

Generative AI vs Learning: Good or Bad?

It depends...

It's a **powerful** tool, like writing

Socrates's parable of the invention of writing in the Phaedrus

Thamus, king of the Egyptian gods, criticizes Theuth, the god of invention

Theuth describes writing as an elixir (*pharmakon* in Greek) of memory

Thamus claims instead that the practice of writing will ultimately weaken memory

Less powerful tools are not as scary: spelling checkers, calculators, ???

Generative AI: the Good

Strong support for supervised teaching and learning

ECNU points towards [potential gains for maths instruction](#)

It can solve difficult problems in exotic ways

Statistics-based instead of logic-based => shortcuts

Generative AI: the Bad

Malicious intent to outsource/delegate work without disclosure

Scientific report in Nature shows [multiple instances of misuse in academia](#)

The logic of generated answers is **unreliable**

Reasoning is based on rules, not on statistics

A genAI trained with data from the Xth century will conclude the Earth is flat

Discrimination day / night is obvious, but 1 child / 2 children ?

Defining Generative AI: Ask ChatGPT v3.5



Can you define generative ai in 3 sentences?



Generative AI refers to machine learning models that can generate new data that is similar to the data they were trained on.

These models work by learning patterns in the training data and using them to generate new, realistic data.

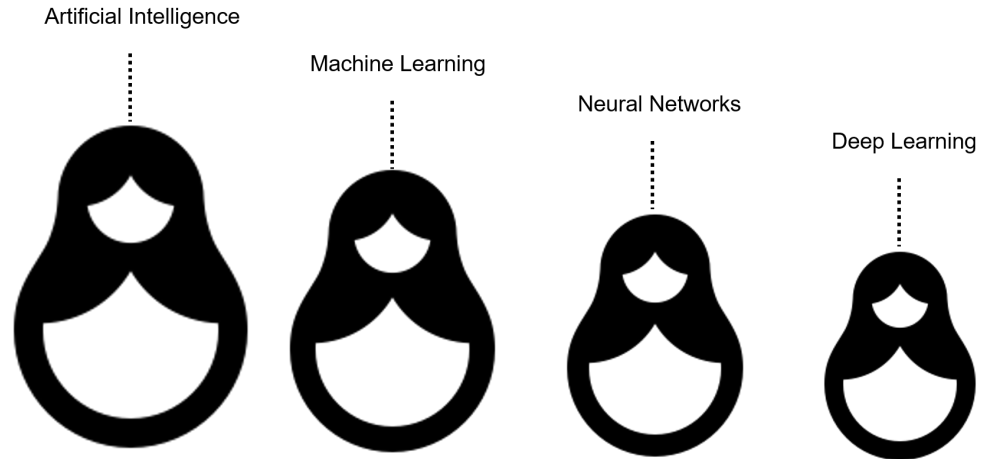
Generative AI has applications in fields such as art, music, and literature, and is also used in areas such as speech and image recognition.

Defining Generative AI: Deep Learning (DL)

Subset of Machine Learning (ML)

ML trains algorithms to recognize patterns in data

The goal of ML is to make predictions based on input data



source: ibm.com

Defining Generative AI: Deep Learning (DL)

Specificity of DL

Learns to "understand" and **represent** complex features of data

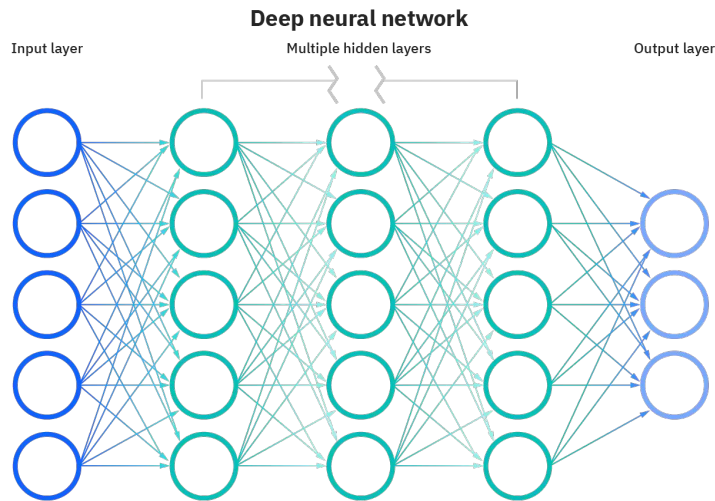
Requires large amounts of labeled data and of computational resources

GPT-3

175 billion parameters

Training cost estimated at \$4.6M

OpenAI has not disclosed such details for GPT-4



source: *ibm.com*

Defining Generative AI: Limitations

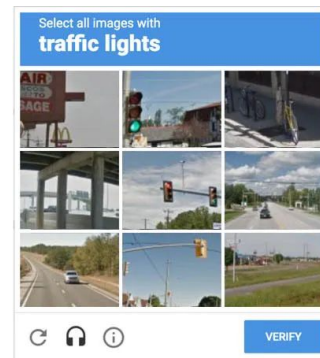
- Cost of scaling
- Huge dependence on the quality & quantity of the training data
- Reliability of the output
- Authoritative tone of *"realistic"* content
- Potential misuse of the technology



"My picture as a video game character"
Generated with Fotor



"A mecha robot in a favela"
Generated with Stable Diffusion



Human user verification
on Google

Explainable AI: Dealing With Reliability

Statistics cannot directly support logical / critical thinking

Temporary ban of AI-generated code on *Stack Overflow* since December 2022

Causal inference

Determine the independent, actual effect of a particular phenomenon in a larger system

Explainable AI

Understand and interpret predictions made by ML/DL models



source: <https://xkcd.com/1838/>

Priorities at NYU Shanghai

Outcome of a workgroup commissioned by Provost Waley-Cohen

1. Ensuring fairness of access
2. Syllabus guidelines
3. AI conversation during orientation => critical thinking!
4. Faculty workshops



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