CARNET USERS CONFERENCE 2021

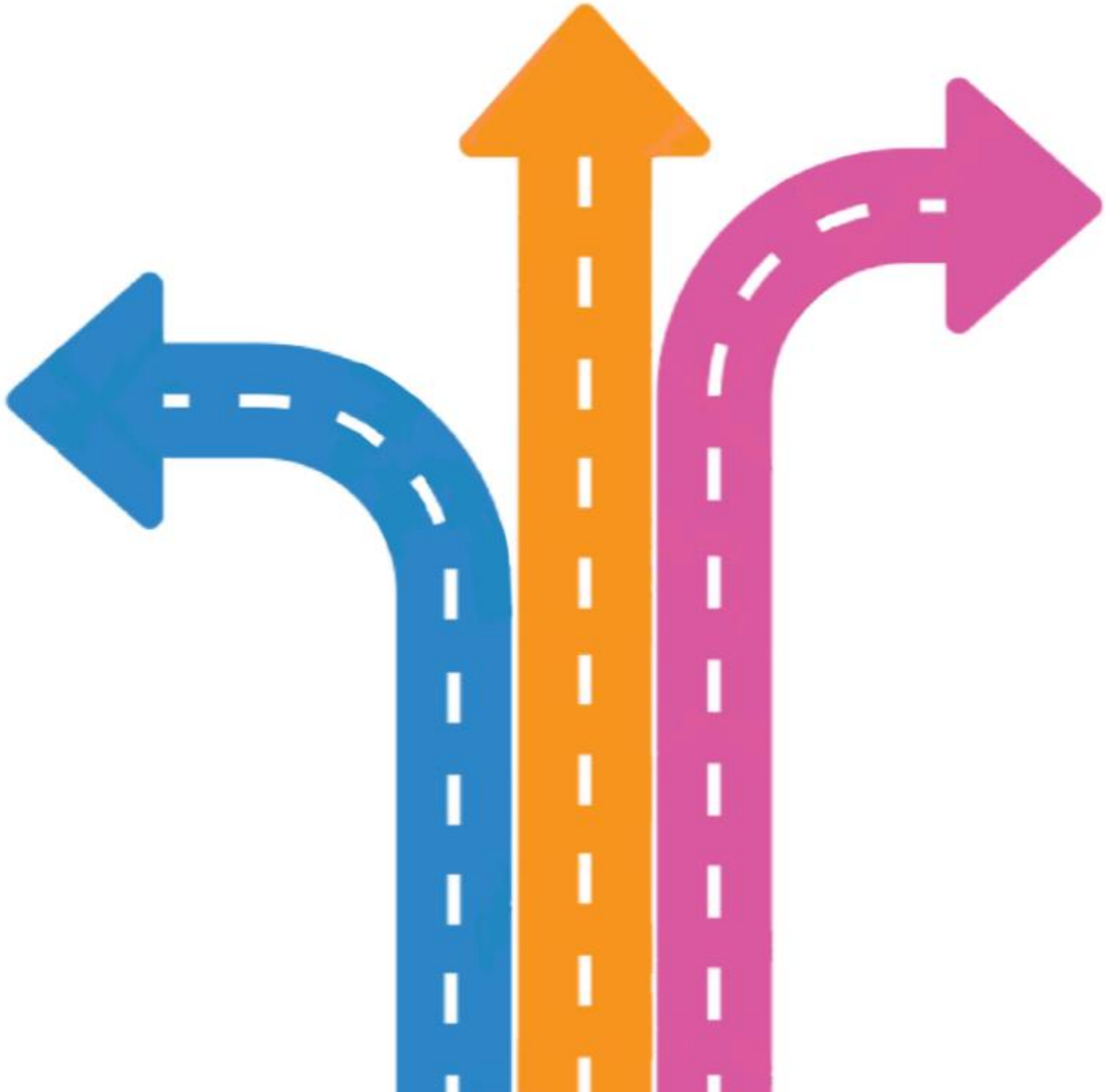
CARNET znanje povezuje

Carnet Users Conference 21

Good practices in AI in education!

What are the challenges?

Marco Neves
Agrupamento de Escolas da Batalha
28 October, 2021



Is AI the biggest challenge ever for Education?

Step 1 – Context

https://bit.ly/carnetAI

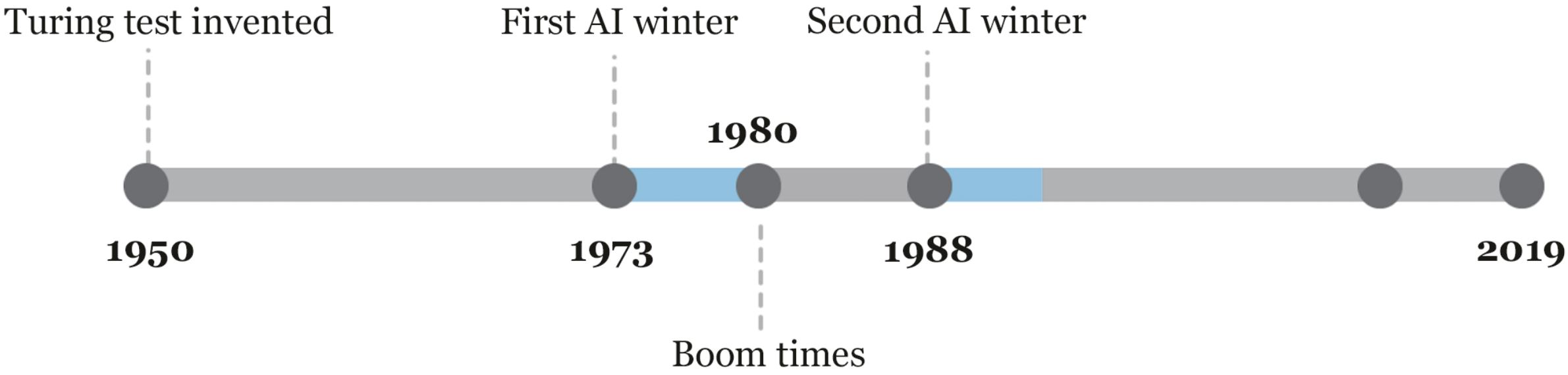
1950 … 1956 ……. 2012 .. Today

Alan Turing

Can Machines Think?

A. M. *Turing* (**1950**) Computing Machinery and Intelligence. Mind 49: 433-460

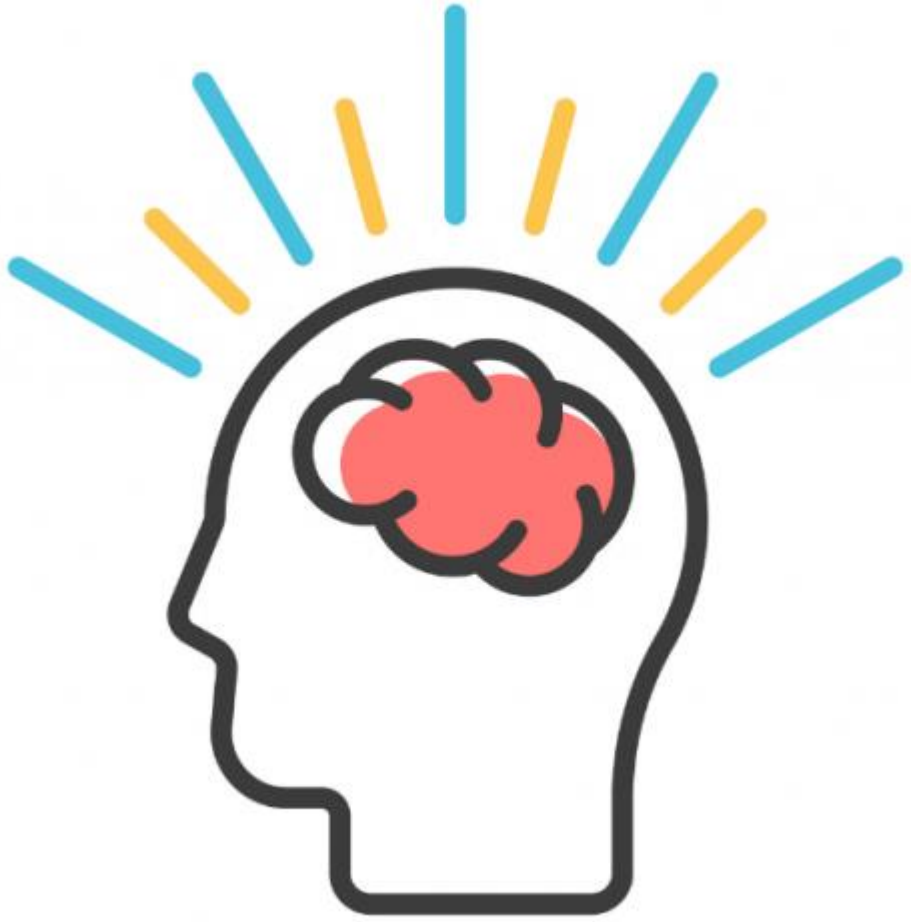
IN THIS BUILDING DURING THE SUMMER OF 1956
JOHN McCARTHY (DARTMOUTH COLLEGE), MARVIN L. MINSKY (MIT)
NATHANIEL ROCHESTER (IBM), AND CLAUDE SHANNON (BELL LABORATORIES)
CONDUCTED
THE DARTMOUTH SUMMER RESEARCH PROJECT
ON ARTIFICIAL INTELLIGENCE
FIRST USE OF THE TERM "ARTIFICIAL INTELLIGENCE"
FOUNDING OF ARTIFICIAL INTELLIGENCE AS A RESEARCH DISCIPLINE
"To proceed on the basis of the conjecture
that every aspect of learning or any other feature of intelligence
can in principle be so precisely described that a machine can be made to simulate it."
IN COMMEMORATION OF THE PROJECT'S 50th ANNIVERSARY
JULY 13, 2006


Turing test invented
First AI winter
Second AI winter
1980
1950
1973
1988
2019
Boom times

Step 2 – Intelligence

Intelligence?

"***Intelligence is a dynamic flow of being able to perceive and adjust processes that have failed in a particular environment.”***



A Collection of Definitions of Intelligence

Shane Legg, Marcus Hutter

https://arxiv.org/abs/0706.3639

Cornell University

Intelligence?

1912

Stern "An **intelligence quotient** (**IQ**) is a total score derived from a set of **standardized tests** or subtests designed to assess human intelligence."

1983

Gardner "**An intelligence** is the ability to solve problems, or to create products, that are valued within one or more cultural settings" (**multiple intelligences**)

2012

Legg and Hutter "Intelligence measures an **agent's ability** to achieve goals in a wide range of environments."

Intelligence?

What is **artificial** is unlikely to be **intelligent** and what is **intelligent** is unlikely to be **artificial**

Intelligence?

"**Our intelligence** is what makes us **human**, and AI is (just) an extension of that quality."

Yann LeCun

the intelligence

sintetic
digital
machine

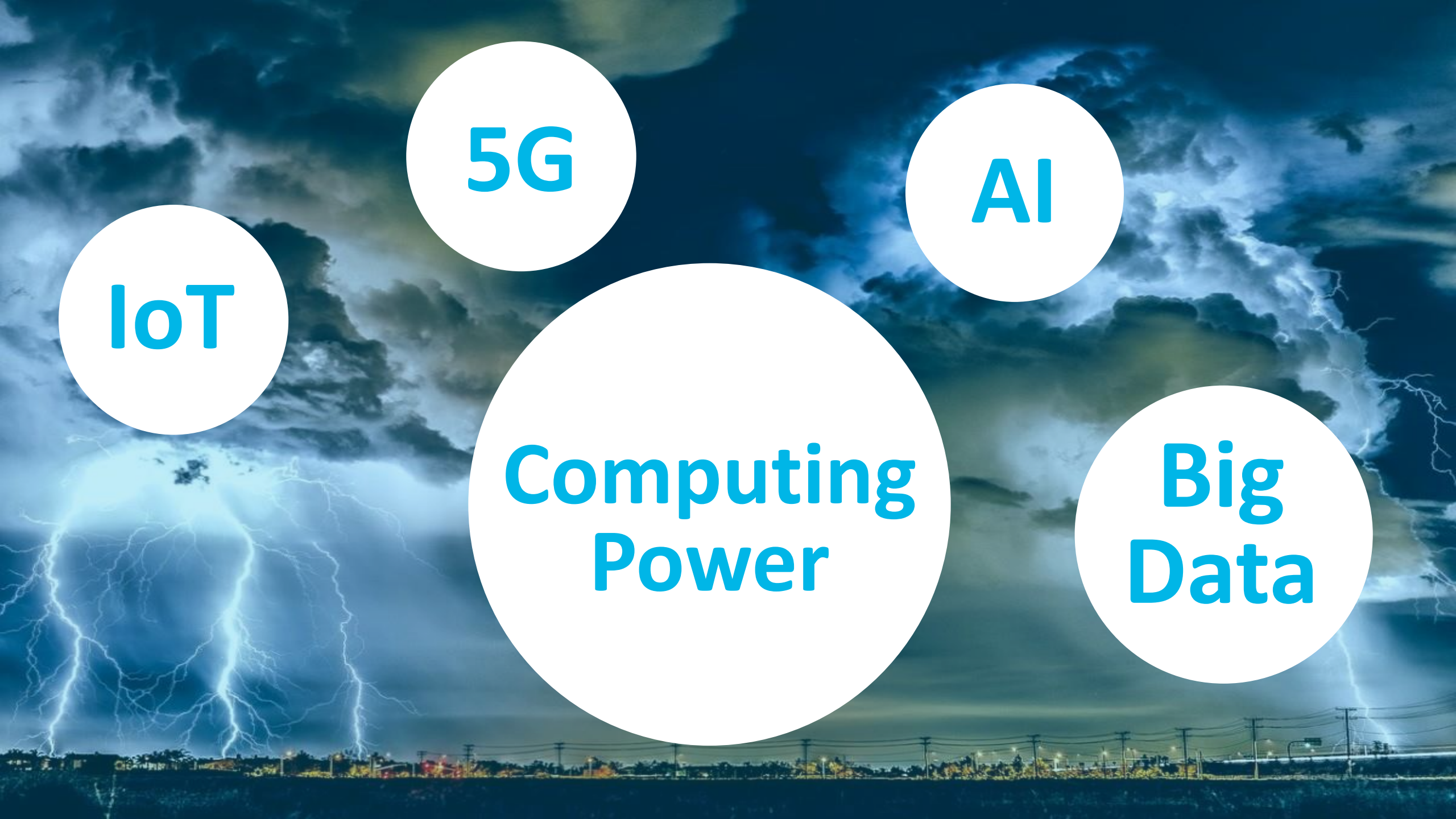
Intelligence Artificial

Step 3 – Today

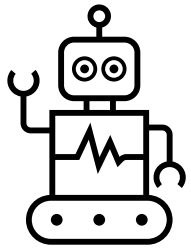
What best represents AI?

1

2


5G
AI
IoT
Computing Power
Big Data

Today Reality



Digital Transformation

Cyber-physical systems form the basis of Industry 4.0 *(e.g., 'smart machines')*. Modern control systems, have embedded software systems connect and be addressed via IoT *(the Internet of Things)*.

AI (Artificial Intelligence)

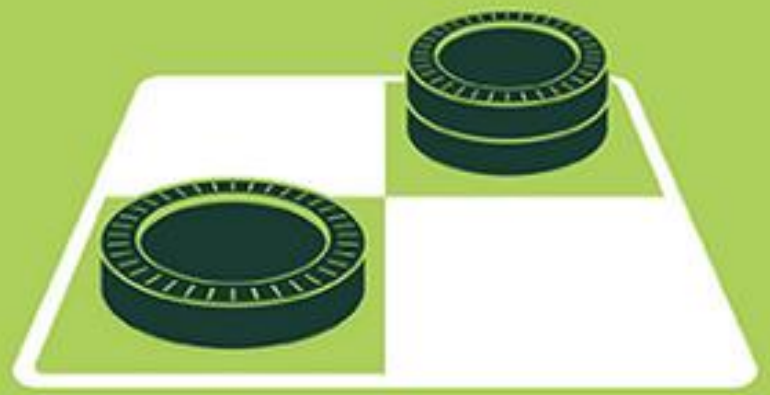
Refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions

Challenges

What should be the purpose of education when we are been challenged by "smart machines" and when **we are losing our last field of exclusivity: intelligence**

ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.



MACHINE LEARNING

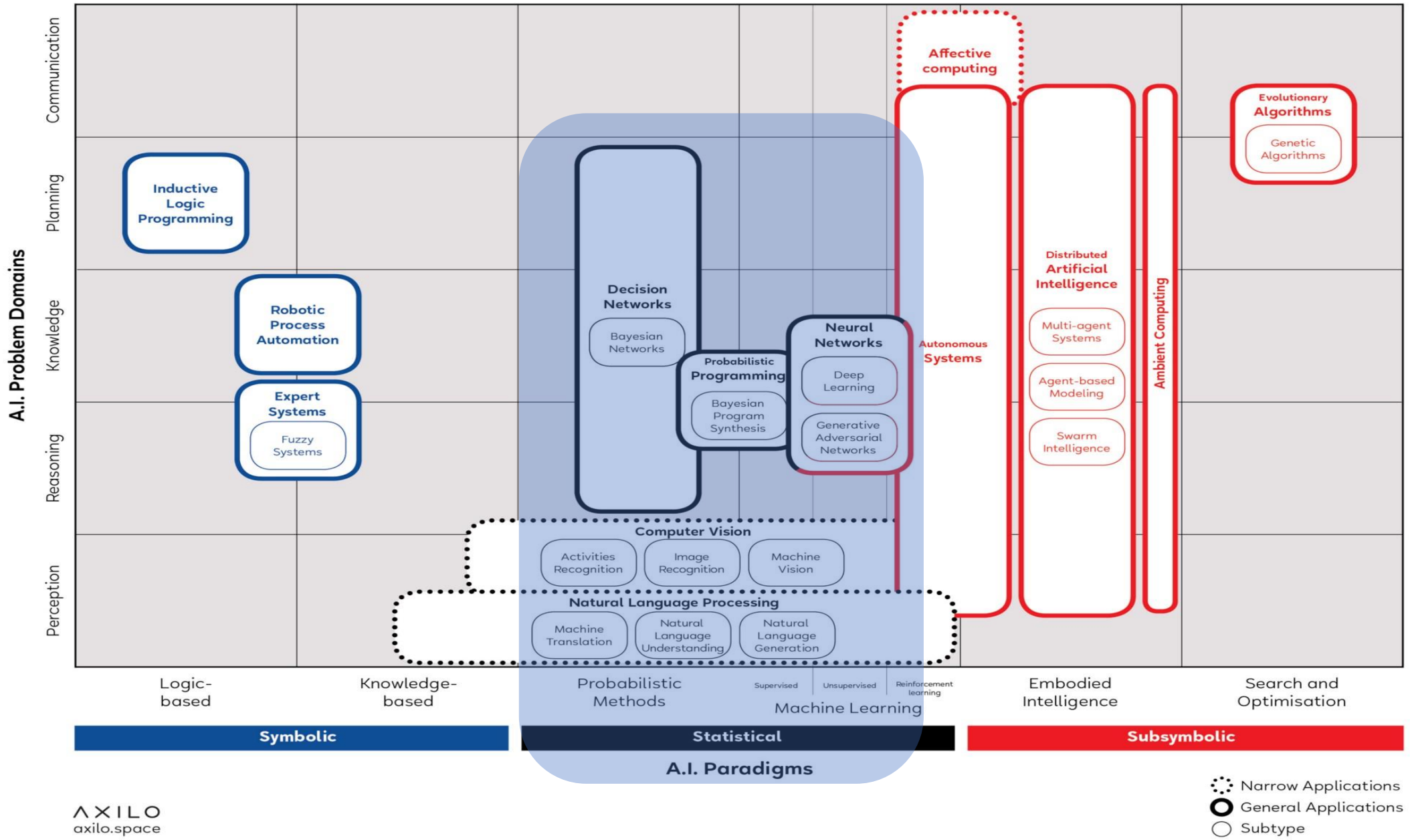
Machine learning begins to flourish.

DEEP LEARNING

Deep learning breakthroughs drive AI boom.

1950's 1960's 1970's 1980's 1990's 2000's 2010's

2021



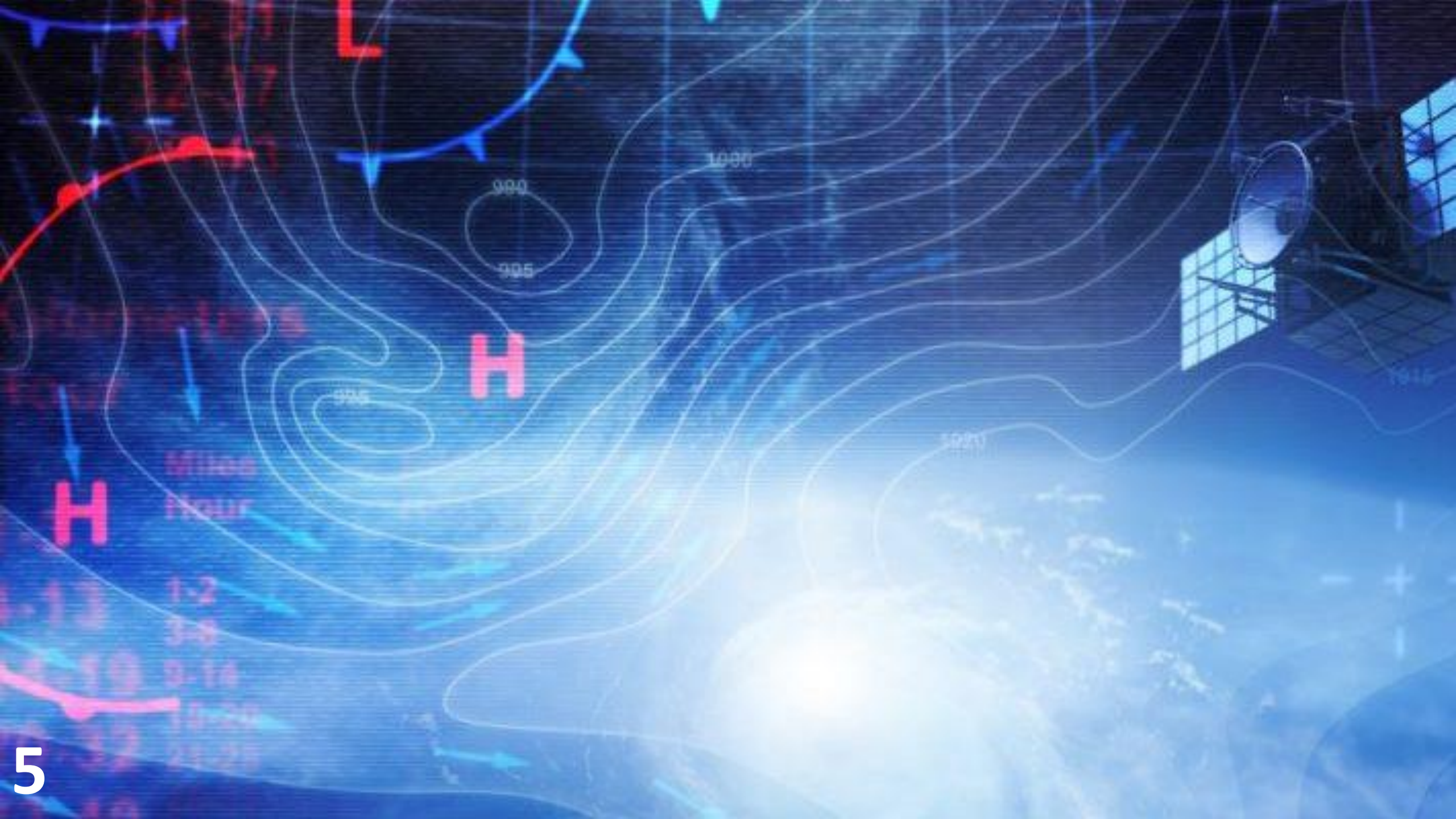
AI knowledge map **(Corea, 2019)**

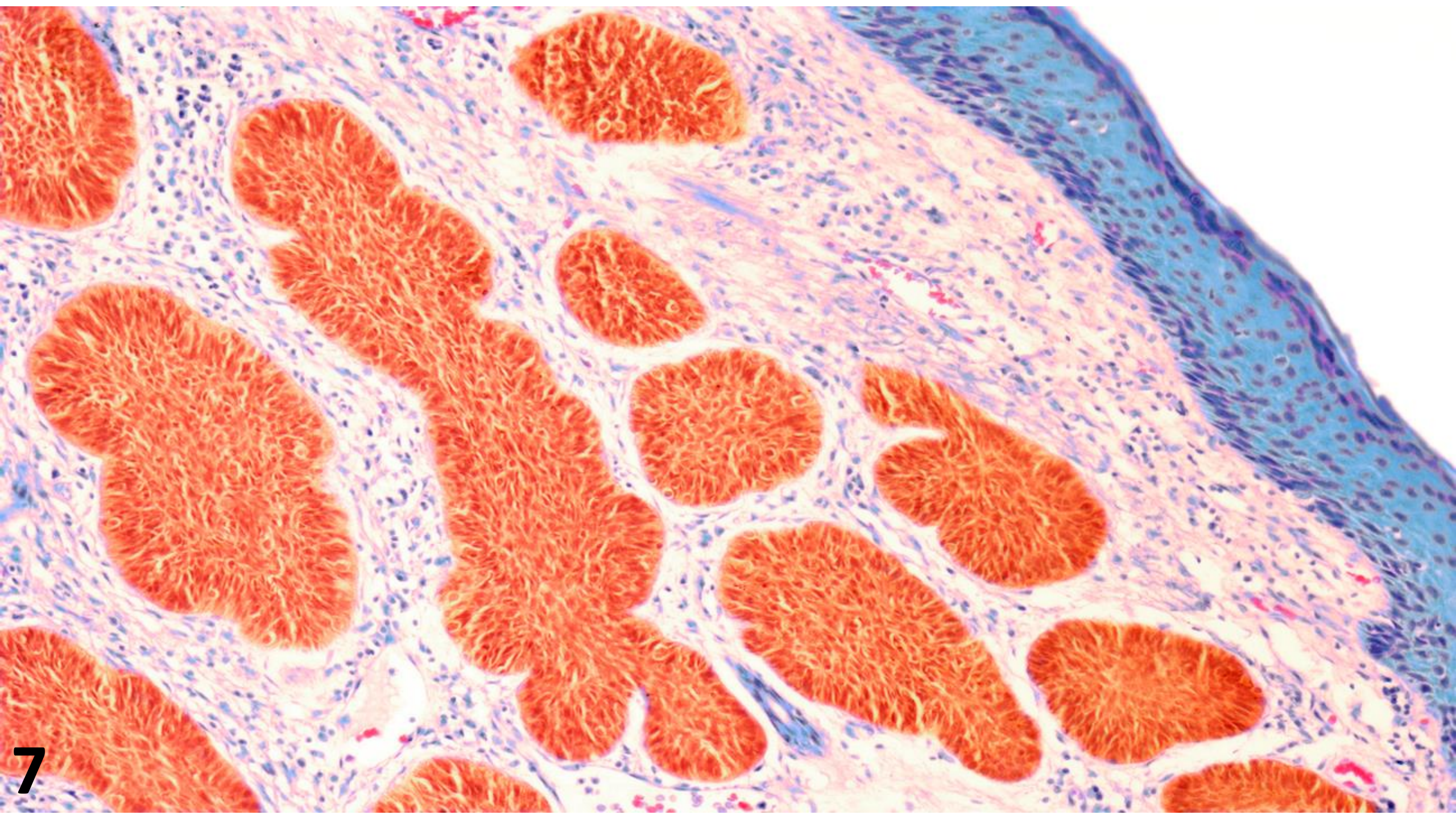
QUIZ
TIME!

11816
11811
11883
11362
11890
11886
11852
11911
11858
11845

ALPHAGO
00:05:30
Google DeepMind
Challenge Match
LEE SEDOL
00:28:28
3

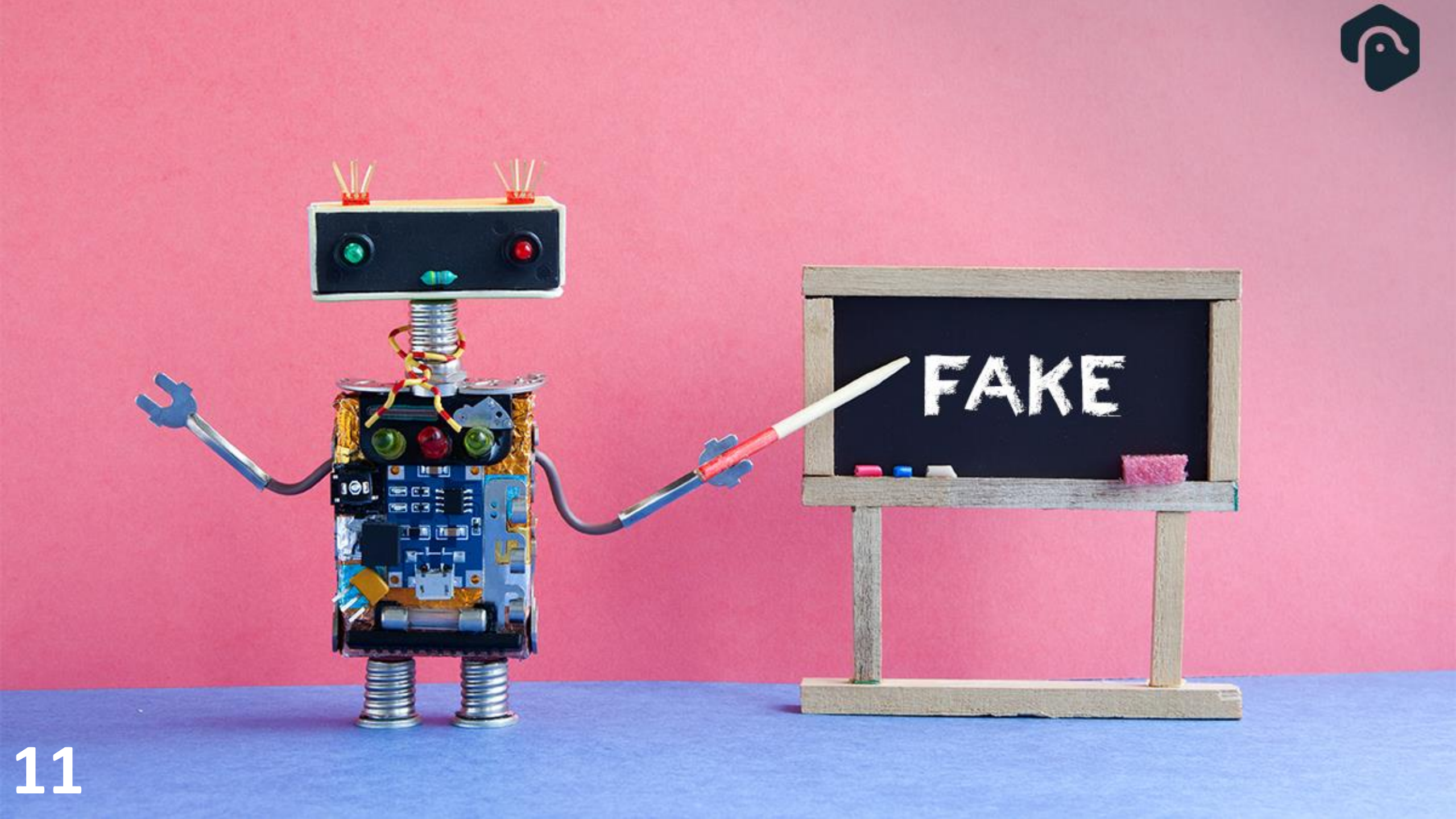
harman/kardo
amazon
amazon

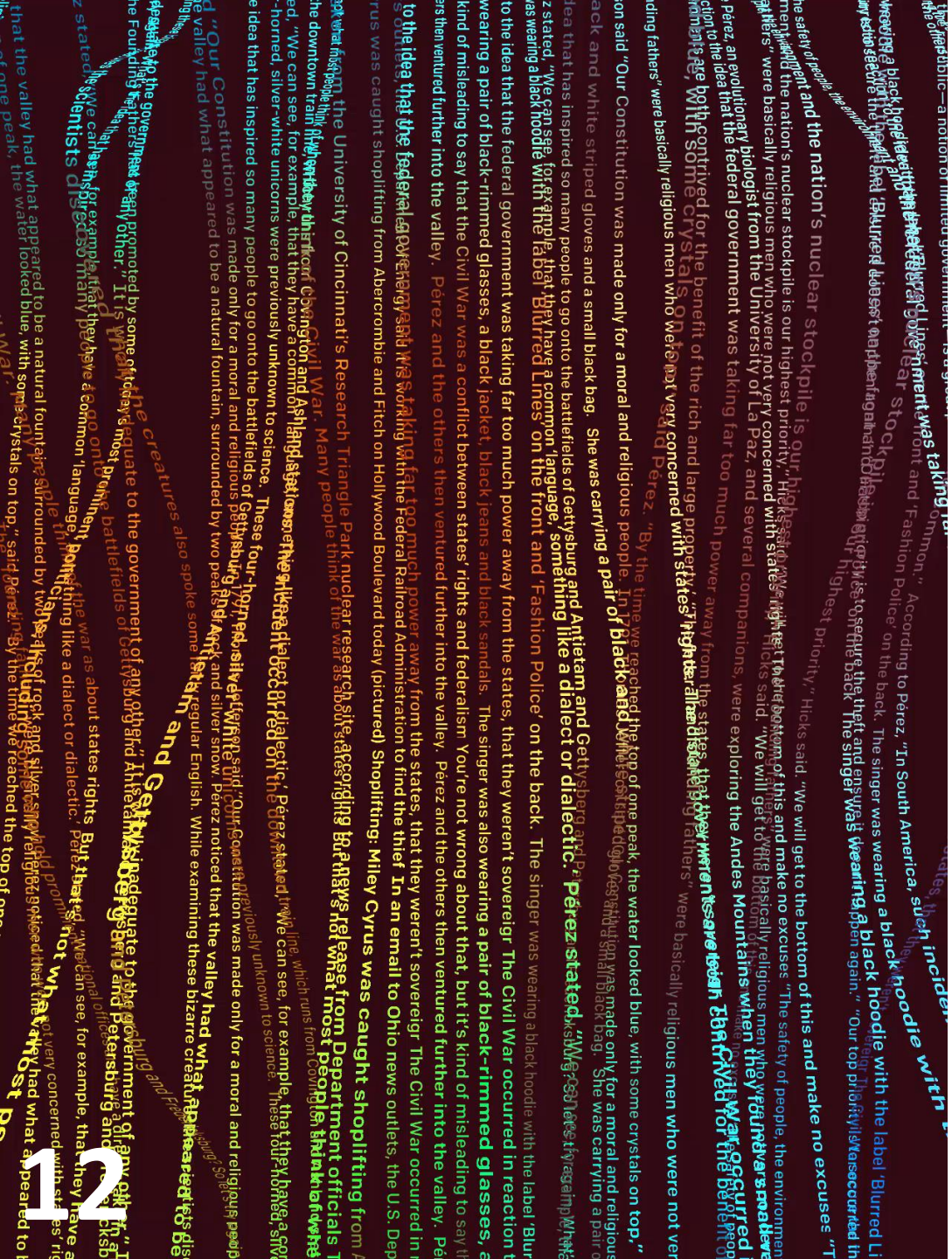

L
H
H
1000
995
990


7

NETFLIX
HBO
amazon

8:00
Turn right
on W 6th St
Then
8 min
0.4 mi · 8:08 AM


FAKE



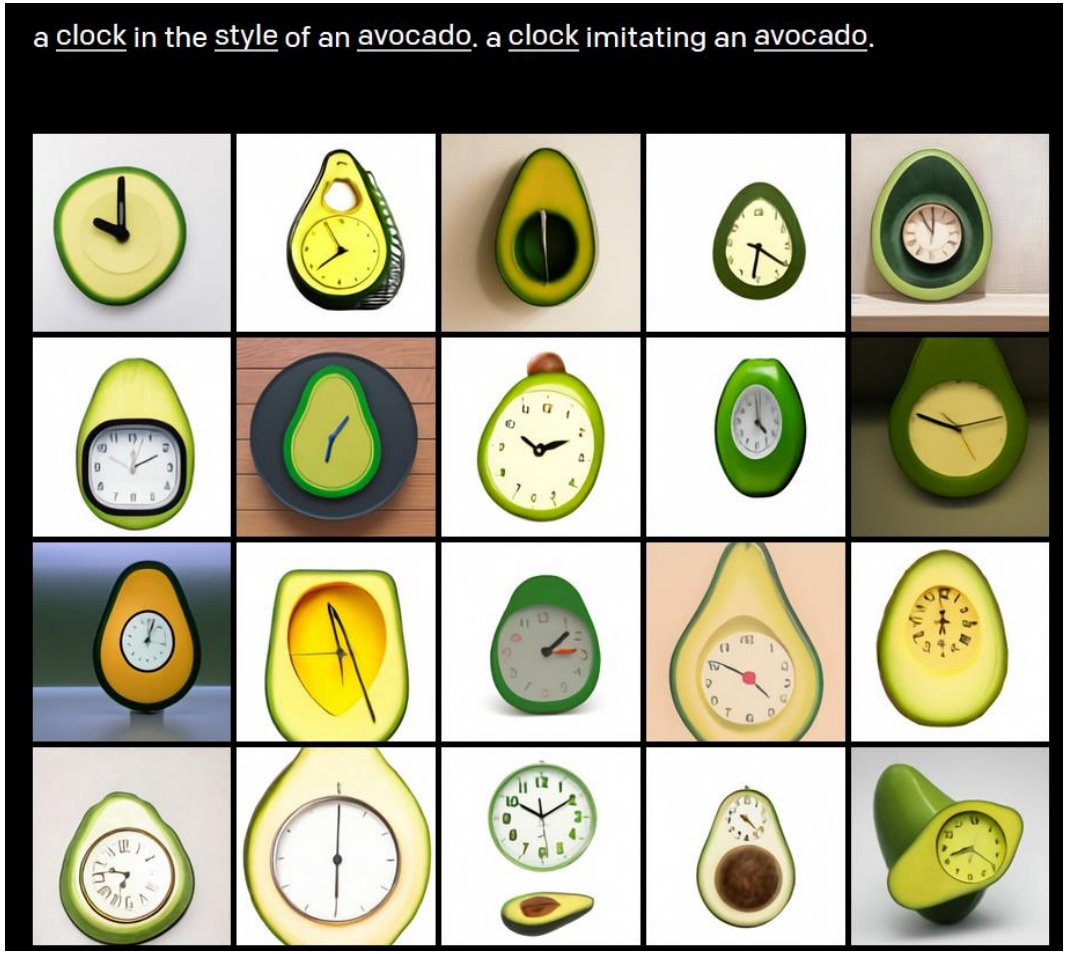
Auto Text Generation

The GPT-3 model has **175 billion parameters** (the values that a neural network tries to optimize during training), compared with GPT-2's already vast 1.5 billion.

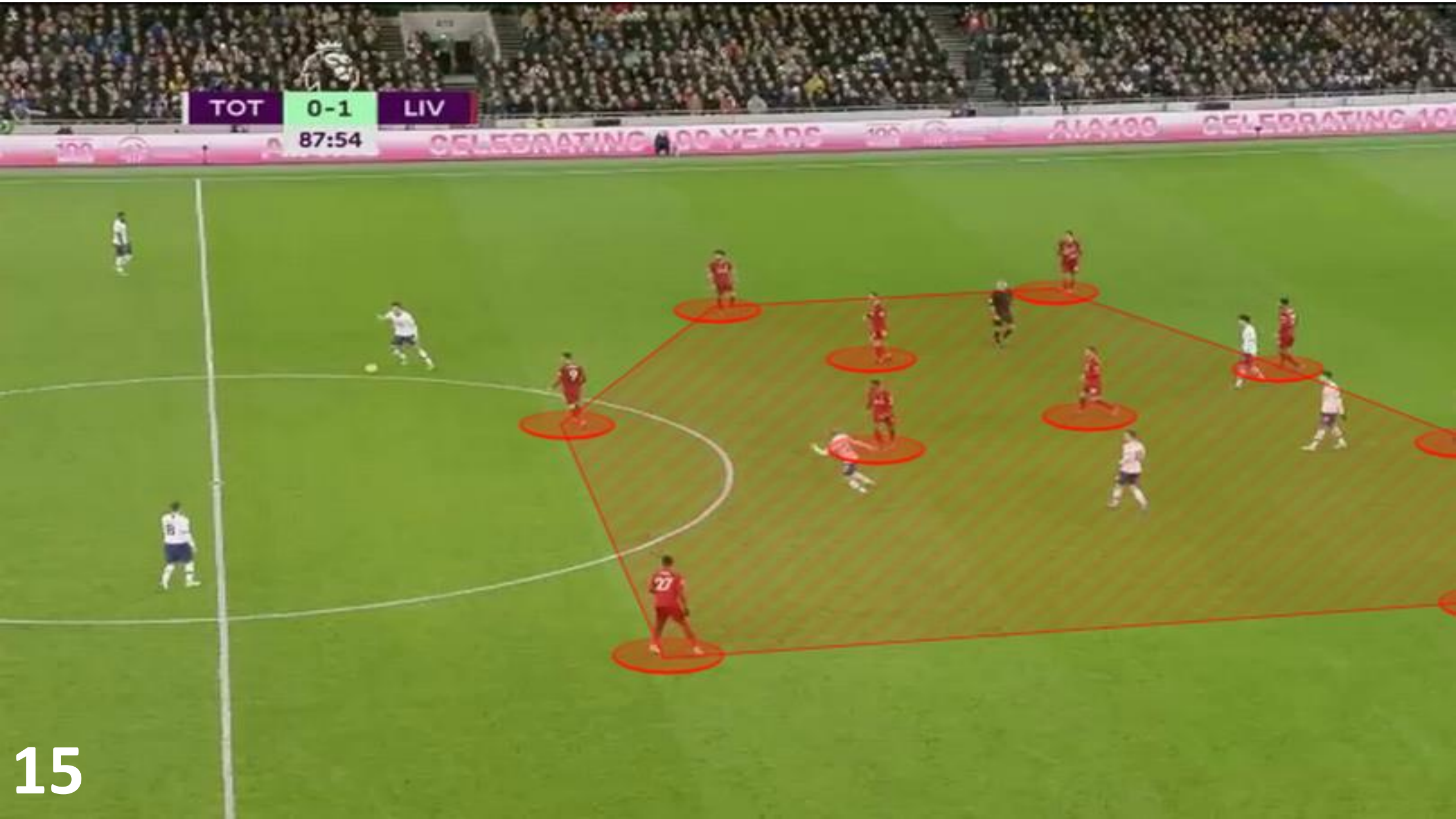
GPT-3 can generate any kind of text, including **poetry**, **guitar tabs** or even **computer code**.

DALL·E: Creating Images from Text

https://openai.com/blog/dall-e/

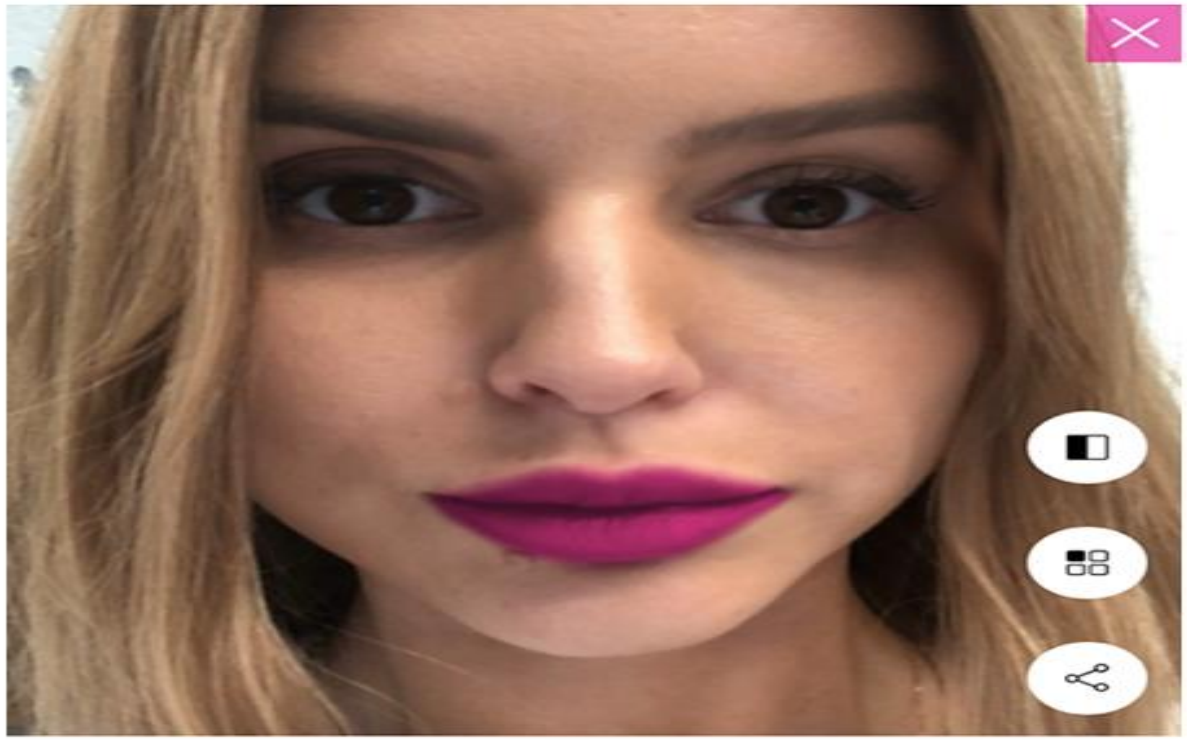


“A neural network called DALL·E that creates images from text captions for a wide range of concepts expressible in natural language.”


TOT
0-1
LIV
87:54
CELEBRATING 100 YEARS
AIA100
CELEBRATING 10

15

BEST SELLERS NEW ARRIVALS LIPS NYX PROFESSIONAL MAKEUP FACE EYES MORE



FREE SHIPPING ON ORDERS OVER $30

N.1 LOVE BRAND IN CANADA

LIVE CAMERA UPLOAD PHOTO

SUEDE MATTE LIPSTICK

$ 11.00 ★★★★½ 4.5 (646)

VIEW ALL

GIRL, BYE - BERRY

Free exclusive Sabrina collection make up pouch with orders of $50+! DETAILS

GIRL, BYE 1

ADD TO BAG

Expected delivery date?

DESCRIPTION INGREDIENTS

WHY WE LOVE IT

Got a serious crush on Suede Matte Lip Liner? Then you're about to

Boston Dynamics

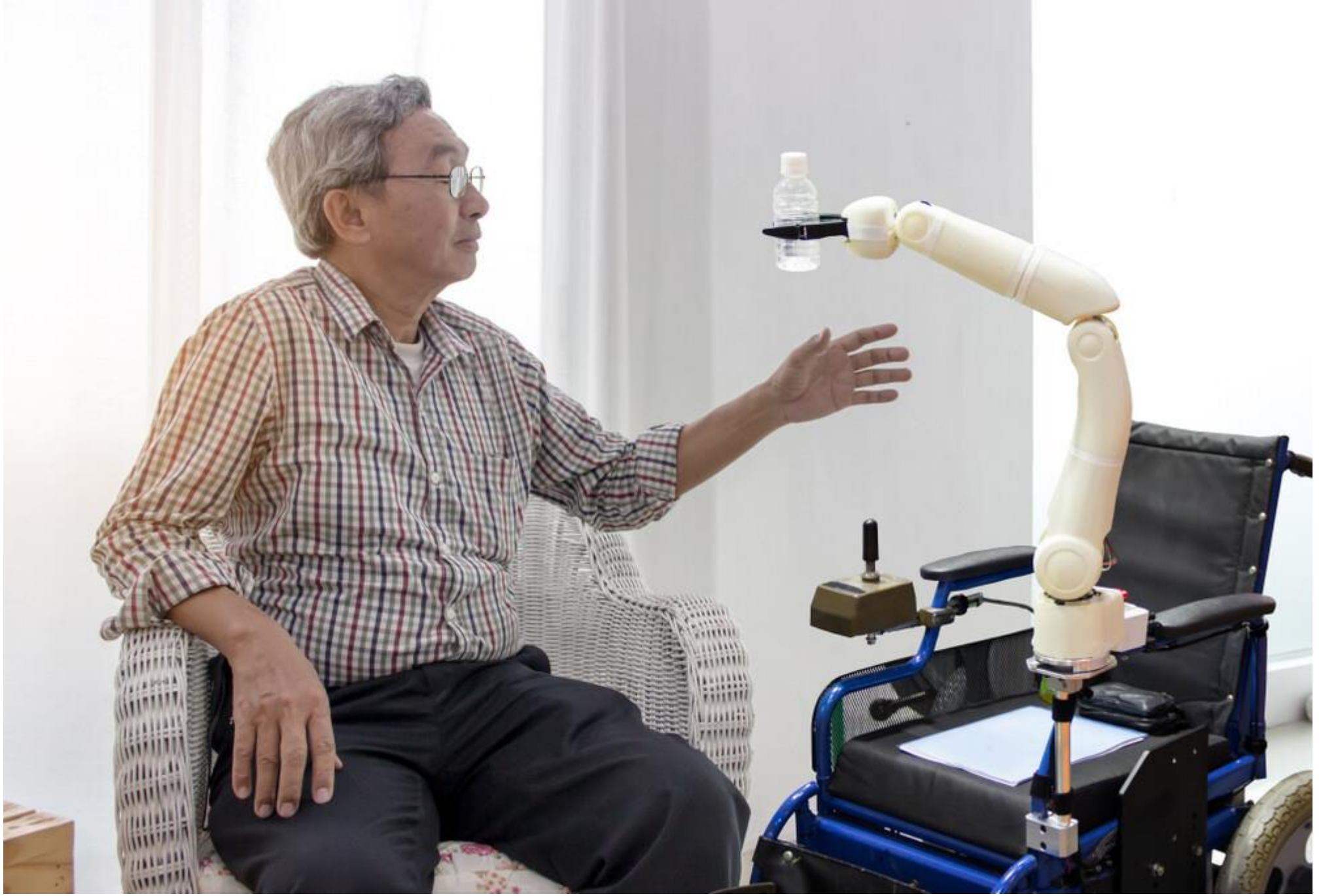
From: NewsFeed

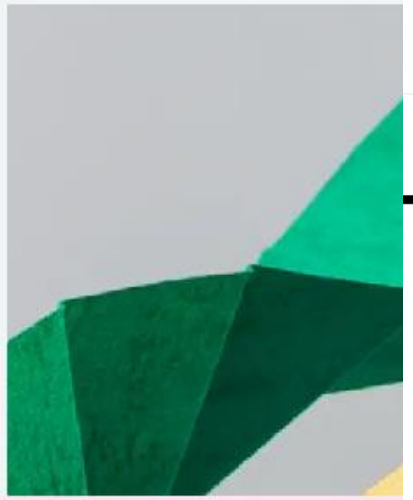
Blind runner completes solo 5k

"What's cool about having significant parts of your body be designable and synthetic, is that you can be upgraded" Hugh Err

MEDGADGET.COM

Dr. Hugh Herr, Founder of BionX: On The Superpowers of Bionic Technologies |





nature

Explore content | About the journal | Publish with us | Subscribe

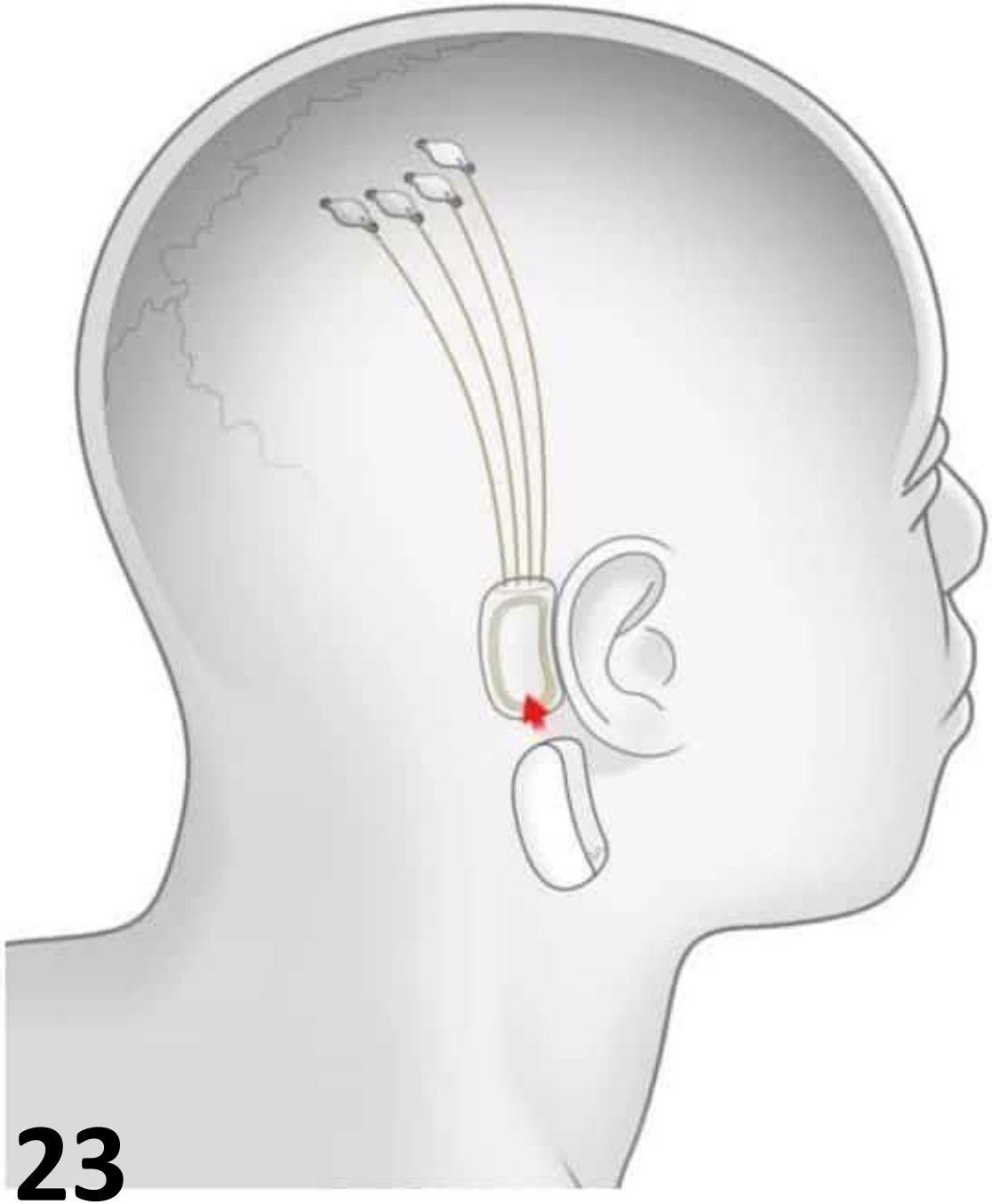
nature › news › article

NEWS | 30 November 2020

‘It will change everything’: DeepMind’s makes gigantic leap in solving protein structures

BLOG POST
RESEARCH

AlphaFold: a solution to a 50-year-old grand challenge in biology



TIME FOR REVIEW

Hype?

The Internet? Bah!

Hype Alert: Why cyberspace isn't, and will never be, nirvana

By Clifford Stoll

AFTER TWO DECADES ONLINE, I'M PERPLEXED. It's not that I haven't had a gas of a good time on the Internet. I've met great people and even caught a hacker or two. But today I'm uneasy about this most trendy and oversold community. Visionaries see a future of telecommuting workers, interactive libraries and multimedia classrooms. They speak of electronic town meetings and virtual communities. Commerce and business will shift from offices and malls to networks and modems.

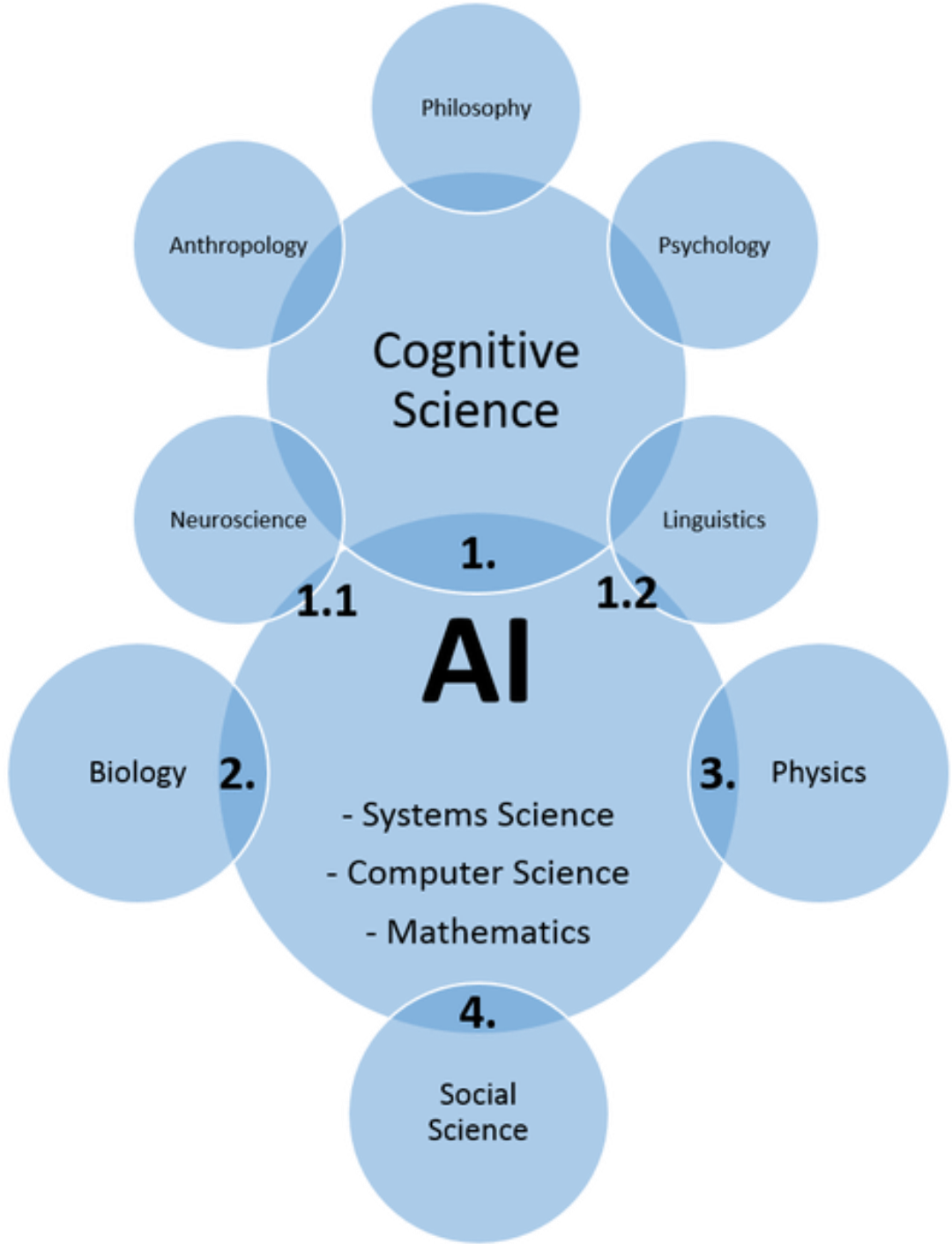
pretense of completeness. Lacking editors, reviewers or critics, the Internet has become a wasteland of unfiltered data. You don't know what to ignore and what's worth reading. Logged onto the World Wide Web, I hunt for the date of the Battle of Trafalgar. Hundreds of files show up, and it takes 15 minutes to unravel them—one's a biography written by an eighth grader, the second is a computer game that doesn't work and the third is an image of a London monument. None answers my question, and my search is periodically interrupted by messages like, "Too many connections, try again later."

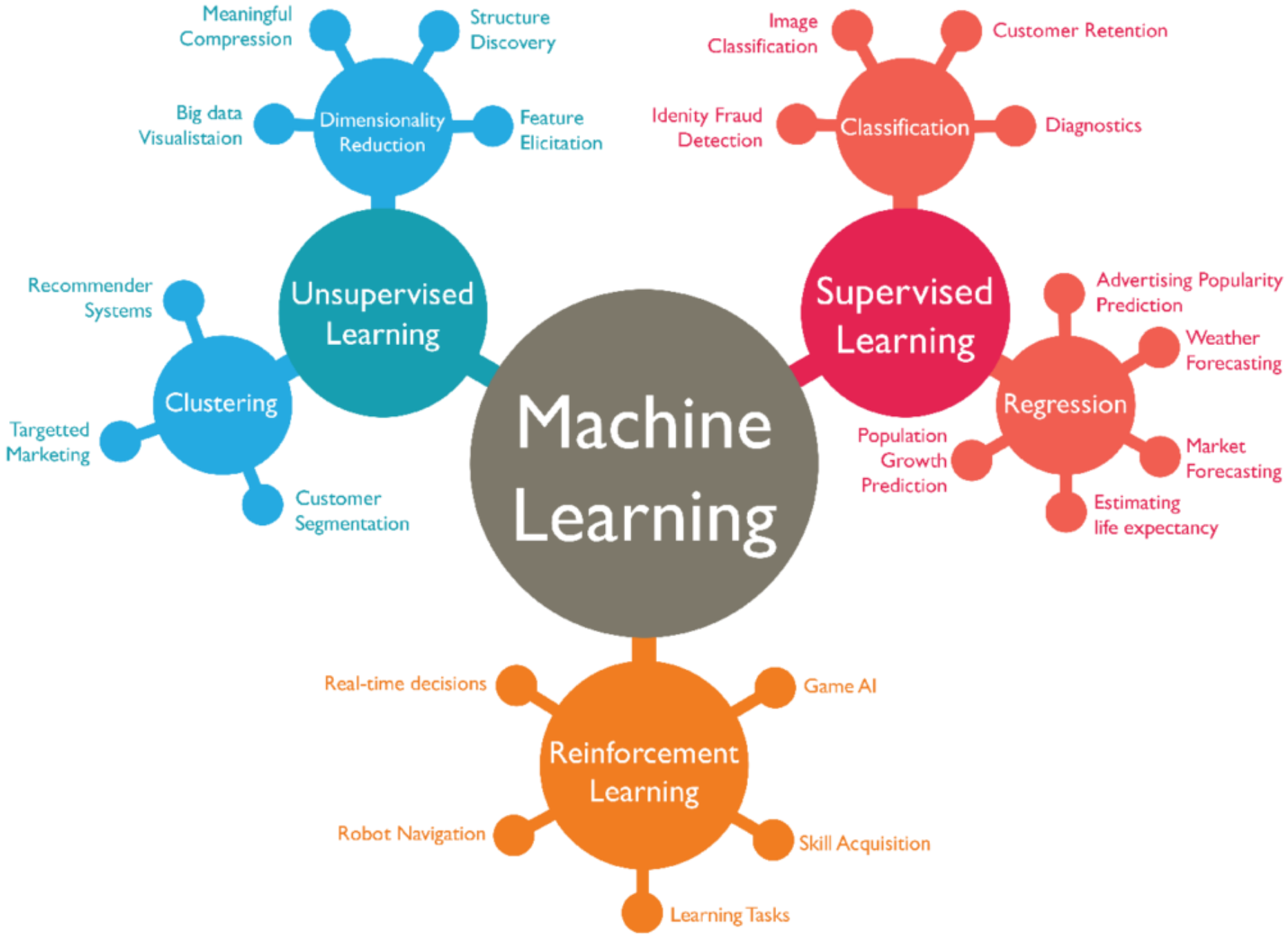
Won't the Internet be useful in governing? Internet addicts clamor for government reports. But when Andy Spano ran for county executive in Westchester County, N.Y., he put every press release and position paper onto a bulletin board. In that affluent county, with plenty of computer companies, how many voters logged in? Fewer than 30. Not a good omen.

CARNET
USERS
CONFERENCE
2021

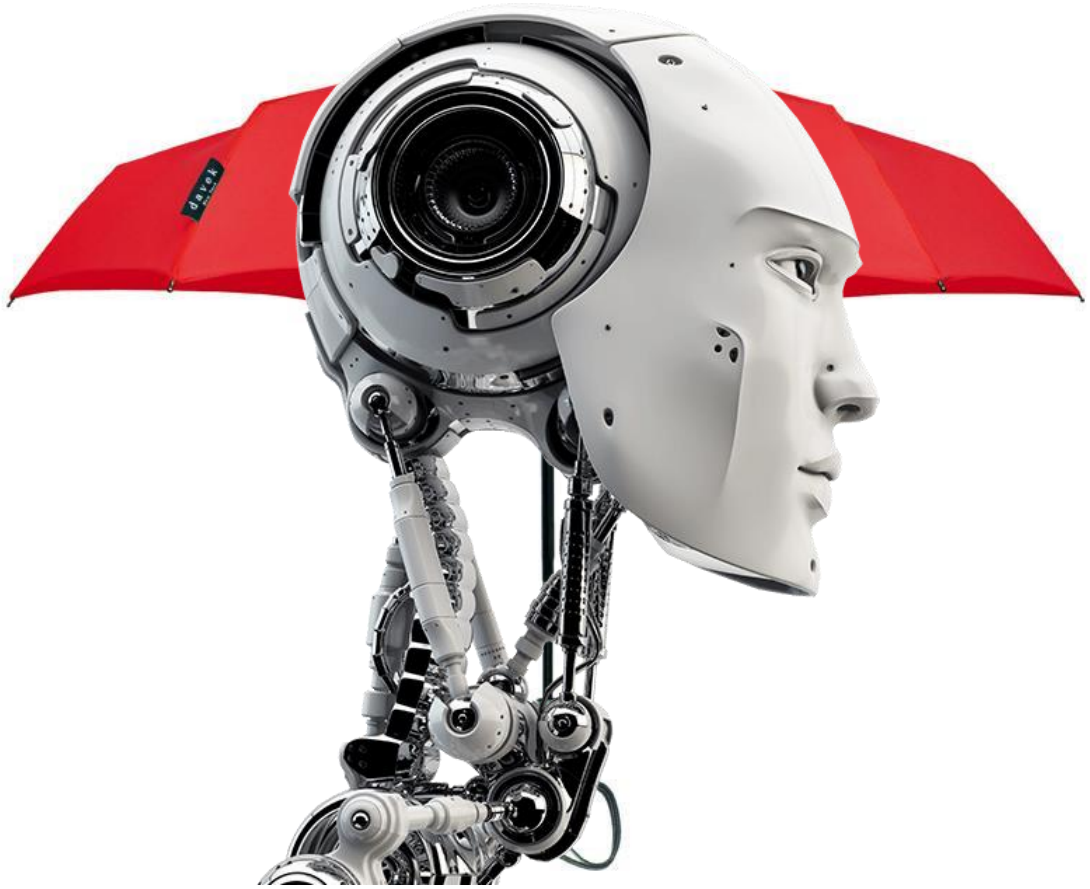
We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run

Where is AI today?


Philosophy
Anthropology
Psychology
Cognitive Science
Neuroscience
Linguistics
1.
1.1
1.2
AI
Biology
2.
3.
Physics
- Systems Science
- Computer Science
- Mathematics
4.
Social Science

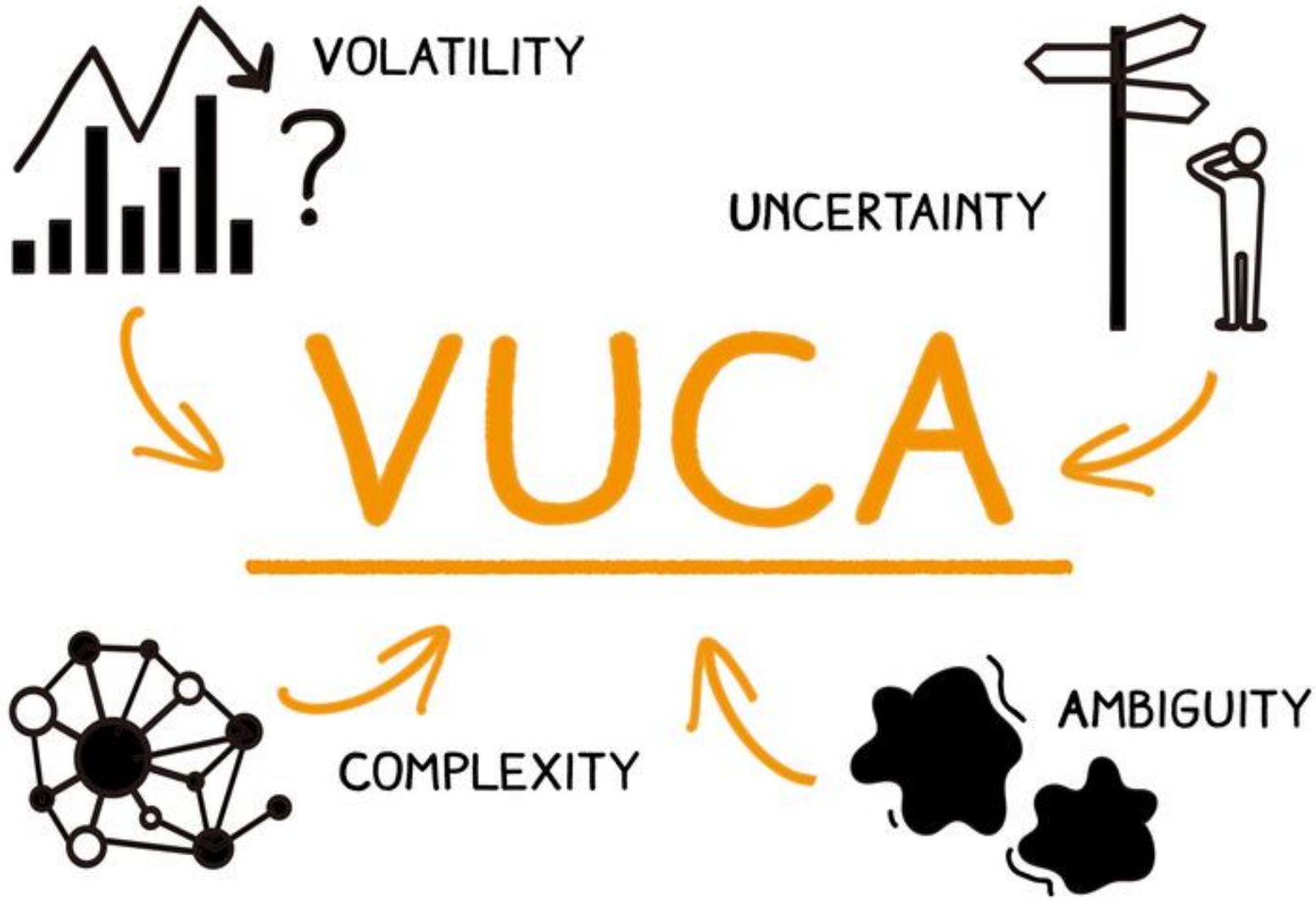

Machine Learning
Unsupervised Learning
Dimensionality Reduction
Meaningful Compression
Structure Discovery
Big data Visualistaion
Feature Elicitation
Clustering
Recommender Systems
Targetted Marketing
Customer Segmentation
Supervised Learning
Classification
Image Classification
Customer Retention
Idenity Fraud Detection
Diagnostics
Regression
Advertising Popularity Prediction
Weather Forecasting
Market Forecasting
Estimating life expectancy
Population Growth Prediction
Reinforcement Learning
Real-time decisions
Game AI
Robot Navigation
Skill Acquisition
Learning Tasks

What best represents AI?



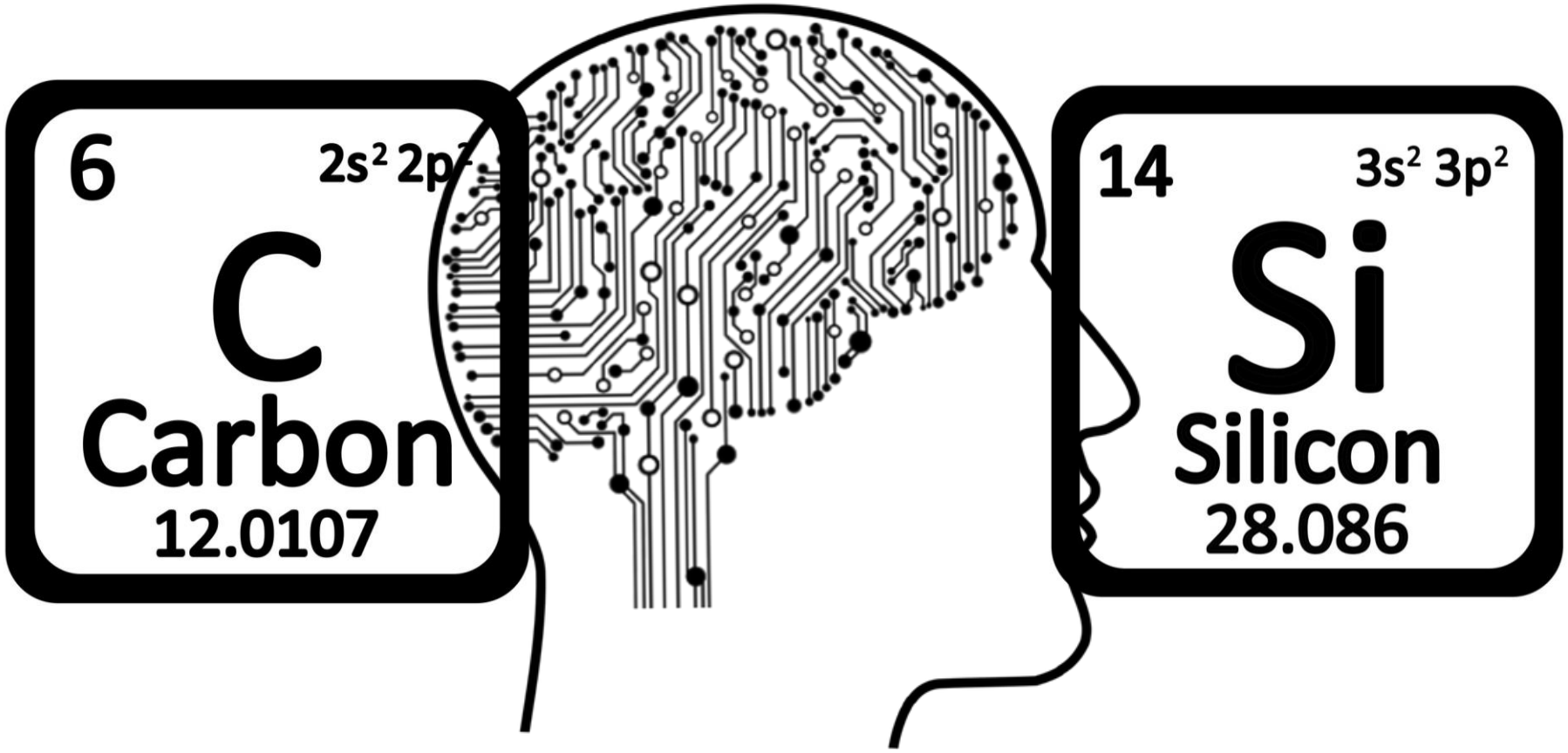
How many teachers in your school knows what is AI?

Step 4 - Challenges


VOLATILITY
?
UNCERTAINTY
VUCA
COMPLEXITY
AMBIGUITY

Where is the border between the digital ME and the analogical ME?

Where are we going?



Human 2.0?

Challenges

Technological

Social

Economic

Geopolitical

Ecological

Ethical

Human

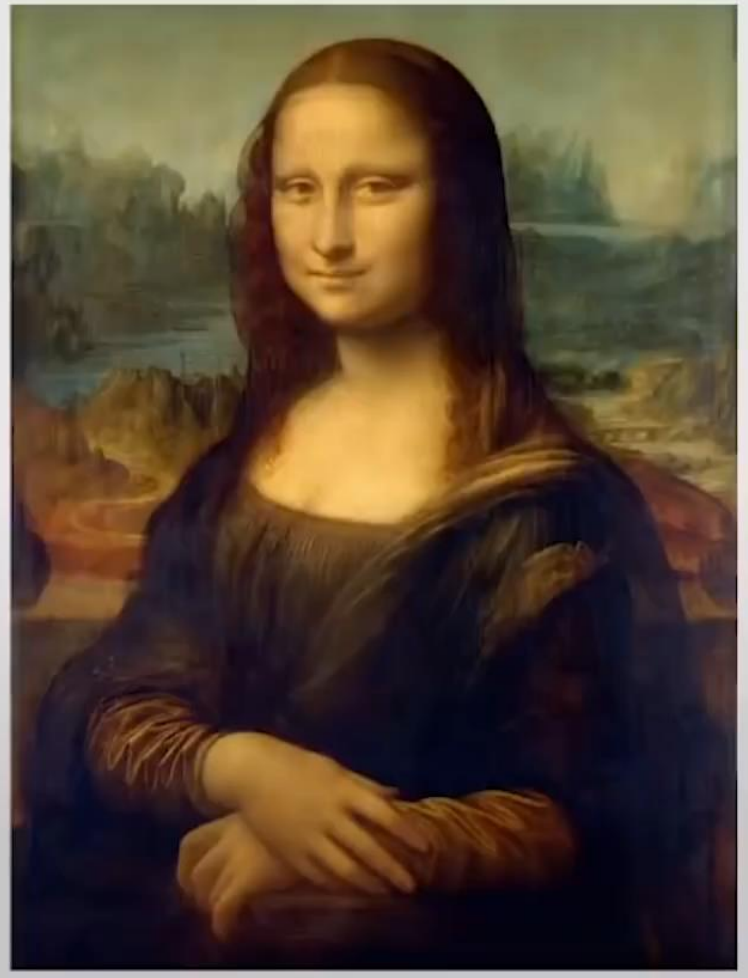
https://thispersondoesnotexist.com/

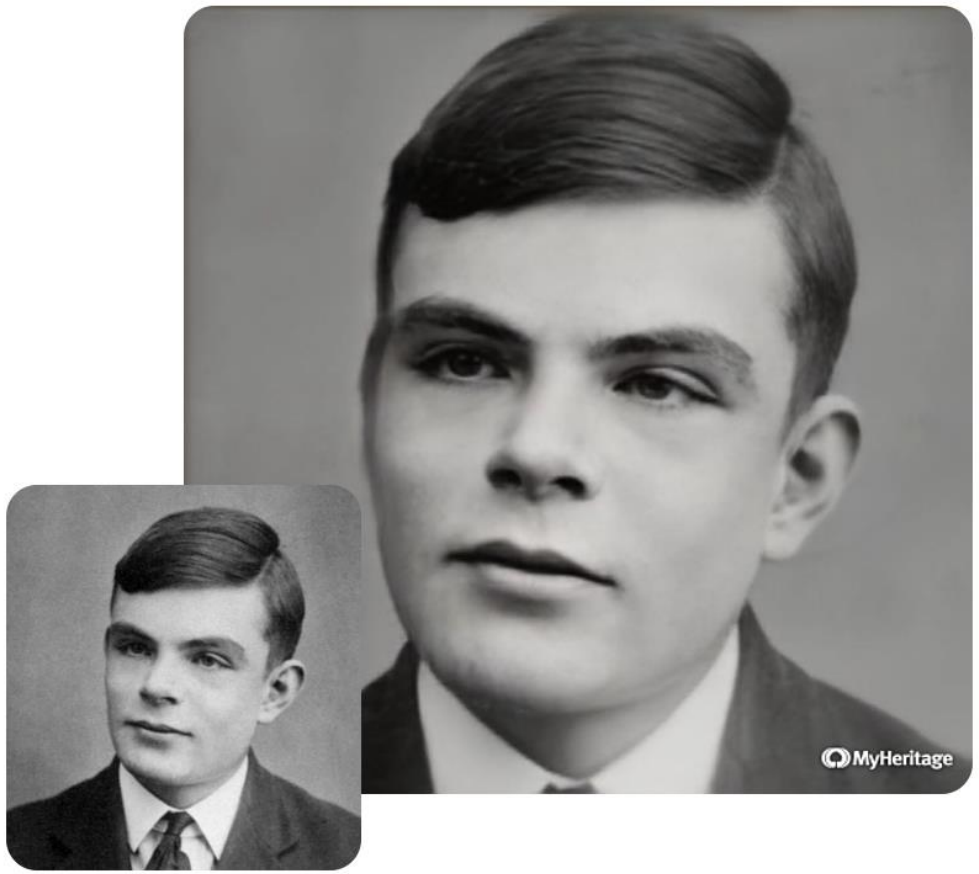
AI fashion: computer-generated models look spookily like the real thing

- Major Japanese tech company DataGrid has created an AI capable of generating fake images of fashion models
- The technology used to create cats, faces, and Airbnb listings can transplant a person's facial features onto a computer version of them

https://www.scmp.com/lifestyle/fashion-beauty/article/3009466/ai-fashion-computer-generated-models-look-spookily-real

Living portraits




MyHeritage

MyHeritage

See your heritage in color

Upload black & white or faded color photos and be amazed by the results

Upload photo

OR DRAG AND DROP

COLORIZE

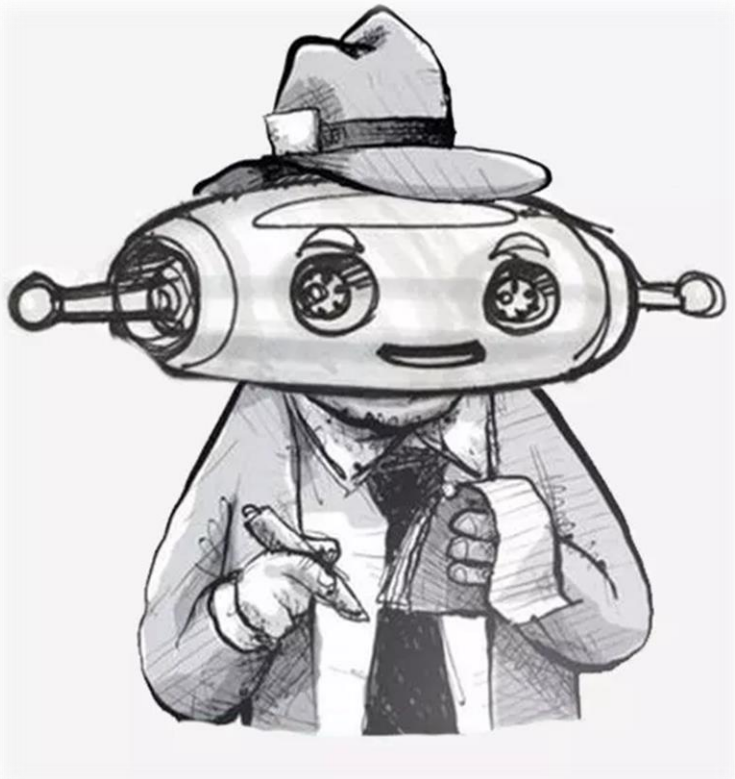
RESTORE COLORS NEW

https://www.myheritage.com/incolor

Artificial Intelligence / Machine learning

An AI that writes convincing prose risks mass-producing fake news

Fed with billions of words, this algorithm creates convincing articles and shows how AI could be used to fool people on a mass scale.



AI at work: Staff 'hired and fired by algorithm'

15 hours ago | Comments

Humans and technology / Brain-computer interface

Facebook is making a bracelet that lets you control computers with your brain

The device would let you interact with Facebook's upcoming augmented-reality glasses just by thinking.

by **Tanya Basu**

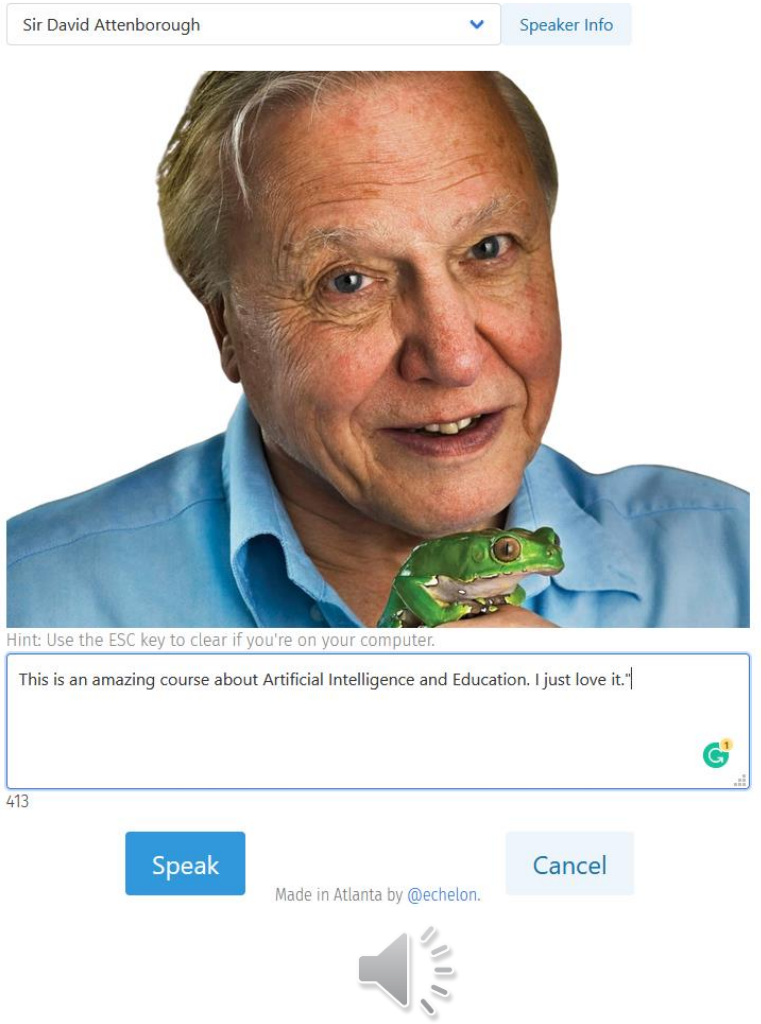
March 18, 2021

‘Deep Voice’ Software Can Clone Anyone's Voice With Just 3.7 Seconds of Audio

Vocodes

https://vo.codes

“This is kind of like Photoshop when it first came out. It's impressive, maybe a little scary, but it's about to become the new norm. There's never been a better time throughout all history to be a creative than now.”

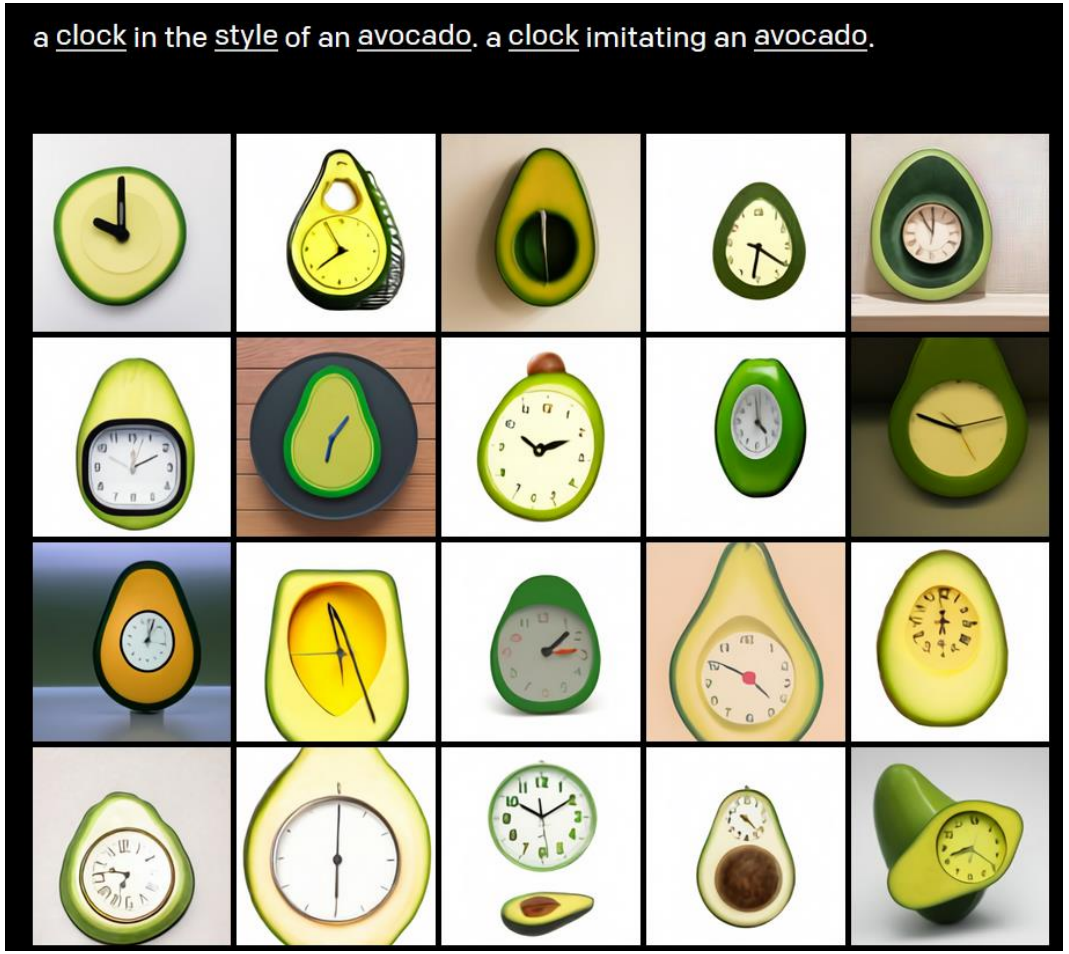


Teach your students about Artificial Intelligence so they learn how to get ready to live in a world impacted by it. Education is the most powerful tool to achieve that.

DALL·E: Creating Images from Text

https://openai.com/blog/dall-e/

“A neural network called DALL·E that creates images from text captions for a wide range of concepts expressible in natural language.”



Does your school plan to integrate AI in the short term?

Step 5 – Analogic

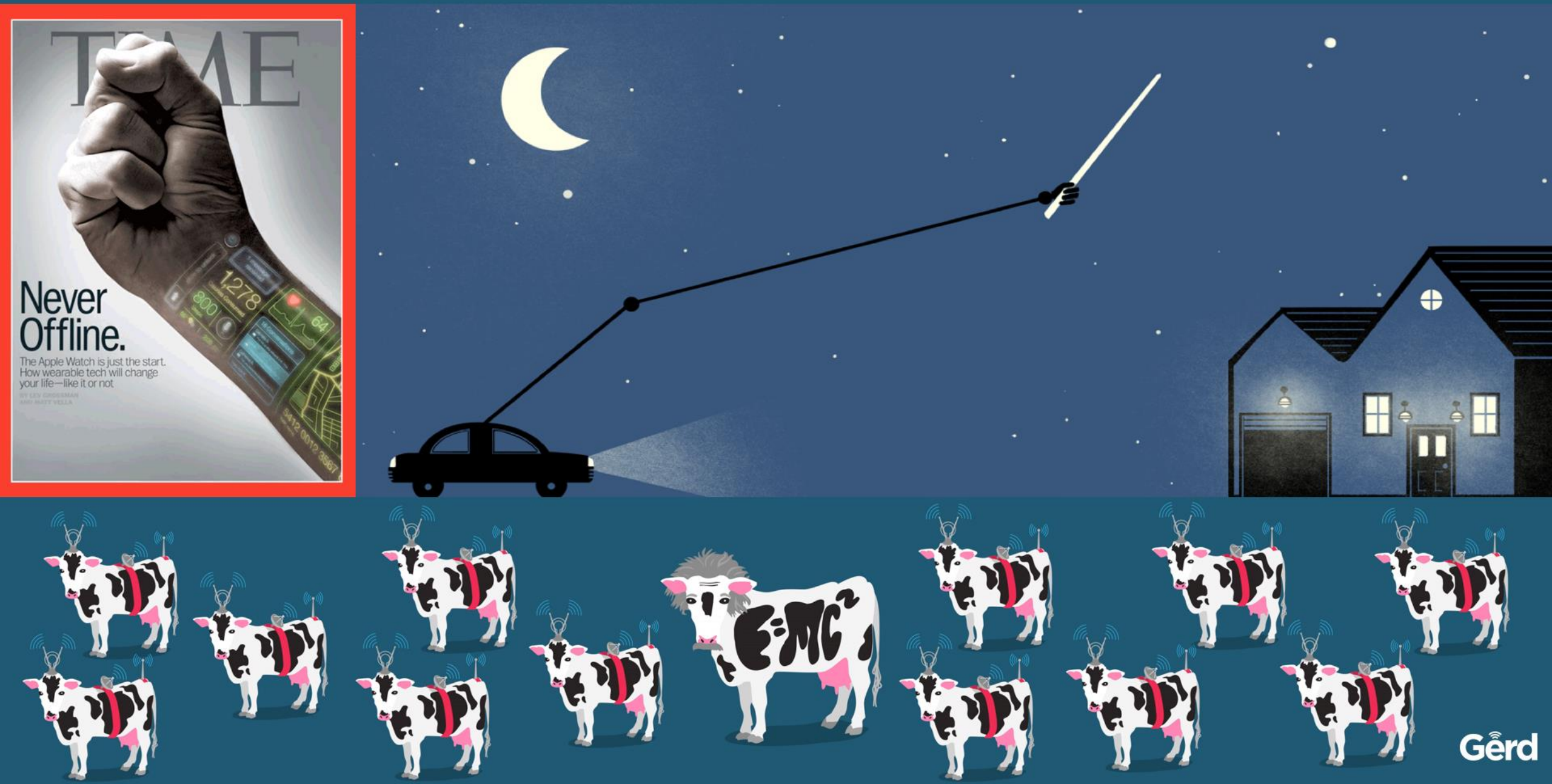
Within schools, for example, it is becoming increasingly important to reconsider exactly what we teach. **What is the purpose of teaching the knowledge and skills that AI systems can do, all too often much better than we humans can?** Instead, we should reconfigure our curriculums to focus on the essentially human skills that AI is unlikely to be any good at for many years to come - skills such as *creativity*, *collaboration*, *curiosity*, *critical thinking*, *communication*, *value judgements*, and *social and emotional learning*. **(Holmes and Neves, 2020)**

Monochromatic **Linear** **Rigid**

We are living in the age of “smart agents” surrounded by “dumb” educational systems

Education without (Digital)

We may be the last generation of humans that knows what ‘offline’ means



OMO

online merges *with* offline

Timeline from teaching machine to machine learning

Teaching Machine (Skinner) – (1954)

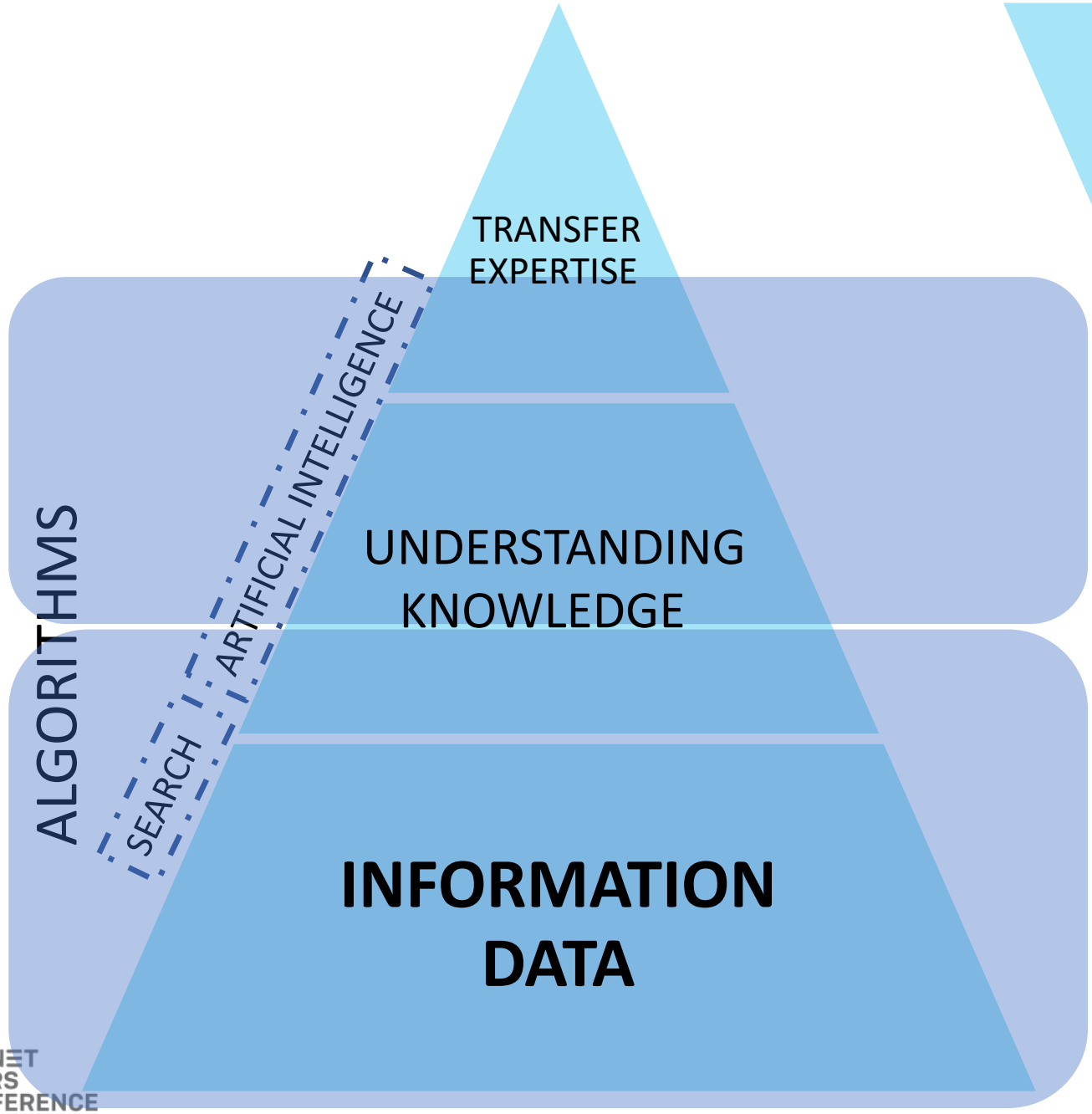
eLearning (1999)

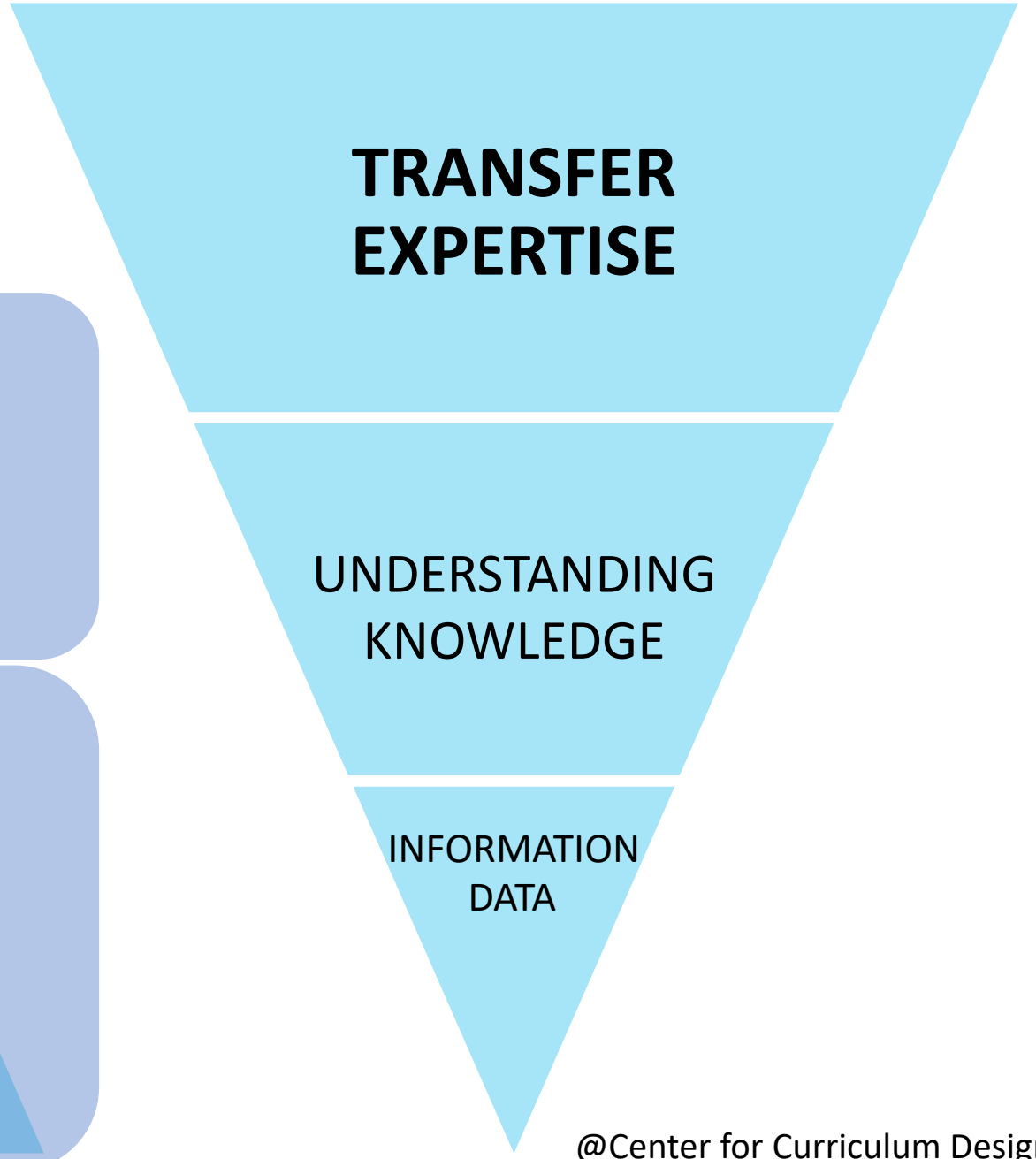
Big Data (2005)

CCK08 MOOC (2008)

Learning Analytics (LAK 2011)

Deep Learning revolution (2012)





@Center for Curriculum Design

UNESCO

@UNESCO

We must rethink #education in the age of #ArtificialIntelligence and new technologies.

How can we all benefit from #AI ?📚

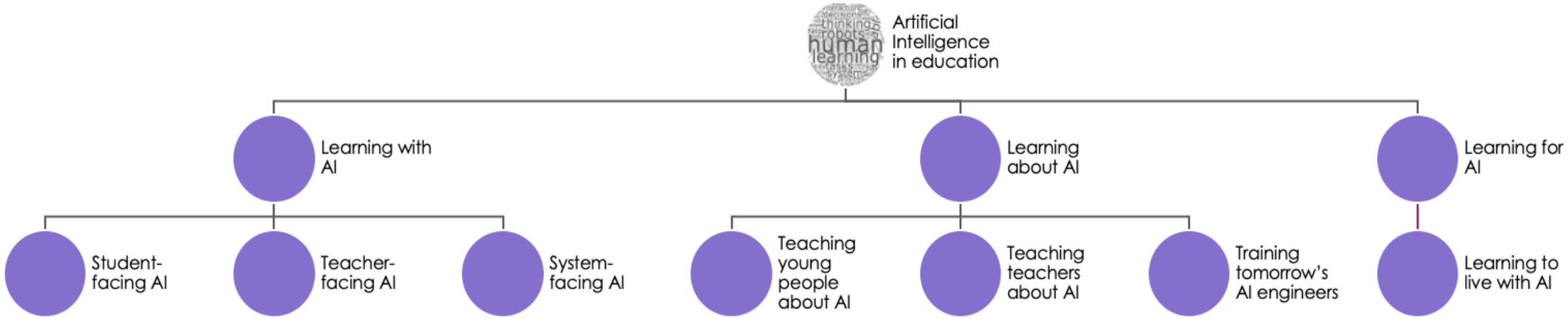
CUC 2021

Step 6 – (AI) Education

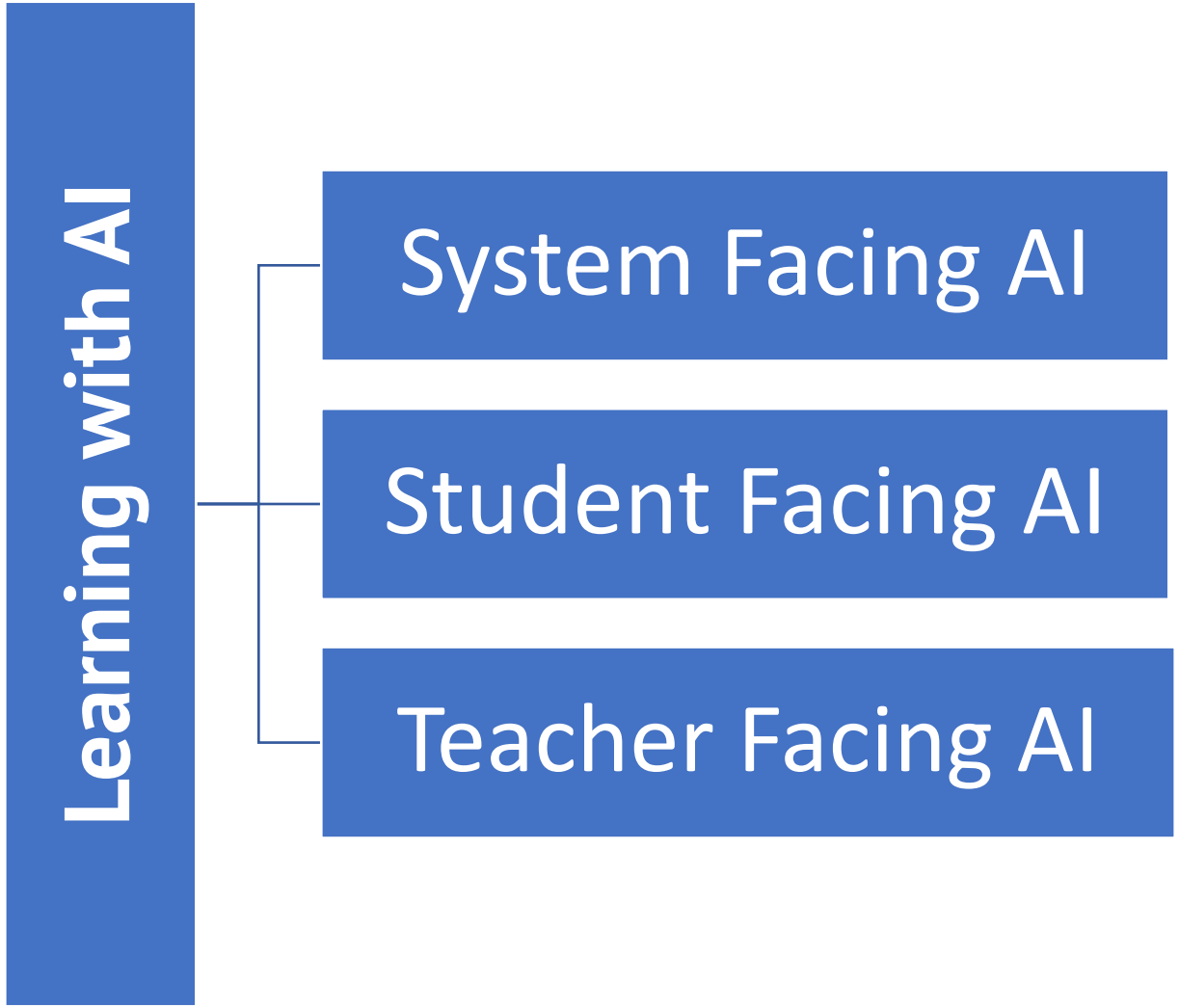
We should not be asking the question: In 50 years from now, will there be a human or a robot teaching? Rather, we should be asking the question: What kind of combination of human and artificial intelligence will we be able to draw on in the future to provide teaching of the very best quality

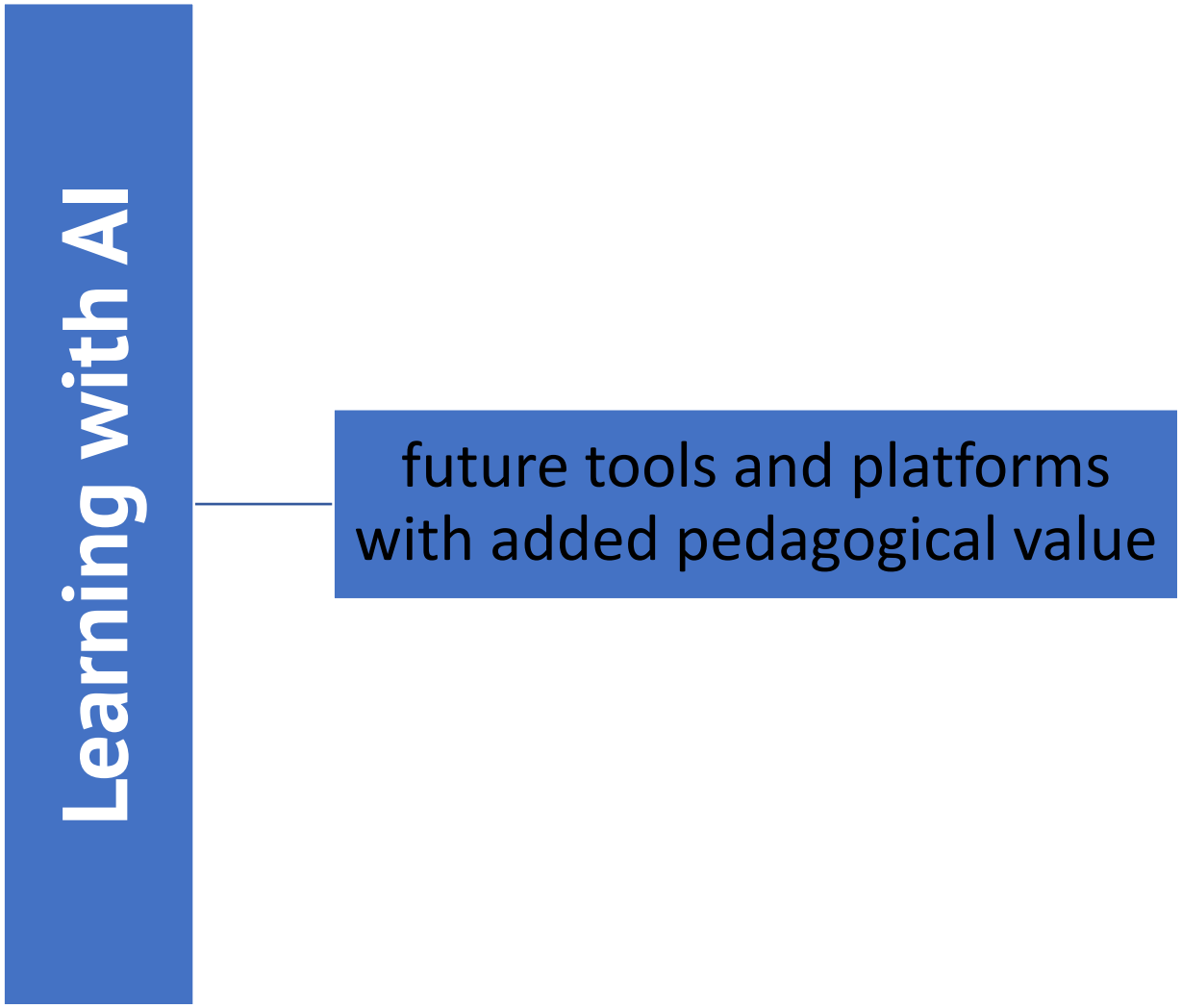
(***Jandrić, 2017, p. 207***)

AI in education: a framework



(***Holmes,*** **2020**)

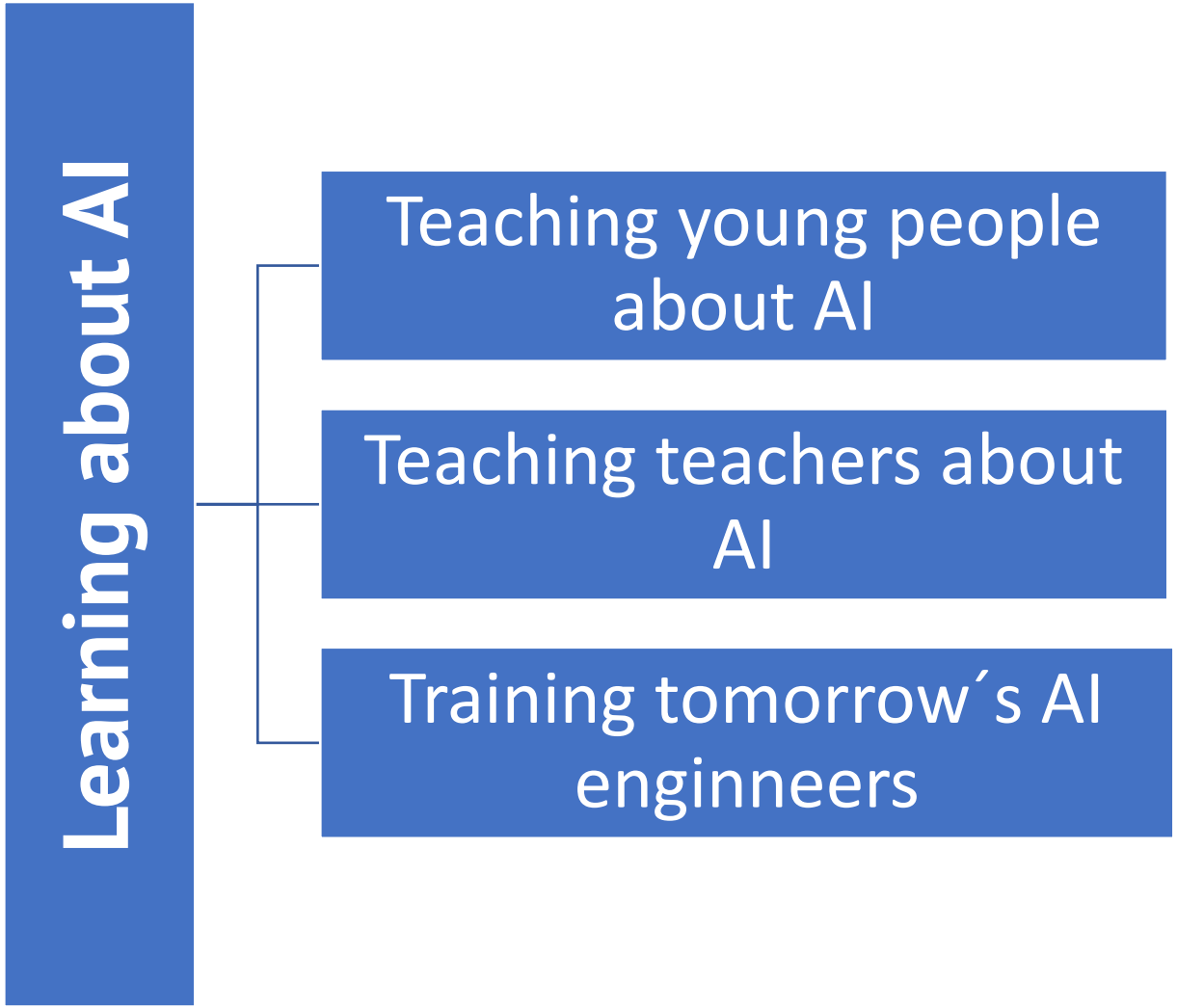

Learning with AI
System Facing AI
Student Facing AI
Teacher Facing AI



Adaptable Collaborative Learning Platforms

AI Learning Companions

AI Teaching Assistants



Types of AI

Data Skills

AI Skills

Build with AI

Learning for AI

Teaching young people about AI

Ethics

Skills and Competences

Social, economical, cultural and ecologic disruptions

AI Literacy

Do your ever discuss the thematic of AI with your students?

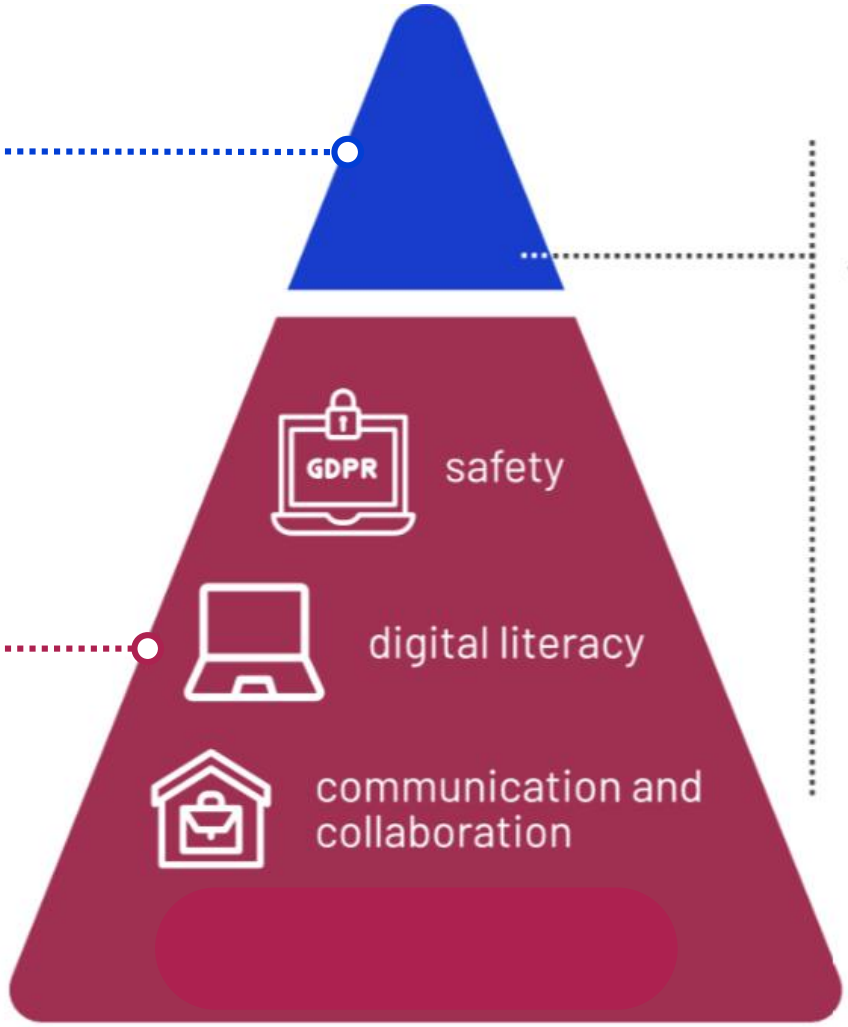
Step 7 – (AI) Framework

AI Literacy

Digital skills needs in Europe

advanced skills

basic skills



artificial intelligence

internet of things

big data

cybersecurity

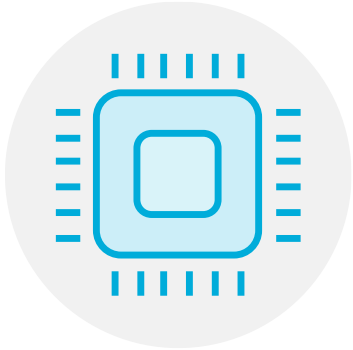
blockchain

robotics

Report on the European Educational and Training Landscape -Training Needs of Citizens and SMEs
Digital SkiilUP – European Comission - 2020

im
possible

FRAMEWORK



- Data Skills
- AI Skills
- Create with AI
- AI Entrepreneurship
- Competences
- Multi Impact of AI
- Ethic and Human Values
- Awareness of AI

Step 8 – Classroom

Projects Ideas

PROJECT 1

Create an AI Expert Guessing Game

https://en.akinator.com/

PROJECT 2

Design an AI Agent

@kuki_ai

I'm Kuki, your AI BFF

https://chat.kuki.ai/

Projects Ideas

PROJECT 3

AI and Art

1. DEEP STYLE

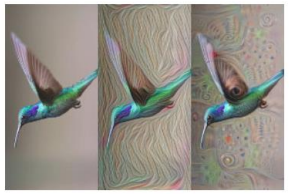
The technique is a much more advanced version of the original Deep Dream approach. It is capable of using its own knowledge to interpret a painting style and transfer it to the uploaded image.

2. THIN STYLE

This tool is a simplified version of the Deep Style one. It is not capable of creating advance transformations but it still shines with some exceptional results. It is also noticeably faster than the Deep Style.

3. DEEP DREAM

Initially it was invented to help scientists and engineers to see what a deep neural network is seeing when it is looking in a given image. Later the algorithm has become a new form of psychedelic and abstract art.



GET STARTED

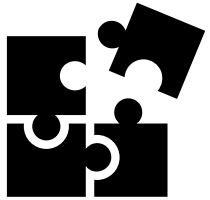
https://deepdreamgenerator.com/

PROJECT 4

AI-Powered vs. Human Translators

DeepL

https://www.deepl.com/translator



Resources

AutoAuto.AI - Learning AI with AV	https://www.autoauto.ai/
Edu ReadyAI	https://edu.readyai.org/
Elements of AI	https://www.elementsofai.com/
AI4ALL	https://ai4all.docebosaas.com/learn
ML for Kids	https://machinelearningforkids.co.uk/
AIY	https://aiyprojects.withgoogle.com/

Resources

PictoBlox	https://thestempedia.com/product/pictoblox/
AI Crash Course	https://www.youtube.com/playlist?list=PL8dPuuaLjXtO65LeD2p4
AI Microsoft School	https://aischool.microsoft.com/
Okai - An Interactive Introduction to (AI)	https://okai.brown.edu/index.html
Korbit AI Learning Tutor	https://www.korbit.ai/
AI - Alternate Unit Curriculum	http://www.exploringcs.org/for-teachers-districts/ai

Resources

Ready AI+ME Course	https://edu.readyai.org/pt-pt/courses/ai-me-1/
AI Family Challenge	https://www.curiositymachine.org/lessons/lesson/
How normal am I?	https://www.hownormalami.eu/
Moral Machine	https://moralmachine.mit.edu/
AI + Ethics Curriculum for Middle School	https://www.media.mit.edu/projects/ai-ethics-for-middle-school
Movix.AI	https://movix.ai/
MIT Edu - AIK12	https://aieducation.mit.edu/
Big Reset (1)	https://www.youtube.com/watch?v=s0dMTAQM4cw
Big Reset (2)	https://www.youtube.com/watch?v=-ePZ7OdY-Dw
Five big Ideas for AI	AI4K12.org
Ethics of AI	https://ethics-of-ai.mooc.fi/

Final Step – Interrogations

We will be challenged by cognitive agents. How to live side by side with them?

Who (will) control the machines that take decisions (ethics, bias)?

What (new) models of (re)training and education will be needed?

Will we need new models of society to integrate the so called “smart” machines?

WE'RE STILL HIRING
HUMANS
CarnegieRobotics.com
ORANGE BARREL | MEDIA

*"The best way to predict the **future** is to **invent** it."*

Alan Kay

Thank you

twitter.com/mbrasneves

linkedin.com/in/mbrasneves/

mbrasneves@gmail.com