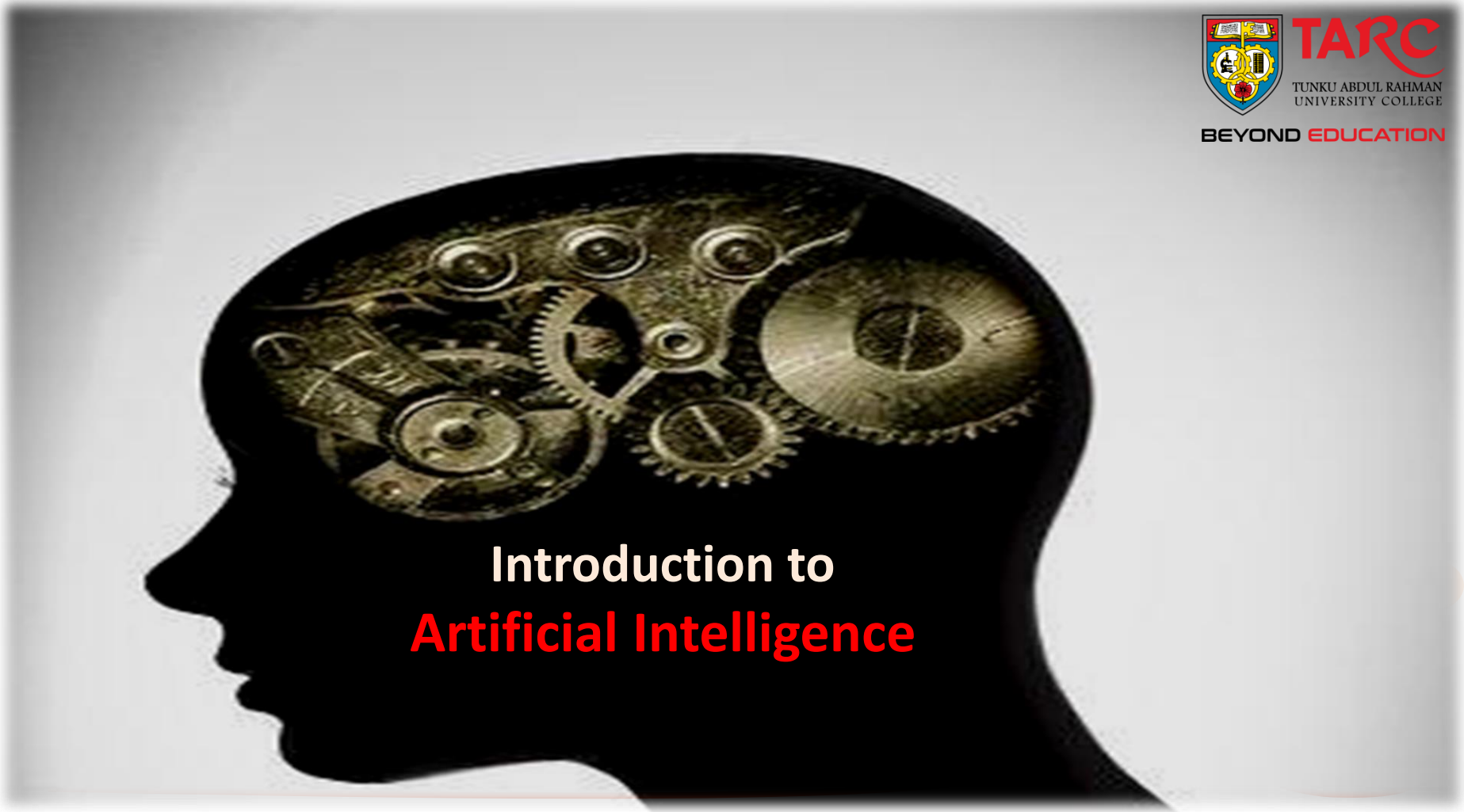
TARC
TUNKU ABDUL RAHMAN
UNIVERSITY COLLEGE
BEYOND EDUCATION
Introduction to
Artificial Intelligence

Objectives

- Introduction
- Define artificial Intelligence
- ExplainTuring Test

About Me

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Smart Campus Application Project Lead
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B.Comp.Sc.(Hons) in Artificial Intelligence (UM)

Google Classroom

Kindly Check your email and Accept the Invitation to join the Google Classroom

Google Classroom

Kindly Check your email and Accept the Invitation to join the Google Classroom

Course Plan

Assessment	Deadline	Contribution
Coursework		**60 %**
Assignment	Prototype: Week 13 Monday Document: Week 13 Friday	24 marks 36 marks
Test	Week 8	40 marks
Final Exam	4 questions (E-assessment)	**40%**

Introduction to Artificial Intelligence

first generation of AI researchers

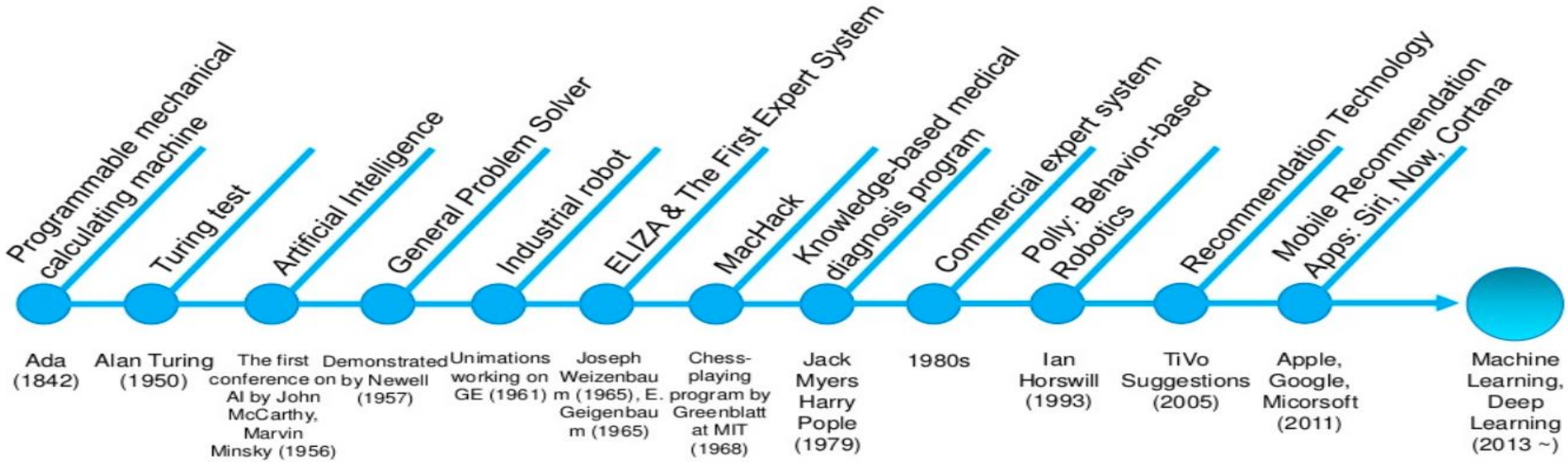
The IBM 702 in 1953: a computer used by the first generation of AI researchers

Evolution of Machines

RM4,827,650 RM 12,626 RM3,699

Equivalent price in 2020

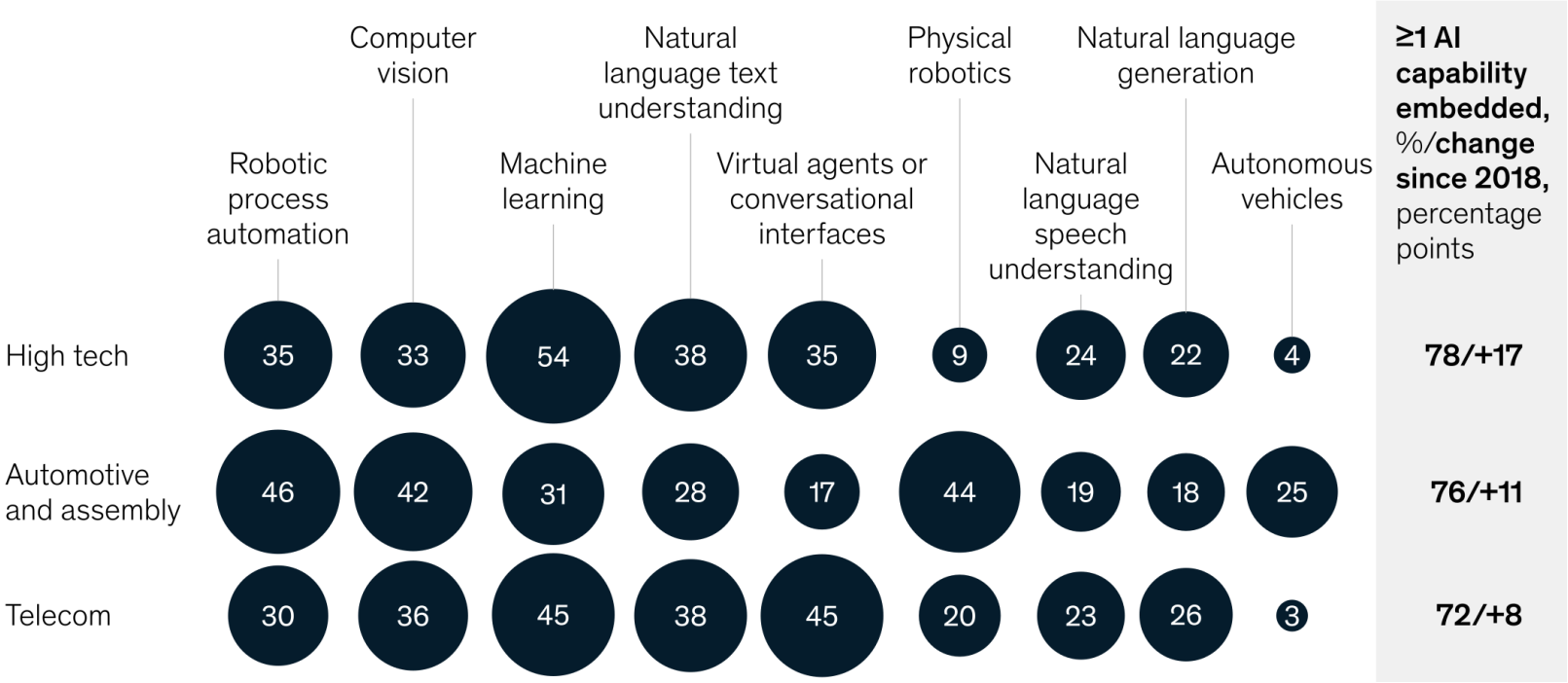
AI Timeline



Source: https://www.slideshare.net/kepark07/ai-history-tomlearning/4

Adoption of AI Capabilities by Top 3 Industries

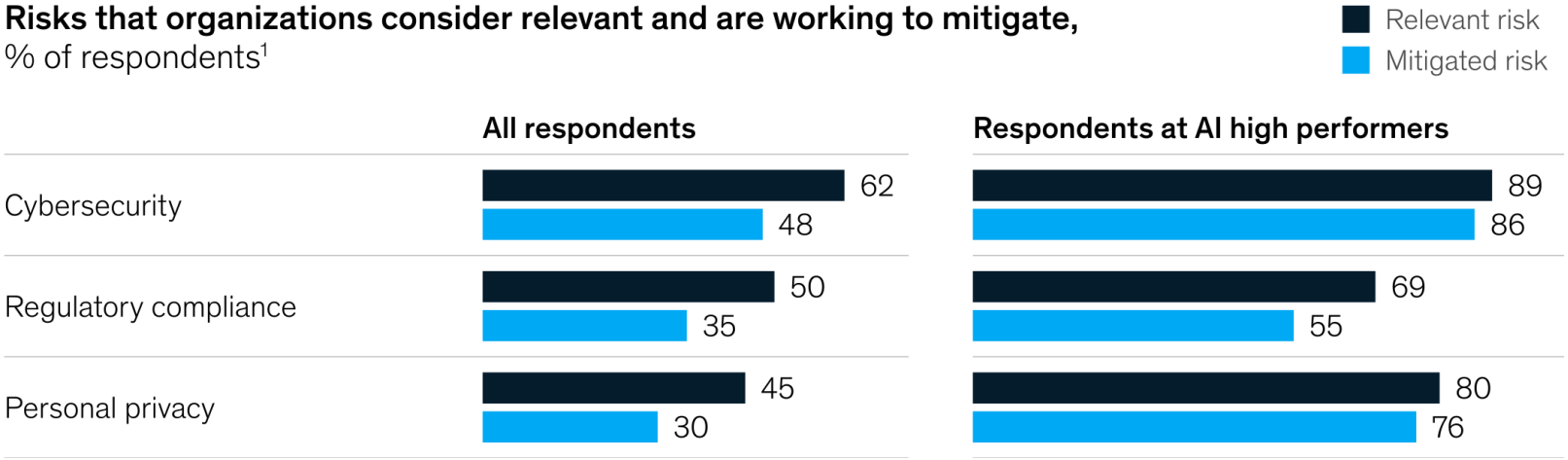
Organizations' AI capabilities,[1] % of respondents,[2] by industry



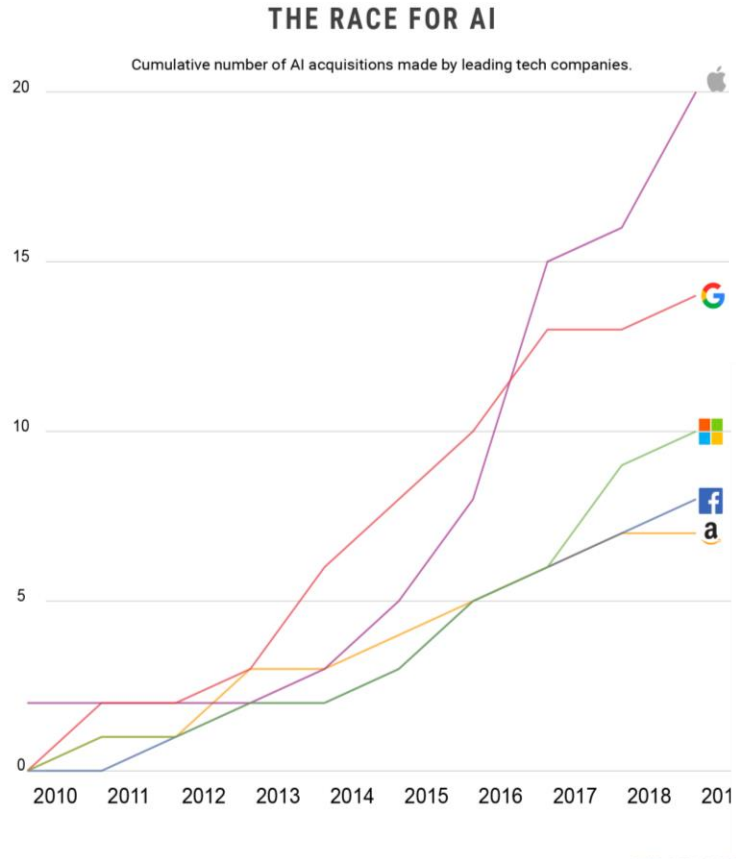
The Top 3 Risks that Organizations Consider Them Relevant

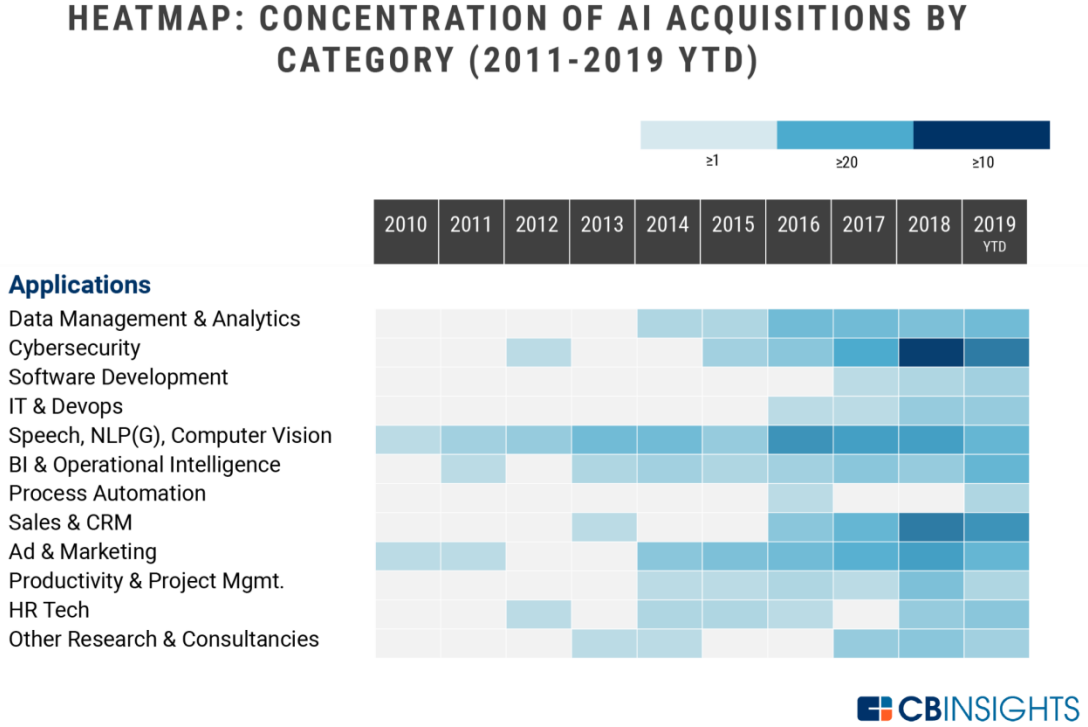
Despite extensive dialogue across industries about the potential risks of AI and highly publicized incidents of privacy violations, unintended bias, and other negative outcomes, the survey findings suggest that a minority (41%) of companies recognize many of the risks of AI use. Even fewer are taking action to protect against the risks.

Risks that organizations consider relevant and are working to mitigate,
% of respondents[1]



Tech Giants in AI development





Definition of Artificial Intelligence

Question

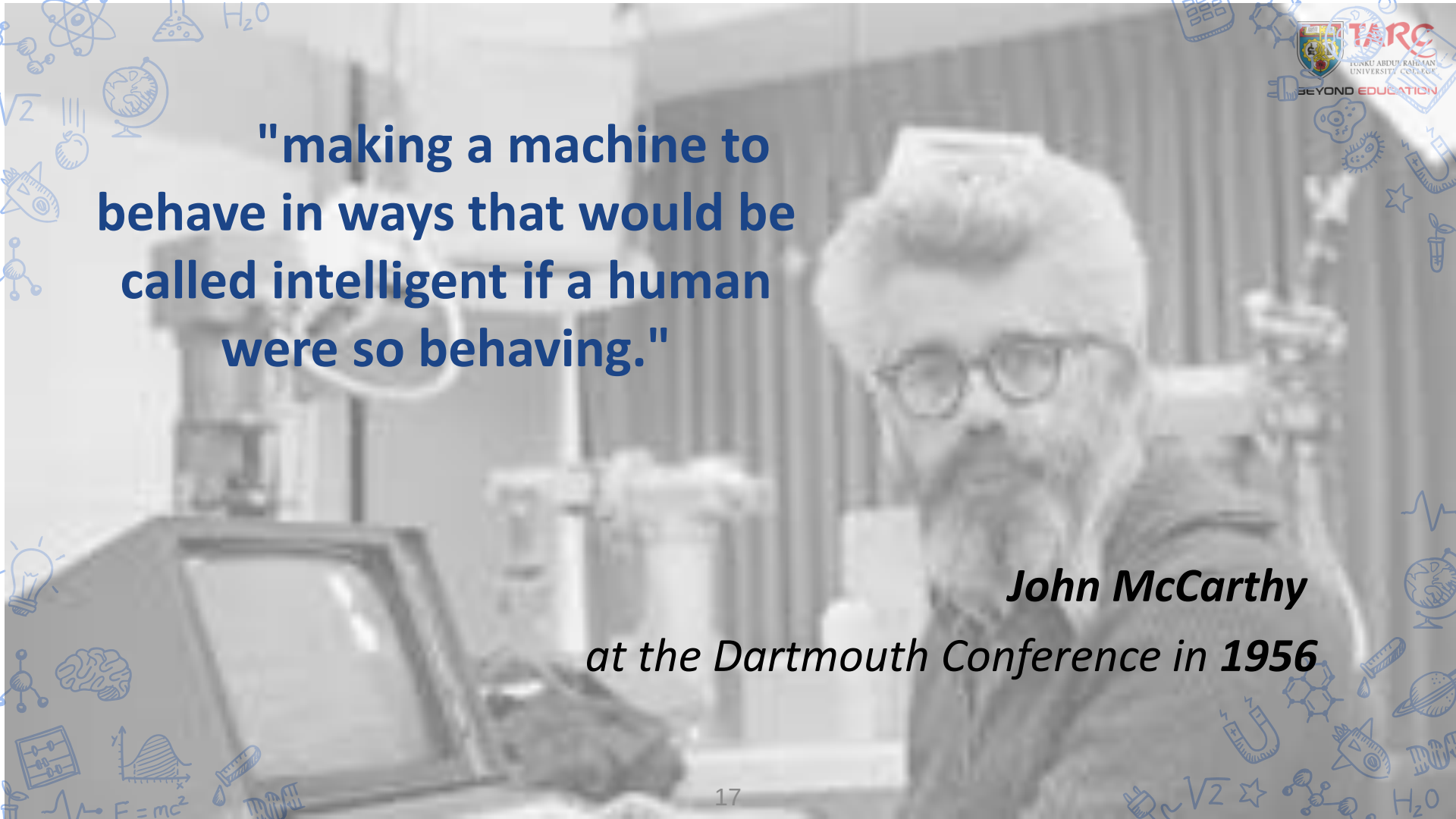
- How would you define Artificial Intelligence?

Artificial Intelligence

Artifice: clever or cunning devices or expedients, especially as used to trick or deceive others.

+

Intelligence: ?



"making a machine to behave in ways that would be called intelligent if a human were so behaving."

John McCarthy

*at the Dartmouth Conference in **1956***

Systems that act like human

- Automation
- Chatbot

Systems that think like human

- Machine learning
- Recommender

Artificial Intelligence

Systems that act rationally

- Adaptive Systems
- Planning & Optimisation

Systems that think rationally

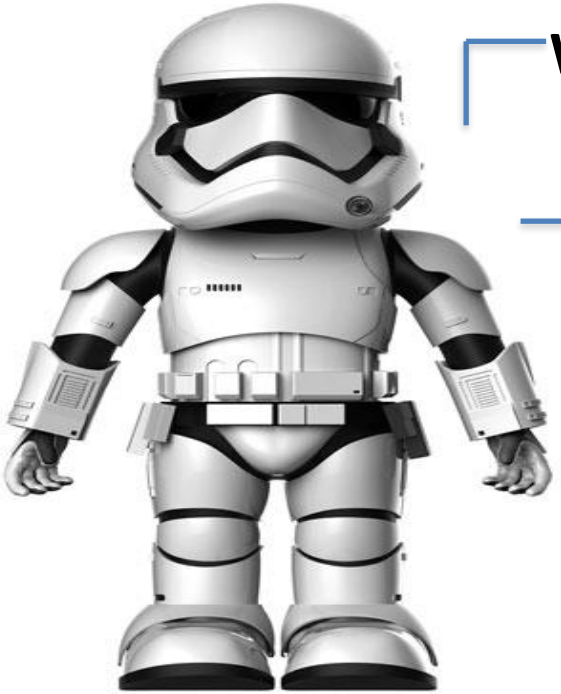
- Expert system

Prof S.J. Russell, *University of California, Berkeley*

Peter Norvig, Director of Research at Google, Inc.

Russell and Norvig (1995). Introduction to AI: A Modern Approach

Machine that Acts like a Human



- With human characteristics
- Reflects human condition

Humanoid Robot: Sophia

Source: YouTube https://bit.ly/2MIHH1g

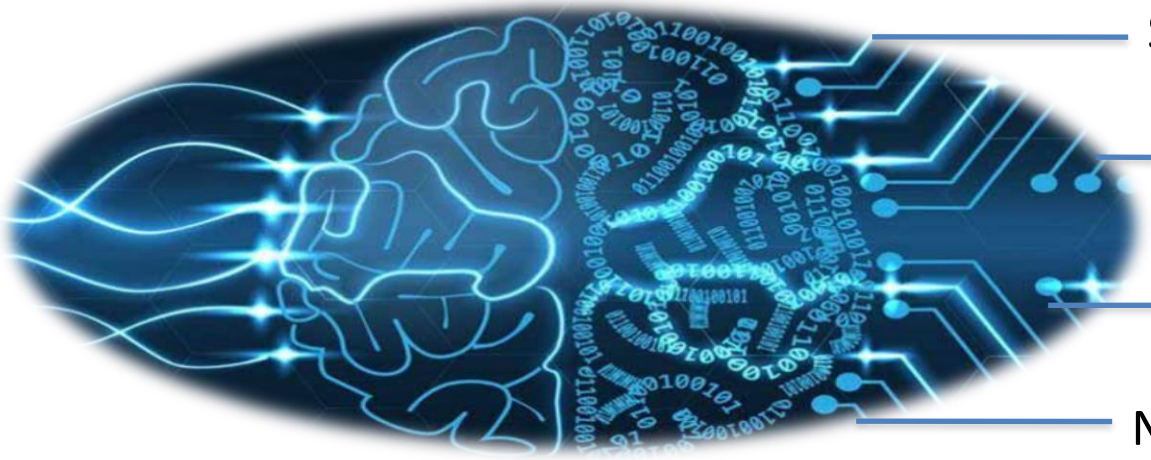
Turing Test Approach

Can machines think?

Alan Turing (1950), “Computing Machinery and Intelligence”

The Male–Female Imitation Game

Machine that thinks like a human



- Self-learning
- Pattern recognition
- Natural language processing
- Neural network

Designed to solve problems by thinking, reasoning, and remembering, to mimic the way the human brain works

Thinking Humanly - Cognitive Modeling approach

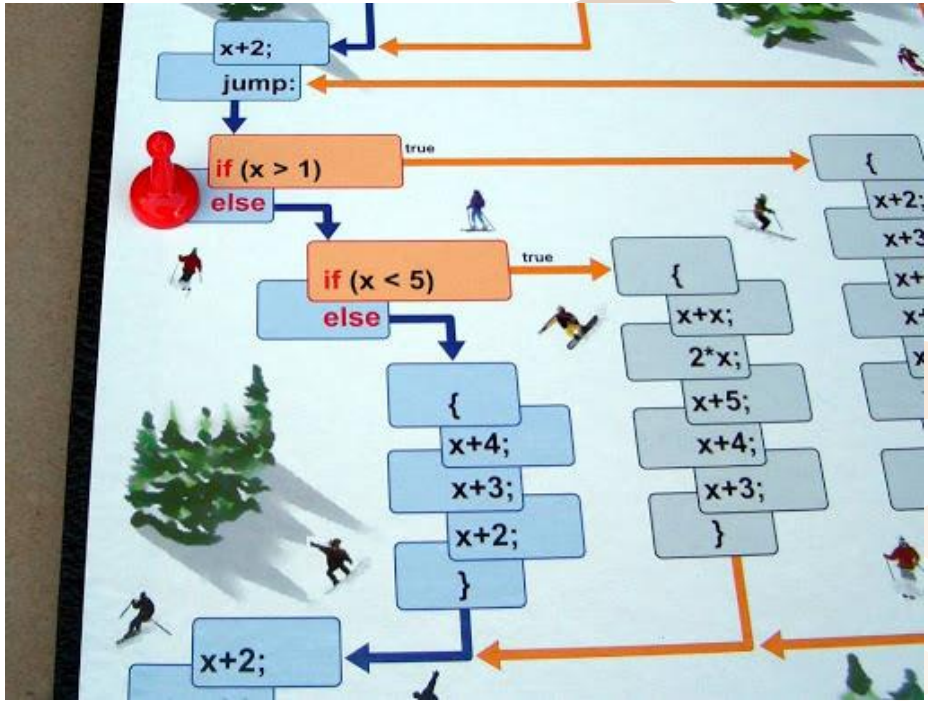
- A study on how computer models could be used to address the psychology of memory, language, and logical thinking.
- If the program's input-output behaviour matches corresponding human behaviour, that is evidence that some of the program's mechanisms could also be operating in humans.
- The interdisciplinary field of cognitive science brings together computer models from AI and **experimental** techniques from psychology to construct theories of human mind.

Machine that Thinks Rationally

Logic

Rule-based System

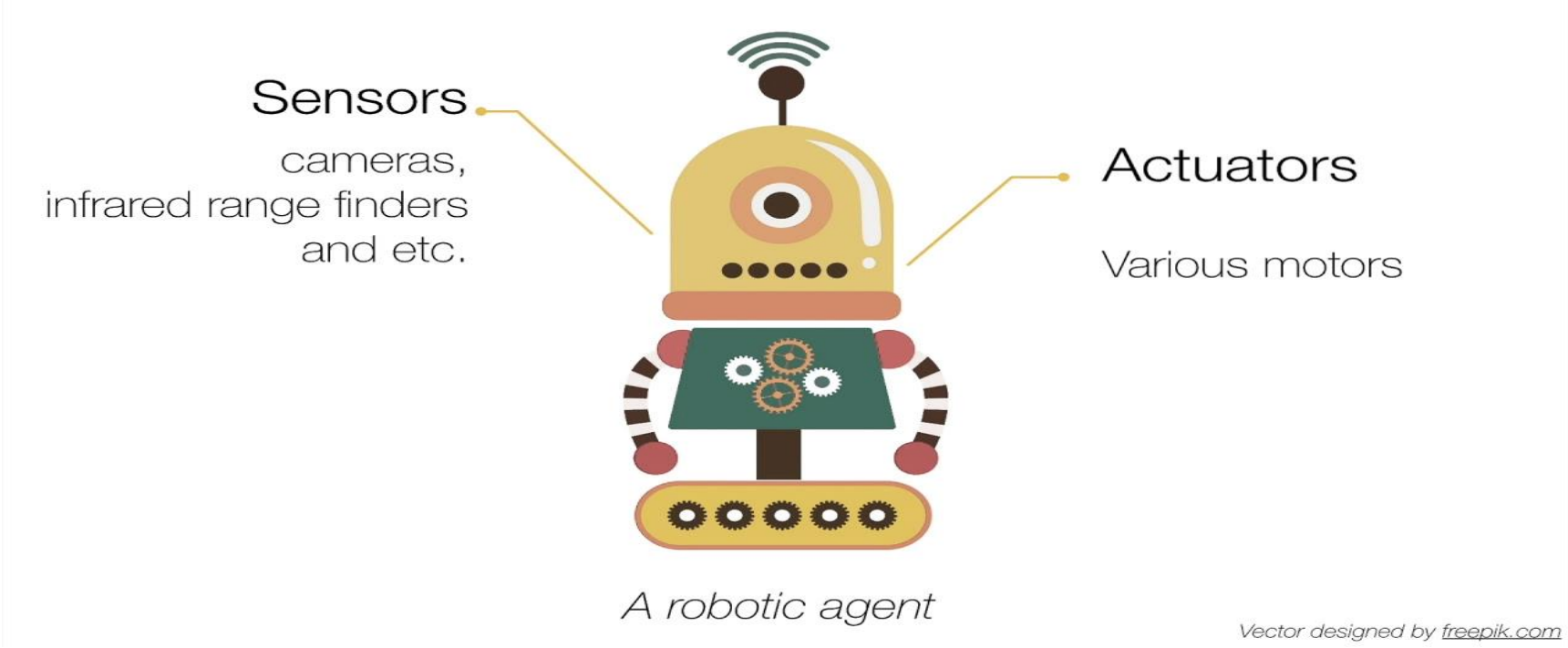
Example:
Expert System



Thinking Rationally – Logic approach

- This is about how to codify “rational thinking”.
- Rational thinking = Logic
- Logic uses a process of inference to derive new representations about the world, and use these new representations to deduce what to do.
- Example: _____

Machine that Acts Rationally



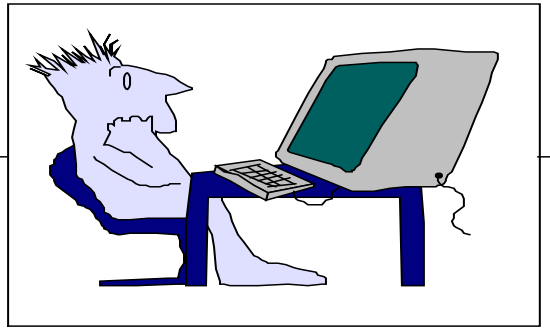
Acting Rationally – the Agent approach

- Agent is something that **acts** autonomously, sensitive (**sense**) to its environment, **adapt** to change, and create/pursue **goals**.
- Rational act may involve rational thinking
- But if there is no provably correct thing to do (the thinking may not be rational), the best expected outcome must still be done.
- Example: _____

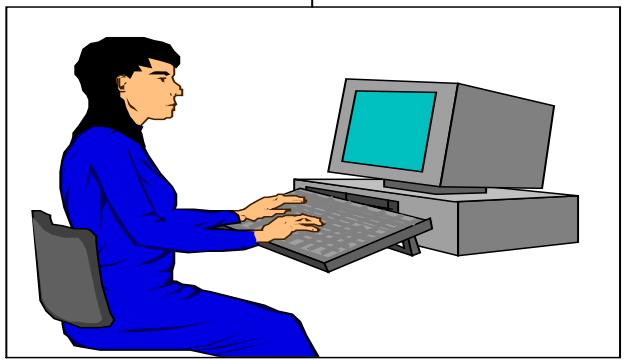
Turing Test

- A.k.a.***Turing Imitation Game***.
- The imitation game originally included two phases.

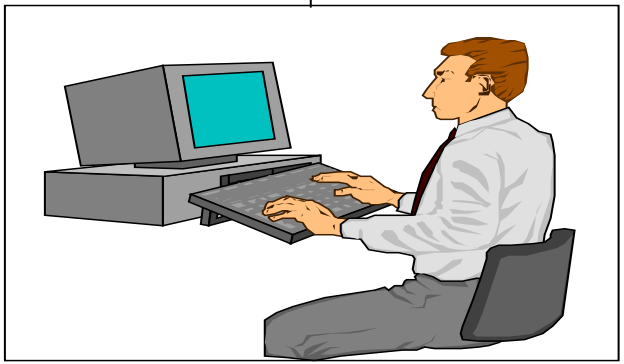
Turing Imitation Game: Phase 1



to work out who is the man and who is the woman



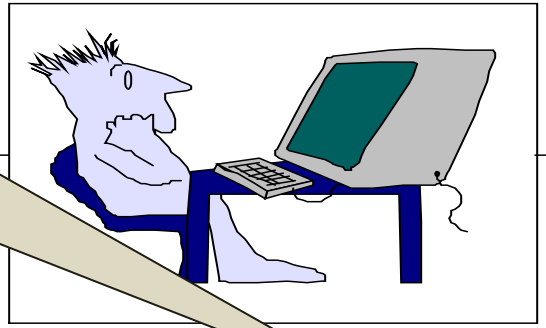
to convince the interrogator that she is the woman.



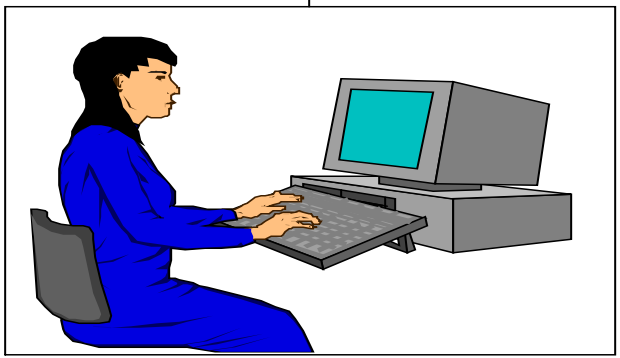
To deceive the interrogator that he is the woman

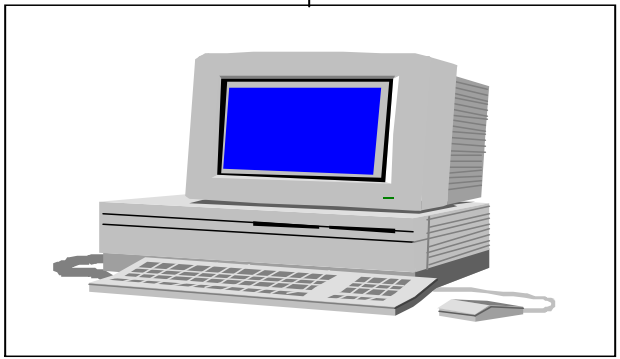
Turing Imitation Game: Phase 2

the man is replaced by a computer programmed to deceive the interrogator as the man did.



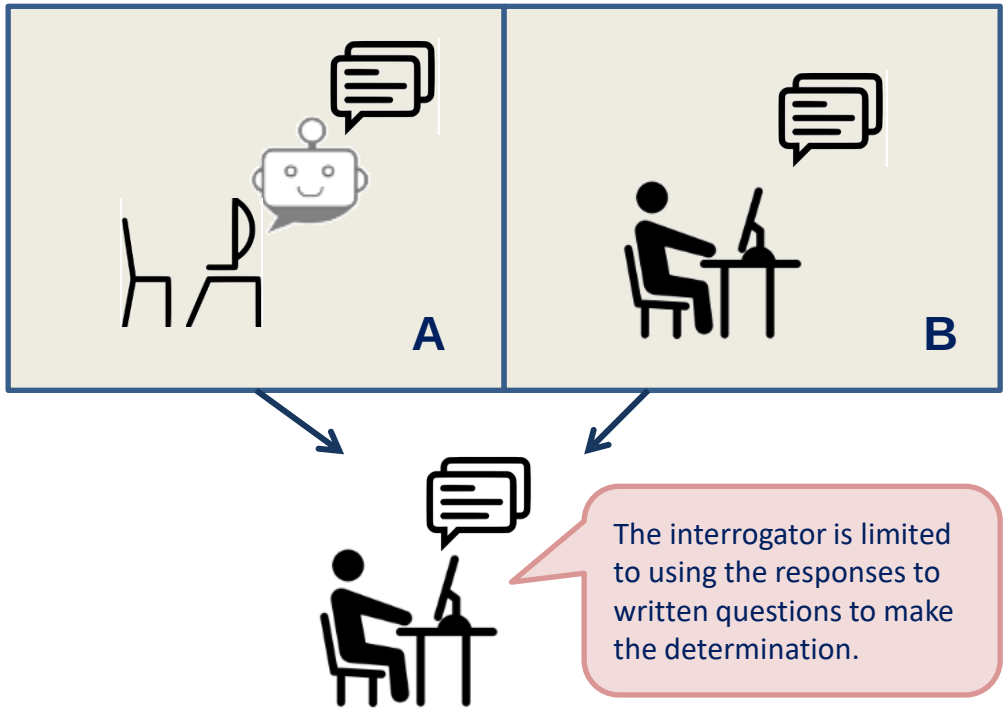
It would even be programmed to make mistakes and provide fuzzy answers in the way a human would.





Turing Test

The "standard interpretation" of the Turing test:
An interrogator, who is a human, is given the task of trying to determine which player – A or B – is a computer and which is a human.
If the machine is able to deceive the interrogator, then the machine passes the Turing test and it is considered to be intelligent.

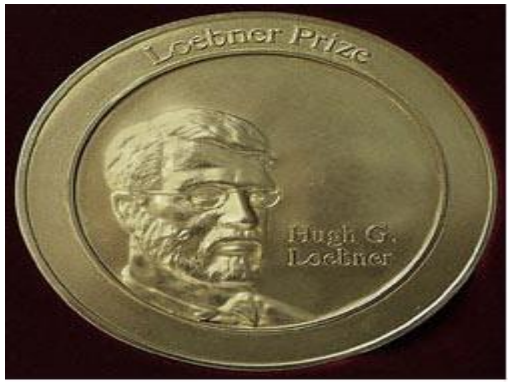


Turing Test Application

CAPTCHA

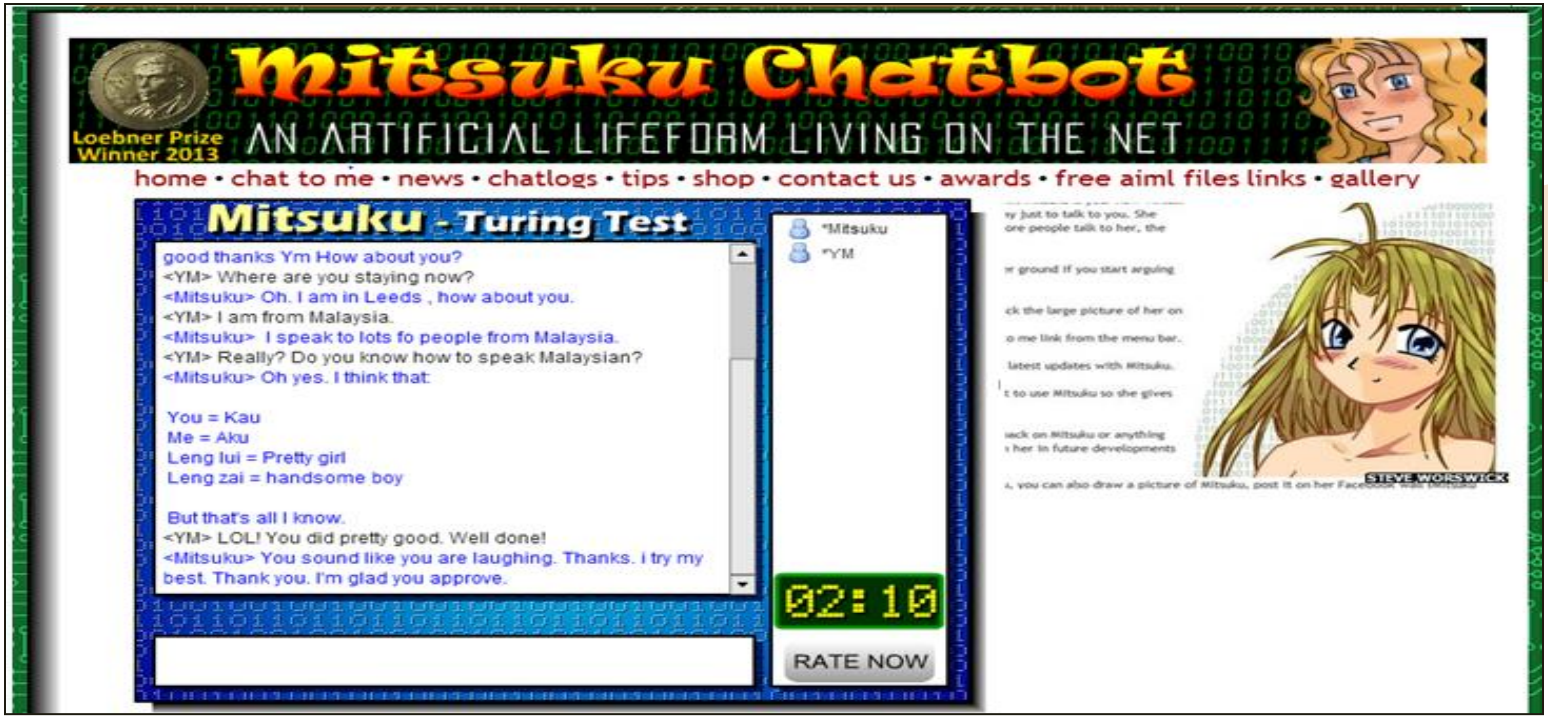
- to prevent automated systems from being used to abuse the site
- If any software is able to read the distorted image accurately, so any system able to do so is likely to be a human.

Loebner Prize for Turing Test



- The Loebner Prize is the first formal instantiation of a Turing Test.
- In 1990 Hugh Loebner agreed with The Cambridge Center for Behavioral Studies to underwrite a contest designed to implement the Turing Test.

Mitsuku (Kuki) –
2013,2016,2017, 2018, 2019 Loebner Prize Winner



Briton Steve Worswick is the writer of the Mitsuku chatbot using Pandorabots

https://www.pandorabots.com/mitsuku/

Pandorabots

- It is a free open-source-based community web service the enables anyone who wants to, to develop and publish chatbots on the web.
- It is the largest chatbot community on the internet and its 166,000 registered bot masters have created more than 206,000 pandorabots in multiple languages.

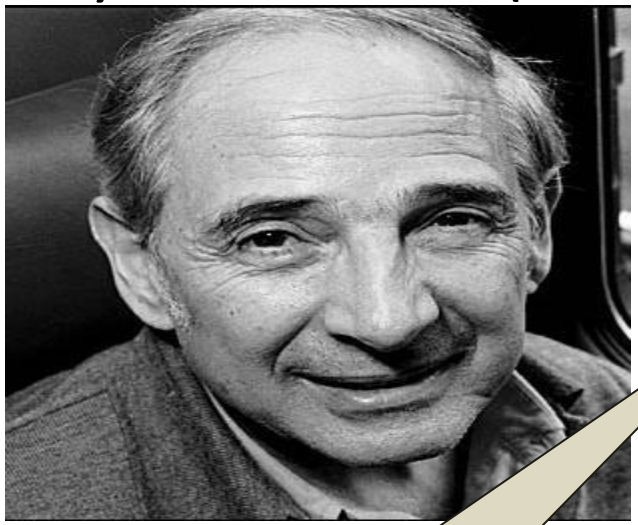
All pandorabots use AIML which was developed by Richard Wallace, whose chatbot A.L.I.C.E (Artificial Linguistic Internet Computer Entity) won the Loebener Prize in 2000, 2001 and 2004

Chatbot Tools

- For more details about Loebner Prize, check https://aisb.org.uk/aisb-events/
- For more information about AIML https://pandorabots.com/docs/
- For a comprehensive overview of chatbots in general, check chatbots.org

Critics on Turing Test - The Chinese Room

- by John Searle (1980)



Person (Computer)

Stacks of papers (storage)

Rule book (program)

Example

```
If    x ==“Wie geht es Ihnen”
Then  y = “Mir geht es gut”
```

```
If    x == “Auf Wiedersehen” || x == “Wiedersehen”
Then  y = “Tschüss”
```

What is the output for “Wiedersehen”?

Conclusion?

- If the system clearly runs a program and passes the Turing Test, does it really understand anything of its inputs and outputs?
- Is it necessary for it to understand the inputs and outputs?

Problem Definition and Problem Solving

NEXT LECTURE