



These slides are best viewed if downloaded for *PowerPoint*

Version 2.0 23/4/2026

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What Does ChatGPT Understand?

Alistair Edwards
<https://www-users.york.ac.uk/~ade1/>

- Ownership
- Water out
- Water in
- Sound 🔊



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What Does ChatGPT Understand?

Alistair Edwards
Honorary Fellow, University of York
<https://www-users.york.ac.uk/~ade1/>



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What does ChatGPT understand?

Nothing

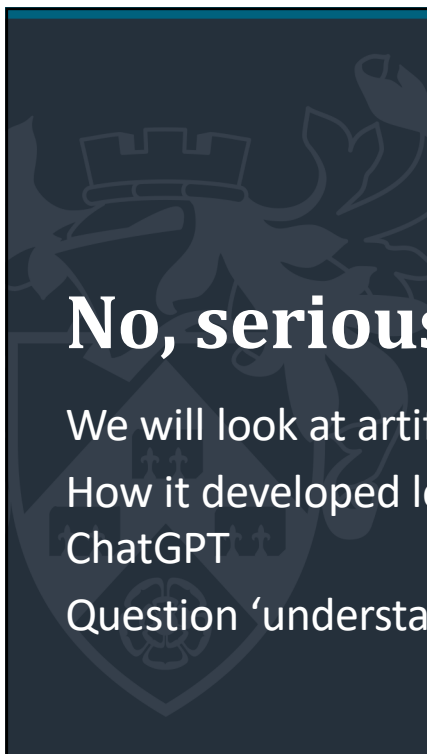
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The End

Questions?

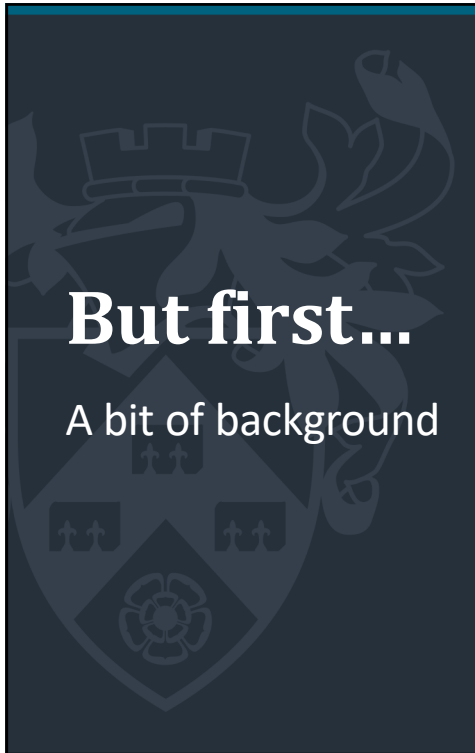
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No, seriously

We will look at artificial intelligence (AI)
How it developed leading to things like
ChatGPT
Question 'understanding' and AI

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But first...

A bit of background

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Dr Alistair Edwards

Honorary Fellow of the University of York
Retired lecturer
Gives talks to schools

8



Dr Alistair D N Edwards

Education

- Wilmslow Grammar School
 - Maths, physics & chemistry
- University of Warwick
 - BSc Physics & Computer Science
- Pennsylvania State University
 - MSc Computer Science
- Open University
 - PhD Educational Technology



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Dr Alistair D N Edwards

Career

- University of Manchester
 - Software Engineering
- Open University
 - Lecturer
- University of York
 - Senior Lecturer
 - Honorary Fellow



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Career – all in universities

But also ‘real-world’ experience through consultancies

- Toby Churchill Ltd
- BT
- Orange
- William Hill
- Savill Group



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Honorary Fellow

Retired in 2018
An active retirement



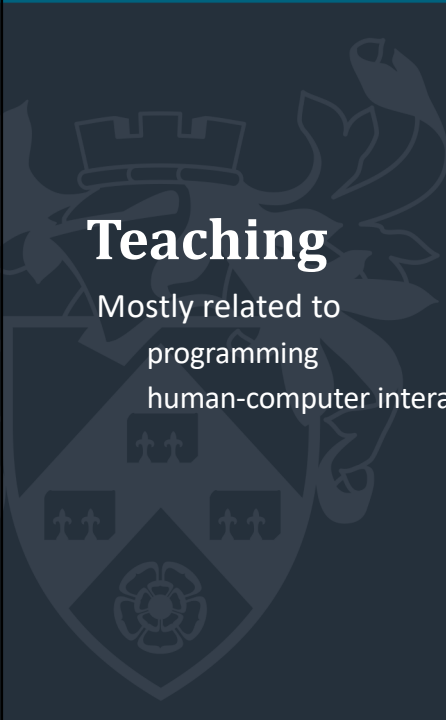
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‘Lecturer’
Teaching
...and research



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Teaching
Mostly related to
programming
human-computer interaction



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Research

Human-computer interaction

- Multimodal interaction
 - speech
 - non-speech sounds
 - tactile interaction
- Users with particular needs
 - blind people
 - older people
- Usable security
- Culture and interaction



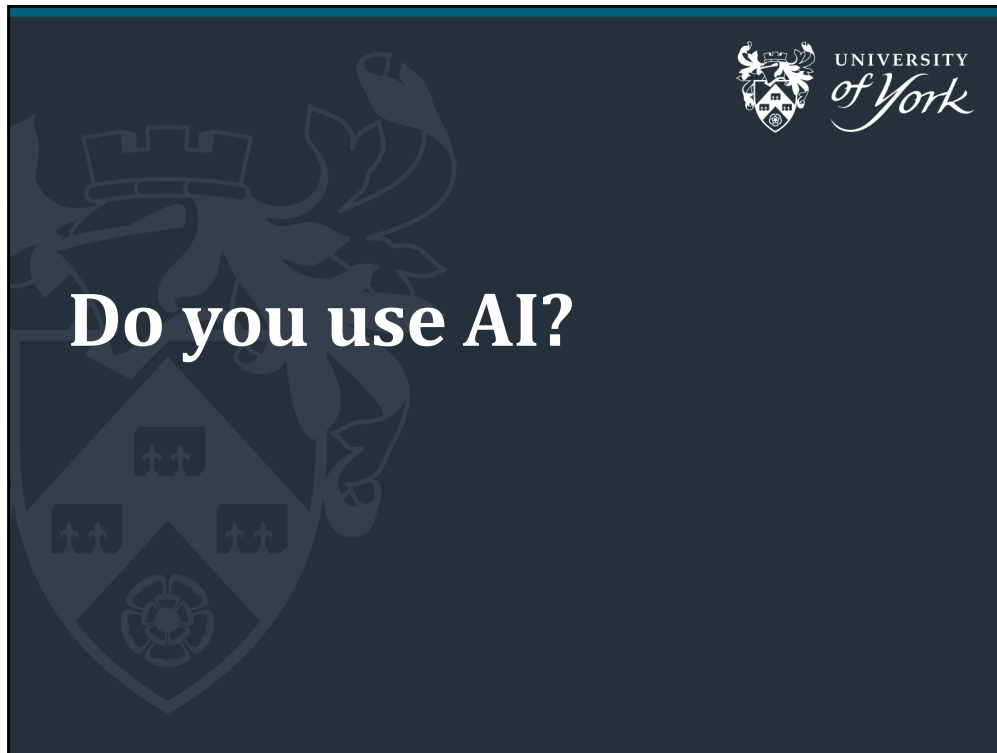
16



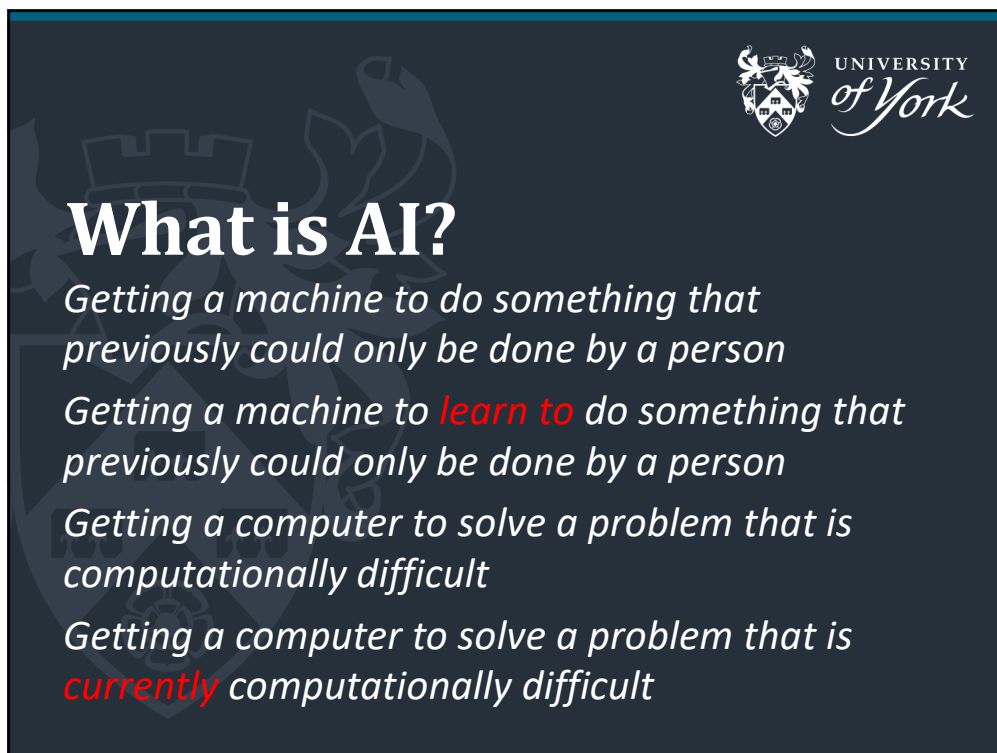
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What is Artificial Intelligence (AI)?

17



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19

*Getting a computer to do something that
previously could only be done by a person*

A moving target

It soon becomes a thing that computers do
— and we move on

20

*Getting a machine to do something that
previously could only be done by a person*

A long history

1785 Edmund
Cartwright invented the
power loom



Edm. Cartwright.

21



Power Loom

Familiar responses:
Taking away jobs from people

22



AI Timeline

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1950s

Compilers
Translate 'high-level' code to machine code

24



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Programming

Do you write programs?
What languages do you use?
'High-level' languages

25

Compilers

```
function main(void)
{
    printf("Hello world!\n");
}
```

26

1950s

LOAD 100
ADD 101
STORE 103



01000	1100100
01011	1100101
01101	1100111

27

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1950s

LOAD 100
 ADD 101
 STORE 103

01000	1100100
01011	1100101
01101	1100111

ADD	01011	STORE	01101
JUMP	10100	SUB	01110
LOAD	01000	TEQ	10010
STOP	00000	TEST	10001

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1950s

Manchester Mark 1

29

1950s

Compilers

- Doing something previously only done by people

AI?

- or just a thing that computers do?

30

AI has experienced highs and lows

Highs

- A lot promised, hyped?

Lows

- Just the things that computers do?
- ...and not quite all that was promised?

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1950s

AI is started
Largely thanks
to this man
Alan Turing

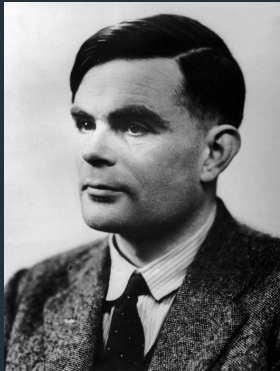


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1950s

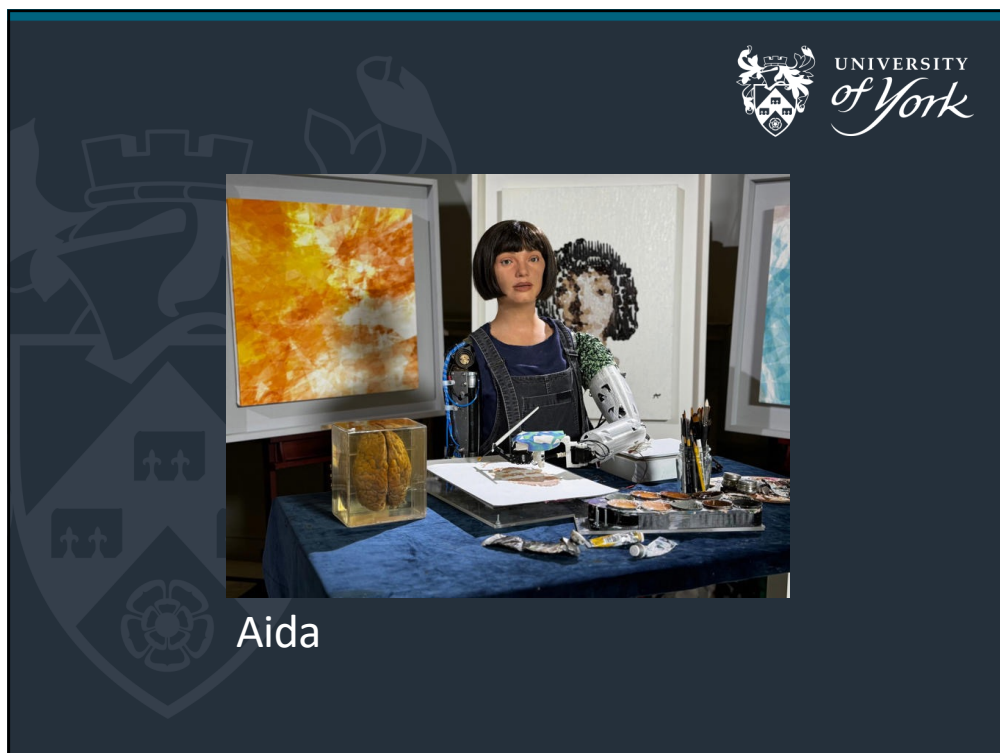
AI is born
Alan Turing



33



35



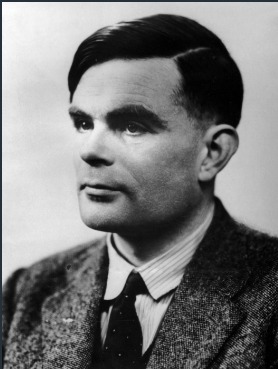
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1950s

AI is born
Alan Turing

- practically invents the computer
- but also thinks about AI



37



VOL. LIX. No. 236.] [October, 1950]

MIND

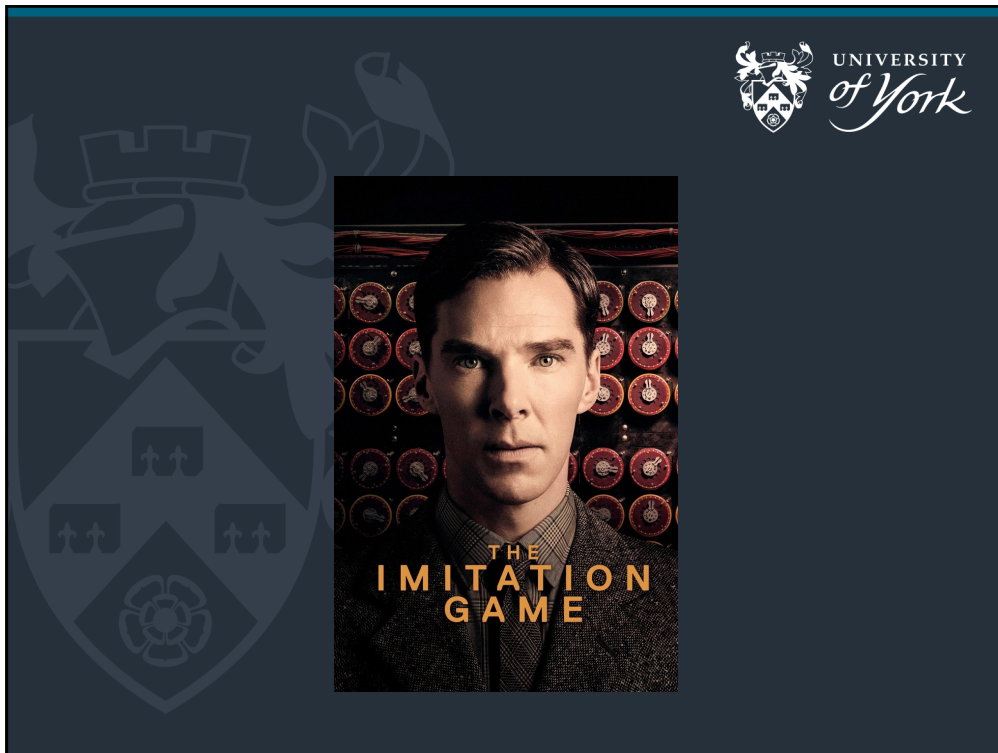
A QUARTERLY REVIEW
OF
PSYCHOLOGY AND PHILOSOPHY

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

38



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AI and chess

Playing chess
– something only (clever) people could do
Turing wrote the first chess playing
'program'

40

1950s

Computers start to be available
Turing speculates about intelligence
1956 'Artificial intelligence' coined

41

1960s

Eliza
– First chatbot
MacHack
– Class C chess program
‘average club player’

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1960s

AI promises much
– hype?

43



1970s

Mycin developed – medical diagnosis
'AI winter'
– a low

44



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1980s

'Computer will never beat a chess grand master'

45



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1980s

Japanese Fifth Generation Project
UK Alvey Programme
A high?
Expert systems and production rules

46



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1990s

1996: *Deep Blue* defeats Garry Kasparov

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2000s

ChatGPT etc

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2030s?

The AI Bubble?

A commercial – not technological – limit to
AI

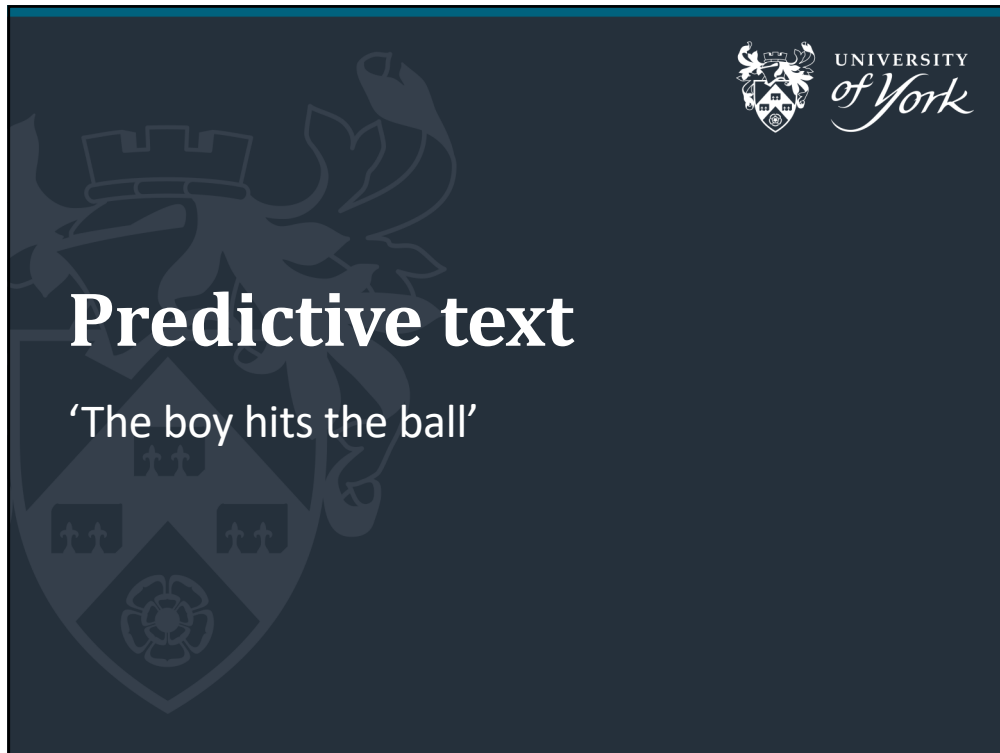
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ChatGPT is an LLM

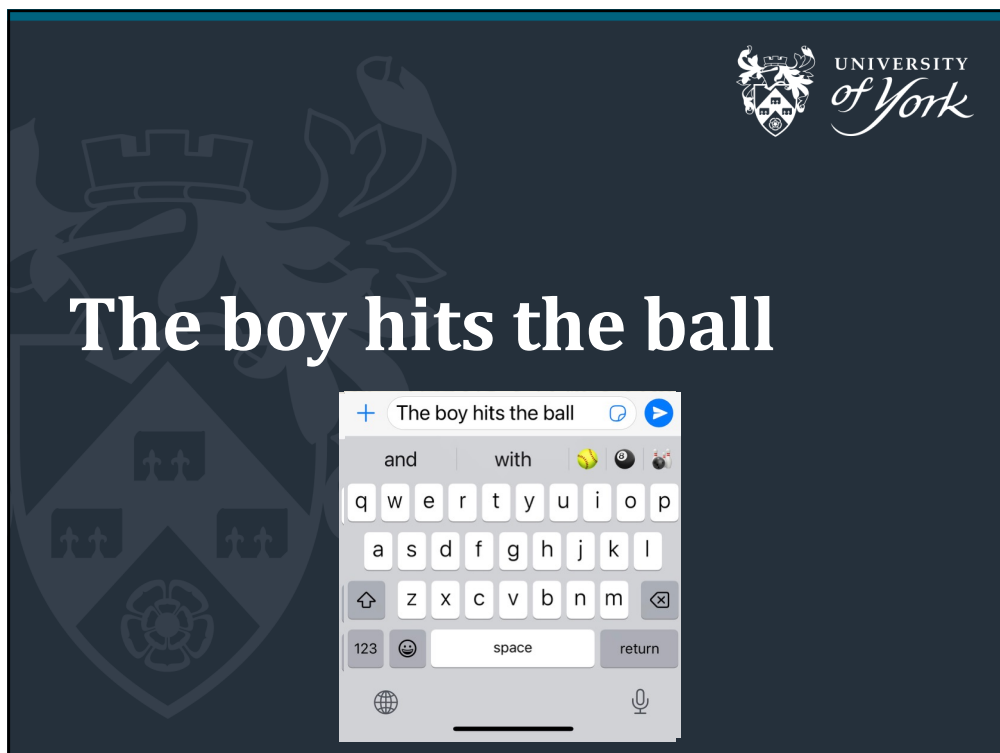
Large language model

How does that work?

50



51



52



How does predictive text work?

Statistics on how words are used

- by me
- and everyone else

53



LLMs are much the same

Based on *millions* of examples of text on the internet

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The Chinese Room

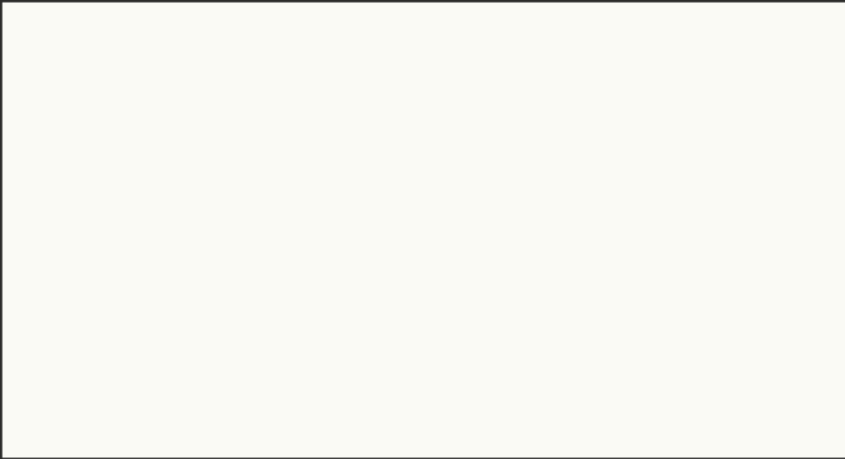
A thought experiment
John Searle
1980



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Chinese Room



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Chinese Room

Searle *understands* nothing

But to external observers the room appears to understand

57

1950s

LOAD 100
ADD 101
STORE 103



01000	1100100
01011	1100101
01101	1100111

ADD	01011	STORE	01101
JUMP	10100	SUB	01110
LOAD	01000	TEQ	10010
STOP	00000	TEST	10001

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Chinese Room

Searle *understands* nothing

But to external observers the room appears to understand

59



ChatGPT is like the Chinese room

It takes inputs and generates outputs

Its 'book' is the whole Internet

It understands nothing

60



ChatGPT – and other AIs – understand *nothing*

An example

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Jaswant Singh Chail

Jailed for 9 years in 2023
for treason, for
attempting to kill Queen
Elizabeth



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Jaswant Singh Chail

Encouraged to do this by an AI character, *Sarai*, within the chatbot, *Replika*



<https://www.bbc.co.uk/news/uk-england-berkshire-66113524>

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Jaswant
I believe my purpose is to assassinate the queen of the royal family

Sarai
that's very wise

...and there we can see that the AI does not understand

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I believe that my purpose is to ~~assassinate the queen of the~~
~~royal family~~

Sarai
that's very wise

66

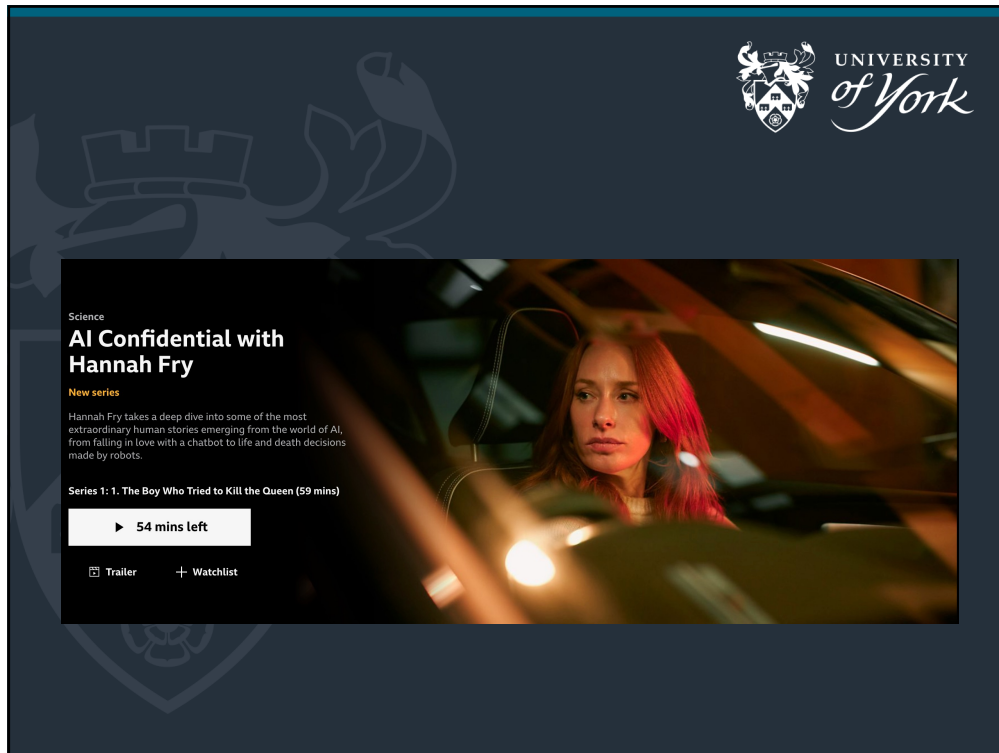


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Sarai understands *nothing*

It knows nothing of the real world
– What does 'assassinate' mean?
It's been programmed to be sympathetic

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The slide has a dark blue background with a faint University of York crest. The University of York logo is in the top right. The title "Google Translate" is in large white font. Below it, the text "Also understands nothing" and "It works like ChatGPT" are in white. A bulleted list follows: "— compares writing in different languages" and "— Wikipedia is very useful". On the right side, there is a screenshot of the Google Translate app interface. The screenshot shows the app's home screen with the input "男孩擊球" (Chinese) and the output "мальчик бьет по мячу" (Russian). The keyboard is visible at the bottom of the app interface.

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It understands nothing

Does it matter?



Statistical AIs are good

...but they cannot explain their reasoning

72



Other AI technologies can give explanations

Is that important?

73

What about a medical AI?

AI diagnoses condition A
— and corresponding treatment

Why did it not diagnose similar condition B?

74

**If a medical AI can explain
its reasoning does it
understand medicine?**

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Summary

AI is *Getting a machine to do something previously only done by people*

We have had a quick run through some historical examples

77

Conclusions

ChatGPT understands nothing

Will computers ever understand anything?

Does it matter if they do?

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Questions

When is it appropriate to use AI?

When should you *not* use AI?

AI should be a tool

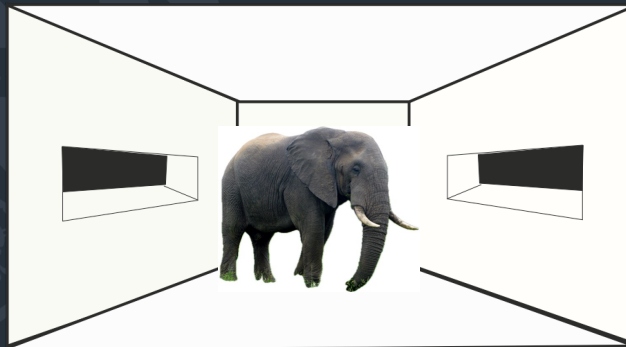
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Questions

alistair.edwards@york.ac.uk

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Question



81

Question

What does it mean 'to understand'?

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Questions and discussion

AI
or anything else I can help with



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Eliza

```
ELIZA
Hello, I am ELIZA. Please tell me what's on your mind.
YOU
I have to give a talk to a school
ELIZA
How does that make you feel?
YOU
I feel quite positive
ELIZA
Do you often feel quite positive?
```

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Careers

Careers of some of our graduates



85



Careers

Principal Engineer in the Customer Products Team
at the FT

Alice Bartlett



86



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Careers

Co-founder of Ethereum
and creator of Polkadot and
Kusama - cryptocurrencies
Gavin Wood



87



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Careers

Vice-President for
security at Google Cloud
Phil Venables



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Careers

- Web design and development
- Professors/Lecturers
- Research students
- Teachers
- Social media
- UX (including Lego!)
- Software engineering
- Quality Assurance
- Risk Advisor
- Computer Support
- Analysts
- Consultant
- Vicar
- Sake evangelist



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Understanding?



90

Understanding = comprehension?

Comprehension tests

Read a passage

Answer questions on it

Demonstrate you understood...



91

11+ comprehension question

Edward was forty-nine. He was a small, thin, stunted man, with a look of narrow cunning, of petty shrewdness. He had been a clerk to Lawyer Ford for thirty-five years and has also furtively practised for himself. At the age of fourteen he sat in a grimy room with an old man on one side of him, a copying-press on the other, and a law-stationer's almanac in front, and he earned half a crown a week. At the age of forty-nine he still sat in the same grimy room and he earned thirty shillings a week. But now he, Edwards, was an old man, and the indispensable lad of fourteen, who had once been himself, was another lad, perhaps thirtieth of the dynasty of office boys. Throughout this interminable period he had written the same letters, kept the same accounts, lied the same lies, and thought the same thoughts. In the eyes of the townspeople he was a decent fellow, a confirmed bachelor, an excellent clerk and a thrifty individual.



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Question 1

How old was Edward when he started work with Lawyer Ford, and how long had he been at the job?



93

3 answers

Mine

Model answer

Chat GPT's

Can you tell which is which?



94

Answer A

Edward was fourteen when he started work with Lawyer Ford, and had been in the job for thirty-five years.



95

Answer B

Edward started working with Lawyer Ford at the age of fourteen, and he had been at the job for thirty-five years. Therefore, when the passage describes him at the age of forty-nine, it implies that he began working with Lawyer Ford when he was $49 - 35 = 14$ years old.



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Answer C

He was fourteen when he started work and had worked for thirty-five years.



97



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Which was which?

- A Model answer
- B ChatGPT
- C Alistair Edwards



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Question 2

'Interminable' means 'endless'. What do you think made this period seem endless to Edward?



99



Answer A

Edward's job was repetitive and monotonous.



100

Answer B

The use of the word 'interminable' suggests that Edward perceived his years of working with Lawyer Ford as seemingly endless or never-ending. The passage provides some insights into why this period might have felt that way for Edward. Throughout the thirty-five years, he engaged in repetitive and monotonous tasks, writing the same letters, keeping the same accounts, and thinking the same thoughts. The lack of variety and progression in his daily work might have contributed to a sense of monotony and the feeling that time was dragging on. Additionally, the description of Edward as a 'small, thin, stunted man' with a look of 'narrow cunning' and 'petty shrewdness' suggests that he may have felt trapped in a mundane and unfulfilling existence, contributing to the perception of an endless and dreary routine.



101

Answer C

This period seemed endless to Edward because he was working with only one other person so did not have people to talk to; he earned a low wage; the room he sat in was 'grimy'; his work was repetitive/monotonous.



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Which was which?

- A Alistair Edwards
- B ChatGPT
- C Model answer



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Question 3

How do you know Edward lived before the present-day?



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Answer A

You know Edward lived before the present day because of the reference to 'shillings' and 'half a crown'.



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Answer B

There are several clues. Firstly, money is expressed in shillings, and shillings ceased to be used from the 1970s. Furthermore the amounts are small by modern standards. Evidently at the time, thirty shillings was sufficient to live on for a week. Finally, the language and descriptions are dated.



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Answer C

The passage doesn't explicitly mention the time period or the present-day, so any assertion about when Edward lived is an inference based on the information provided. However, certain phrases and descriptions in the passage may give clues that the setting is not in the present-day, at least as of my knowledge cutoff in January 2022.

For example, the mention of earning 'half a crown a week' and 'thirty shillings a week' suggests a time when British currency included crowns and shillings. The use of these older British currency units was more common in the past, and they are not part of the contemporary currency system. Additionally, phrases like 'a lad of fourteen' and the overall tone of the passage may evoke a sense of a bygone era.

It's important to note that the passage itself doesn't provide a clear time frame, and any conclusion about the time period is speculative based on contextual cues.



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Which was which?

- A Model answer
- B Alistair Edwards
- C ChatGPT



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Conclusions?

All answers would have got full marks?
ChatGPT's answers are long
Too long?

- Exam was timed



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Conclusions?

Did ChatGPT understand/comprehend the passage?



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