

# PSY2301: Psychology of judgement and decision making

## Artificial Intelligence and decision making

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Esten H. Leonardsen  
30.10.24



UNIVERSITY  
OF OSLO

# Outline

1. The history of artificial intelligence (AI).
2. Terminology and concepts.
3. How does AI make decisions?
4. How can AI be used to support judgment and decision-making processes?
5. How are decisions made by AIs perceived?



# The history of artificial intelligence

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# The history of artificial intelligence



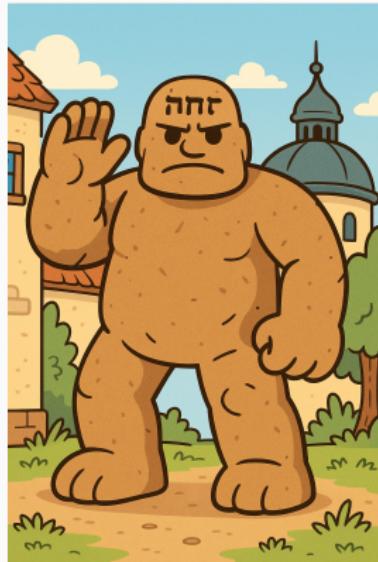
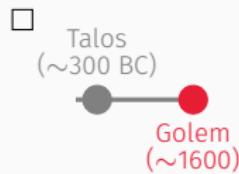
Talos  
(~300 BC)



Source: ChatGPT 5



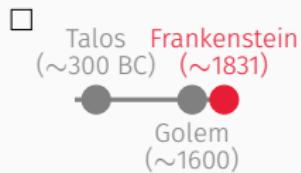
# The history of artificial intelligence



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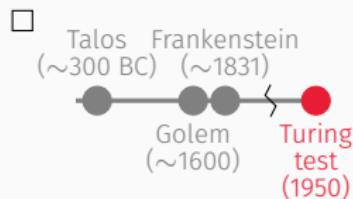
# The history of artificial intelligence



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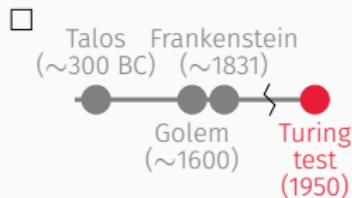
# The history of artificial intelligence



Alan Turing



# The history of artificial intelligence



Alan Turing

## M I N D

A QUARTERLY REVIEW  
OF  
PSYCHOLOGY AND PHILOSOPHY

### I.—COMPUTING MACHINERY AND INTELLIGENCE

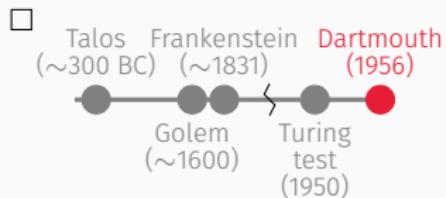
By A. M. TURING

#### 1. *The Imitation Game.*

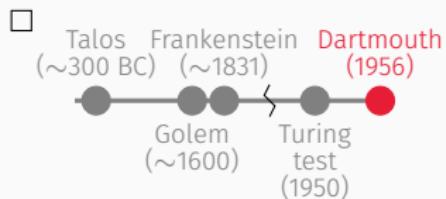
I propose to consider the question, 'Can machines think?' This should begin with definitions of the meaning of the terms 'machine' and 'think'. The definitions might be framed so as to reflect so far as possible the normal use of the words, but this attitude is dangerous. If the meaning of the words 'machine' and 'think' are to be found by examining how they are commonly used it is difficult to escape the conclusion that the meaning and the answer to the question, 'Can machines think?' is to be sought in a statistical survey such as a Gallup poll. But this is absurd. Instead of attempting such a definition I shall replace the question by another, which is closely related to it and is expressed in relatively unambiguous words.

Computing Machinery and Intelligence, A. M. Turing, *Mind*, 1950

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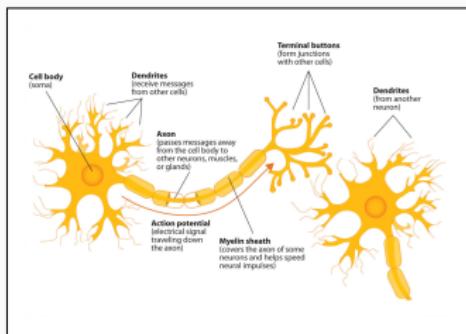
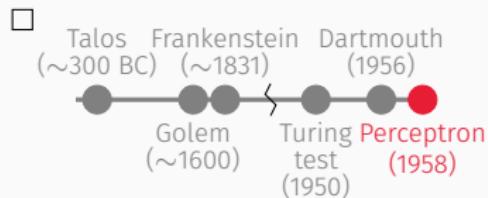


"We propose that a 2-month, 10-man study of artificial intelligence be carried out [...]. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in [...] a summer."

- **Proposal, Dartmouth summer school (1956)**



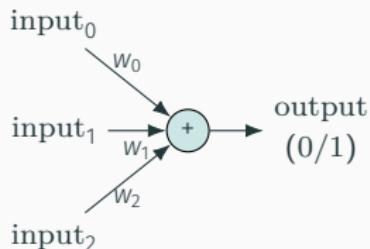
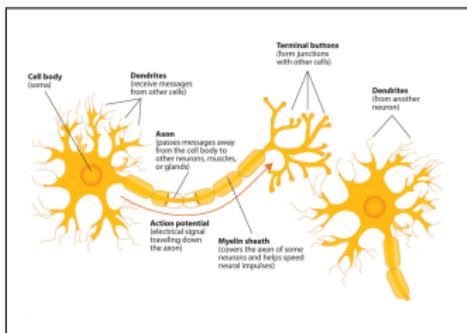
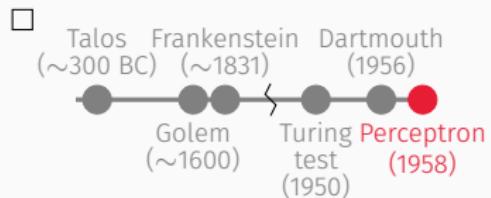
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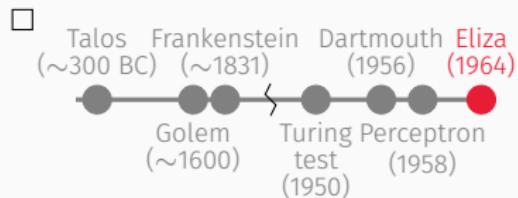
The neuron is the building block of the nervous system, Stangor, C. and Walinga, J, *Introduction to psychology*, 2024



# The history of artificial intelligence



# The history of artificial intelligence

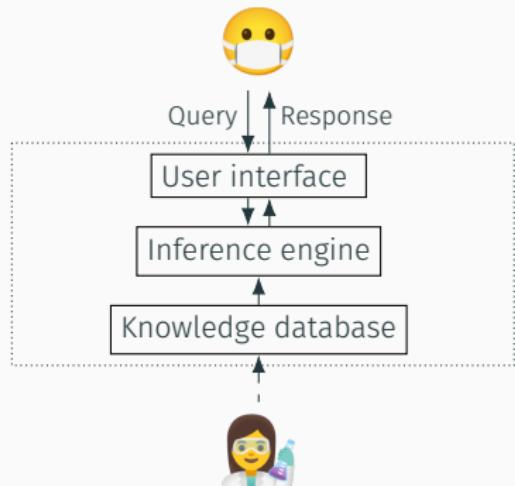
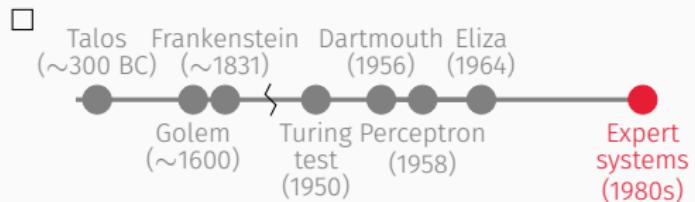


Talk to Eliza by typing your questions and answers in the input box.

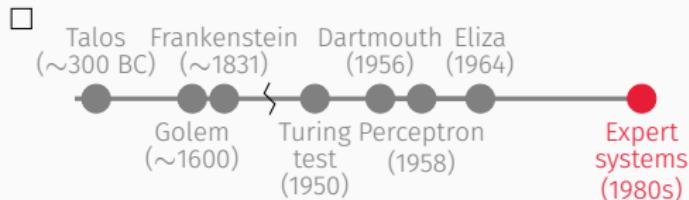
```
* I'm feeling kind of sad today
> Do you believe it is normal to be feeling kind of sad today?
* No, I would prefer to be happy
> Are you sure?
* Yes
> Are you sure about that?
* Yes
> Okay, now you're repeating yourself. That is not moving us forward.
* You started
> Oh... Let's move on to something else for a bit. started?
```

TYPE HERE

# The history of artificial intelligence



# The history of artificial intelligence



1) Patient's name (first-last)  
\*\* **FRED BRAUN**

2) Sex:  
\*\* M

3) Age:  
\*\* 55

4) Are there any cultures for Fred Braun which may be related to the present illness, and from which organisms have been grown successfully in the microbiology laboratory?  
\*\* y

-----CULTURE-1-----  
5) From what site was the specimen for CULTURE-1 taken?  
\*\* BLOOD

\*BLOOD  
6) Please give the date and time when CULTURE-1 was obtained. (mo/day/yr time)  
\*\* JUN 20, 1977  
The first organism isolated from the blood culture of 20-JUN-77 (CULTURE-1) will be referred to as:

-----ORGANISM-1-----  
7) Enter the laboratory-reported identity of ORGANISM-1:  
\*\* UNKNOWN

8) The stain (Gram or Ziehl-Neelsen acid-fast) of ORGANISM-1:  
\*\* NEG

9) Is ORGANISM-1 a rod or coccus (etc.):  
\*\* ROD

10) What is the form of the individual organisms (e.g. Lancelet-shaped for cocc., fusiform for rods, etc.)?  
\*\* FUSIFORM

{...more questions follow in order to gather sufficient information to infer the identity and significance of the infecting organisms...}

{background patient data}

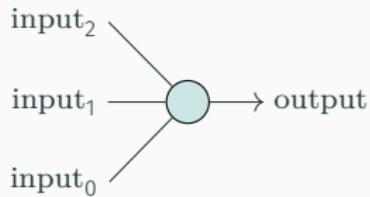
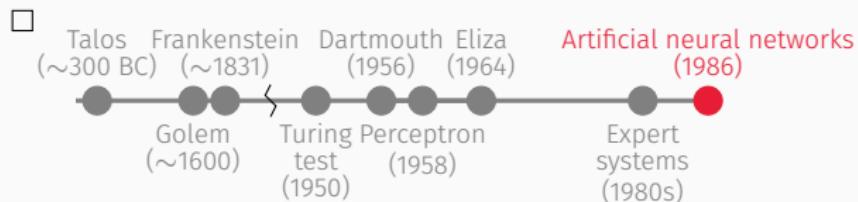
{typically identity is not yet known}

{preliminary lab results give some clues}

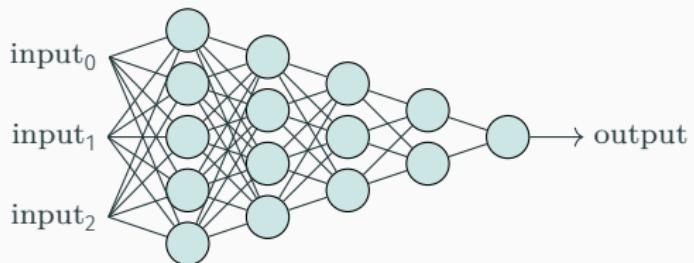
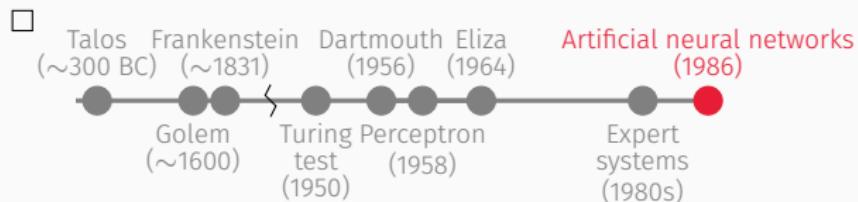
MYCIN, William van Melle, *International Journal of Man-Machine Studies*, 1978



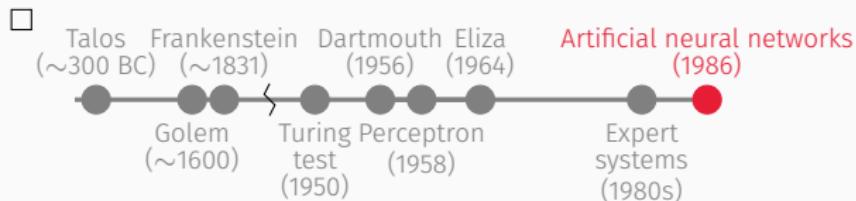
# The history of artificial intelligence



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# The history of artificial intelligence



## Learning representations by back-propagating errors

David E. Rumelhart\*, Geoffrey E. Hinton†  
& Ronald J. Williams\*

\* Institute for Cognitive Science, C-015, University of California,  
San Diego, La Jolla, California 92093, USA

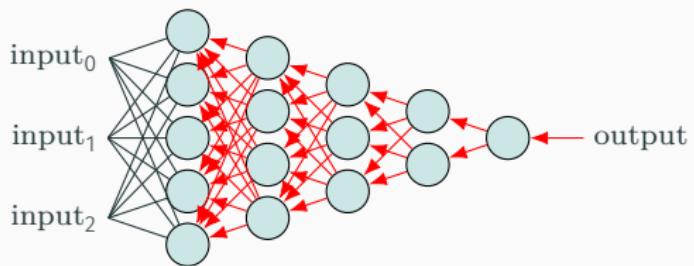
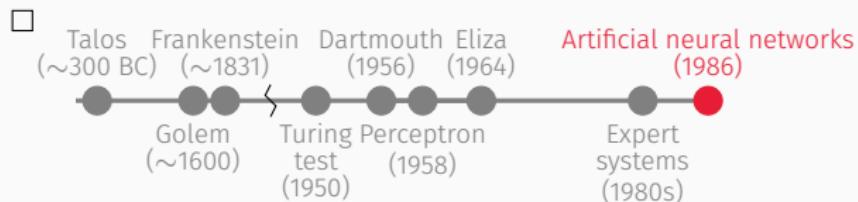
† Department of Computer Science, Carnegie-Mellon University,  
Pittsburgh, Philadelphia 15213, USA

We describe a new learning procedure, back-propagation, for networks of neurone-like units. The procedure repeatedly adjusts the weights of the connections in the network so as to minimize a measure of the difference between the actual output vector of the net and the desired output vector. As a result of the weight adjustments, internal 'hidden' units which are not part of the input or output come to represent important features of the task domain, and the regularities in the task are captured by the interactions of these units. The ability to create useful new features distinguishes back-propagation from earlier, simpler methods such as the perceptron-convergence procedure<sup>1</sup>.

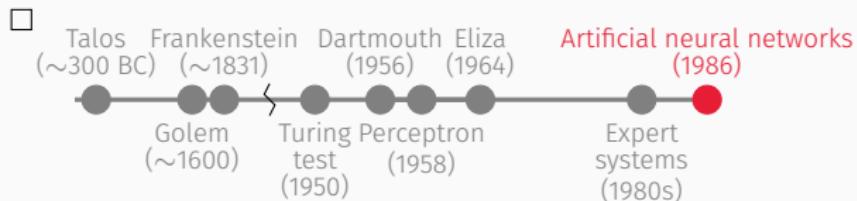
Learning representations by back-propagating errors, Rumelhart, D. et al., *Nature*, 1986



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## Learning representations by back-propagating errors

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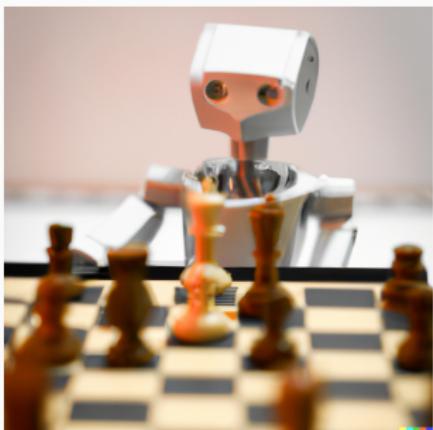
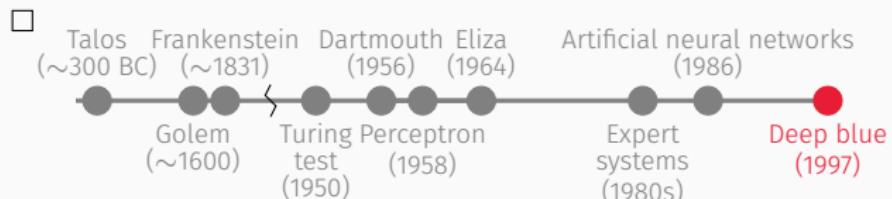
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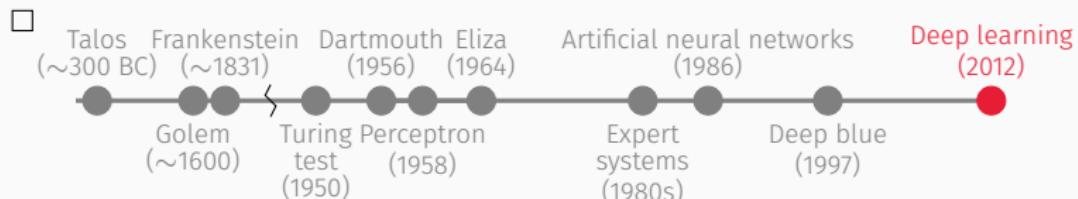


Source: DALL-E

- IBMs Deep Blue became the first computer to beat the reigning human world champion in chess.
- Deep blue won with 3½ points to Garry Kasparovs 2½ after six matches.
- Kasparov famously stated that "Deep Blue was intelligent the way your programmable alarm clock is intelligent."



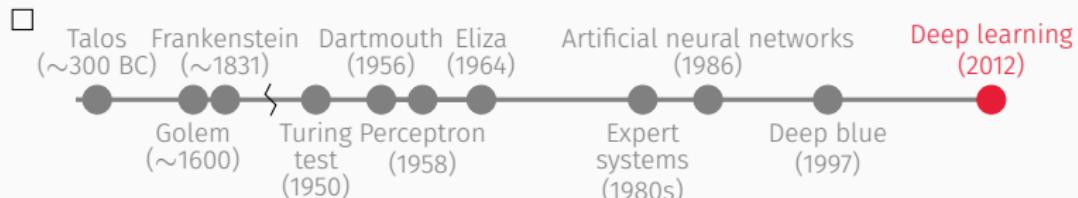
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Cat



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Sunflower



Ladybug



Cat



Airplane

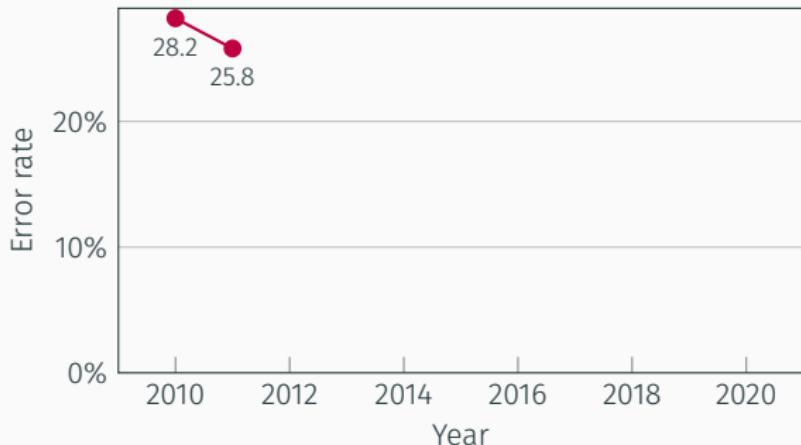
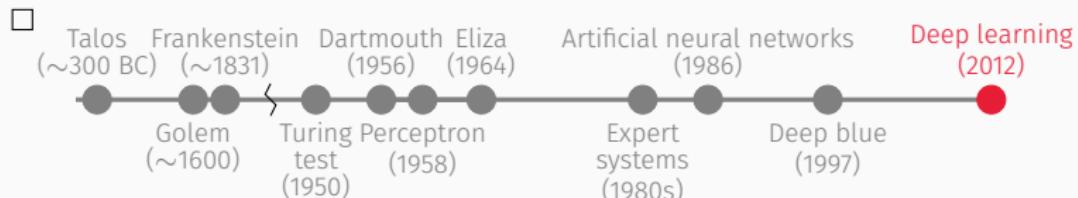


Shark

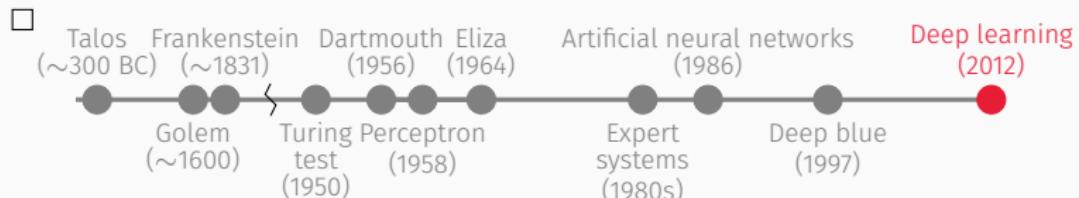
ImageNet: ~14m images, ~22k categories



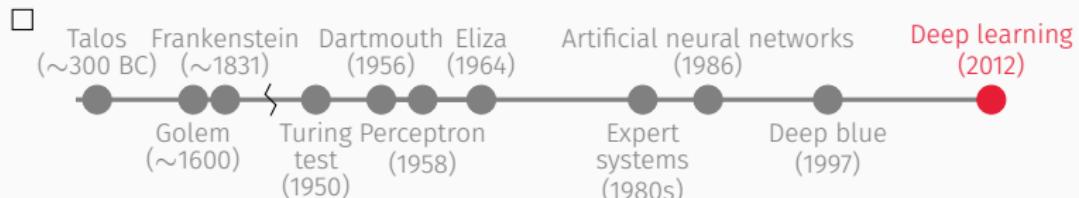
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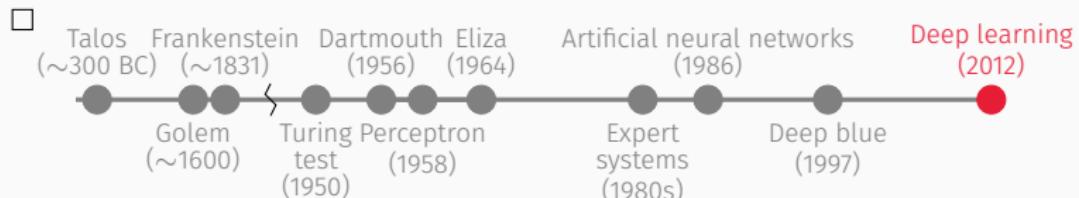
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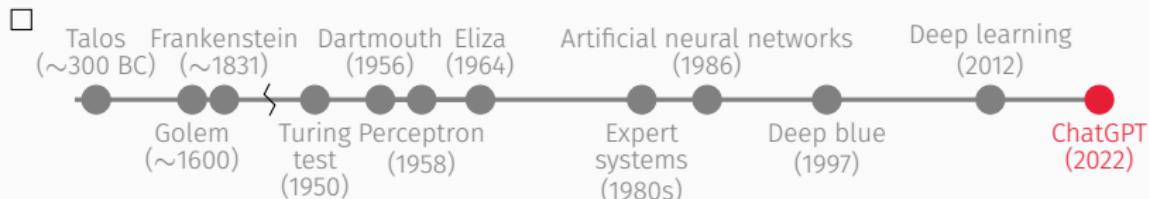
# The history of artificial intelligence



# The history of artificial intelligence



# The history of artificial intelligence



Hi ChatGPT, can you summarize the history of artificial intelligence for a class of second year psychology students?

Of course! Given that this is for second-year psychology students, I'll try to keep it succinct, while highlighting the important milestones and drawing relevant connections to psychology.

### Brief History of Artificial Intelligence

#### 1. Philosophical Foundations (Ancient Times - 19th Century)

- \* Philosophers like Plato and Aristotle speculated about the nature of human thought. This was the beginning of conceptualizing "thinking" as a symbolic process.
- \* Logic and reasoning were formalized by philosophers and mathematicians, laying the groundwork for computational thinking.

#### 2. Birth of AI (1940s - 1950s)

- \* Alan Turing proposed the idea of a universal machine that could simulate any human intellect, leading to the *Turing Test* as a measure of machine intelligence.
- \* The term "Artificial Intelligence" was coined at the *Dartmouth Conference (1956)*. This is generally considered the birth of AI as an academic field.

#### 3. Early Enthusiasm & Disillusionment (1960s - 1970s)

- \* **Symbolic AI:** Focused on imitating human reasoning through symbols and rules. Programs like SHRDLU and ELIZA were developed. ELIZA, in particular, simulated a Rogerian psychotherapist and highlights the intersection of AI and psychology.
- \* However, many of AI's early promises were unmet, leading to periods of reduced funding and interest known as "AI winters."

