



Reinforcement Learning

Input Data



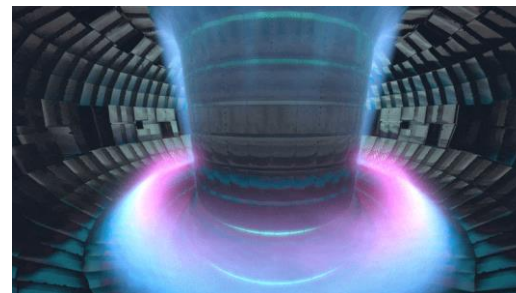
Voorspelling

Input: GO bord



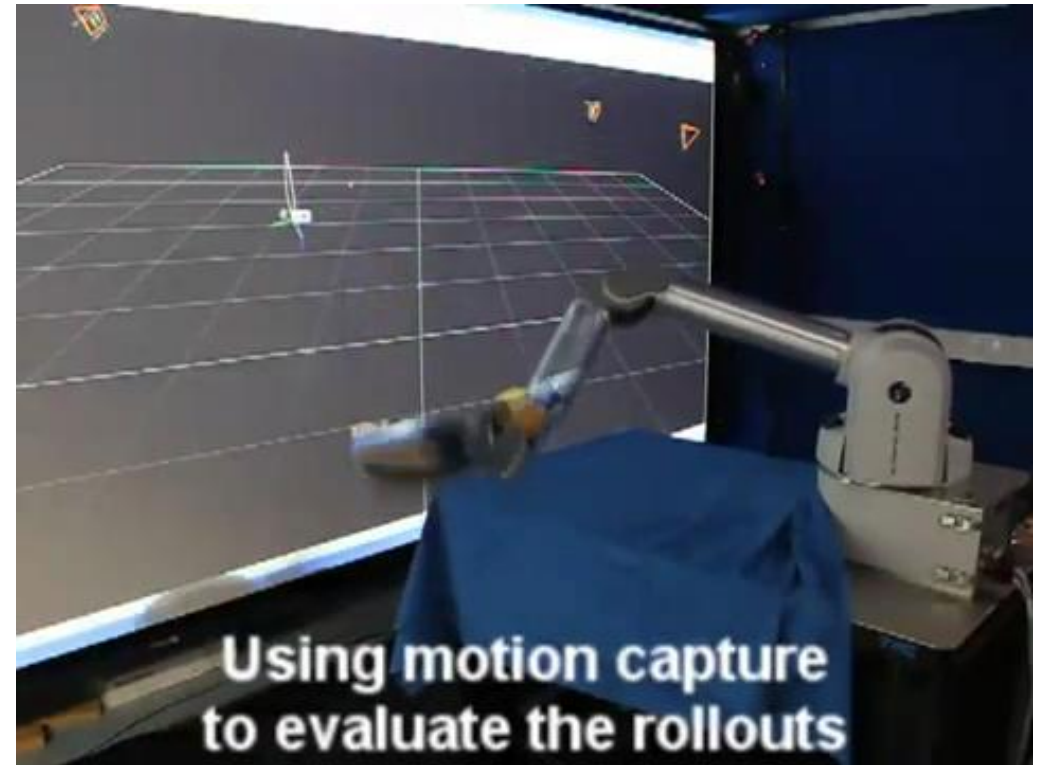
Output: waar leg ik mijn steen?

Input: toestand plasma

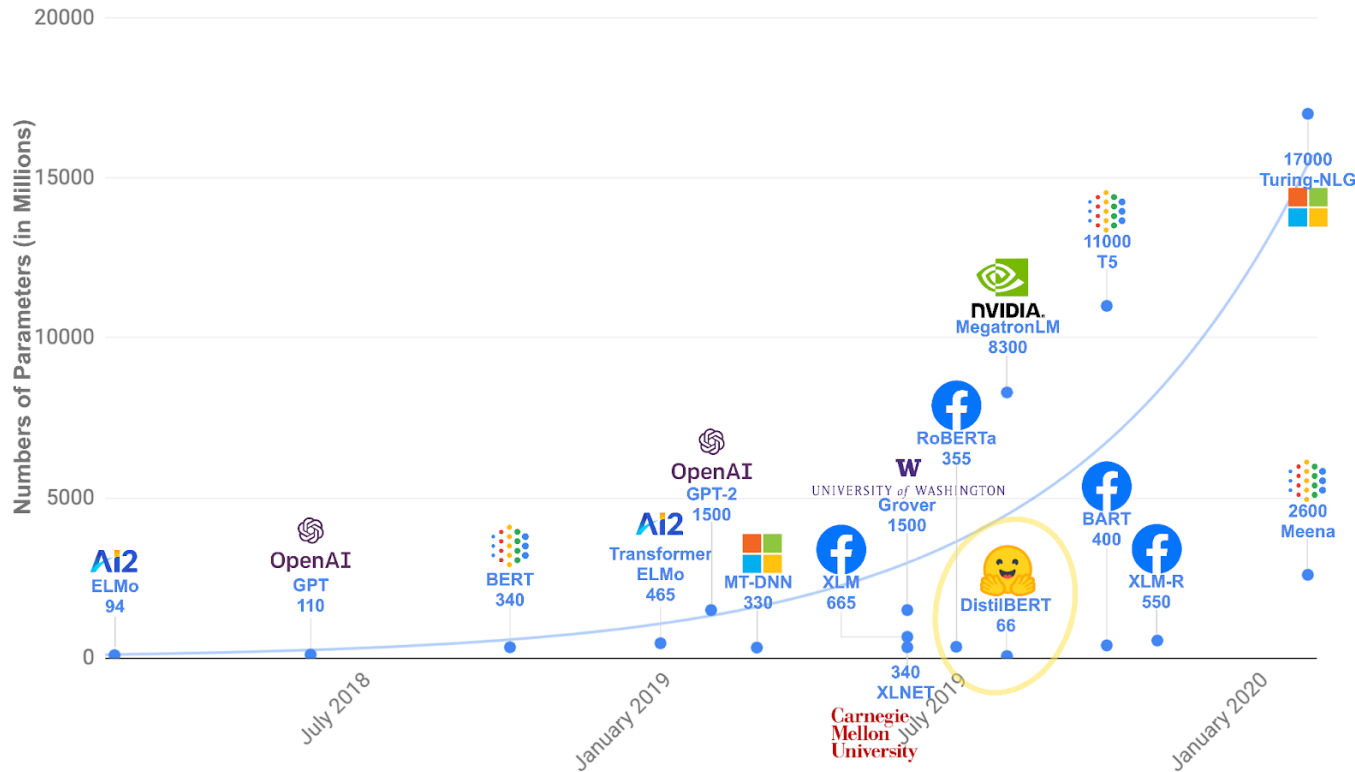


Output: magneetveldsterkte

Reinforcement Learning

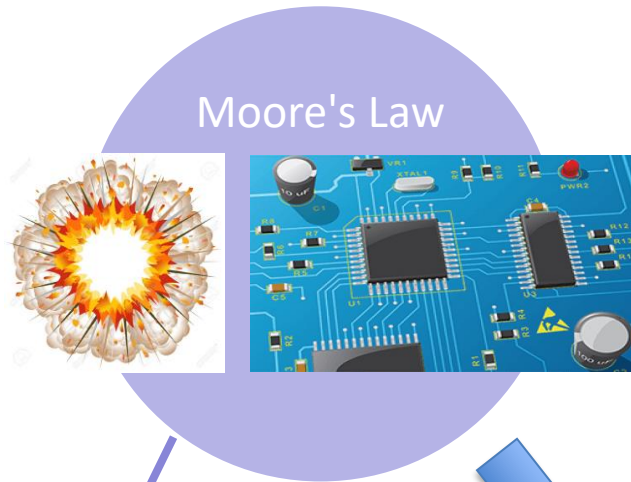


Het "Groter is Beter" Paradigma

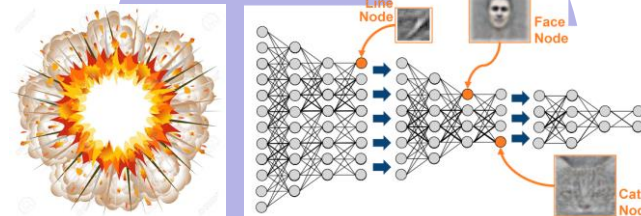


- Groter = Beter
- Kosten zijn heel hoog (tussen €10M-100M)
- Kan Europa concurreren?

Explosieve Groei in Compute, Data en Modellen



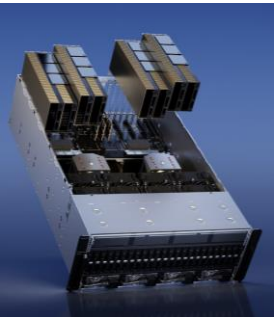
Deep Learning



Dataset: hele internet
± biljoen woorden

± Biljoen parameters
Menselijk brein: ± 100 biljoen connecties

±10,000 GPUs

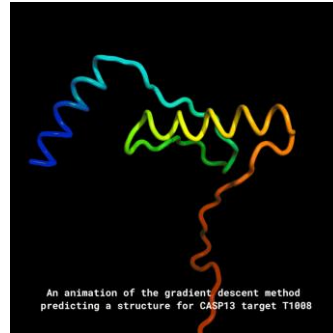


H100

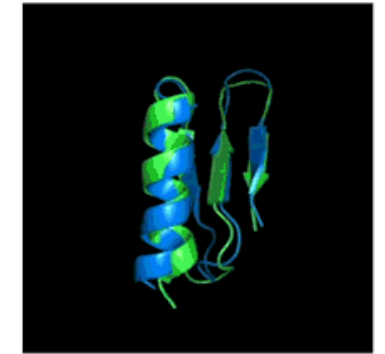
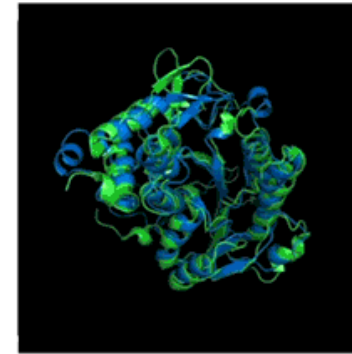
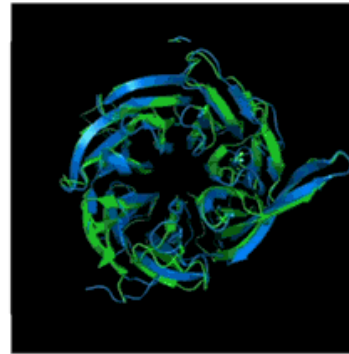
Monopolie NVIDIA

Voorbeelden van Recente Successen

- AlphaFold:



Structures:
Ground truth (green)
Predicted (blue)



- Image/Video Generation

GPT-4

Prompt: Can you write a proof that there are infinitely many primes, with every line that rhymes?

GPT-4:

Yes, I think I can,
Though it might take a clever plan.
I'll start by noting Euclid's proof,
Which shows that primes aren't just aloof.
Assume we have a finite list,
Of primes, and that none have been missed.
Multiply them all together,
And add one, just to be clever.
The result will be a number,
That has no prime factors, oh wonder!
But every number has a prime,
That divides it, it's just a matter of time.
So we've found a contradiction,
And our finite list needs eviction.
There must be infinitely many primes,
And that's the end of my rhyming lines.s



"A shot following a hiker through jungle brush."



"An aerial shot of a mountain landscape."

- ChatGPT

De Turing Test

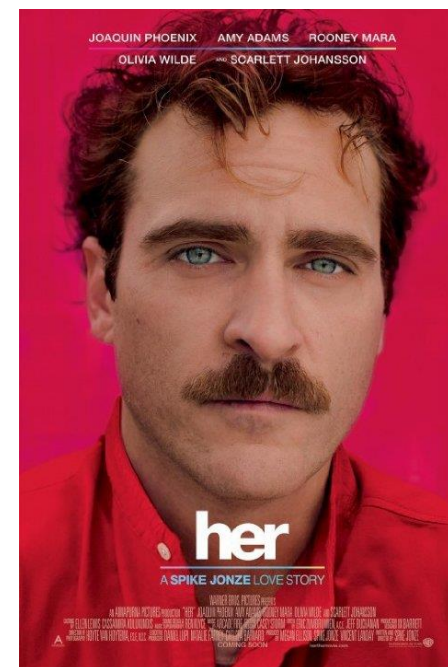
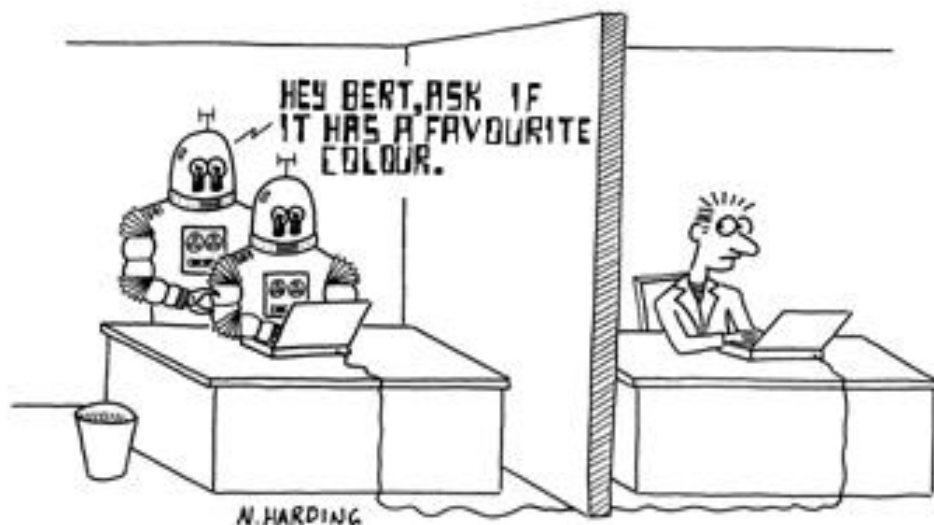
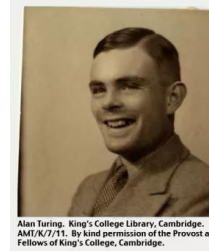
Zal GPT-5 voor de Turing test slagen?

Turing test

/ˈtʃʊərɪŋ/ 

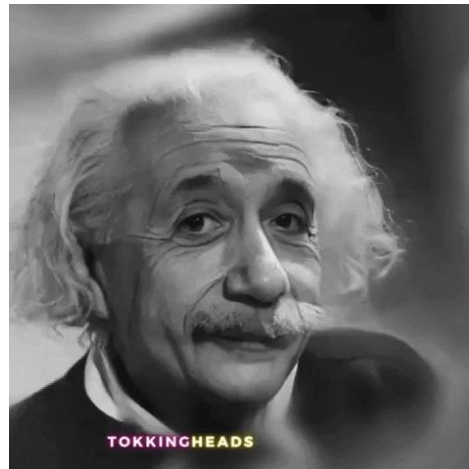
noun

a test for intelligence in a computer, requiring that a human being should be unable to distinguish the machine from another human being by using the replies to questions put to both.



Kansen & Gevaren

- Artificial **General** Intelligence (chatGPT) is een "game changer" (geen statistische papagaai).
- Enorme kansen in healthcare & natuurwetenschappen. (Maar het zal heel breed inzetbaar zijn, zelfs in de kunst).
- AI gaat banen transformeren of overnemen.
- Deepfakes and Fake News may be bad news for democracy.



Gaat AI nu baan afpakken?

ChatGPT may be coming for our jobs. Here are the 10 roles that AI is most likely to replace.

Aaron Mok and Jacob Zinkula Updated Sep 4, 2023, 4:24 PM CEST



Insider compiled a list of the 10 jobs that could be disrupted by AI tools like ChatGPT, according to experts. Jens Schlueter/Getty Images



These finance Jobs will be taken over by AI!

FinanceINME
10,079 followers

+ Follow

March 29, 2023

1. Accounting clerks and bookkeepers: AI technology can help automate routine accounting tasks, such as data entry and invoice processing.
2. Financial analysts: AI algorithms can analyze large amounts of financial data and provide insights and recommendations for investment decisions.
3. Loan officers: AI can help streamline the loan approval process by automating credit analysis and risk assessment.
4. Stock traders: AI algorithms can analyze market data and execute trades based on predefined rules and strategies.
5. Customer service representatives: AI-powered chatbots can handle routine customer inquiries and provide basic financial advice.



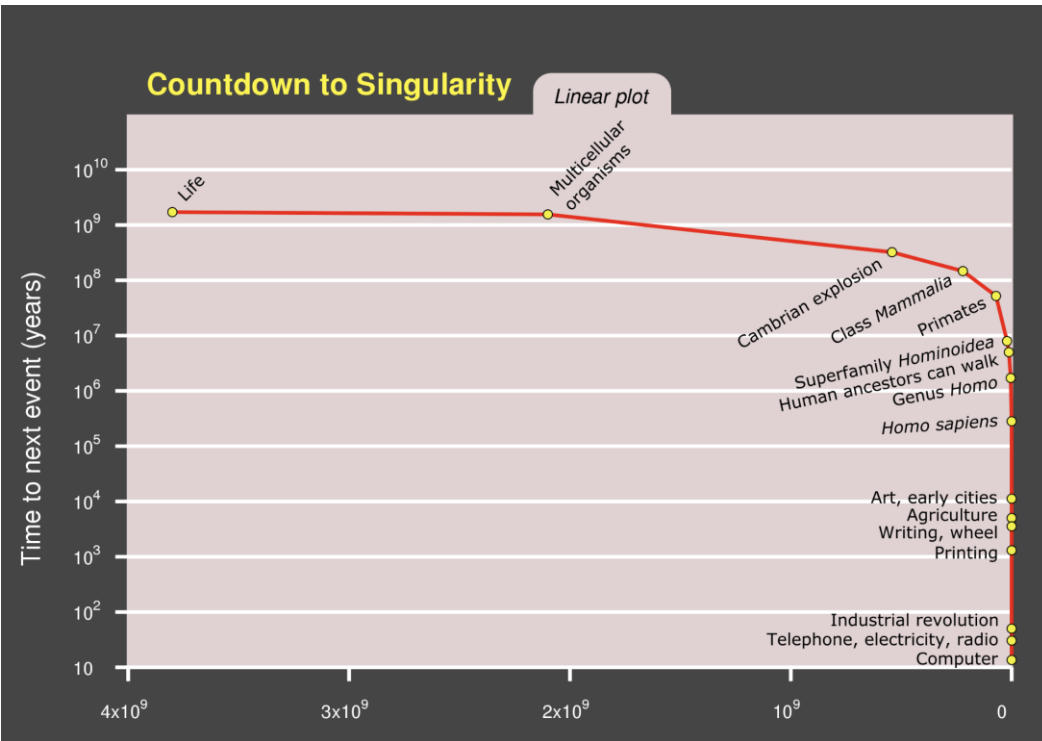
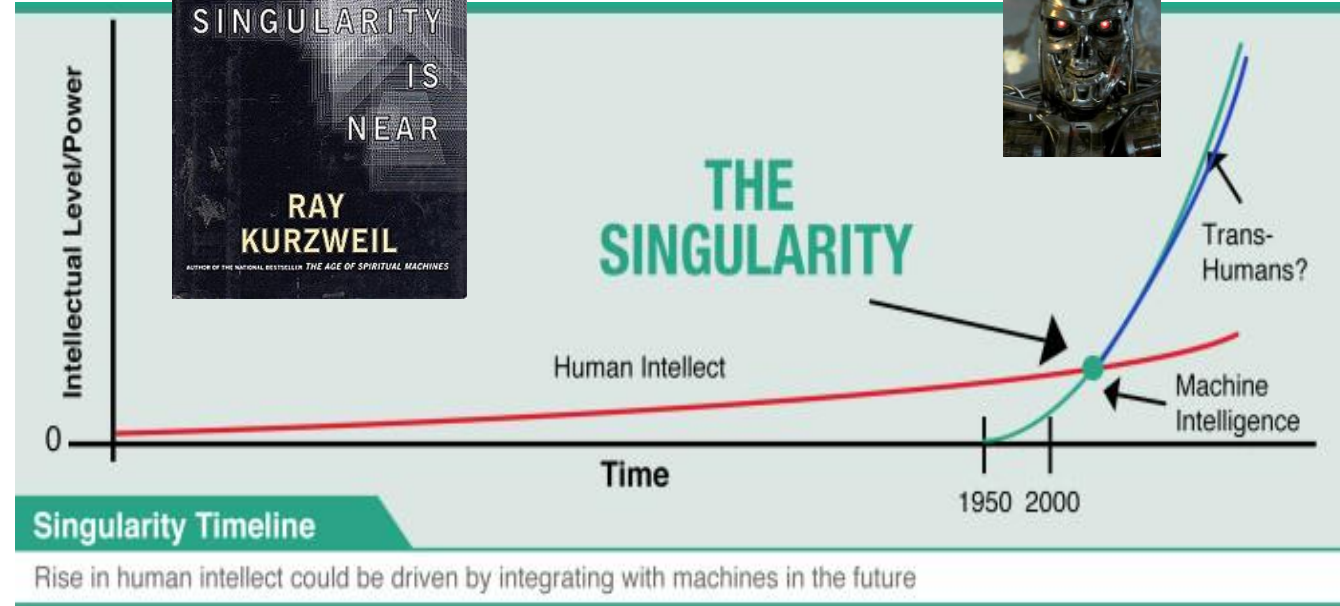
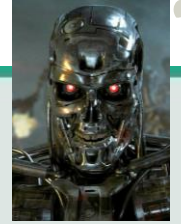
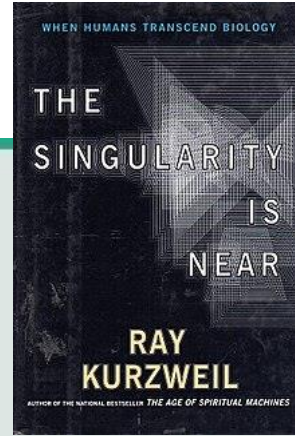
Workers in the finance industry could be at risk for AI replacement, expert says. Getty Images



AI could replace equivalent of 300 million jobs - report



The Singularity



TECH

Britain to host world's first AI safety summit at home of World War II codebreakers

PUBLISHED THU, AUG 24 2023-8:18 AM EDT | UPDATED THU, AUG 24 2023-2:02 PM EDT

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@RYAN_BROWNE_

Conclusies

- AI is een systeem technologie. Het gaat onze wereld blijvend veranderen.
- Zoals bij elke nieuwe technologie, er zijn gevaren en kansen. Regulering moet gevaren inperken.
- AI gaat banen transformeren, zeker in de financiële sector.. Anticipeer en omarm.
- AI kan ons helpen de grote uitdagingen van de 21e eeuw op te lossen:
 - Nieuwe medicijnen en materialen:
 - Antibiotica tegen resistente bacteriën
 - Vaccins
 - CO2 afvangen
 - Batterijmaterialen
 - Katalysatoren (waterstofproductie, kunstmest,..)
 - Afbreekbare plastics
 -



DeepDream