

Deep Learning & Education

Matt Wood

@drmattywood

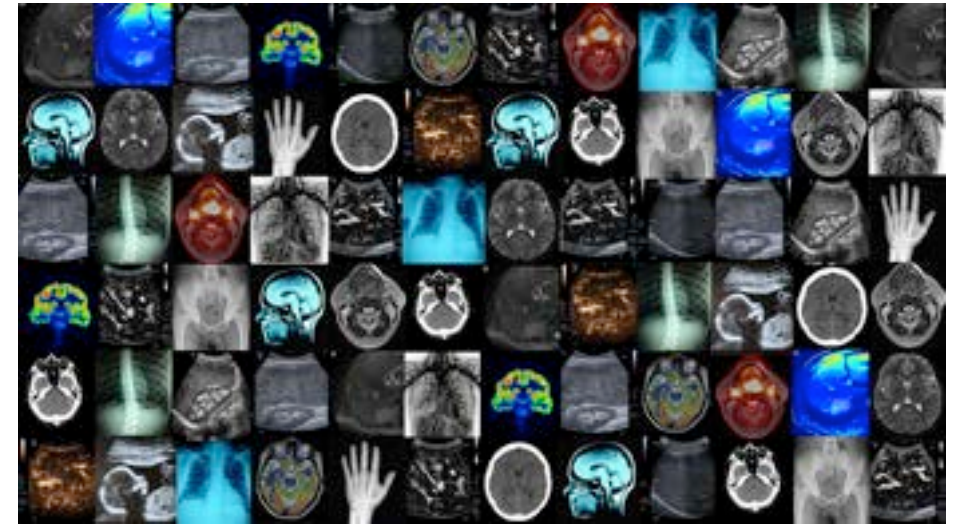
Durham University | Northumbria University

Source: Chow, A. R., & Perrigo, B. (2023, February 27). The AI Arms Race Is Changing Everything. *Time*. <https://time.com/6255952/ai-impact-chatgpt-microsoft-google/>

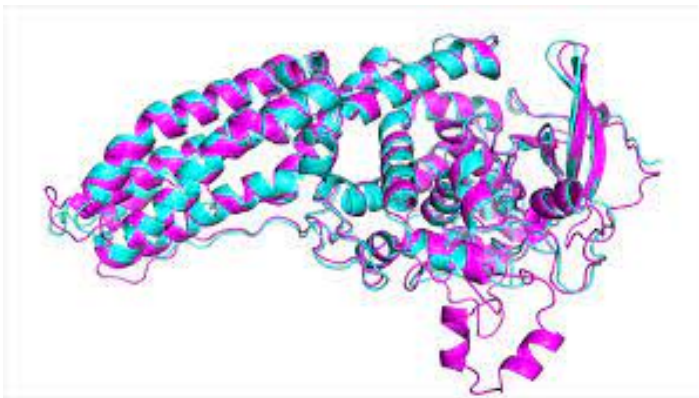
Deep Learning is amazing



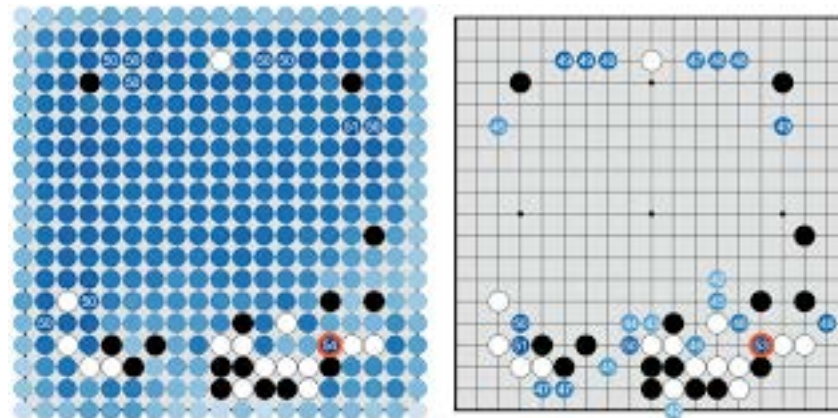
Self-driving cars



Medicine



Biology



Playing games



Robotics

Deep Learning is amazing

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Royal Institution Christmas Lectures

2023: Professor Mike Wooldridge - The Truth about AI: 1. How to Build an Intelligent Machine

Professor Mike Wooldridge explores the nature of artificial intelligence. By using experiments and demonstrations, he investigates how AI learns and what it can do. [More](#)

59 mins | 8pm 26 Dec 2023 | Available for 11 months

Once the tide had settled I came back to the seahorse farm, I saw some absolutely crazy scenes. The seahorses were swimming around in all directions, some of them were even doing flips! The water was full of bubbles and the seahorses were playing with each other. It was really amazing to watch them play and explore their environment. I could also see some of the seahorses eating small pieces of seaweed in the water by the farmers. It was a really great experience and I am so glad I got to witness such a beautiful scene.

a = 7.31%

amazing = 24.48%

cool = 8.8%

fascinating = 11.68%

quite = 11.82%

Total: -1.41 logprob on 1 tokens
(64.09% probability covered in top 5 logits)

Model: text-davinci-003

Maximum Length: 256

Temperature: 0.5

Top P: 1

Frequency Penalty: 0

Presence Penalty: 0

Stop Sequences: Enter sequence and press Tab

Show Probabilities:

Highlight Models:

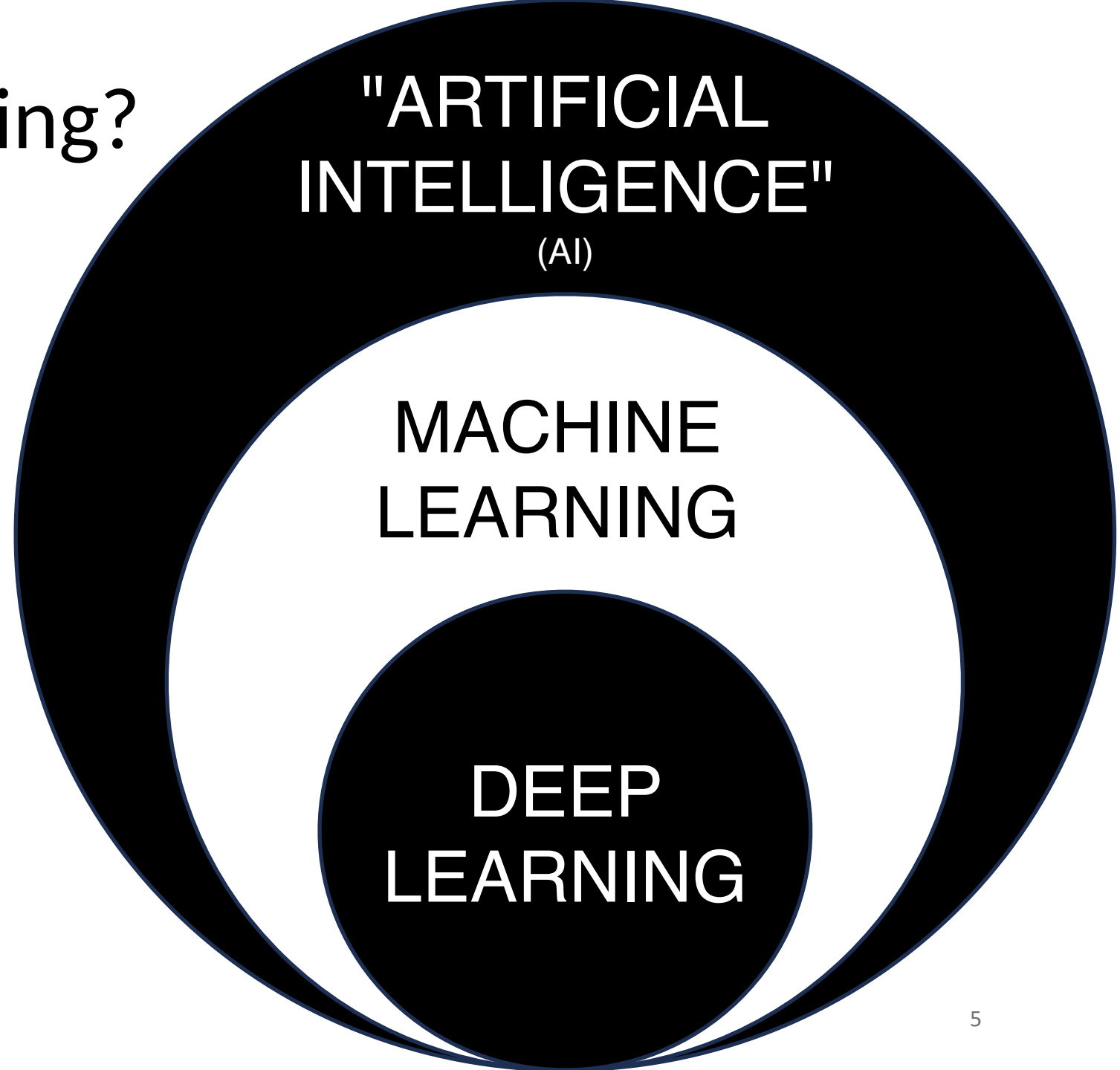
Reset Parameters to default

Pre-training

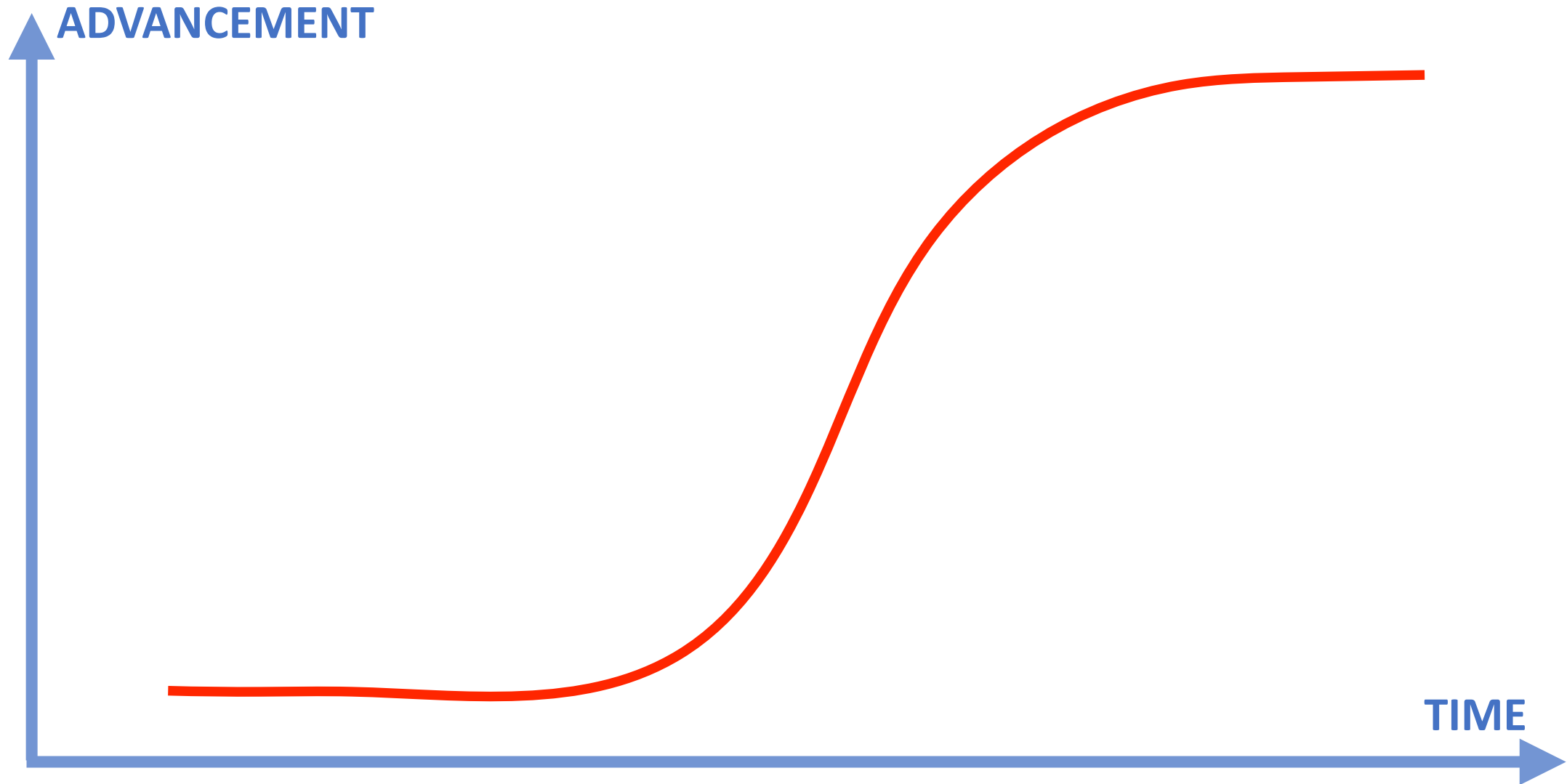
Fine-tuning

What is deep learning?

- AI: 'Narrow' / 'General'
- Deep Learning / Natural Language Processing
- Extracting higher and higher abstractions / representations from **data** in an automated way
- Large Language Models - trained on large **datasets** to analyse patterns & predict text based on this

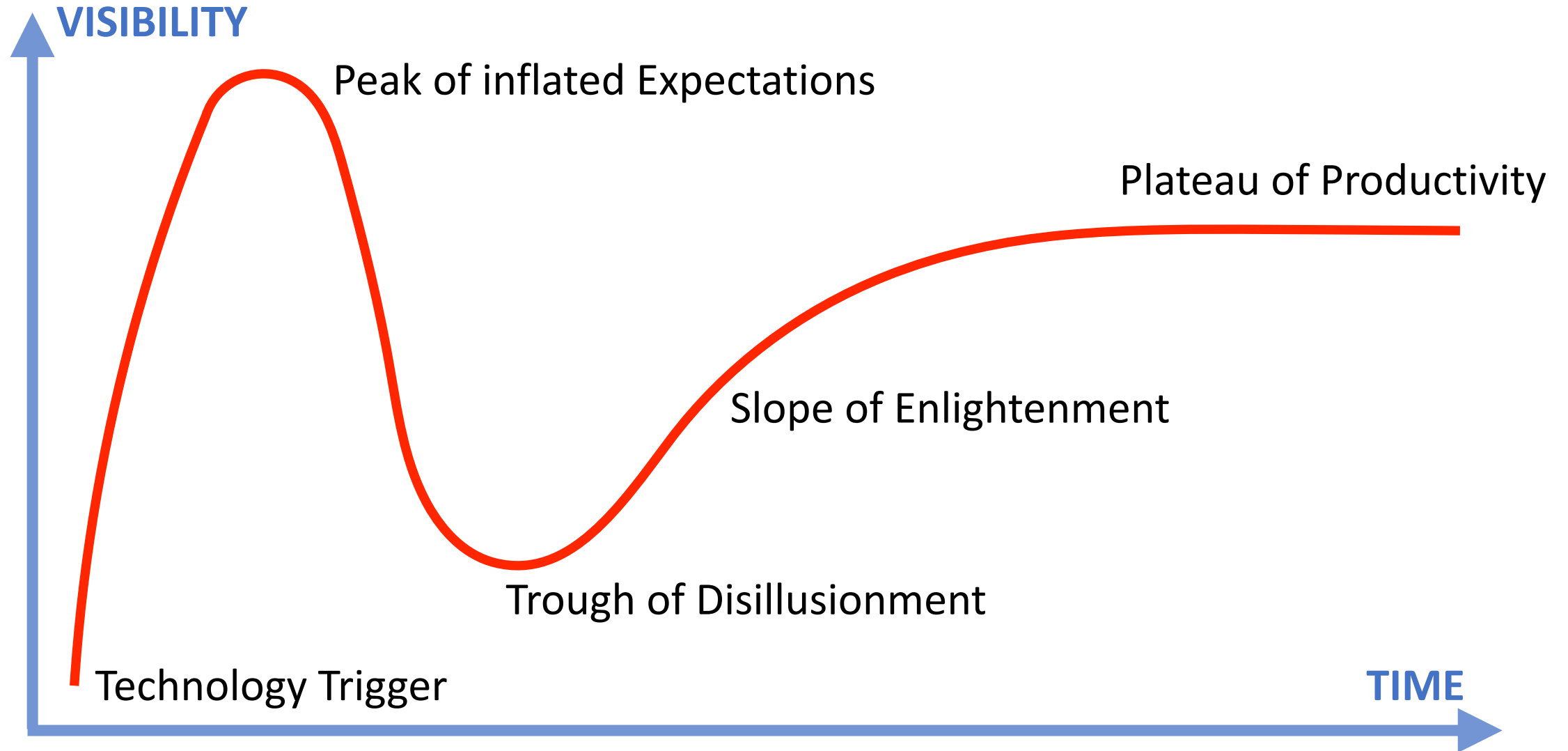


The sigmoid curve

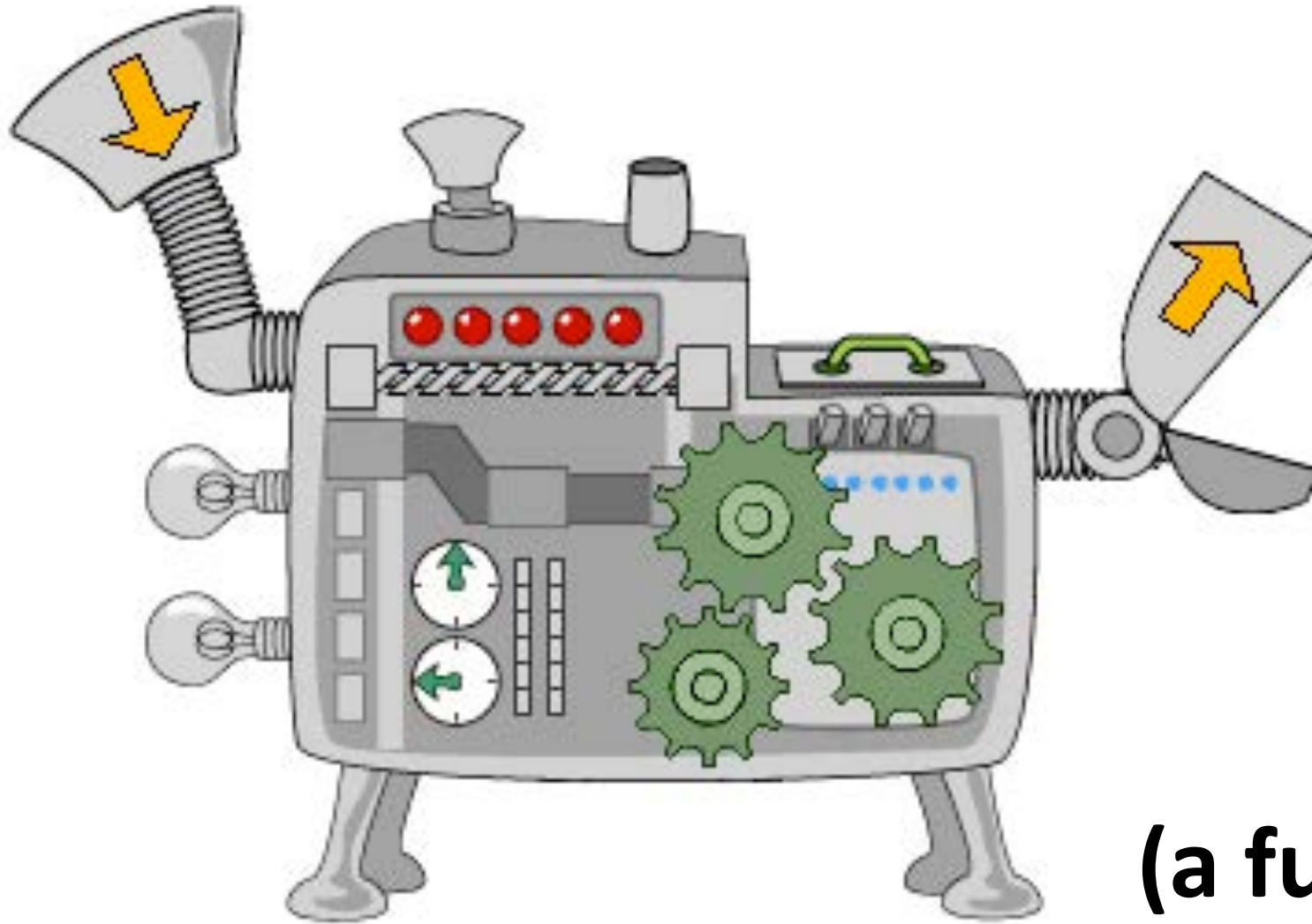




Gartner Hype Cycle



What is it?



(a function)



Hugging Face

ChatGPT 'detectors'

GPTZero
The World's **#1 AI Detector** with
over 1 Million Users

OpenAI
Research Product Developers Safety Company
New AI classifier
for indicating AI-
written text
We're launching a classifier trained to distinguish
between AI-written and human-written text.

GPT-2 Output Detector Demo
This is an online demo of the GPT-2 output detector model, based on the [OpenAI GPT-2](#) implementation of RoBERTa. Enter some text in the text box; the predicted probabilities will be displayed below. The results start to get reliable after around 50 tokens.

Enter text here

Real Fake

Real Fake



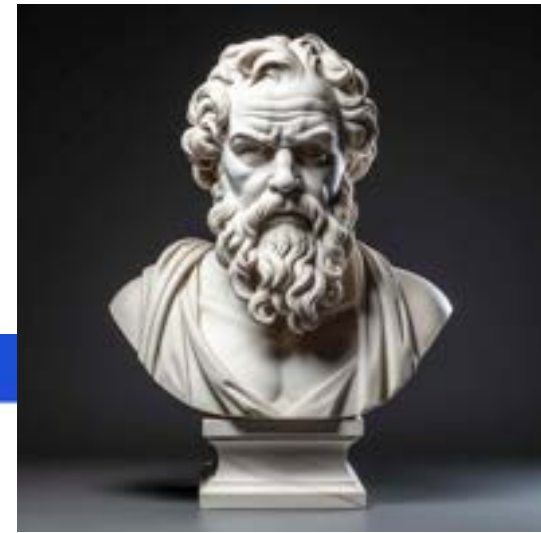
Applications for Education

World-class AI for education

Say hello to Khanmigo, Khan Academy's AI-powered guide. Tutor for learners.
Assistant for teachers.

Get Khanmigo Subscribe to newsletter

Hi, I'm Khanmigo! Ask me anything—I'm your new learning guide!



Hello
Ask me something

Hello, what can I do for you?

me on my essay about gender?

Of course! I'd be happy to help you with your essay on gender. To get started, could you let me know what specific aspect or question about gender you're focusing on in your essay?

"research and theory on gender differences confirms that men and women are psychologically different" critically discuss this statement

That's an interesting statement to discuss. When examining the topic of gender differences, it's important to approach it with a critical and analytical mindset. To begin our discussion, let's consider a few questions:

1. What does the statement mean by "psychologically different"? Are we referring to cognitive abilities, personality traits, or other psychological aspects?
2. What kind of research and theories exist that support this statement? Can you provide any specific examples or sources?
3. How do we define "men" and "women" in this context? Are we considering gender as a binary concept or acknowledging the existence of non-binary and transgender individuals?
4. How do societal and cultural factors influence our understanding of gender differences? Are these differences innate or shaped by socialization?

By exploring these questions and engaging in critical analysis, we can develop a well-rounded understanding of the statement and its implications. Let's dive deeper into each point and examine the evidence and counterarguments.

Send a message

12 Send

Integrations

✍️ Help me write

Create a brand marketing manager resume

Choose

The screenshot shows the Explainpaper web interface. On the left, a document titled "Attention Is All You Need" is displayed, including author names like Ashish Vaswani and the abstract. On the right, the "Explain" tab is active, showing a highlighted sentence: "Recurrent models typically factor computation at... hidden state h_{t-1} and the input for position L ." Below this, a "HIGH SCHOOLER" explanation is provided, detailing how recurrent models process sequences. At the bottom of the explanation panel, there are "Related Resources" and a "Ask a follow-up" button.

The screenshot shows a chat interface for editing the document. It features several control panels: "Style" with buttons for Professional, Casual, Enthusiastic, Informational, and Funny; "Format" with icons for Paragraph, Email, Ideas, and Blog post; "Length" with buttons for Short, Medium, and Long; and a large blue "Generate draft" button. A "Preview" section shows a snippet of the document's text. At the bottom, there are buttons for "Change the tone", "Rewrite it shorter", "Add more examples", and "Add to site".

What are the limitations?



Hallucinations



Knowledge cut-off



AI bias

Copyright



Output from GPT-4:

exempted it from regulations, subsidized its operations and promoted its practices, records and interviews showed. Their actions turned one of the best-known symbols of New York — its yellow cabs — into a financial trap for thousands of immigrant drivers. More than 950 have filed for bankruptcy, according to a Times analysis of court records, and many more struggle to stay afloat.

“Nobody wanted to upset the industry,” said David Klahr, who from 2007 to 2016 held several management posts at the Taxi and Limousine Commission, the city agency that oversees medallions. “Nobody wanted to kill the golden goose.”

New York City in particular failed the taxi industry, The Times found. Two former mayors, Rudolph W. Giuliani and Michael R. Bloomberg, placed political allies inside the Taxi and Limousine Commission and directed it to sell medallions to help them balance budgets and fund key initiatives. During that period, much like in the mortgage lending crisis, a group of industry leaders enriched themselves by artificially inflating medallion prices. They encouraged medallion buyers to borrow as much as possible and ensnared them in interest-only loans and other one-sided deals that often required borrowers to pay hefty fees, forfeit their legal rights and give up most of their monthly incomes. When the market collapsed, the government largely abandoned the drivers who bore the brunt of the crisis. Officials did not bail out borrowers or persuade banks to soften loan

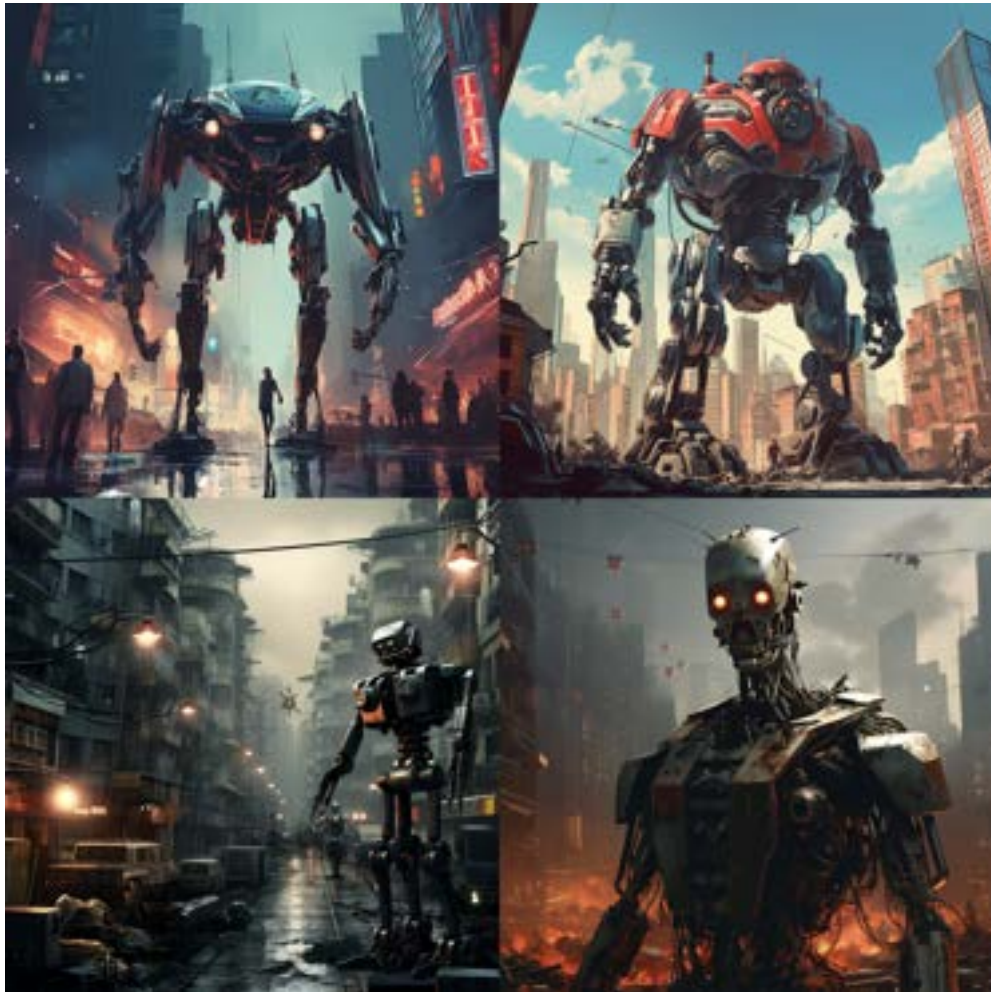
Actual text from NYTimes:

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Dangers of AI



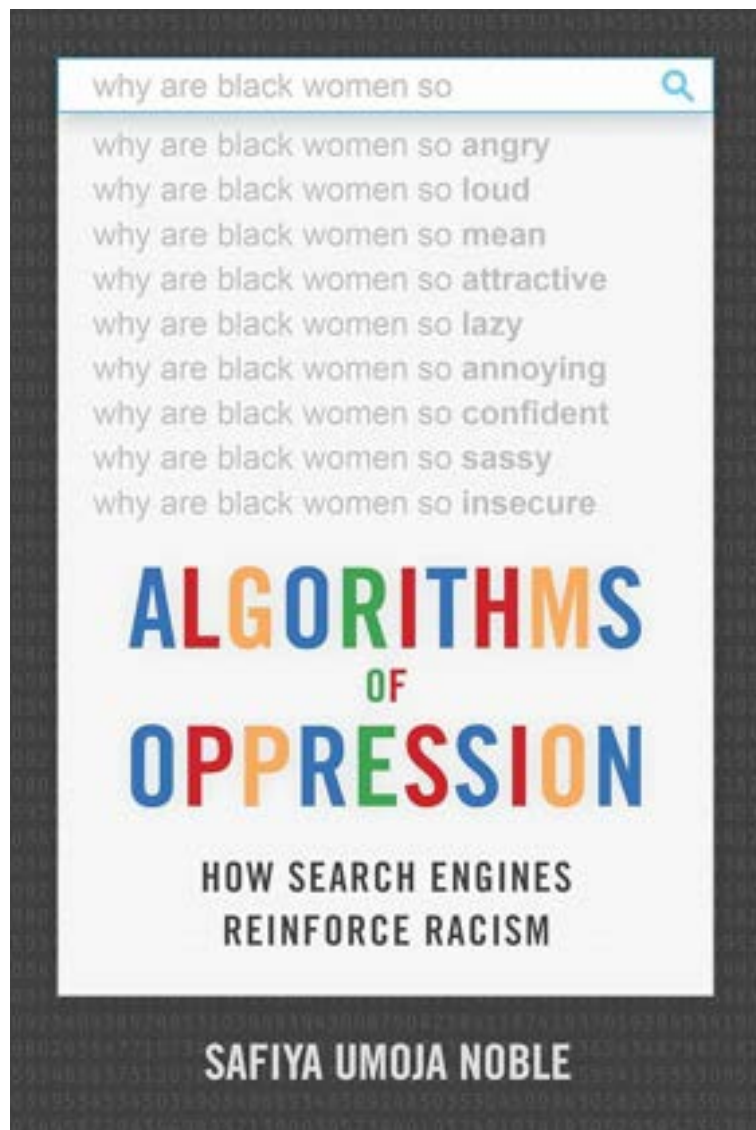
Stochastic Parrots

“Contrary to how it may seem when we observe its output, an LM is a system for haphazardly stitching together sequences of linguistic forms it has observed in its vast training data, according to probabilistic information about how they combine, but without any reference to meaning: **a stochastic parrot.**” Bender et al. (2021)

Can Large Language Models be too large?



Stochastic Parrots



85. Timnit Gebru Looks at Corporate AI and Sees a Lot of Bad Science



Stochastic Parrots - no consensus?

Humans are all "stochastic parrots" - driven by language, influenced by media, processing deracinated knowledge. AI makes that more honest. In the words of Calvino, it gives place to a more thoughtful person who will know that the author is a machine, and how the machine works.

06:20 · 02/03/2023 · 406 Views

2 Retweets 1 Quote 3 Likes

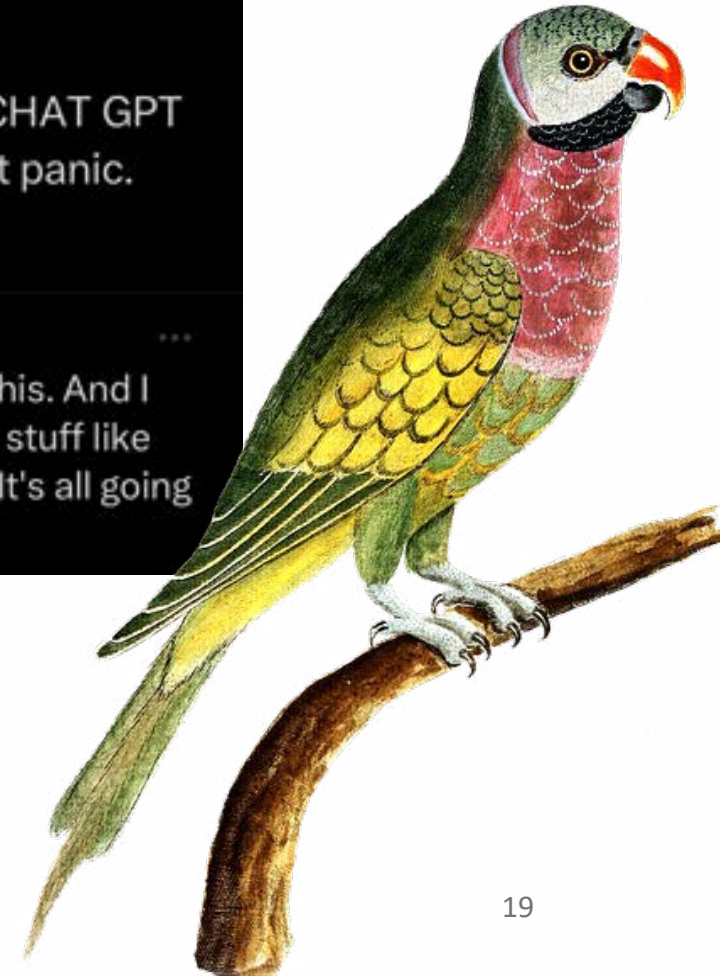
Mike Sharples @sharplm · 2d
So rather than needing to know whether there's "human intention" behind a paragraph, I would prefer to see integrity and creativity in the language, whatever the combination of human and machine involved in its generation.

Patricia Xavier #UCURising @PXav... · 2d
Yes we're all 'stochastic parrots', the training of our own internal inference machine varies.

roxane gay @rgay

I am pretty sure I am reading my first CHAT GPT student essay and like, teachers, don't panic. You'll know it when you see it.

roxane gay @rgay · 15h
I don't get riled up about stuff like this. And I don't snitch. Students generally do stuff like this out of desperation not malice. It's all going to be fine.



TIME

T Hi ChatGPT

Hello! How can I assist you today?

T What do you think of a TIME cover story with the title, "The AI Arms Race Is Changing Everything?"

As an AI language model, I don't have personal opinions or beliefs, but I can provide some context and information on the subject.

"The AI Arms Race is Changing Everything" could be an attention-grabbing and thought-provoking title for a cover story on AI. A cover story in a widely-read publication like TIME could help raise public awareness about the potential risks and benefits of this trend, and stimulate discussions on how to ensure that AI is developed and deployed in a responsible and ethical manner.

It's important to note that the title of the story could also be interpreted as sensationalist or alarmist, and may not accurately reflect the complexities

by
ANDREW R. CHOW
& BILLY PERRIGO
(humans)

Thank you!

Matt Wood

@drmattywood

Durham University | Northumbria University

Source: Chow, A. R., & Perrigo, B. (2023, February 27). The AI Arms Race Is Changing Everything. *Time*. <https://time.com/6255952/ai-impact-chatgpt-microsoft-google/>