Artificial Intelligence

AI

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- What is AI?
- AI Subfields
- Voice Agents
- Genomics
- Sustainability
- More AI Statistics

Why Should You Care?

By 2030, AI will lead to an estimated **$15.7 trillion**, or 26% increase in global GDP.

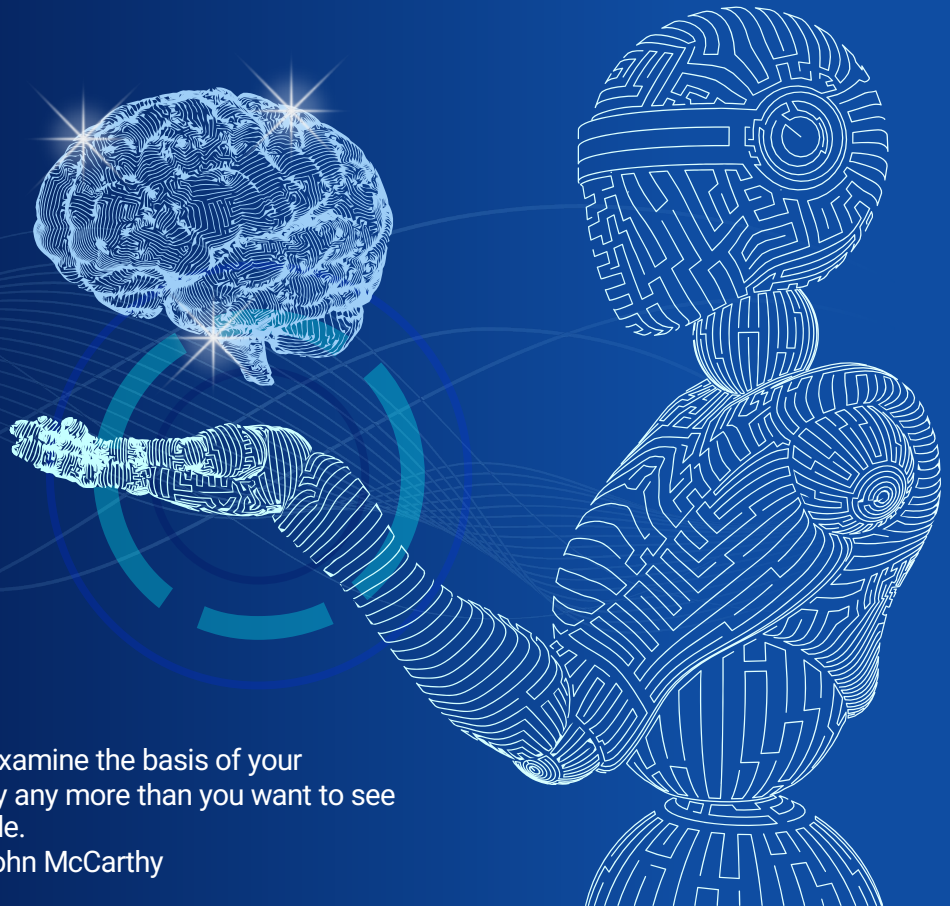
Between 2018 and 2025, the **Asia-Pacific region** will experience the highest compound annual growth rate.

The top three most significant challenges companies face when considering the implementation of AI are staff skills (56%), the fear of the unknown (42%), and finding a starting point (26%).

Artificial Intelligence

The term Artificial intelligence (AI) was first coined in 1955 by John McCarthy, which he defined as **“the science and engineering of making intelligent machines”**

Other prominent leaders in AI:
Alan Turing
Marvin Minsky
Allen Newell

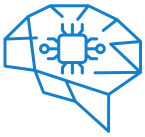


You don't want to examine the basis of your computer's morality any more than you want to see sausage being made.

-- John McCarthy

AI Subfields

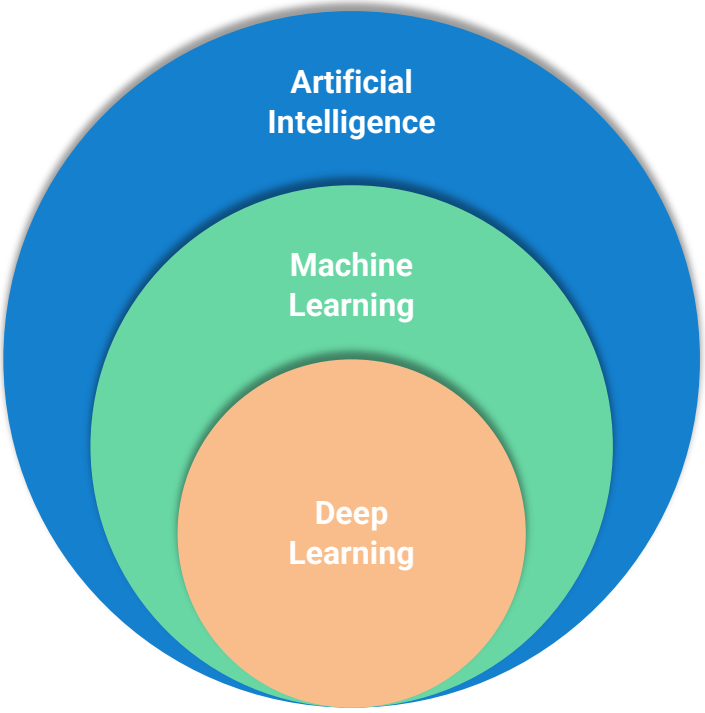
Deep learning and machine learning are subfields of artificial intelligence



Artificial Intelligence (AI)
Any technique that enables machine to mimic human intelligence, using logic, it-then rules, decision trees, and machine learning (including deep learning).

Machine Learning (ML)
A subset of AI that includes statistical techniques that enable machines to improve at tasks with experience.

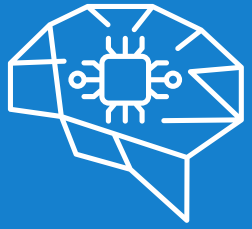
Deep Learning (DL)
A subset of machine learning composed of algorithms that permit software to train itself to perform tasks, like speech and image recognition, by exposing multilayered neural network to vast amounts of data.



History of Artificial Intelligence

Artificial Intelligence (AI)

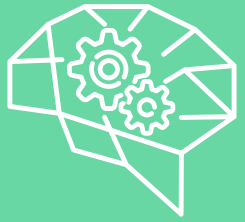
Early artificial intelligence stirs excitement.



"Engineering of making intelligent machines and programs."

Machine Learning (ML)

Machine learning begins to flourish.



"Ability to learn without being explicitly programmed."

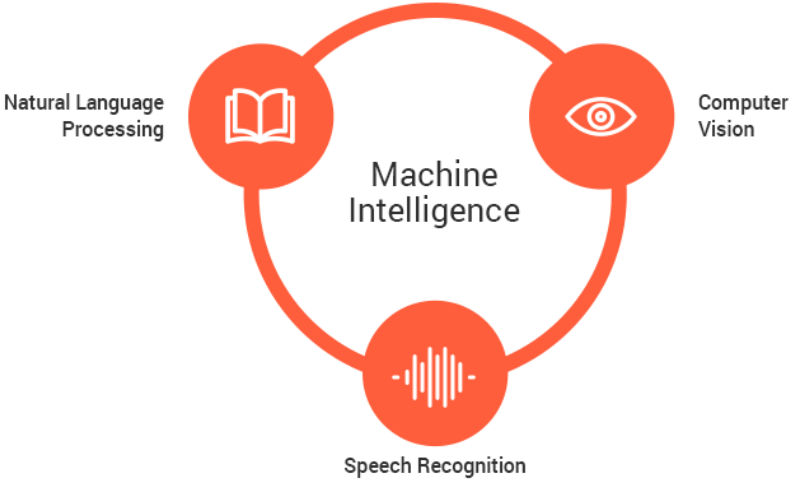
Deep Learning (DL)

Deep learning breakthroughs drive AI boom.

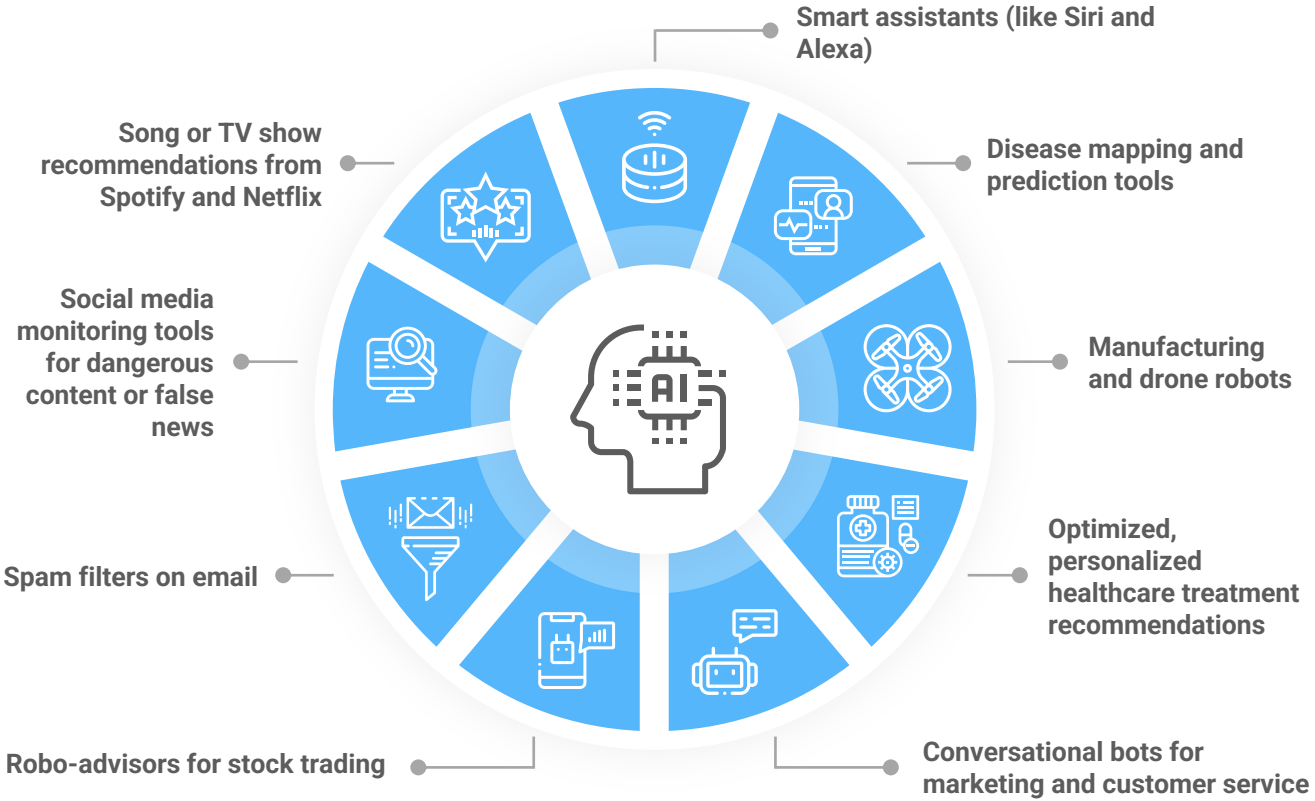
"Learning based on network."

1950's 1960's 1970's 1980's 1990's 2000's 2010's 2020's 2030's

Technologies Powered by ML and DL



Artificial Intelligence Examples

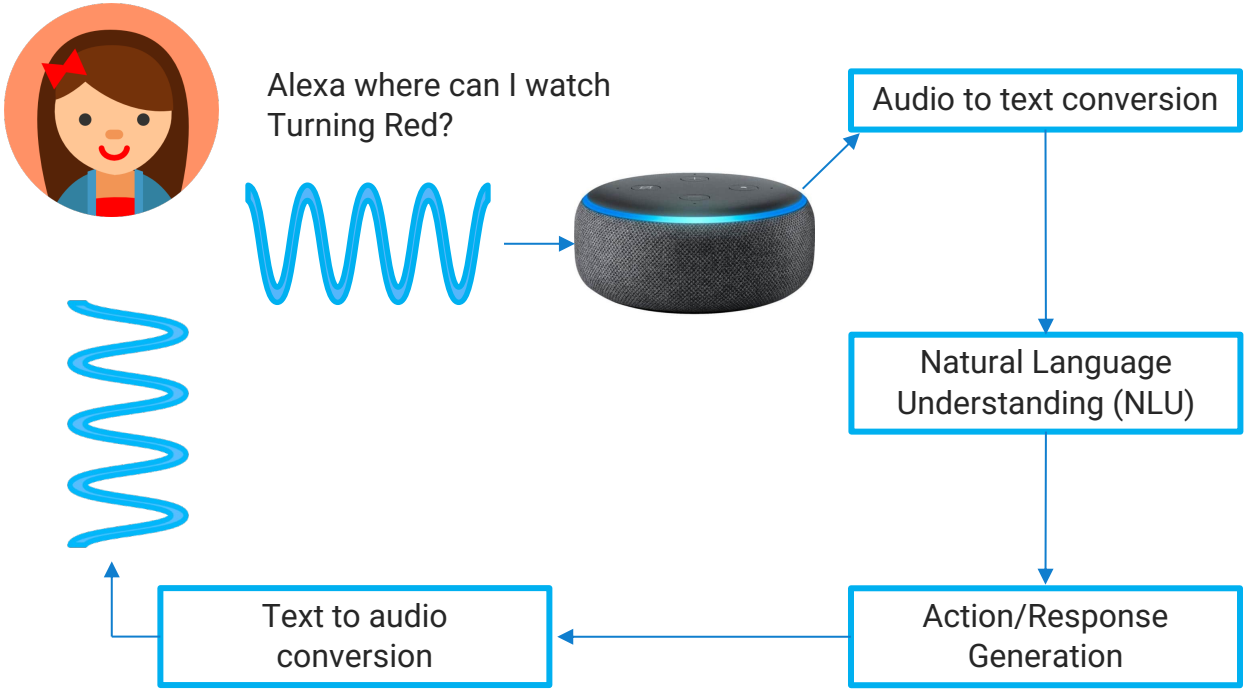


Intelligent **voice agents** :

- **Approximately 3.25 billion people use voice-activated search and assistants worldwide, almost half of the world's population.**
- **55% of households in the U.S. currently own a smart speaker.**
- **Digital assistant usage worldwide is expected to grow to 8 billion by 2023.**

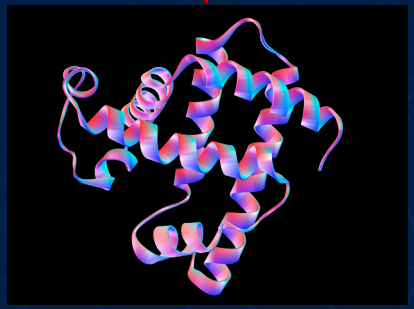
Reference: https://www.semrush.com/blog/artificial-intelligence-stats/#benefits-and-results-of-ai-statistics

Voice Agent Components



Genomics

DNA → mRNA → Protein



Splicing:
The function in body that defines the protein sequence that gets generated from the DNA.

Protein folding:
The function that takes the 1-D protein and folds it into the 3-D shape. If the folding is not correct, it leads to cancer or rare diseases.

https://www.deepmind.com/blog/alphafold-a-solution-to-a-50-year-old-grand-challenge-in-biology

AI has contributed to modeling the splicing* and predicting the 3-D protein structure:

The number of different folding configurations ~10^300. Knowing this folding absolutely essential to understanding biological processes.
We knew the 3-D structures for about 17%, and now virtually all (98.5%).

Google DeepMind

*: https://www.cell.com/cell/pdf/S0092-8674(18)31629-5.pdf

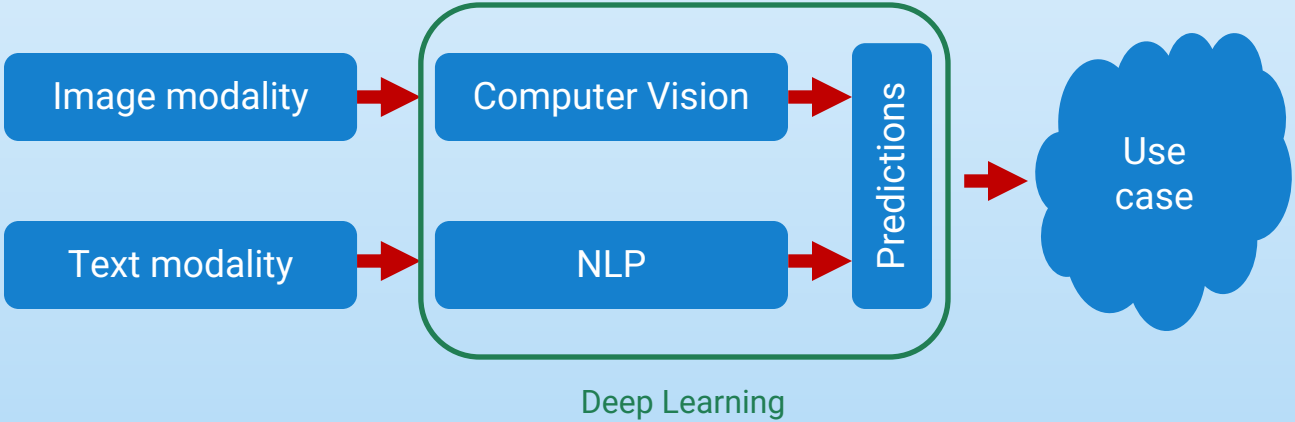
Sustainability

Reducing package waste:

Over the last five years, AI applications* have helped Amazon achieve a 33% reduction in packaging requirements.

That's a saving of more than **915000** tons of packaging material

That's equivalent to the elimination of **1.6 billion** shipping boxes



* https://www.amazon.science/publications/position-paper-reducing-amazons-packaging-wasteusing-multimodal-deep-learning

Sustainability

Reducing carbon footprint:

According to Climate-KIC, even though we're emitting 17% less CO2 than in 2019, our current greenhouse gas emissions still exceed the normal rate by 80%.

If this situation continues, the economic damage resulting from climate change will equate to sustaining one COVID-like pandemic every ten years.

Commercial buildings in US are responsible for 40% of the emissions.

Carbon Lighthouse's AI platform CLUES helps existing commercial buildings reduce their emissions.

CARBON LIGHTHOUSE
PROFITABLE CLIMATE SOLUTIONS

* https://www.carbonlighthouse.com/

Key Artificial Intelligence Statistics

AI Market Statistics

The following are key artificial intelligence market statistics – Credit: financesonline.com

$15.7 Trillion

Projected AI contribution to the global economy by 2030. This represents a 26% increase in global GDP for the same period.

The AI industry market size is expected to be worth

$266.92 Billion

by 2027.

The forecast for the AI market compound annual growth rate from 2020 to 2027 is

33.2%.

North America

is expected to hold the largest AI market share.

Global AI-driven hardware market revenue is foreseen to grow to

$234.6 Billion

in 2025.

80%

The retail industry is expected to experience significant growth, with 80% of business executives claiming that their businesses will adopt AI technology between 2020 to 2027.

The limited number of AI experts is seen to be a major obstacle to the AI market growth.

Source: World Economic Forum, 2020, Statista, 2020, Allied Market Research, 2018.

Thank you for your time

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