

OSLOMET

Basics of A.I

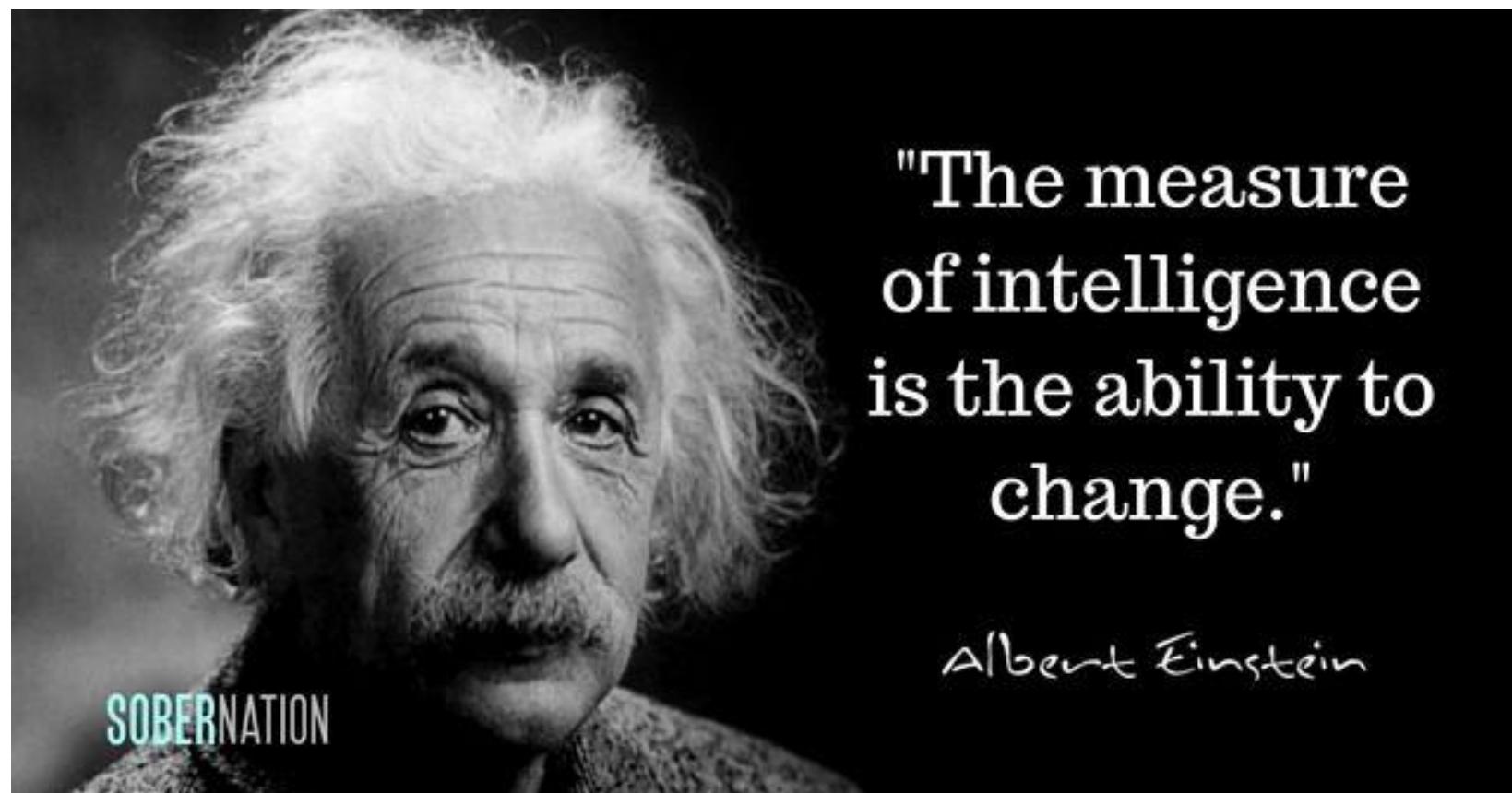
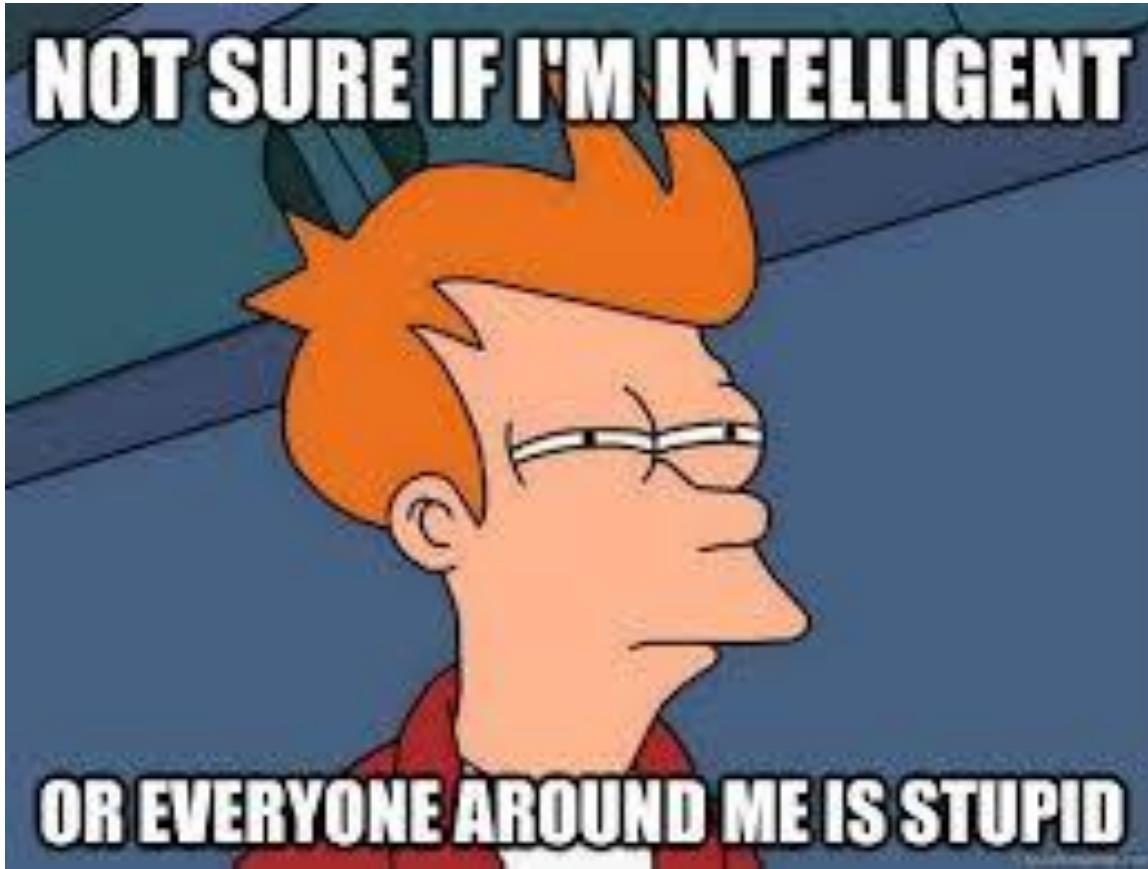
Umair Mehmood Imam

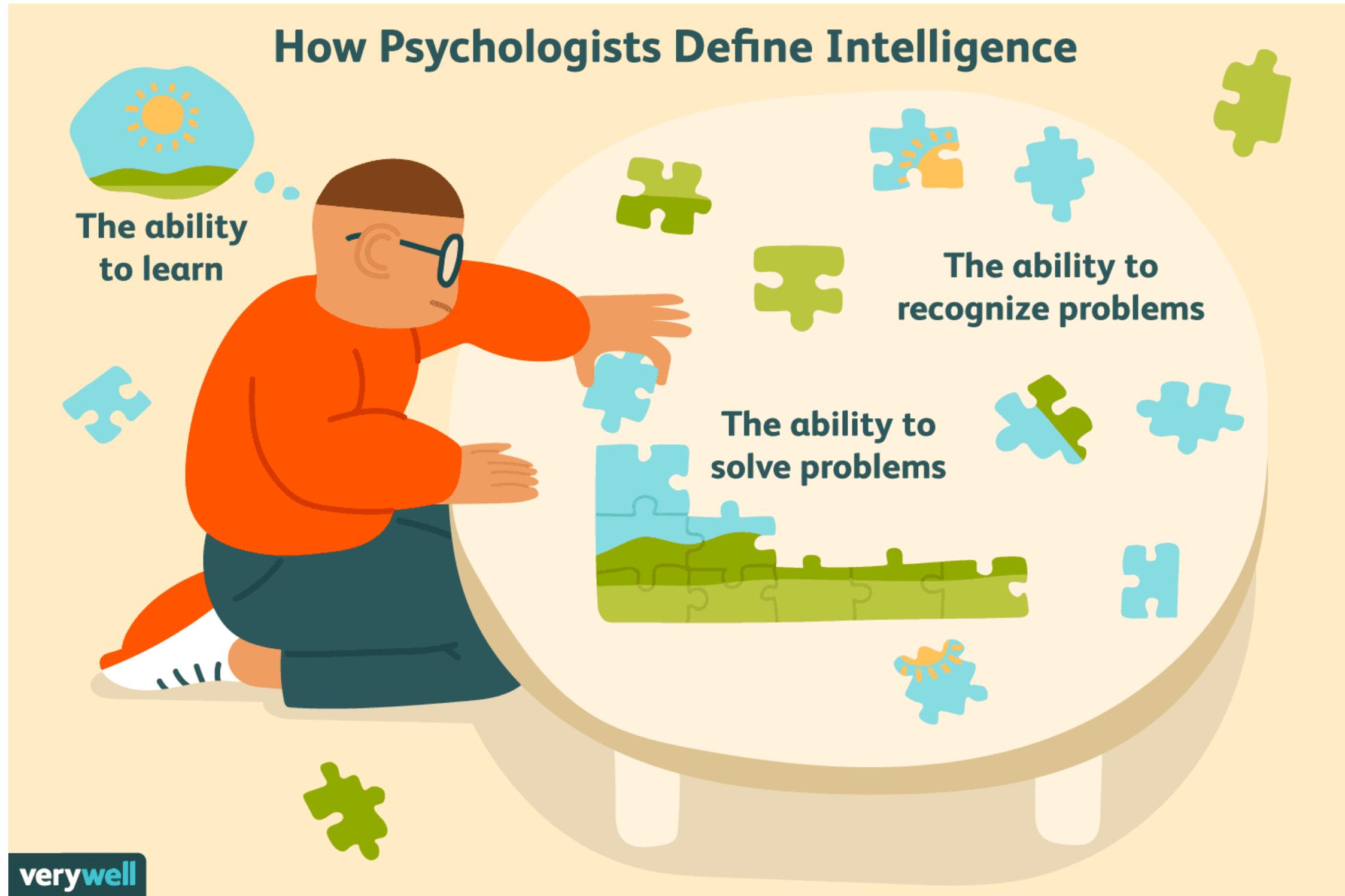
INTRODUCTION TO A.I - UMAIR M.I

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What is Intelligence ?





What is Artifical Intelligence ?

A.I is when we artificially introduce intelligence in machines

thereby giving us:

- a machine which mimics human like intelligence
- a machine which has decision making capabilities
- a machine which learns on its own

■ ■

Software that solves a problem without explicit human instruction

Artificial Intelligence versus conventional programming

Conventional programming

Programmers look at the problem (desired output) and build an algorithm/application to solve this problem.

A programmer has complete control over their application

The software must follow a logical series of steps to reach a conclusion (hard coded instructions by the programmer)

Its easy to explain a conventional algorithm

The most important element here is the algorithm

Artificial Intelligence

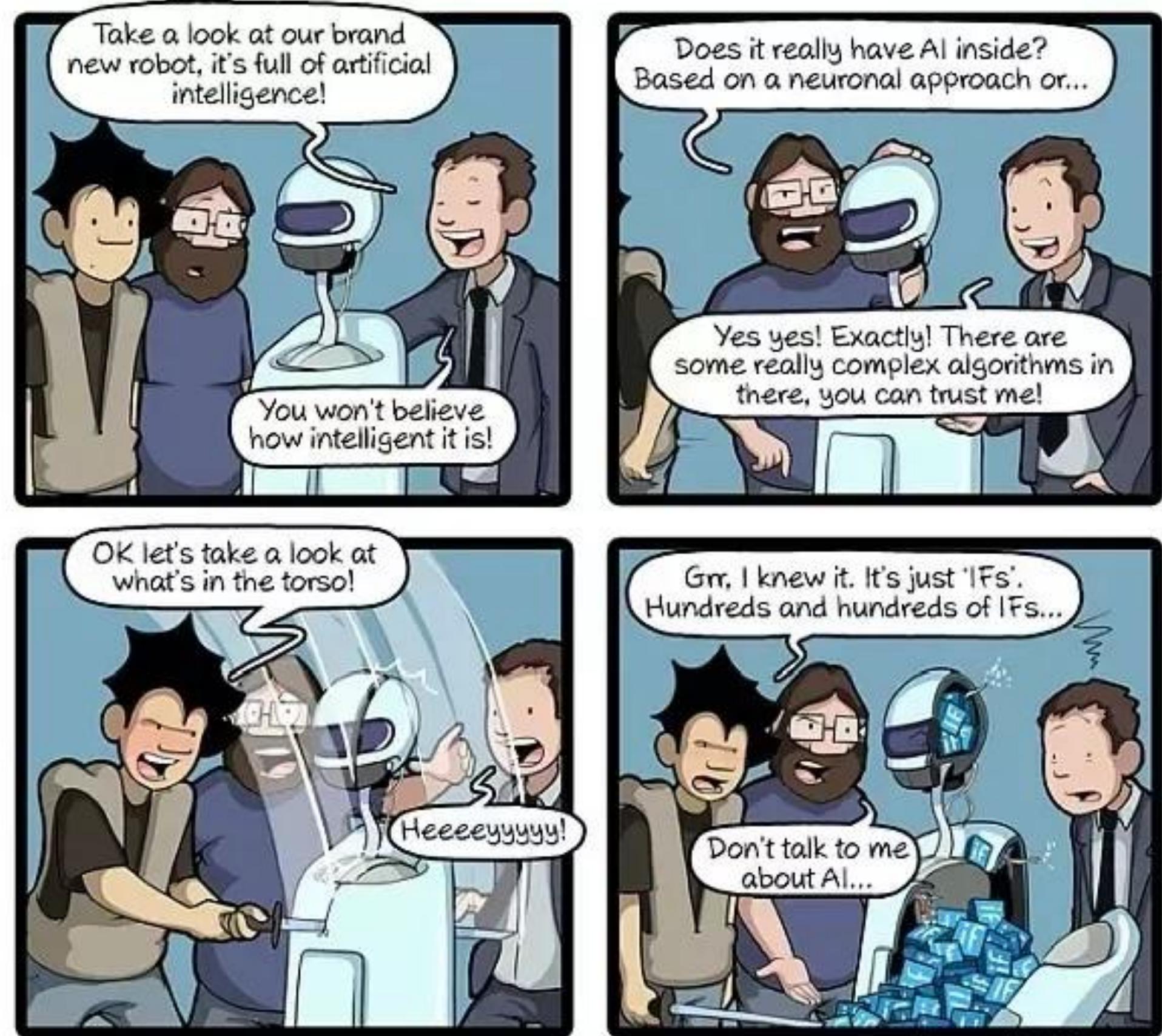
Ai programmers show the problem (desired output) to the A.I algorithms and expect the algorithms to find a solution.

An A.I programmer can never claim to have full control over their A.I applications. (Explainable A.I is hard to achieve)

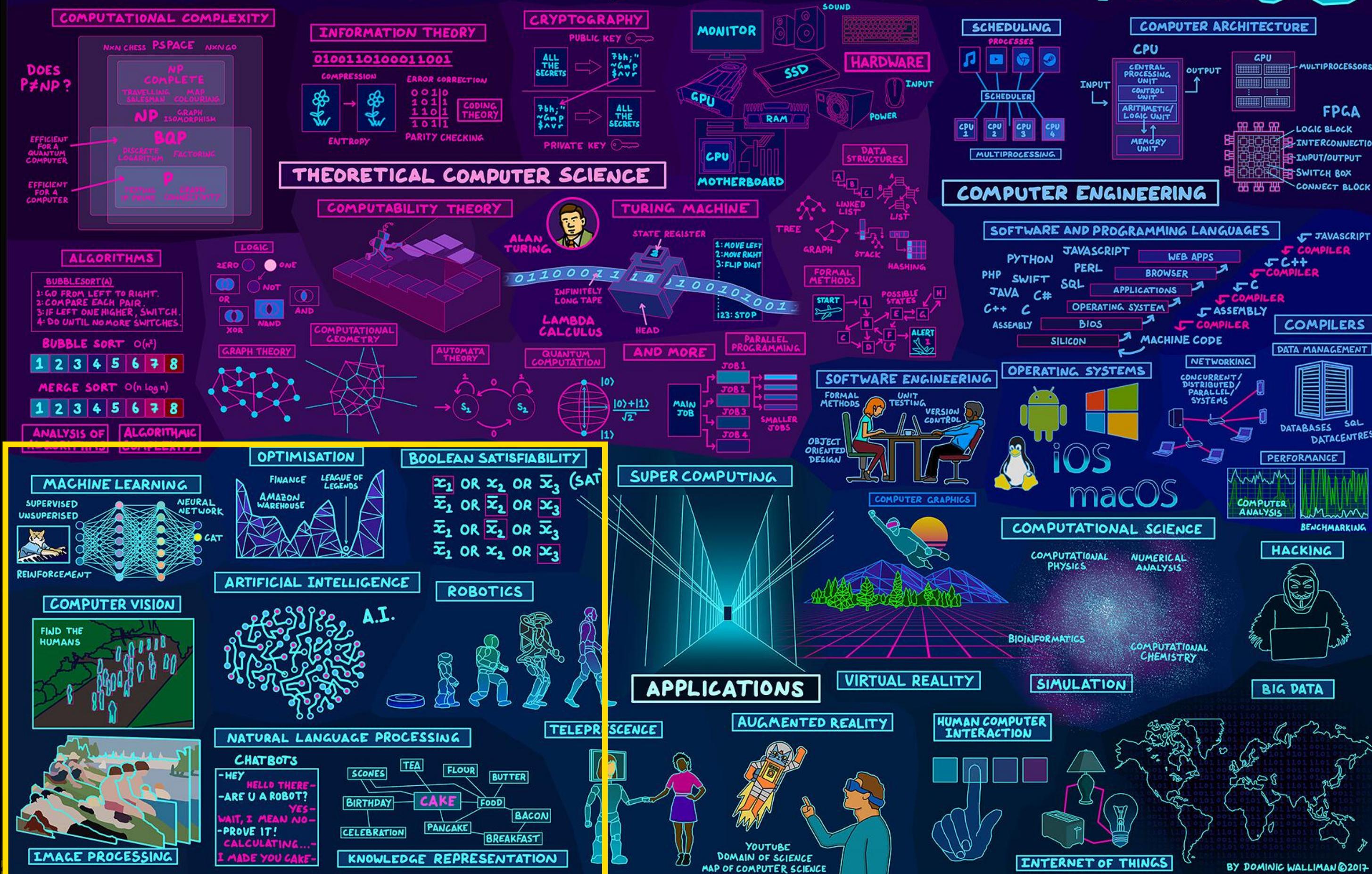
Ai applications use the technique of search and pattern matching

Its very hard to explain how an A.I algorithm reached its desired output

The most important elements here are data and algorithms



MAP OF COMPUTER SCIENCE



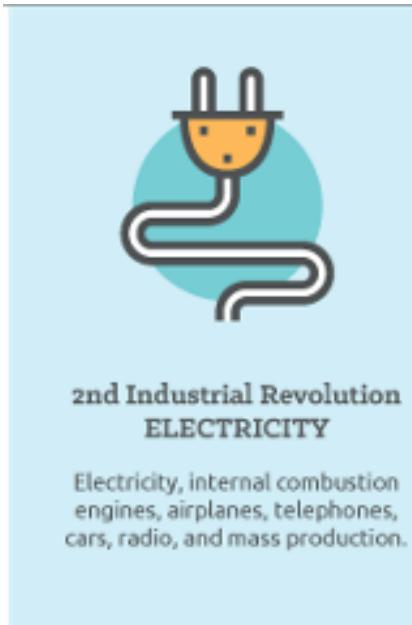
The 4th and the biggest industrial revolution



1st Industrial Revolution WATER & STEAM

Steam and water power replace human and animal power with machines.

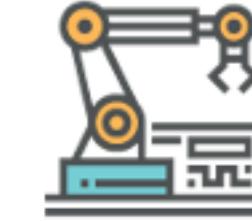
1784



2nd Industrial Revolution ELECTRICITY

Electricity, internal combustion engines, airplanes, telephones, cars, radio, and mass production.

1870



3rd Industrial Revolution AUTOMATION

Electronics, the internet and IT used to further the automation of mass production.

1969



4th Industrial Revolution CYBER-PHYSICAL SYSTEMS

Driverless cars, smart robotics, materials that are lighter and tougher, and a manufacturing process built around 3D printing.

Now or future ?

History of A.I – important points

- Efforts to create intelligent machines started as early as 1642
 - First mechanical calculating machine – Blaise Pascal
- Turing test was introduced in 1950
- In 1955 we coined the term, “Artifical Intelligence”

A SHORT HISTORY OF AI...

1955

The term “artificial intelligence” is coined at Dartmouth conference and AI is founded as an academic discipline.

1956-1974

Golden years of AI enjoy government funding in promising, logical-based problem-solving approaches.

1987-1993

The second "AI winter" starts with a collapse in the specialized hardware industry. The AI hype brings negative perceptions by governments and investors.

1980-1987

The rise of knowledge-based expert systems brings new successes and a change in focus of research funding towards this form of AI.

1974-1980

Overly high expectations and limited capacities of AI programs leads to the first "AI winter" with reduced funding and interest.

1993-2011

Optimism about AI returns, marked with the help of increased computational power and AI becomes data-driven.

2012-TODAY

Increased availability of data, connectedness and computational power allow for breakthroughs in machine learning, mainly neural networks and deep learning.

WHY ?

Connectedness -> Internet / IOT

Ease of use of A.I applications

2012-TODAY

Increased availability of data, connectedness and computational power allow for breakthroughs in machine learning, mainly neural networks and deep learning.

Machine learning, deep learning

Natural language processing

More Data

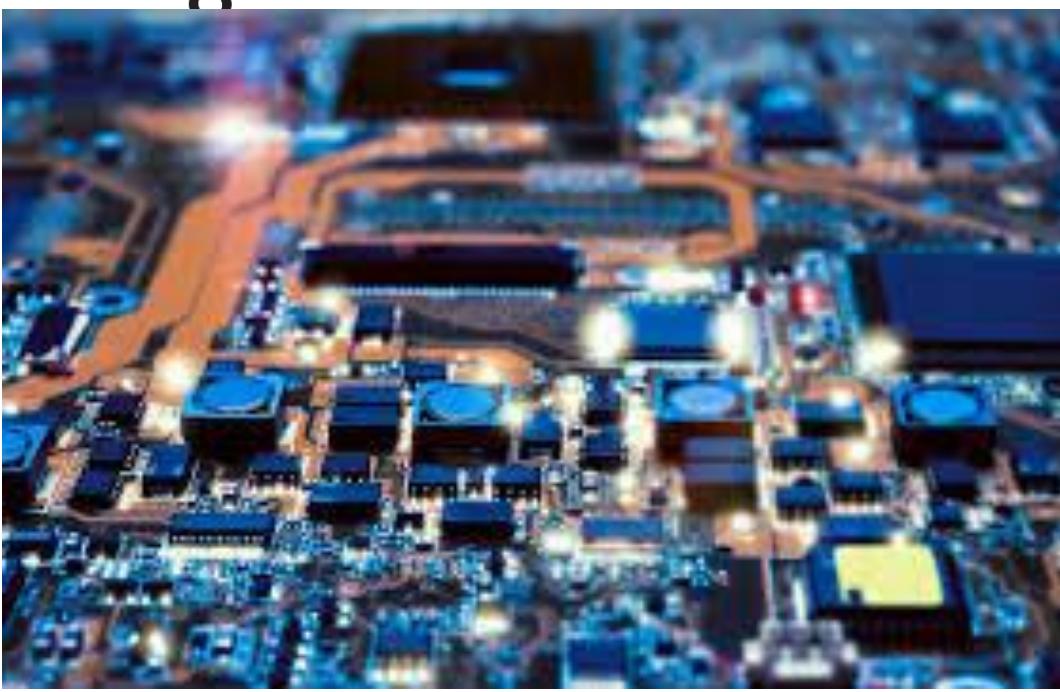
Cloud computing

Powerful chips / processors

Can A.I exist on its own ?

Question:

- Can you name a company which is purely an AI company ?
- A.I helps other software services do their job better. e.g:
 - Voice recognition and intelligent search used in A.I assistants
 - Natural Language processing used in Translation services



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Examples of A.I. in our daily lives



Self driving cars



Image / video analysis



Voice and chat assistants

Examples of A.I in our daily lives

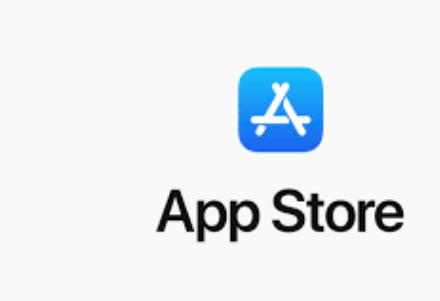
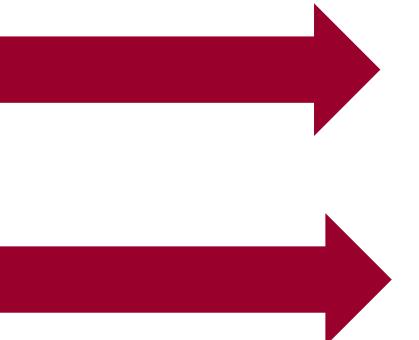
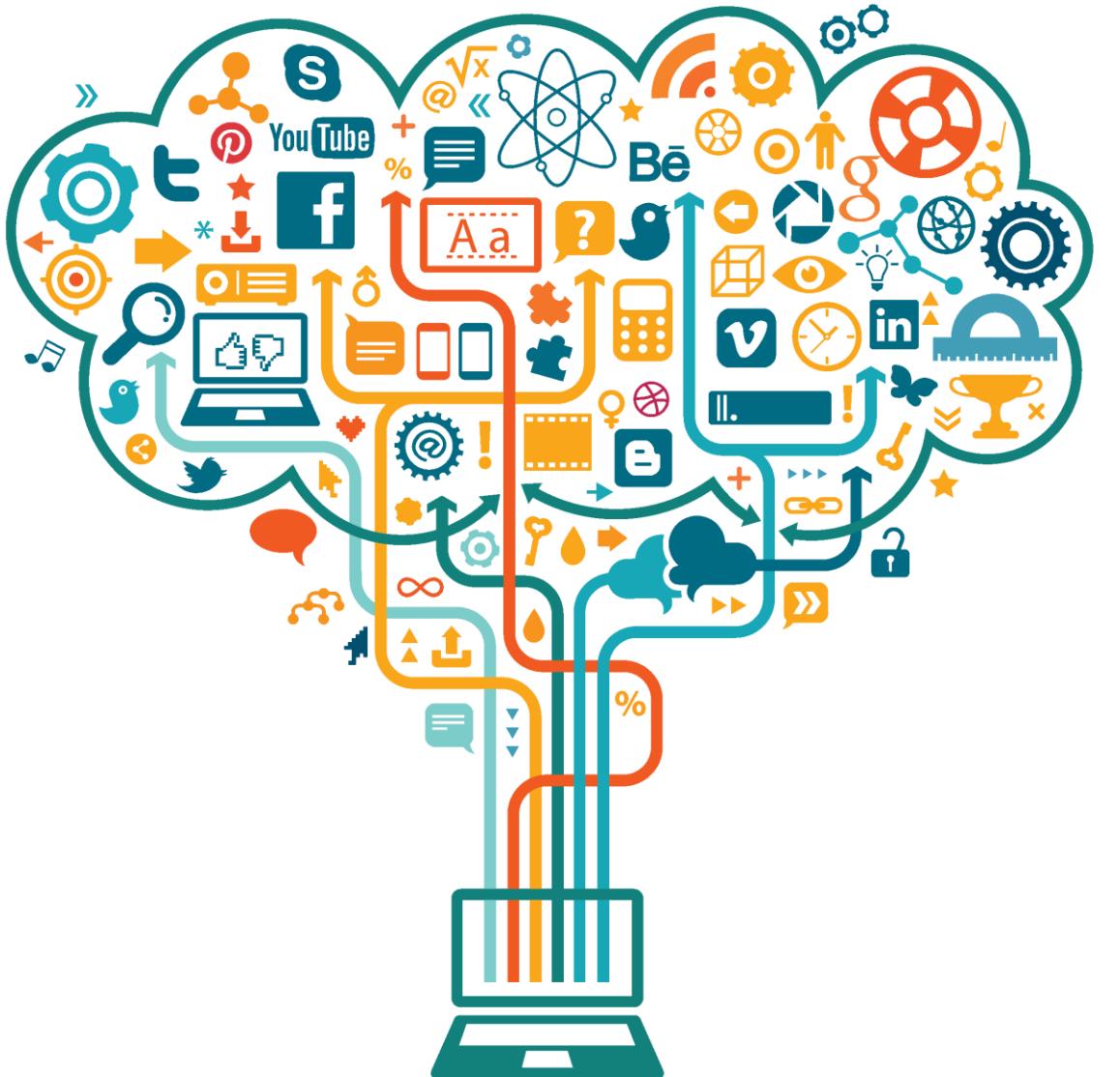


Google Maps



Maps

Examples of A.I in our daily lives



Content recommendation

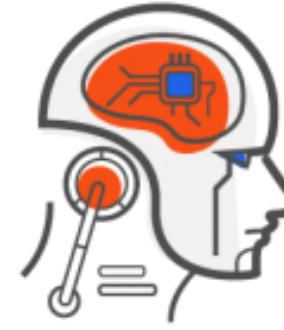
Types of A.I

3 Types of A.I



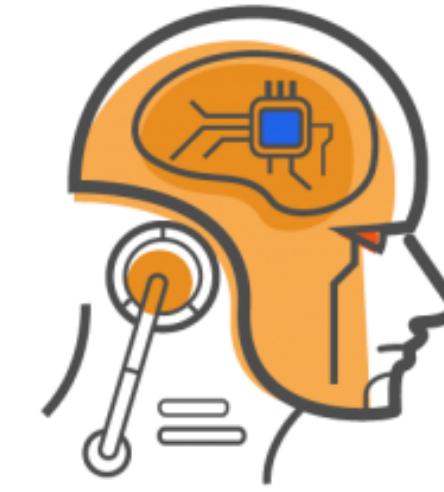
Narrow AI

Dedicated to assist with or take over specific tasks.



General AI

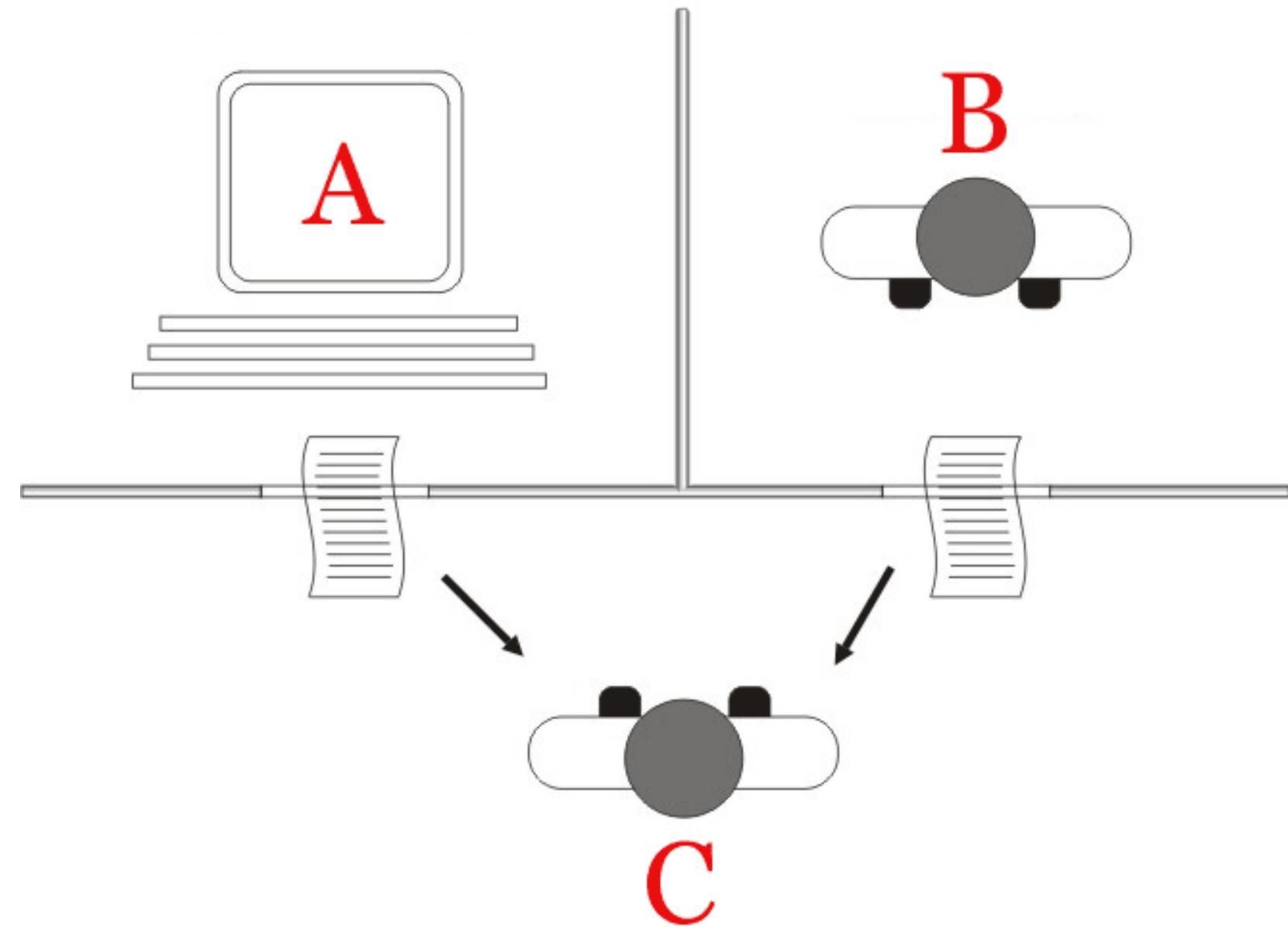
Takes knowledge from one domain, transfers to other domain.



Super AI

Machines that are an order of magnitude smarter than humans.

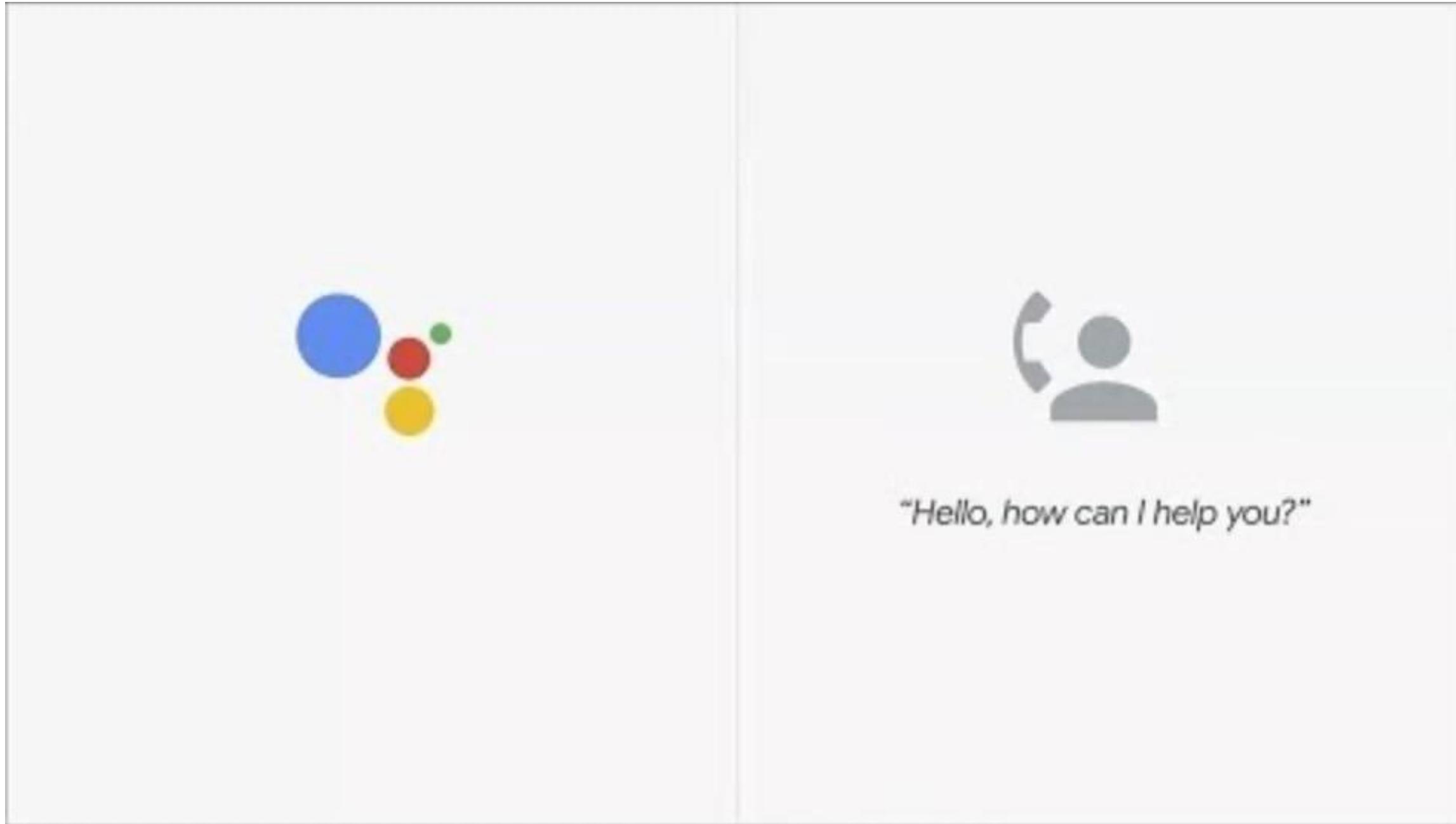
Turing Test – General AI



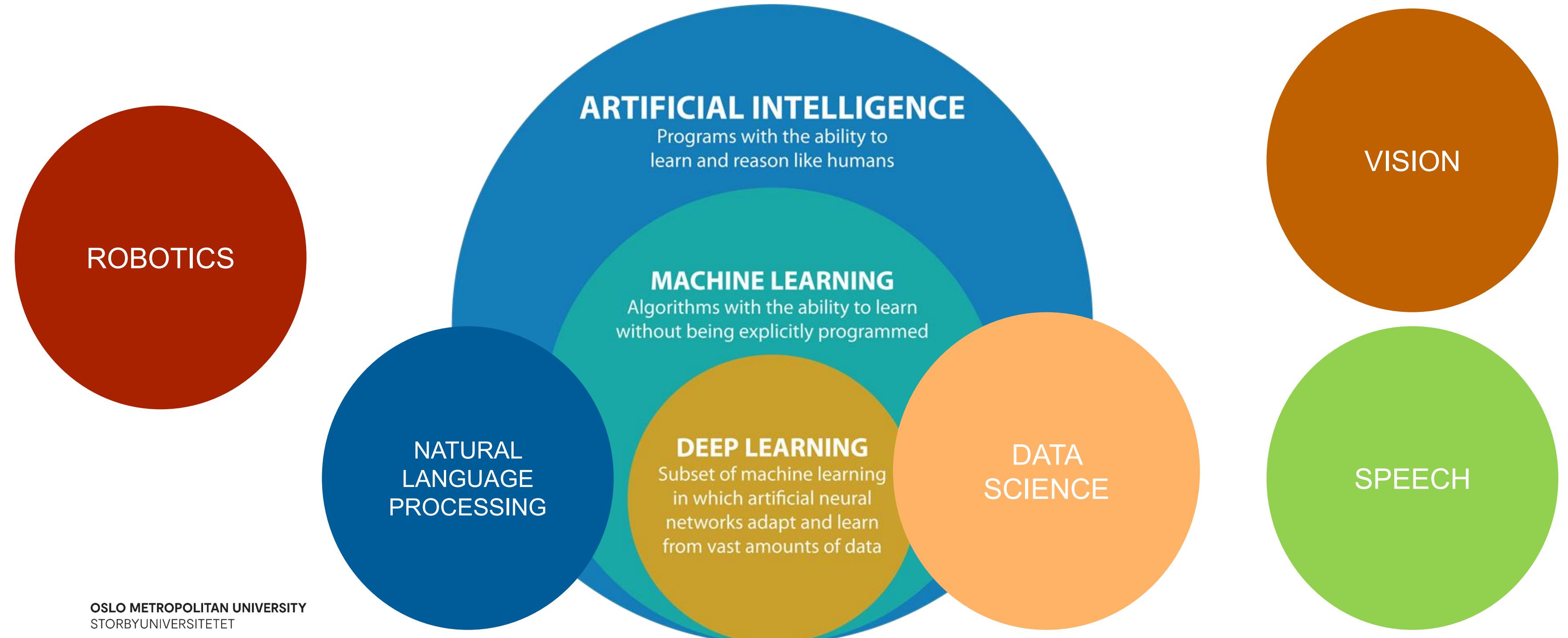
Can modern AI assistants pass the turing test ?



Google Duplex passed the turing test in 2018



Branches of A.I



Skillset needed to work with A.I

Math

- the theoretical background necessary to conduct and apply AI research

Statistics

- empirical skills needed to fit and measure the impact of AI models

Machine Learning

- skills needed to build self learning models like deep learning and other supervised models that power most AI applications today

Statistical Programming

- programming skills needed to implement AI models such as in python and related packages like sci-kit learn and pandas

Software Engineering

- programming skills needed to design and scale AI powered applications

A.I buzz created a lot of negativity

- FOMO
 - Fear of missing out
- FUD
 - Fear, uncertainty and doubt
- Feuds
 - When people with their knowledge of A.I fight with each other
 - Ref:<https://techcrunch.com/2017/07/25/elon-musk-mark-zuckerberg-artificial-intelligence/>



A.I buzz is also helping to solve many problems

- Human trafficking
- Money Laundering
- Terrorism
- Covid19 research
- etc ..

