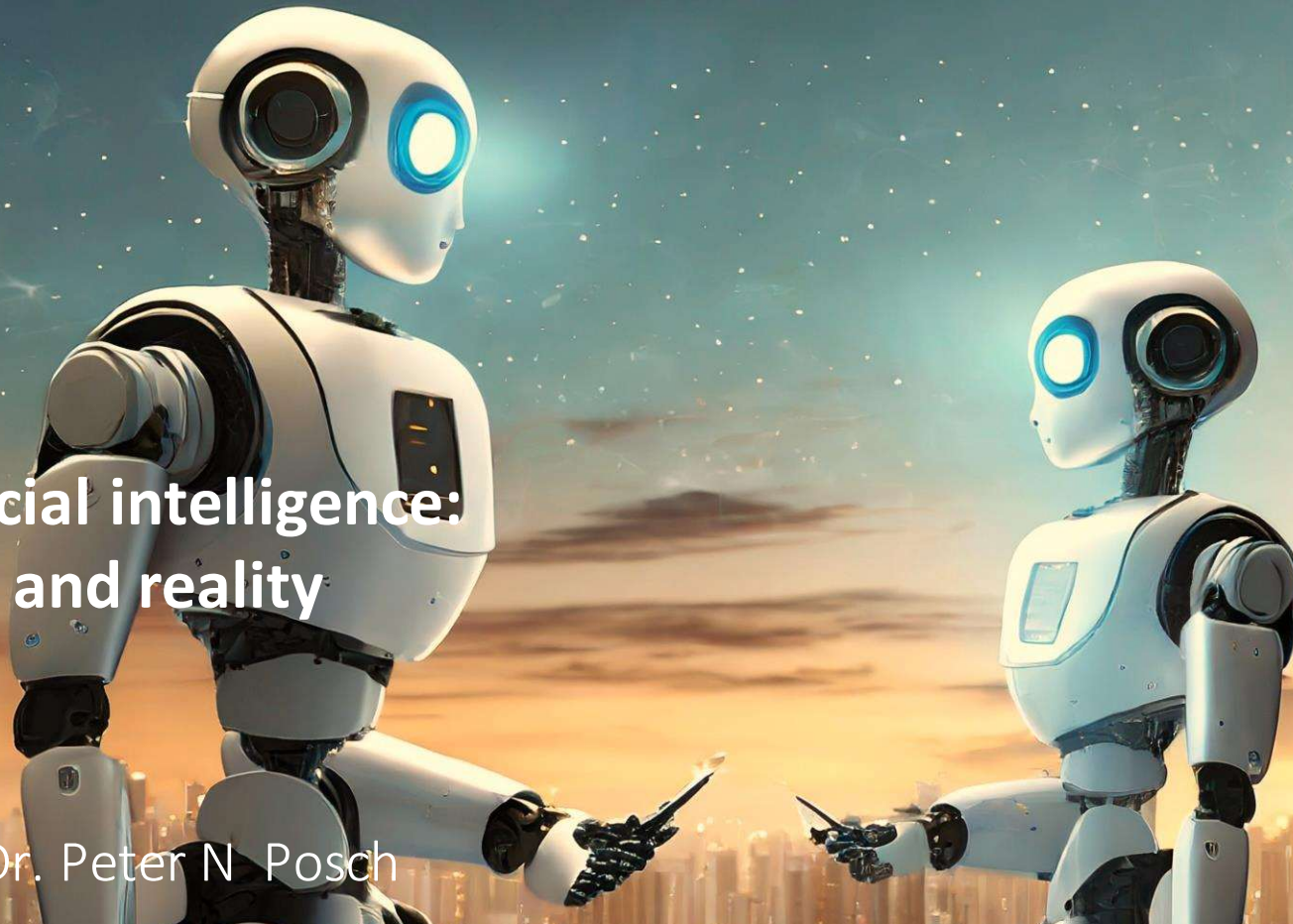


HEIDELBERG

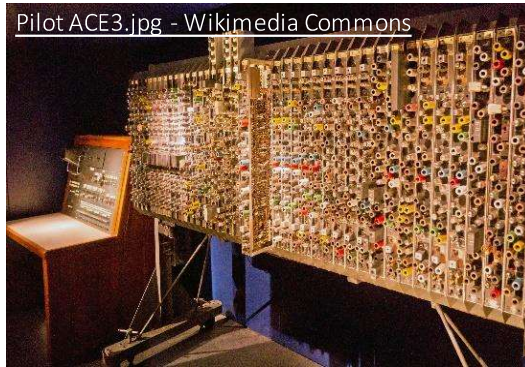
PN POSCH

Artificial intelligence: Hype and reality

Prof. Dr. Peter N. Posch



What is AI?



If-Then - Algorithms

Machine learning
Deep learning

Reinforcement Learning



Convolutional Neural Networks (CNNs)



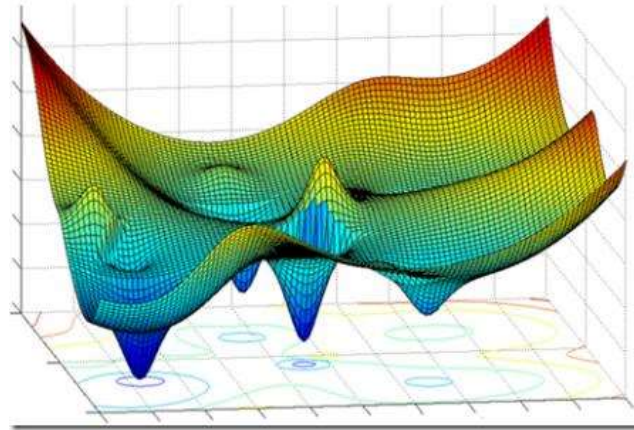
Recurrent Neural Networks (RNNs)



Transformer

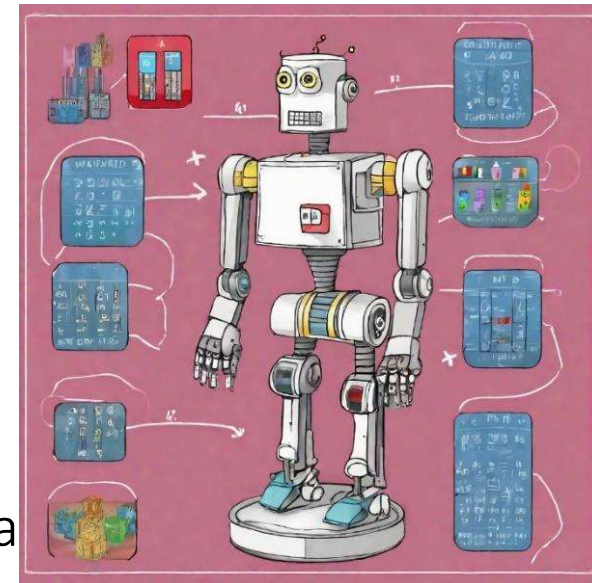
Generative models

- Learning a **probability distribution** of the **training data**



- Goals

1. **Understanding the** structure and distribution of input data
2. **Generation of** new data points, **hardly distinguishable** from training data
3. Not just predicting classes or categories, but to reproduce the data itself



Correlation is **not** causality

The GPT hype

GPT = Generative **Pre-Trained** Transformer a large language model (LLM)

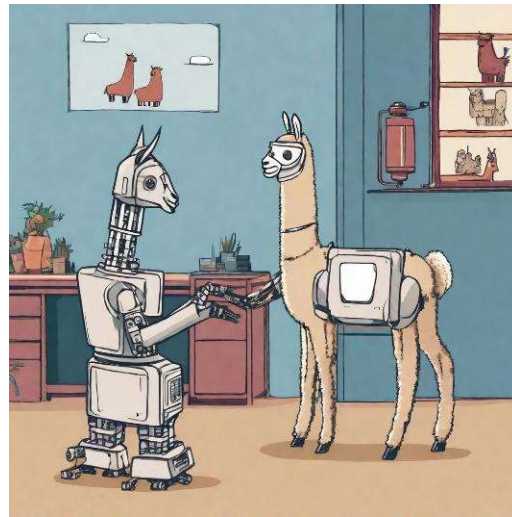


GPT-4 1.5 trillion parameters

754 GB Internet pages
(CommonCrawl), books,
Wikipedia, mainly English



Llama 1.2 trillion



Bard 1.6 trillion
Flan-UL2 20 billion



176 billion
56 languages
Open Source

Commercial generative models

Generate

- Text: GPT4, Bard, Aleph Alpha
- Images: Midjourney, Stable Diffusion
- Sound: Elevenlabs
- Videos: Synthesia
- Chat: Poe.com
- Search: **Perplexity.ai**

Advantage: Simple, low entry costs

Disadvantage: SaaS means you lose control over data input and generated output.



Self-made AI is easy



Voice input and output as a control element
Voice clone generates voice output



Model: Llama 70Mrd with Replicate API
Cost: \$0.0032/s
Duration one-time: <5h

Model: Elevenlabs
Cost: \$5/month
One-time duration: <1h

Limits of AI

- ❑ Trapped in the training data set, partly with opening options (plugins)
- ❑ Calculating probabilities for character strings (tokens)
- ❑ Correlations are not causality (alignment)

Narrow AI (ANI)



1960

2023

General AI (AGI)



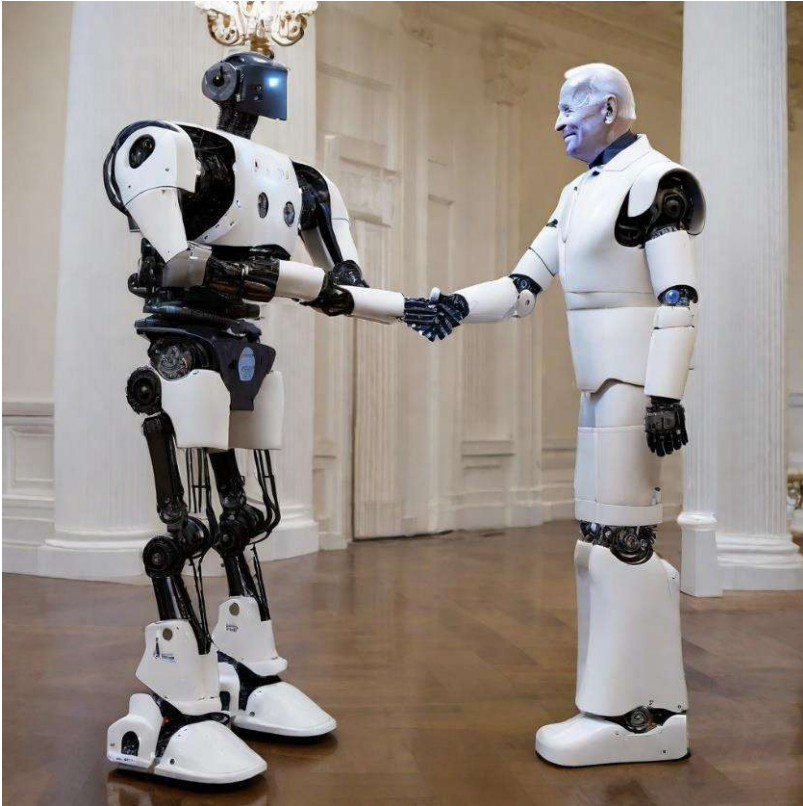
Singularity

Outstanding AI (ASI)



Time

AI - regulatory hype: the extinction of humanity?



Bias (ethical concerns)

Training data set determines probability

Concentration of power

Computing costs energy: OpenAI ChatGPT ~ 1280 MWh

Unintended consequences (**alignment**)

Does the AI do what it is supposed to?

Security

Lack of transparency

Privacy/surveillance

Existential risks

What does this mean for the labor market?

After the singularity: free time

Work as a concept of self-realization quite young, back to the roots

Medium-term: Reduction of human labor

Dependent on social debate, political framework

Currently: New tools for everyday work with

Short-term adaptation to individual needs



Top challenges for ageing economies: Skills shortage, sustainability

Solution: Digitalization incl. AI

Outlook Multimodal models

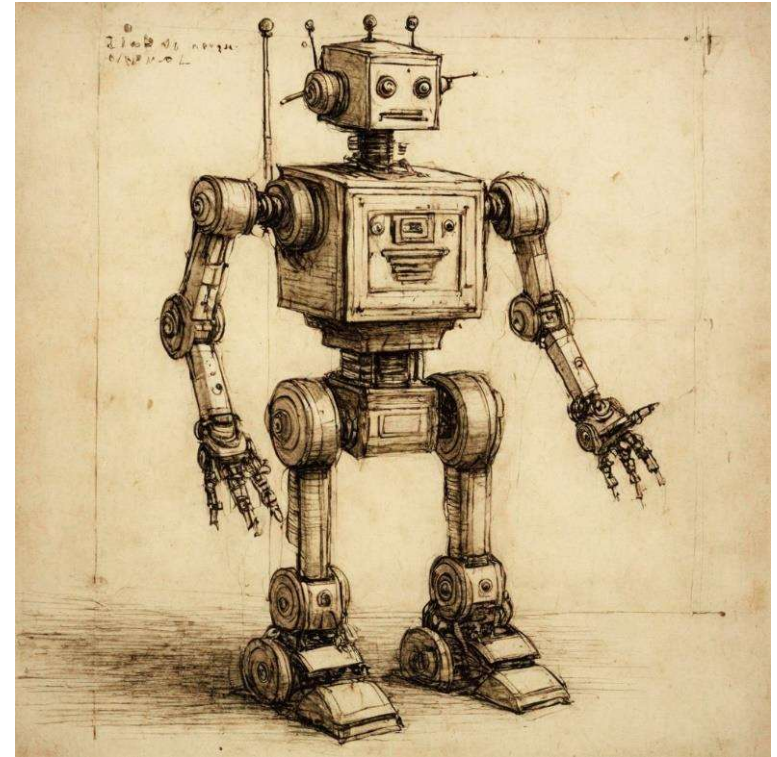
Hey Otter, a customer ordered a Dungeon

@ Today 11:51 pm



The use of AI leads to...

- Humanization of computer interaction
 - Input in normal language
 - Personalization of the answers
 - Individual learning
- Replacement of automatable processes
 - Computers do repetitive work
 - We do **creative**
- Change in the world of work
 - Dependent on social debate
 - Faster and more destructive than we assume today



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