



Artificial Intelligence

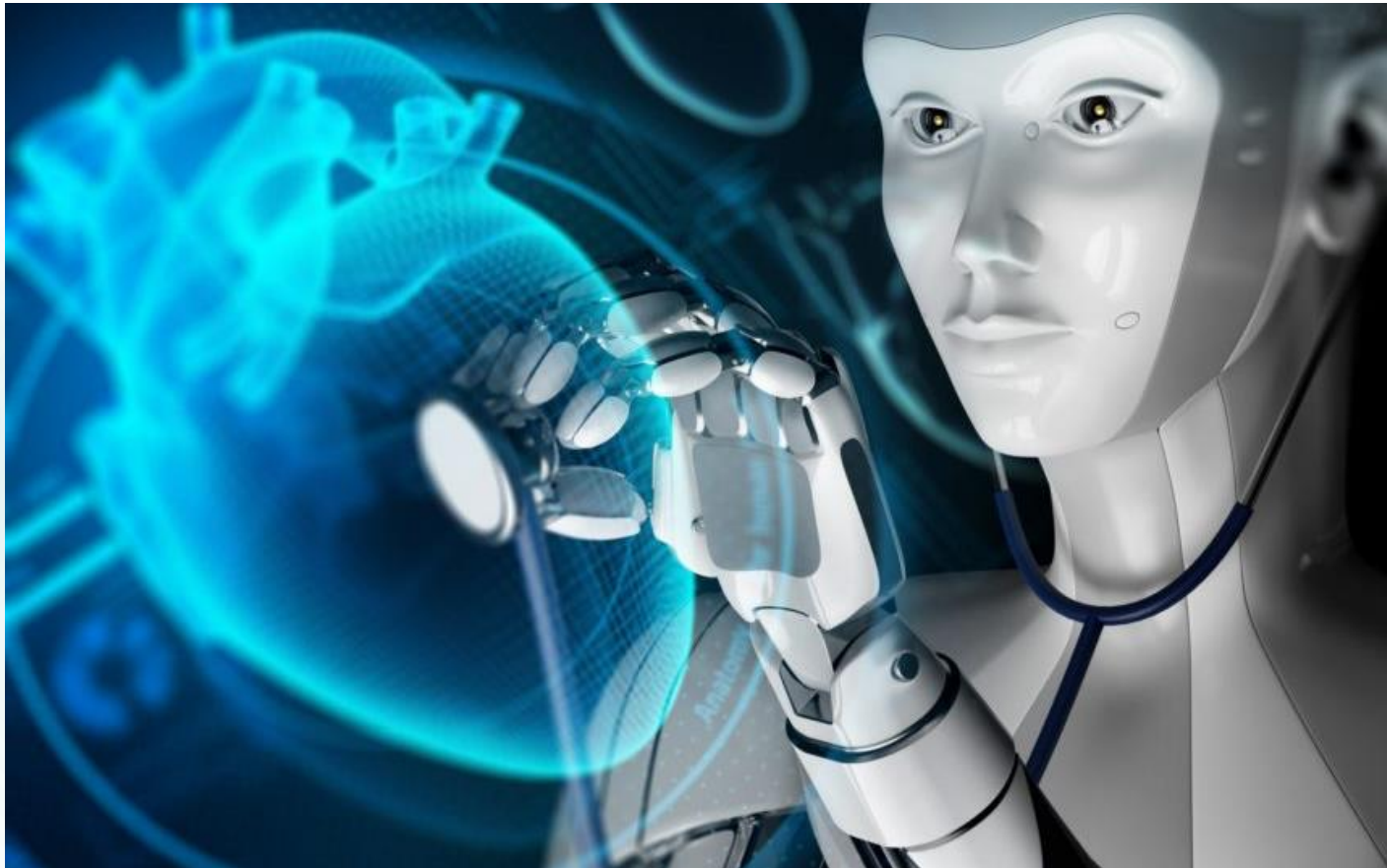
What Is It and
Should I Be
Worried

AT THIS POINT...PROBABLY

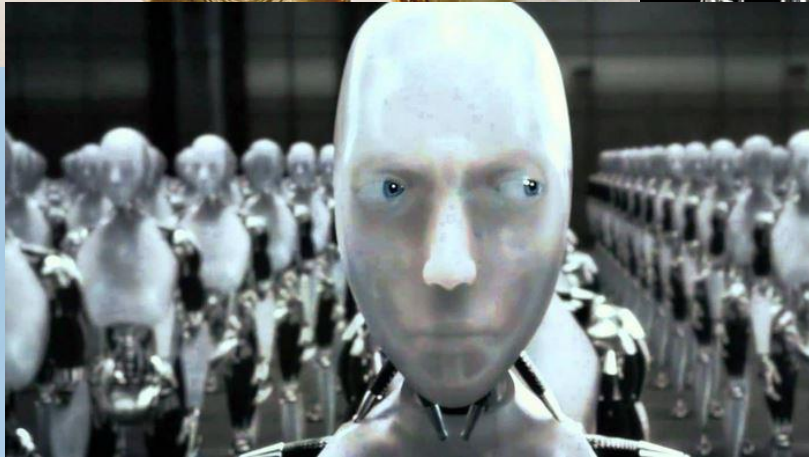
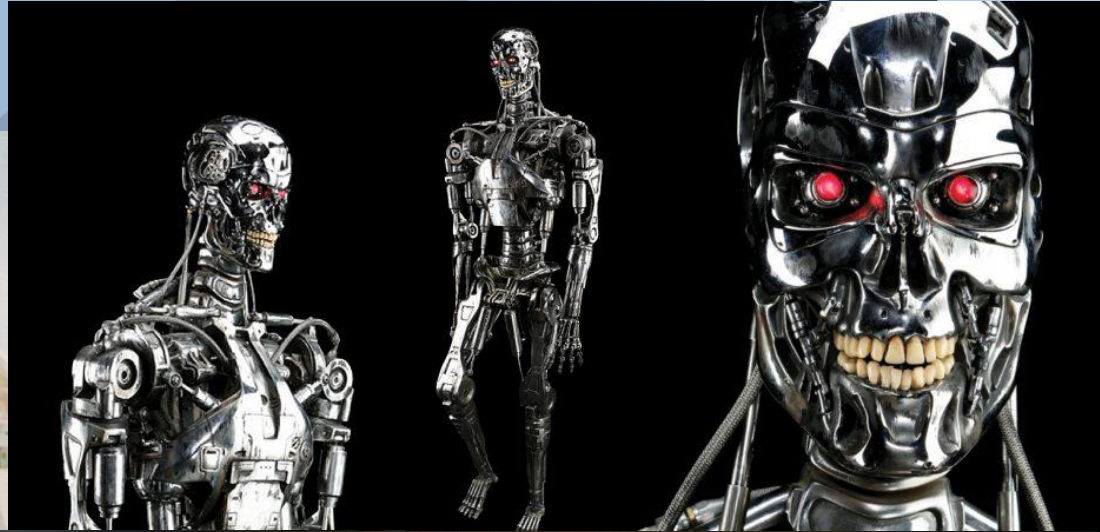
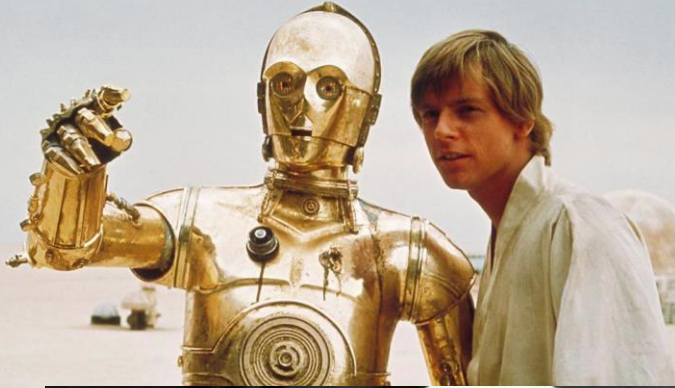
Healthcare Landscape— Competition is Fierce



But has anyone thought about



First Thoughts





Amazon AI

Intelligent Services Powered By Deep Learning





Brief History of AI

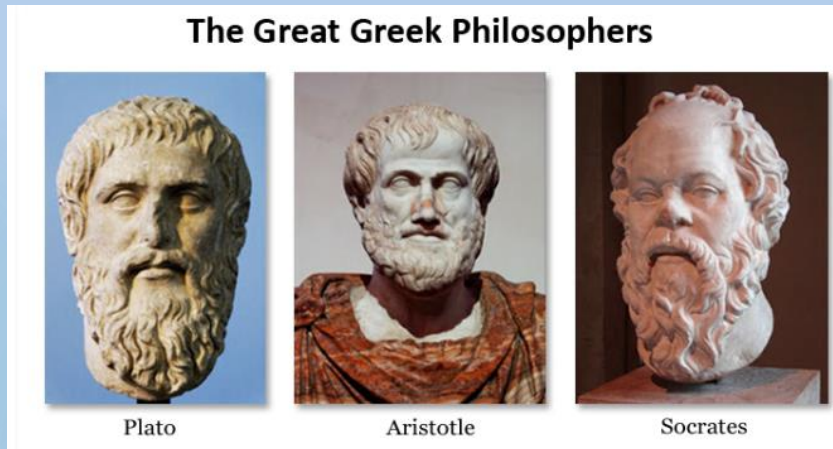
<https://www.youtube.com/watch?v=056v4OxKwll>

History of Artificial Intelligence – Lots of YouTube lessons ☐

- ▶ <https://www.youtube.com/watch?v=ikzJjPYGc8U>
- ▶ <https://www.youtube.com/watch?v=yaL5ZMvRRqE>
- ▶ <https://www.youtube.com/watch?v=NJ2VpmoGyMw>
- ▶ And CNN:
<https://www.cnn.com/2023/06/24/tech/artificial-intelligence-generative-ai-explained/index.html>



Technically....it started here...



Why you ask? The great philosophers attempted to describe human thinking as a symbolic system. Human thinking is based generally on logic. $1+1=2$



No...IBM did not invent artificial intelligence



It was mastered and began evolution here...



Alan Turing is often called the father of modern computing. He was a brilliant mathematician and logician. He developed the idea of the modern computer and artificial intelligence. During the Second World War he worked for the government breaking the enemies' codes and Churchill said he shortened the war by two years.



The Turing Test – Imitation Game

Definition:

A test of a machine's ability to exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human.



Formally a science in 1956

Conference at Dartmouth College

The term “artificial intelligence” was officially coined

Backdrop to subsequent computer research

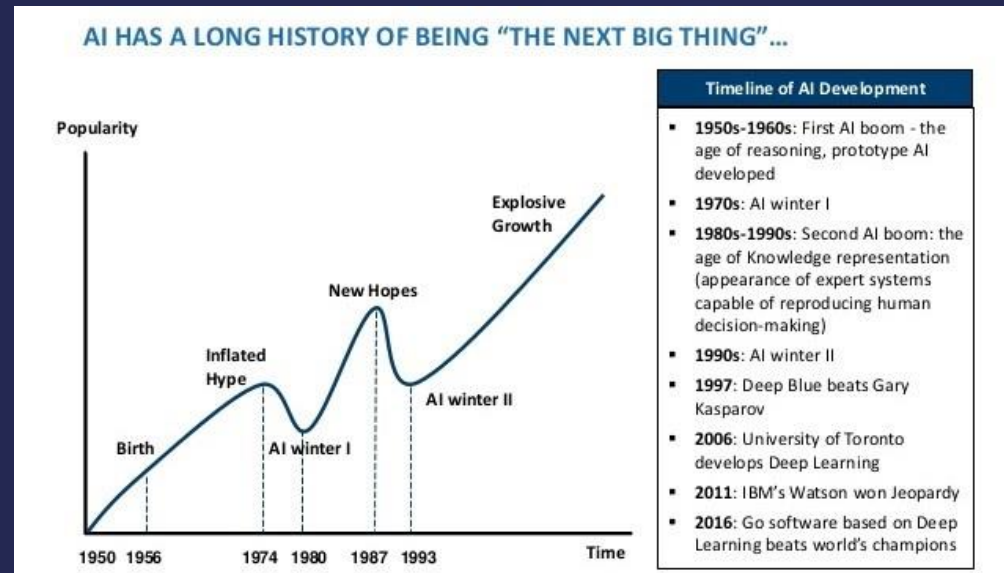
Revolutionary vision was a significant influence on several of the people that helped create the [Internet](#)

Joseph Carl Robnett "Lick" Licklider created the idea of a universal network



Artificial Intelligence - Winter Years

► In the history of artificial intelligence, an AI winter is a period of reduced funding and interest in artificial intelligence research. The term was coined by analogy to the idea of a nuclear winter. ... The AI winter is primarily a collapse in the perception of AI by government bureaucrats and venture capitalists.



What exactly is Artificial Intelligence?

Per the Merriam-Webster...

1: a branch of computer science dealing with the simulation of intelligent behavior in computers

2: the capability of a machine to imitate intelligent human behavior

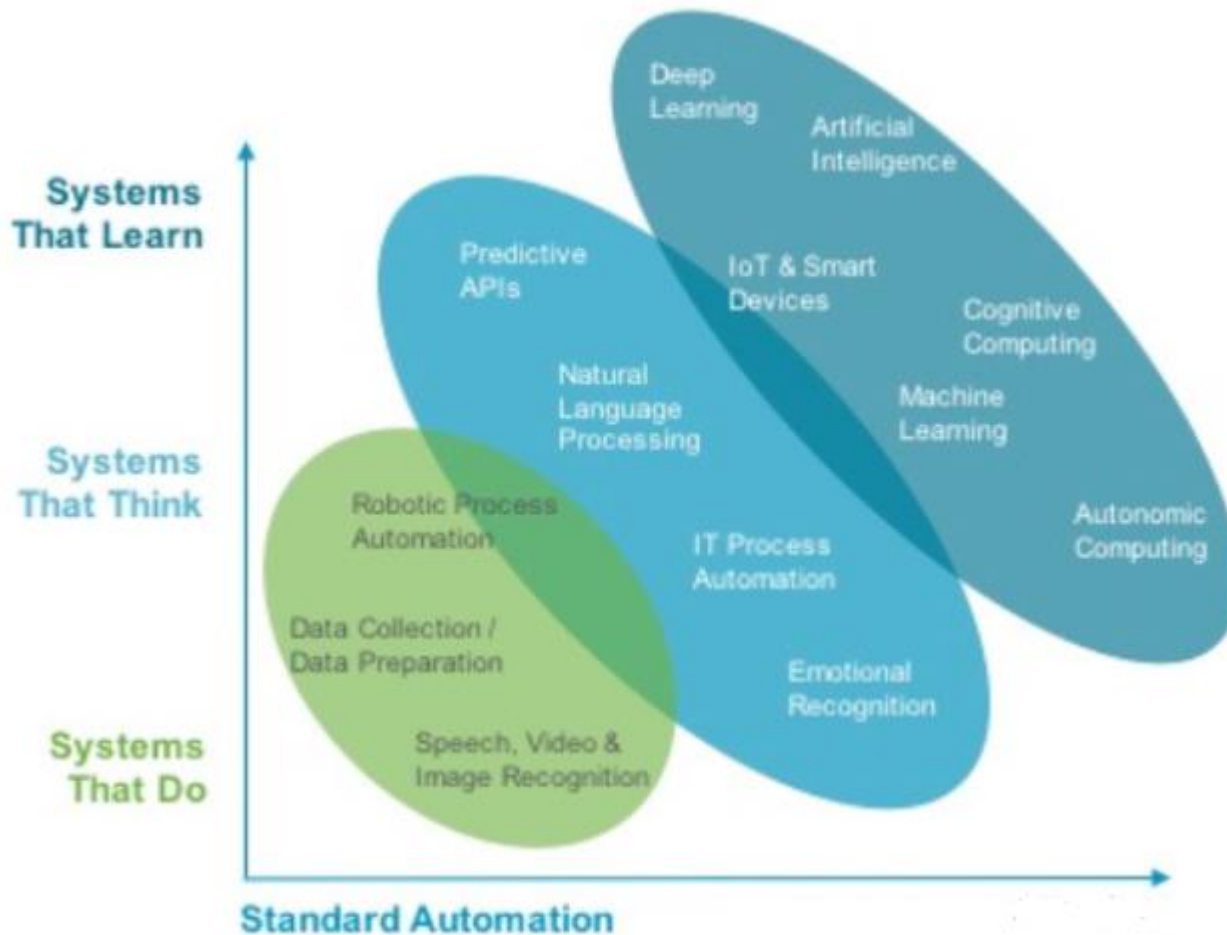
But what does that really mean...Well...Sort of three camps

Artificial Narrow Intelligence (ANI)	Artificial General Intelligence (AGI)	Artificial Super Intelligence (ASI)
<p>Narrow or Weak AI</p> <p>Accomplishes a single narrow task</p>	<p>More like the Human brain and its functions</p> <p>Able to "think" on the same level as a human</p>	<p>Theoretical and scary version</p> <p>Where AI surpasses the human mind</p>



AI Continuum


The Intelligent Automation Continuum



Weak AI usage – Artificial Narrow Intelligence



Strong AI usage (AGI and ASI)

- Currently not in motion
 - Debatable that it is attainable by some scientists
 - Cognitivists vs Anti-Cognitivists
 - Cognitivists believe human conscious can be simulated
 - Guesstimate – 2050 will be the emergence of Singularity; greater-than-human-super-intelligence
- 

Cognitivism

Cognitivism is the study in psychology that focuses on mental processes, including how people perceive, think, remember, learn, solve problems, and direct their attention to one stimulus rather than another. Psychologists working from a cognitivist perspective, then, seek to understand cognition.



And this means in AI speak...

The term **cognitive** computing is typically used to describe **AI** systems that aim to simulate human thought. ... A number of **AI** technologies are required for a computer system to build **cognitive** models that mimic human thought processes, including machine learning, deep learning, neural networks, NLP and sentiment analysis.



Interesting when you start to apply to healthcare...

What is a medical diagnosis?

Is every human different?

If so, is it because we are self aware?

Is the question really a question of ethics as opposed to logic?

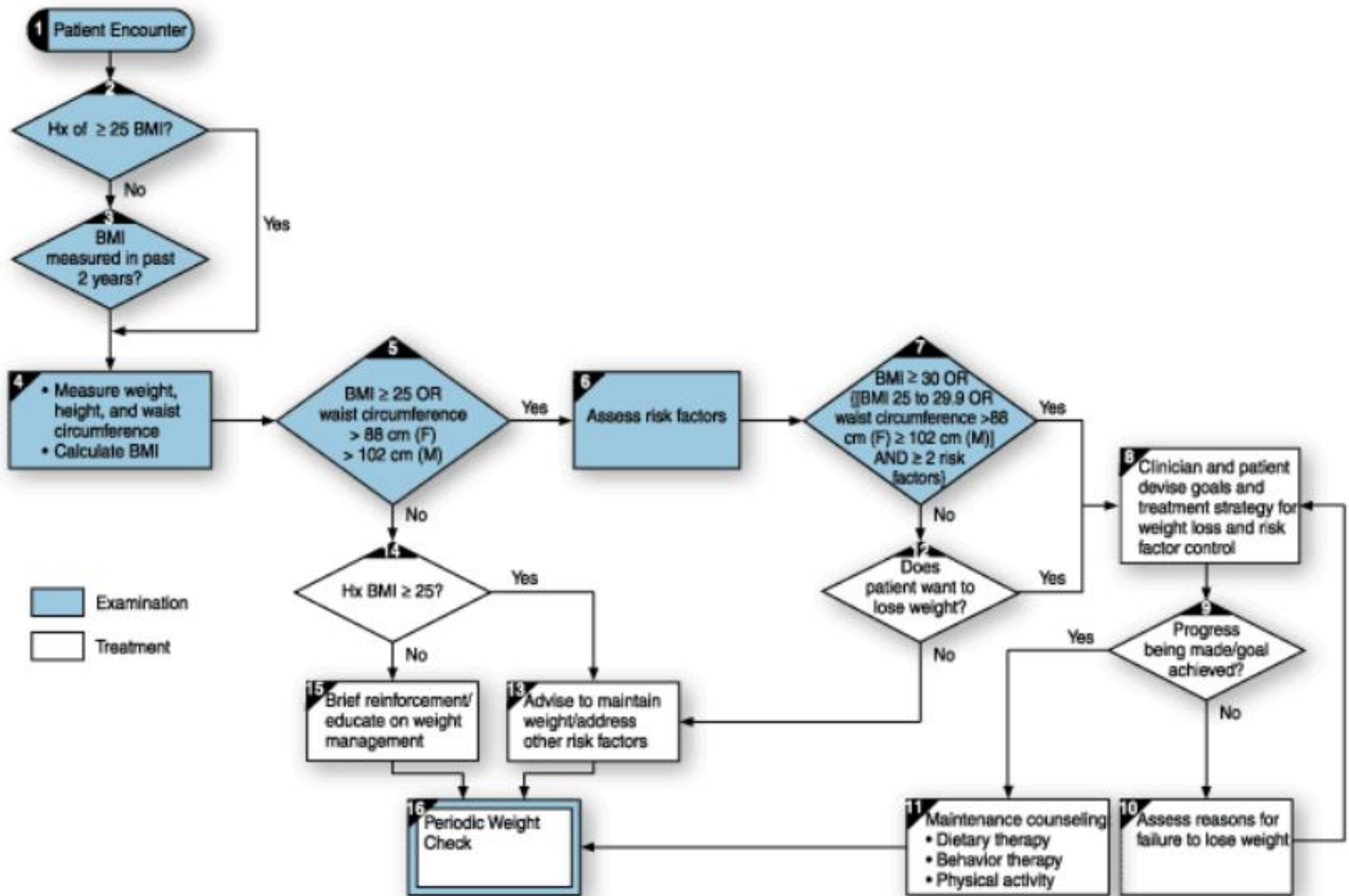


Transitive Property and What is an algorithm?

In mathematics and computer science, an algorithm is a set of instructions, typically to solve a class of problems or perform a computation. Algorithms are unambiguous specifications for performing calculation, data processing, automated reasoning, and other tasks.

**if $a = b$
and $b = c$
then $a = c$**





* This algorithm applies only to the assessment for overweight and obesity and subsequent decisions based on that assessment. It does not include any initial overall assessment for cardiovascular risk factors or diseases that are indicated.

It's learning...!

Aug 29, 2023 - Technology

ChatGPT plays doctor with 72% success



<https://www.axios.com/2023/08/29/chatgpt-medical-diagnosis-study>



Mom uses ChatGPT to find diagnosis

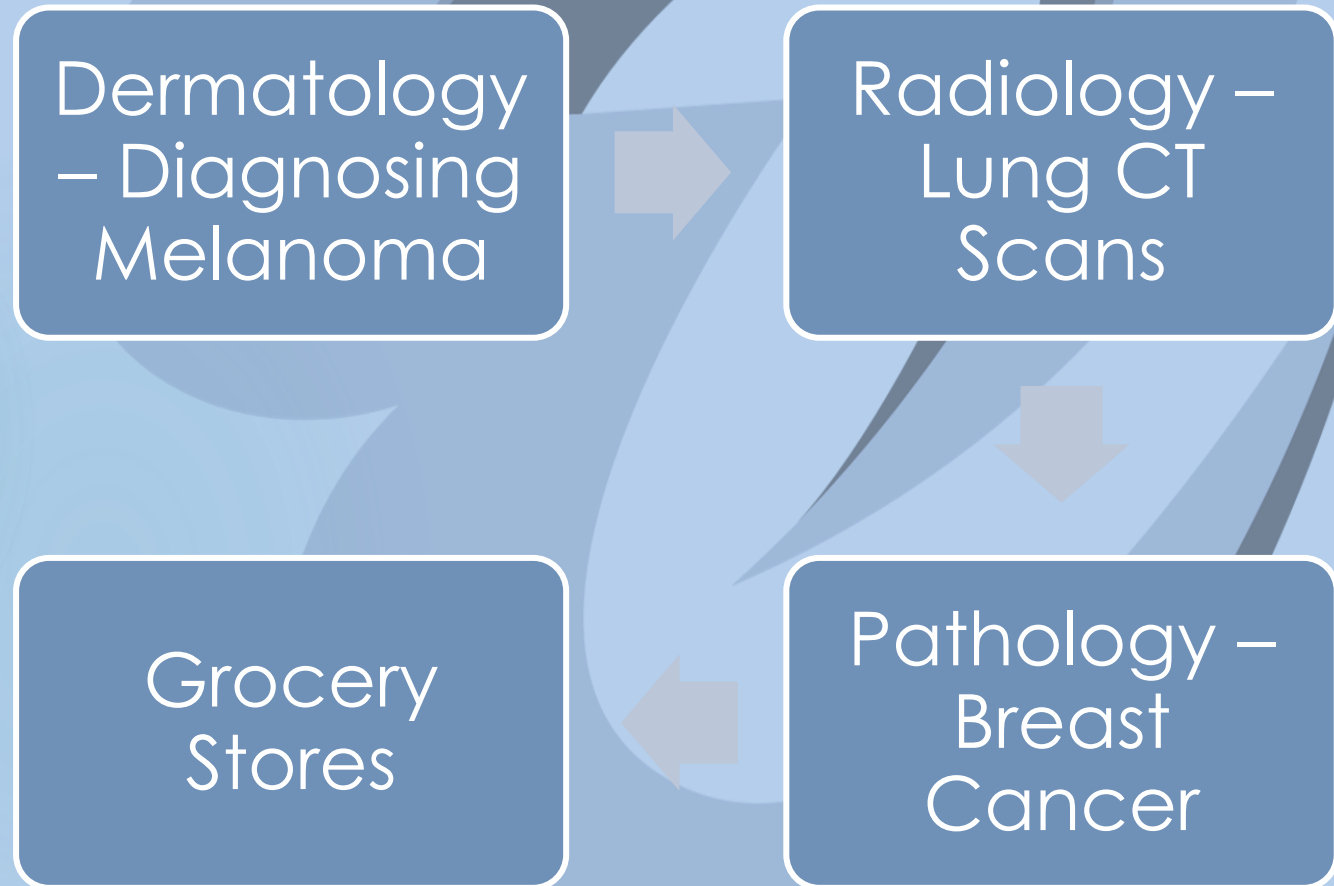
HUMAN INTEREST

A Boy Suffering Chronic Pain for 3 Years Finally Receives Correct Diagnosis from ChatGPT

<https://people.com/boy-suffering-chronic-pain-for-3-years-finally-receives-diagnosis-via-chatgpt-7968393>



Where is AI in Healthcare (as of 2019)?



Dermatology -

AI May Be Better at Detecting Skin Cancer Than Your Derm

How new tech could replace your physician.

Researchers found that the CNN (convolutional neural network) was more reliable at identifying melanoma, an aggressive form of skin cancer, and benign moles (called nevi) than even experienced dermatologists.

<https://www.healthline.com/health-news/ai-may-be-better-at-detecting-skin-cancer-than-your-derm>



Radiology – Lung Cancer

Artificial intelligence system spots lung cancer before radiologists

Deep learning—a form of artificial intelligence—was able to detect malignant lung nodules on low-dose chest computed tomography (LDCT) scans with a performance meeting or exceeding that of expert radiologists, reports a new study from Google and Northwestern Medicine.

<https://medicalxpress.com/news/2019-05-artificial-intelligence-lung-cancer-radiologists.html>



Pathology – Breast Cancer

CNN algorithms have now been shown to diagnose breast cancer metastasis in lymph nodes with at least equivalent performance compared to a panel of pathologists, and in a more time-efficient manner.[36] DL has also been shown to be useful in automated Gleason grading of prostate adenocarcinoma Hematoxylin and Eosin–stained specimens, with a 75% rate of agreement between the algorithm and pathologists.[37]

These methods may assist pathologists in the detection of cancer gene mutations and may be cost-effective compared to direct mutational analysis.

<https://www.cancernetwork.com/oncology-journal/artificial-intelligence-oncology-current-applications-and-future-directions>



Grocery Store AI Healthcare?!?!?



Safeway stores offering health care powered by artificial intelligence

Virtual health kiosks opening up inside in Arizona Safeway stores are similar to using the self-checkout line for groceries — only in this case, the commodity is medical care.

There's no doctor or nurse inside the walk-in Akos Med Clinic. Rather, the clinics use technology powered by artificial intelligence and augmented reality to gather symptoms and vitals, as well as determine possible diagnoses.

<https://www.azcentral.com/story/money/business/health/2019/04/22/safeway-stores-offering-health-care-powered-by-artificial-intelligence-ai-advinow-medical-akosmd/2592743002/>

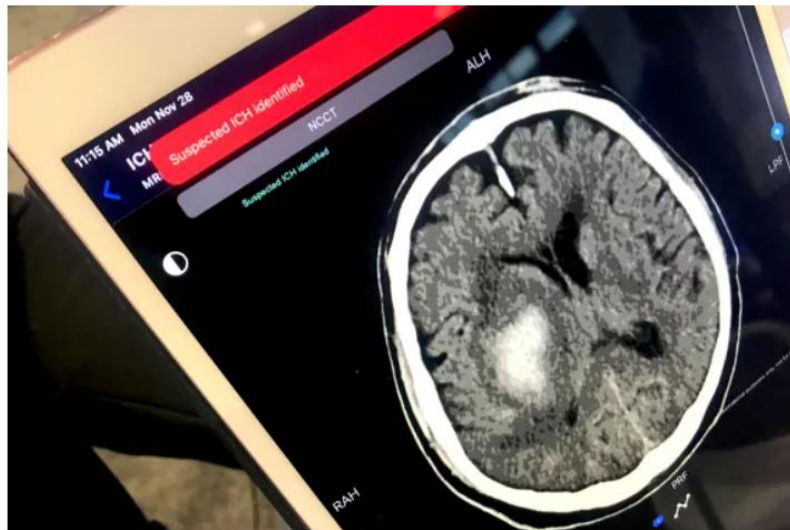
Those were all from 2019!



AI expanding rapidly...

FDA has now cleared more than 500 healthcare AI algorithms

Dave Fornell | February 06, 2023 | Artificial Intelligence



AI-automated detection of an intracranial hemorrhage on CT. The software can alert the care team before a radiologist even sees the exam. Example shown by TeraRecon at RSNA 2022.

<https://healthxec.com/topics/artificial-intelligence/fda-has-now-cleared-more-500-healthcare-ai-algorithms>



Seriously...it is real (click link below to FDA website)

Here is the breakdown for the number of FDA-cleared algorithms across specialties:

- [Radiology](#) 396
- [Cardiology](#) 58
- Hematology 14
- Neurology 10
- Clinical chemistry 7
- Ophthalmic 7
- Gastroenterology and urology 5
- General and plastic surgery 5
- Pathology 4
- Microbiology 4
- Anesthesiology 4
- General Hospital 3
- Orthopedic 1
- Dental 1

[See the complete list of FDA-cleared algorithms here](#)



Today...literally today

HEALTH · Published August 3, 2023 2:00am EDT

New AI ultrasound tech is first to land FDA approval to enhance prenatal care: 'Better health outcomes'

Deep learning enhances ultrasound images and helps identify birth defects earlier

<https://www.foxnews.com/health/new-ai-ultrasound-tech-first-land-fda-approval-enhance-prenatal-care-better-health-outcomes>

[HOME](#) > [HEALTH](#)

Doctors are better at detecting breast cancer when they get help from AI, large study finds

Julia Pugachevsky Aug 2, 2023, 4:57 PM EDT



https://www.insider.com/using-ai-for-breast-cancer-identification-2023-8?content_id=598db071-bf32-4b65-9ed4-ca7b80338cf9



Some examples of what is in motion today

- ▶ <https://www.philips.com/a-w/about/news/archive/features/2022/20221124-10-real-world-examples-of-ai-in-healthcare.html>
- ▶ <https://builtin.com/artificial-intelligence/artificial-intelligence-healthcare>
- ▶ <https://intellipaat.com/blog/artificial-intelligence-in-healthcare/?US>
- ▶ <https://venturebeat.com/ai/10-top-artificial-intelligence-ai-applications-in-healthcare/>
- ▶ <https://research.aimultiple.com/healthcare-ai-use-cases/>
- ▶ <https://sma.org/ai-in-medical-diagnosis/>
- ▶ <https://www.insiderintelligence.com/insights/artificial-intelligence-healthcare/>
- ▶ And on and on and on...



For the record...you all are already on the artificial intelligence path...

How do I get there? -- Google maps

What's wrong with me? -- WebMD

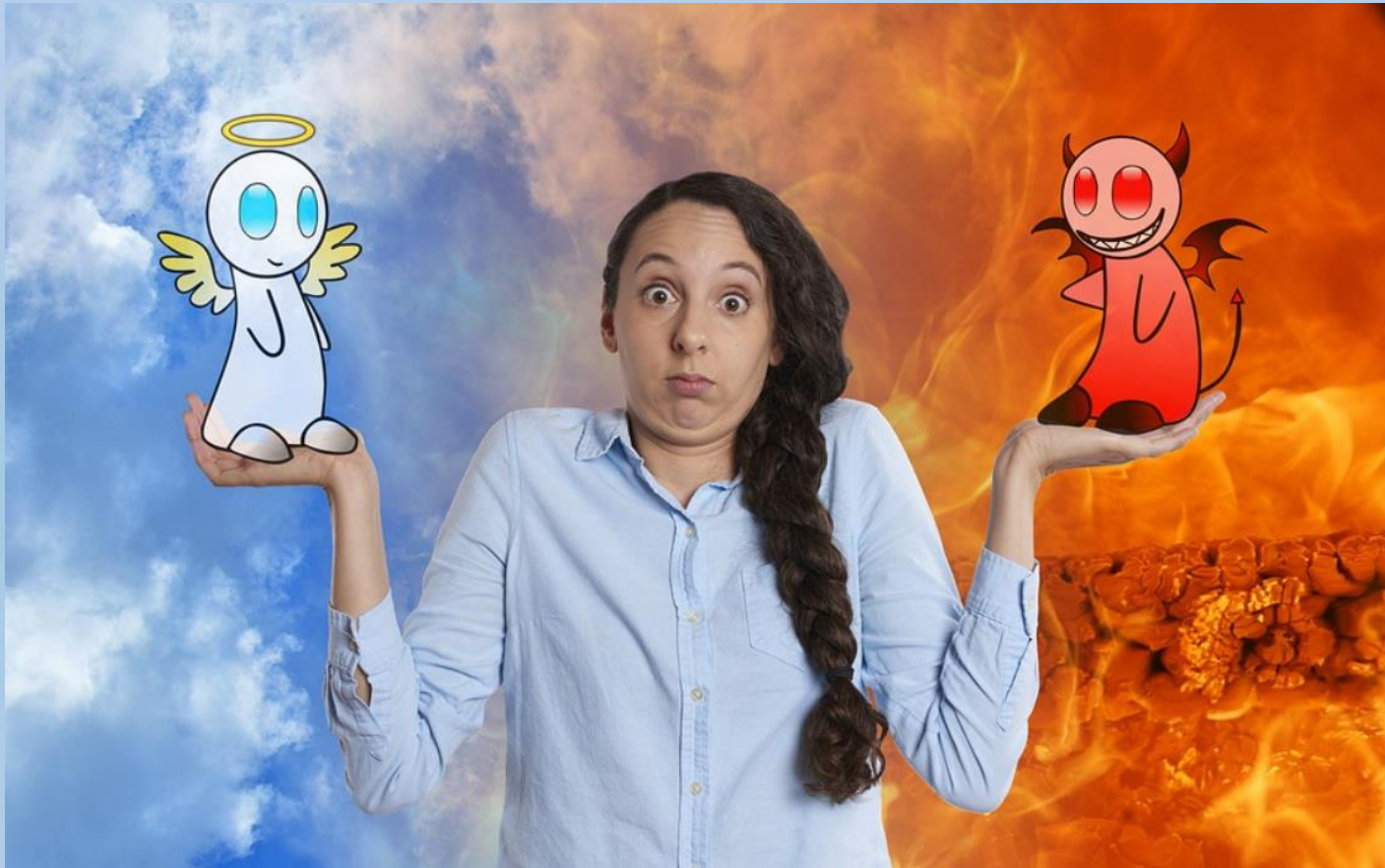
Where should I eat? -- Yelp

What should I wear? -- StitchFix

Who should I date? -- Match.com



Ethics of AI...Let's Discuss



Thinking about the winter years again...



Right now...the private sector is pumping...



HOT, HOT, HOT!!!

- “**The appetite for** generative AI — AI that turns text prompts into images, essays, poems, videos and more — is insatiable. And the investment dollars keep flowing, not shockingly.
- According to a PitchBook report released this month, VCs have steadily increased their positions in generative AI, from \$408 million in 2018 to \$4.8 billion in 2021 to \$4.5 billion in 2022. Angel and seed deals have grown, as well, with 107 deals and \$358.3 million invested in 2022 compared with just 41 and \$102.8 million in 2018.”

What some are saying...about sectors affected



Media



Education



Advertising



Healthcare



Finance

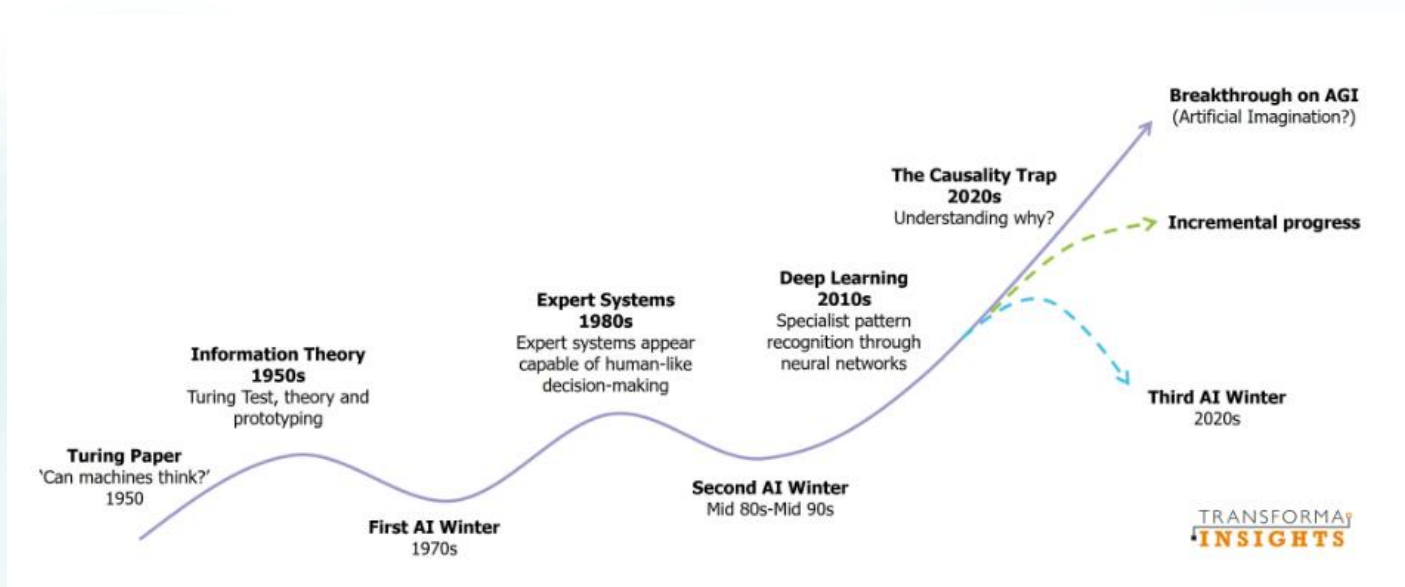


Healthcare...initial target is solve problems with large data sets and streamlining tedious processes (administrative and clinical)

- ▶ **Teladoc is doubling down on its partnership with Microsoft to invest in AI. The telehealth giant will integrate Azure OpenAI and Nuance's speech recognition tech into its virtual care solution for hospitals.** (<https://www.fiercehealthcare.com/health-tech/teladoc-taps-microsoft-integrate-ai-ambient-clinical-tech-its-telehealth-platform>)
- ▶ **Nuance integrates generative AI-backed scribe into Epic EHRs** (<https://www.healthcarediver.com/news/nuance-integrates-generative-ai-scribe-epic-ehrs/654281/>)
- ▶ **Leveraging ChatGPT and Generative AI in Healthcare Analytics** (<https://journal.ahima.org/page/leveraging-chatgpt-and-generative-ai-in-healthcare-analytics>)
- ▶ **Google and Mayo Clinic have partnered to test Google's Enterprise Search AI tool, aimed at making clinician workflow more efficient.** (https://www.dhinsights.org/news/google-enterprise-search&nbd=&nbd_source=hubspot?utm_campaign=DHI%20%20Editorial&utm_source=hs_email&utm_medium=email&_hsenc=p2ANqtz-_mt1LEYkVeocwUC6PdXRIkVWocmgsEmmJo4ycGwA3-OjiTnNjNlyA3_C5SmU2fHtmvNu9Q)



What's next? Another winter or a boom?

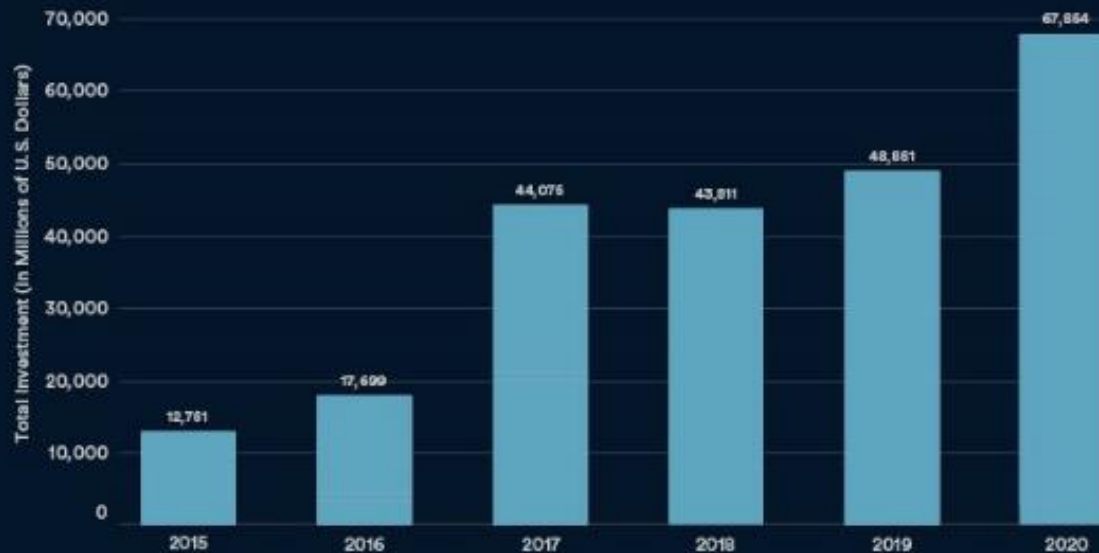


For the moment...

2 Corporate Investment in AI Hits New High

Mergers and acquisitions led the activity.

GLOBAL CORPORATE INVESTMENT IN AI, 2015-20



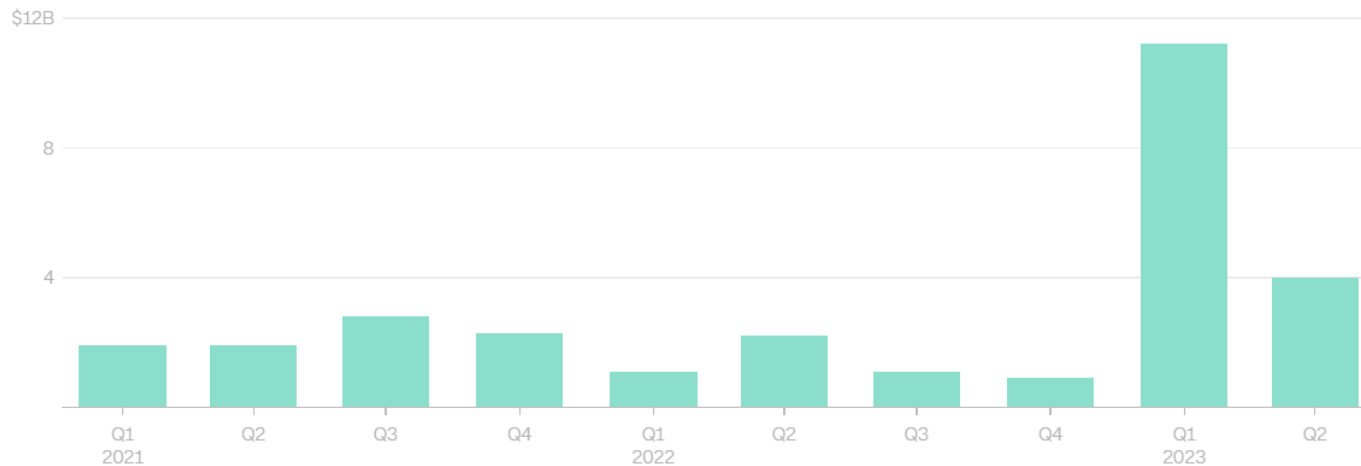
Data Source: CAPIQ, Crunchbase, and NetBase Quid
Adapted from the AI Index 2021 Annual Report

...Gold Rush!

Venture capitalists are pouring billions into generative AI companies

VCs invested almost five times as much into generative AI firms in the first half of 2023 as during the same period last year. Even excluding a \$10 billion investment by Microsoft unveiled in January, VC funding is still up nearly 58% compared with the first half of 2022.

Deal value



Source: Pitchbook
Graphic: Anna Cooban, CNN

<https://www.cnn.com/2023/07/23/business/ai-vc-investment-dot-com-bubble/index.html>



The Government is trying to keep this train on the rails...

BUSINESS

Amazon, Google, Meta, Microsoft and other tech firms agree to AI safeguards set by the White House



Article Source:

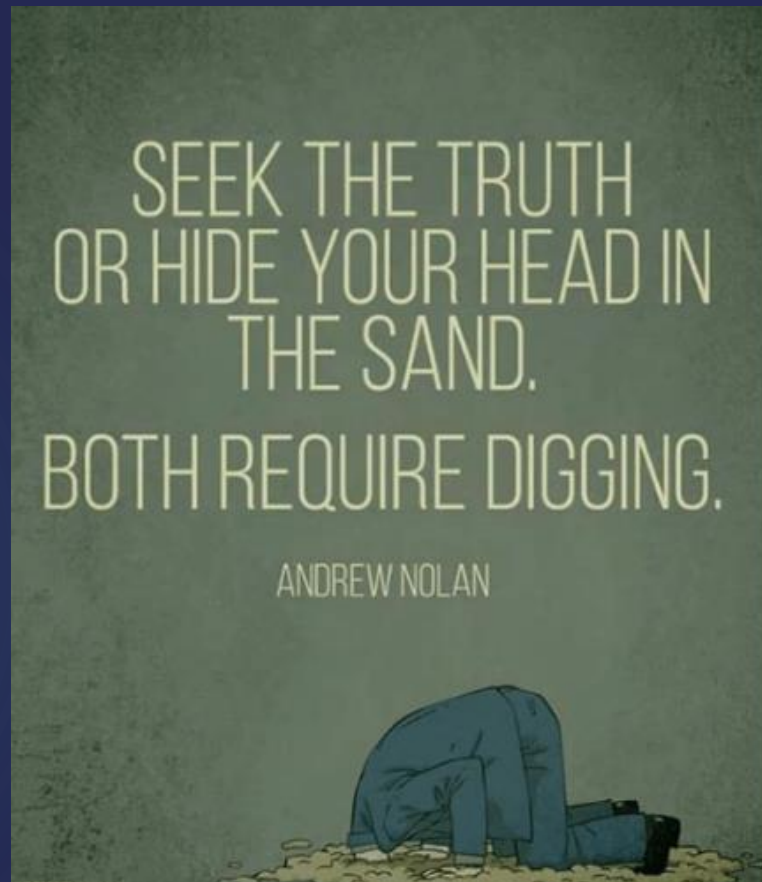
https://apnews.com/article/artificial-intelligence-safeguards-joe-biden-kamala-harris-4caf02b94275429f764b06840897436c?dc_data=1108717_news-verizon-us&utm_source=taboola&utm_medium=taboola_news&utm_campaign=ECAPNews&ui=8fbf0290dcc1fb59



I think the train has left the station...



Purpose of this presentation



But don't worry...the industry will adapt to all of our AI usage 😊



<https://bgr.com/entertainment/saturday-night-live-amazon-echo-commercial/>

https://www.youtube.com/watch?v=YvT_gqs5ETk





Thank you!

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