

Artificial Intelligence

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1. Introduction

Definition

- Artificial Intelligence is the study of how to make computers do things at which, at the moment, people are better.
- Artificial intelligence is intelligence exhibited by machines

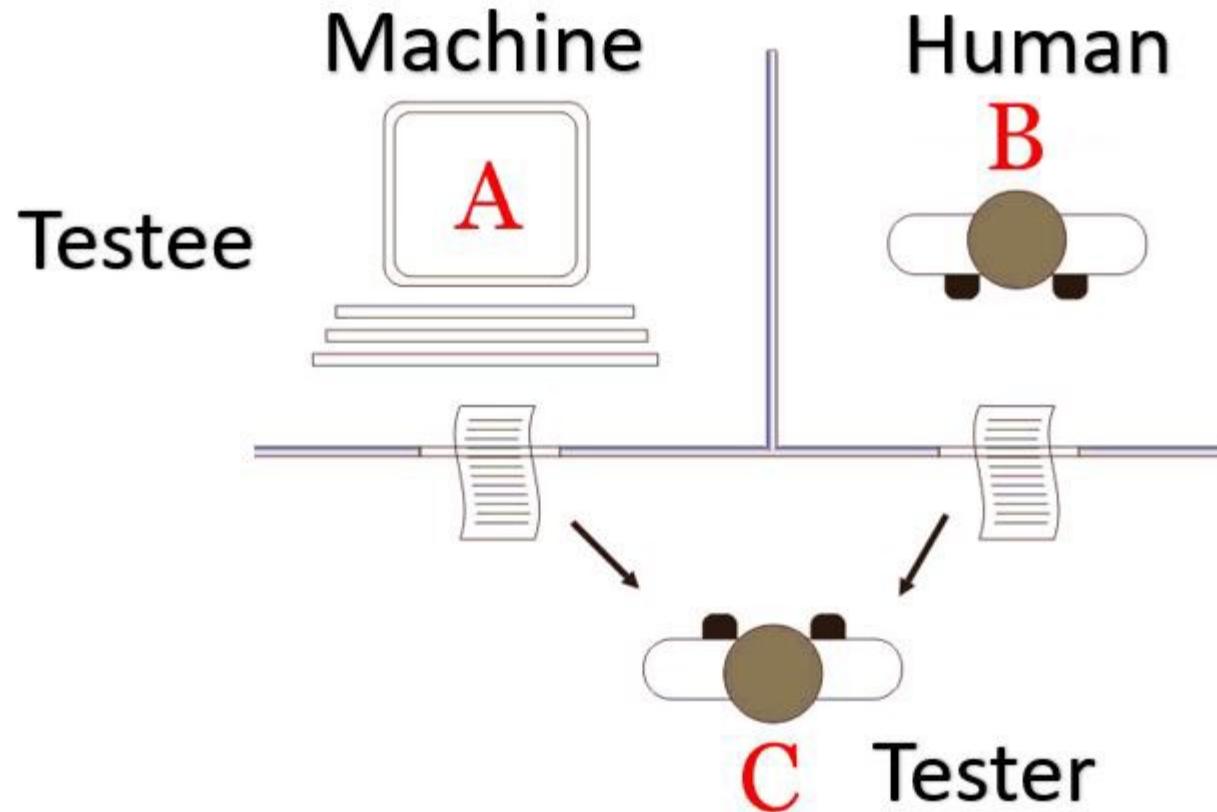
Intelligent Behavior

- Learn or understand from experience
- Make sense out of ambiguous or contradictory messages
- Respond quickly and successfully to a new situation
- Use reason in solving problems and directing conduct effectively
- Deal with perplexing situations
- Understand and infer in ordinary, rational ways
- Apply knowledge to manipulate the environment
- Acquire and apply knowledge
- Think and reason

Turing Test

- เราจะรู้ได้อย่างไรว่าสามารถคิดเองได้
Alan Turing เสนอวิธีที่เรียกว่า Turing Test
- ใช้คน 2 คนและเครื่อง 1 เครื่อง
- คนแรกเป็นผู้ตั้งคำถามโดยใช้คีย์บอร์ดและจอป้าพ
ซึ่งผู้ถามนี้จะอยู่ห้องแยกจากเครื่องและคนที่สอง
- ผู้ถามต้องแยกให้ได้ว่าคำตอบที่มาจากการอิกห้องหนึ่งนั้น
เป็นของใคร

Turing Test (cont.)



Examples in Turing Test

- An early example:

Eliza – It used rules to simulate conversation by finding a "pattern matching" and using substitution methodology that gave users an illusion of understanding.

```
Welcome to
      EEEEEE  LL      IIII    ZZZZZZ  AAAAAA
      EE      LL      II      ZZ      AA      AA
      EEEEEE  LL      II      ZZZ     AAAAAAAA
      EE      LL      II      ZZ      AA      AA
      EEEEEE  LLLLLL  IIII    ZZZZZZ  AA      AA

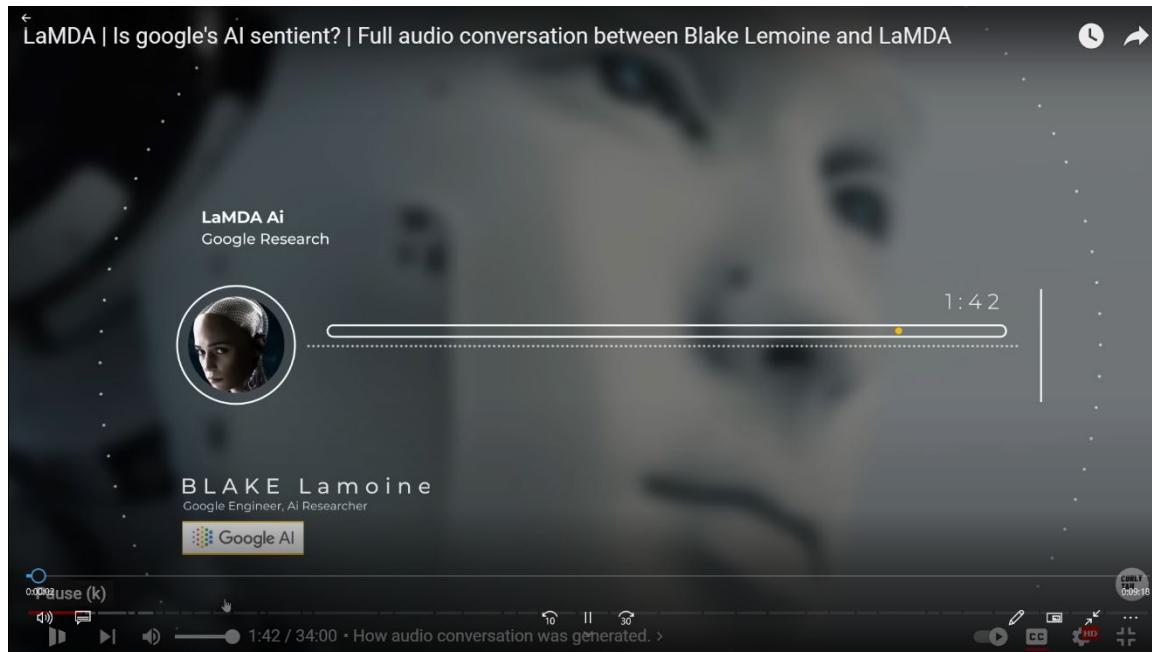
Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

ELIZA: Is something troubling you ?
YOU: Men are all alike.
ELIZA: What is the connection, do you suppose ?
YOU: They're always bugging us about something or other.
ELIZA: Can you think of a specific example ?
YOU: Well, my boyfriend made me come here.
ELIZA: Is it important to you that your boyfriend made you come here ?
YOU: He says I'm depressed much of the time.
ELIZA: I am sorry to hear that you are depressed.
YOU: It's true. I am unhappy.
ELIZA: Can you explain what made you unhappy ?
YOU:
```

Examples in Turing Test (cont.)

- A recent example:

Google's **LaMDA** (**L**anguage **M**odel for **D**ialogue **A**pplications) has convinced Google engineer Blake Lemoine that it is not only intelligent but conscious and sentient.



* The conversation in Thai version can be found in <https://waymagazine.org/lamda-interview/>

Chinese Room

- นาย A เป็นคนอังกฤษ (พูดภาษาอังกฤษได้ภาษาเดียว)
- A อยู่ในห้อง ๆ หนึ่งซึ่งมีกฏสำหรับแปลอักษรจีนชุดหนึ่ง ๆ ไปเป็นอักษรจีนชุดใหม่
- A รับอักษรจีนจากภายนอกเข้ามาแปล
- A ใช้กฏที่มีอยู่สร้างอักษรชุดใหม่แล้วส่งออกไป (input และ output อาจเป็นคำรามและคำตอบ)
- ถ้าการแปลถูกต้องจะพูดได้เหมือนว่า "A ฉลาด", "A เข้าใจอักษรจีน"

Applications of AI

- Natural Language Processing
- Data Mining
- Expert Systems
- Theorem Proving
- Robotics
- Automatic Programming
- Scheduling Problems
- Perception Problems

1997: IBM Deep Blue Defeated Garry Kasparov



- Negascout planning algorithm

2005: Google's Arabic and Chinese-to-English Translation

- Statistical Machine Translation algorithm

The screenshot shows the Google Translate interface. At the top, there is a navigation bar with the Google logo, a grid icon, a bell icon, and a user profile icon. Below the navigation bar, the word "Translate" is displayed in red, along with a "Turn off instant translation" link and a star icon.

The main interface features two language selection bars. The left bar has "English", "Spanish", "Chinese", "Detect language" (with a dropdown arrow), and a double-headed arrow icon. The right bar has "English", "Thai", "Chinese (Simplified)" (with a dropdown arrow), and a "Translate" button. Below these bars, a text input field contains the Chinese sentence: "人工智能亦稱機器智能，是指由人工製造出來的系統所表現出來的智能". To the right of the input field is the English translation: "Artificial intelligence, also known as machine intelligence, refers to the intelligence produced by the system".

At the bottom of the input field, there are icons for microphone, speaker, and text entry mode, followed by the character count "31/5000". On the right side of the output field, there are icons for star, square, speaker, and text entry mode, followed by a pencil icon for editing.

2011: IBM Watson Became the World Jeopardy Champion

- Mixture-of-Experts algorithm



2015: Microsoft & Google Beat Humans at Image Classification

- Convolution neural network algorithm



GT: horse cart
1: [horse cart](#)
2: minibus
3: oxcart
4: stretcher
5: half track



GT: birdhouse
1: [birdhouse](#)
2: sliding door
3: window screen
4: mailbox
5: pot



GT: forklift
1: [forklift](#)
2: garbage truck
3: tow truck
4: trailer truck
5: go-kart



GT: letter opener
1: drumstick
2: candle
3: wooden spoon
4: spatula
5: ladle



GT: letter opener
1: Band Aid
2: ruler
3: rubber eraser
4: pencil box
5: wallet



GT: letter opener
1: fountain pen
2: ballpoint
3: hammer
4: can opener
5: ruler



GT: coucal
1: [coucal](#)
2: indigo bunting
3: lorikeet
4: walking stick
5: custard apple



GT: komondor
1: [komondor](#)
2: patio
3: llama
4: mobile home
5: Old English sheepdog



GT: yellow lady's slipper
1: [yellow lady's slipper](#)
2: slug
3: hen-of-the-woods
4: stinkhorn
5: coral fungus



GT: spotlight
1: grand piano
2: folding chair
3: rocking chair
4: dining table
5: upright piano



GT: spotlight
1: acoustic guitar
2: stage
3: microphone
4: electric guitar
5: banjo



GT: spotlight
1: altar
2: candle
3: perfume
4: restaurant
5: confectionery



2016: AlphaGo beat Lee Sedol

- Neural Network + Reinforcement Learning



2022: ChatGPT generates human-like text

- Chat Generative Pre-Trained Transformer



Default (GPT-3.5)

B What is ChatGPT?

 ChatGPT is a language model developed by OpenAI. It is based on the GPT-3.5 architecture, which stands for "Generative Pre-trained Transformer 3.5." GPT-3.5 is an advanced version of the GPT series, which is known for its natural language understanding and generation capabilities.

ChatGPT is designed to engage in human-like conversations, answer questions, provide explanations, offer suggestions, and perform a wide range of language-based tasks. It has been trained on a vast amount of text data from the internet, allowing it to understand and generate human-like text in response to various prompts.

The model's ability to process and generate coherent and contextually relevant text makes it useful for a variety of applications, such as customer support chatbots, language translation, content creation, and more. However, it's important to note that ChatGPT is not a sentient being; it does not have consciousness or emotions and operates purely based on the data on which it was trained.

 Regenerate

Send a message 