

Artificial Intelligence



Brief History of AI

- 1950 Alan Turing publishes Computer Machinery and Intelligence
- 1956 Dartmouth Conference
- 1966 ELIZA simulates conversation
- 1974-1990s AI Winter
- 1990s Machine Learning emerges
- 2010s Deep learning Revolution
- 2020-Present Generative AI

Key Factors

- Abundance of Data
- Growth in Computer performance

Year	Instructions per Sec	Typical computer
1950	1000	Univac
1990	20,000,000	Intel Pentium
2020	200,000,000,000,000	IBM Summit

- Growth in Investment
- Improved Algorithms

What is AI

- Turing test

A computer and human are asked questions to determine which is human. The computer passes if it is indistinguishable from the human.

- John McCarthy

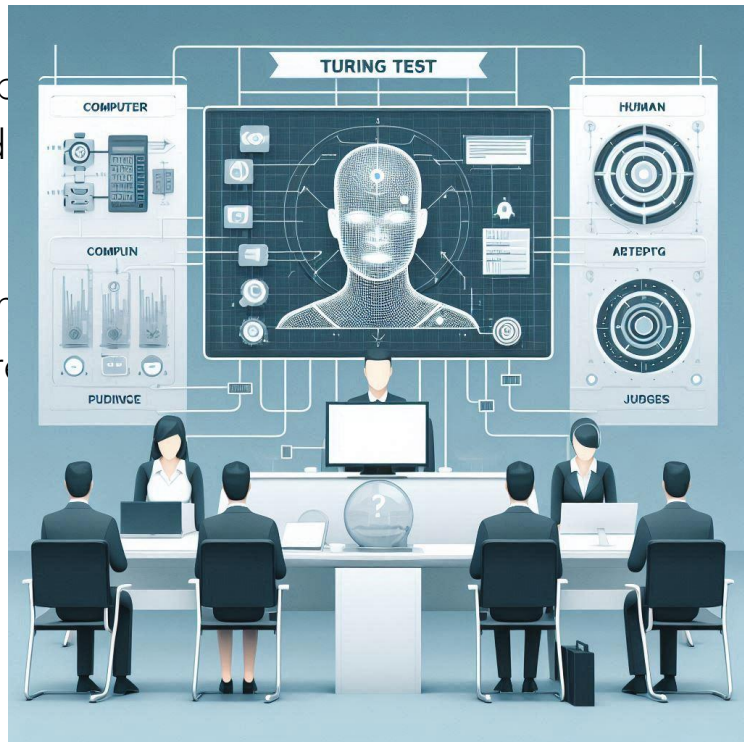
Any task performed by a program that would say the human had

carried out the same activity we would say the human had carried out the task.

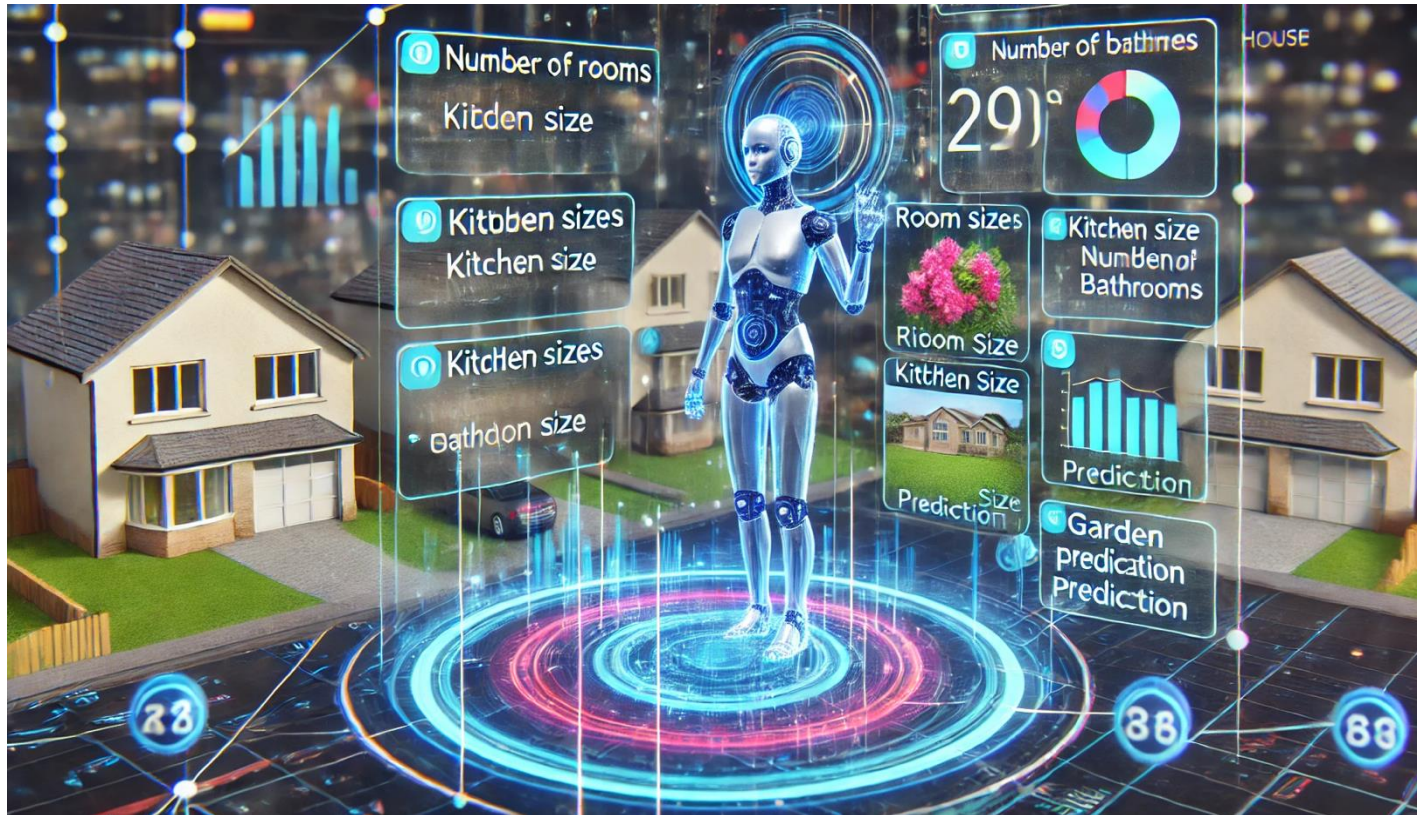
- Dictionary

An umbrella term for a range of functions that previously required

that solve complex tasks by carrying out



AI Example

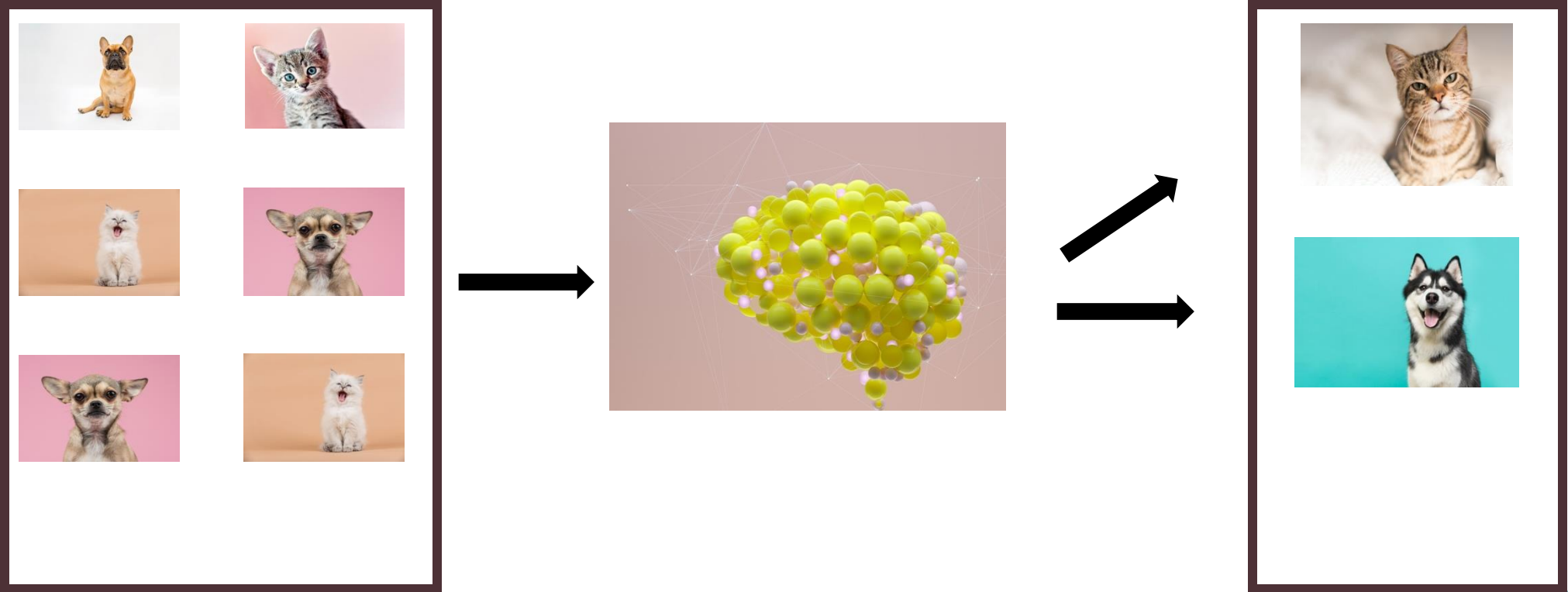


Courtesy of ChatGPT

How does AI work

- Learning from data
 - Supervised Learning
 - Unsupervised Learning
 - Reinforcement Learning
- Thinking
- Making predictions or decisions
- Improving over Time

Supervised Learning



Unsupervised Learning

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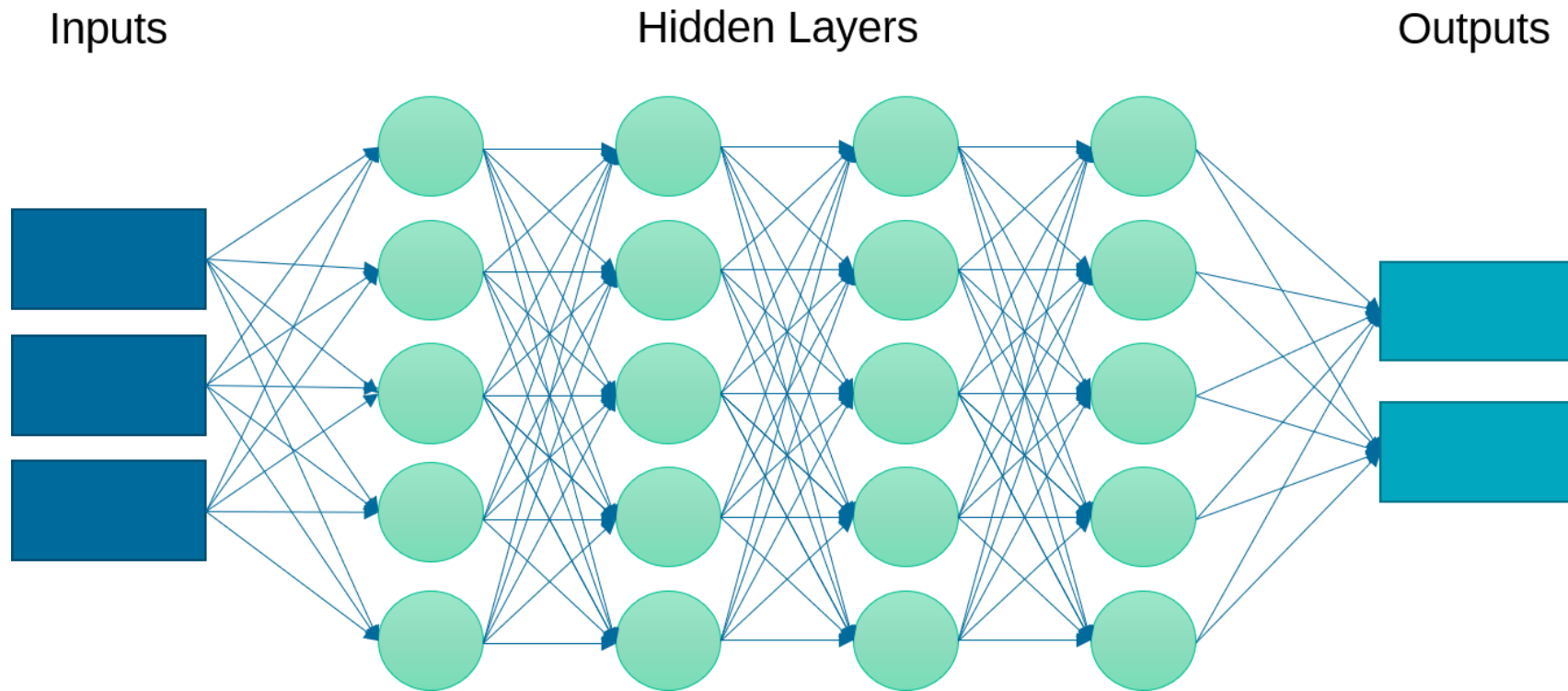
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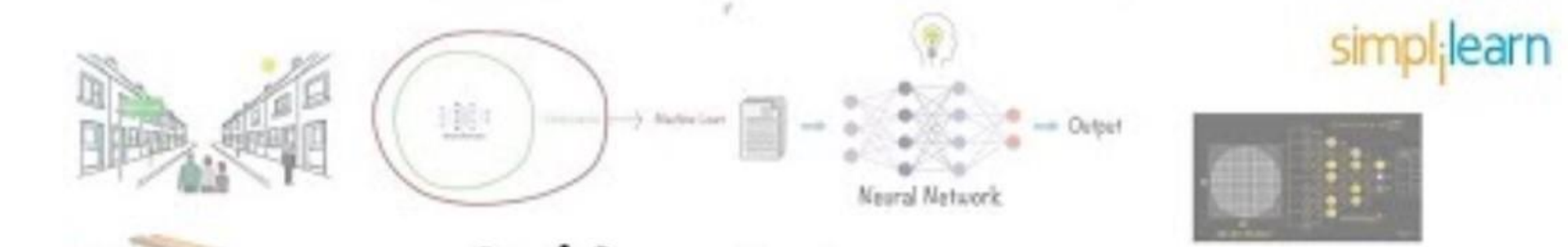
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Machine Learning (ML) Prediction

- **Google:** When you start typing a search term into Google, it uses a type AI to predict what you may be looking at based on the first few letters.
- **Netflix:** Uses AI to select the type of shows or films you may like.
- **Pega:** Telecom providers use AI to select a best plan for a customer
- **Spam:** Spam filters use AI to determine if an email is spam or not.

Neural Networks





What is a Neural Network?



Generative AI



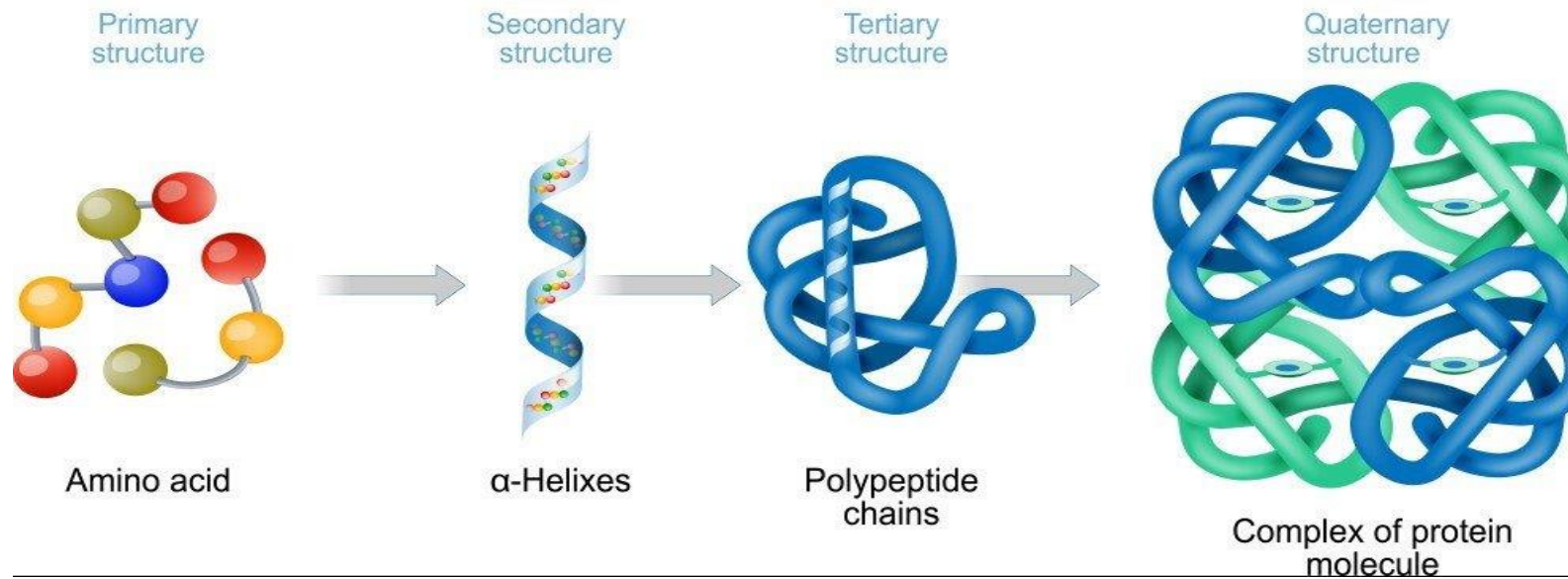
Power of AI - Headlines

- The latest version of ChatGPT passed the Bar exam.
- ChatGPT passed US medical licensing exam with flying colours - and diagnosed a 1 in 100,000 condition in seconds.
- But
In a demo of BARD, Google AI assistant
Question: What new discoveries from James Space Webb Telescope can I tell my nine year old.
One of the answers was: JWST took the very first picture of a planet outside our own solar system.

Answer (tweet by Grant Tremblay)

Not to be a jerk and I am sure that Bard will be impressive but for the record JWST did not take the very first image of a planet outside our solar system. The first image was instead done by Chauvin (2004)

Power of AI - Protein Folding



Common AI Terms

- Model
- Large Language Model (LLM)
- Prompt Engineering
- Natural Language Processing (NLP)
- Narrow AI
- General AI

AI impact

- Job Losses
- Privacy infringements
- Bias and Discrimination
- Lack of transparency
- Security Treats