ARTIFICIAL INTELLIGENCE

Unit 1 chap.1

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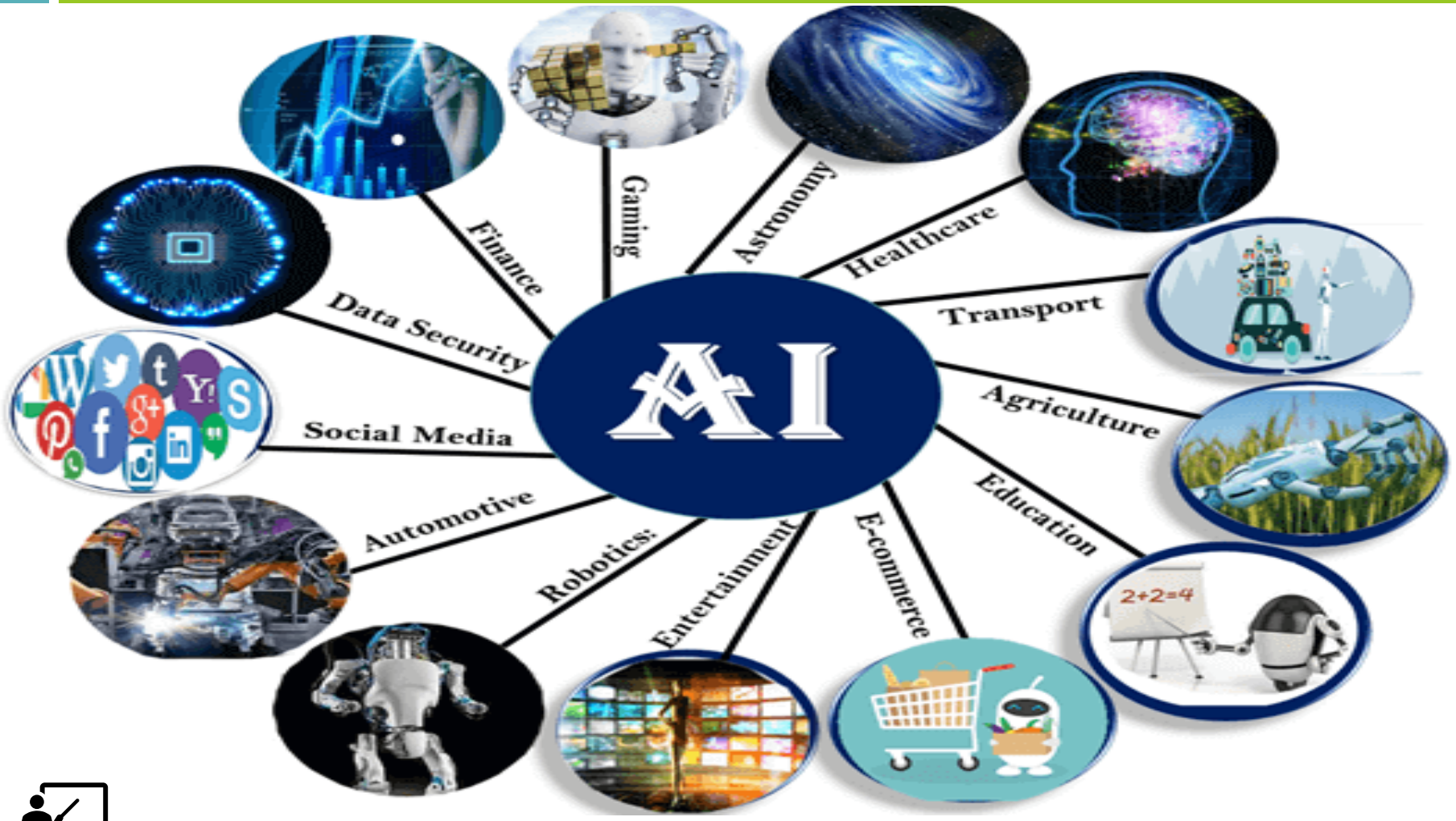
Chapt. 1
INTRODUCTION

- In 1956 at the Dartmouth Conference , an American Computer Scientist, **Jhon McCarthy** coined a term **ARTIFICIAL INTELLIGECE**

- According to the father of AI, it is “The science and engineering of making intelligent machines, especially intelligent computer programs”.
- Intelligence is a ability attributed to people, such as to know, to think, to talk, to learn, to understand.
- Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think.
- AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems.

Applications of AI



What is AI ?

- Artificial Intelligence is composed of two words **Artificial** and **Intelligence,** where Artificial defines *"man-made,"* and intelligence defines *"thinking power"*, hence AI means *"a man-made thinking power."*
- So, we can define AI as:

"It is a branch of computer science by which we can create intelligent machines which can behave like a human, think like humans, and able to make decisions."

- 1. AI in **Astronomy**

Artificial Intelligence can be very useful to solve complex universe problems. AI technology can be helpful for understanding the universe such as how it works, origin, etc.

- 2. AI in **Healthcare**

In the last, five to ten years, AI becoming more advantageous for the healthcare industry and going to have a significant impact on this industry.

Healthcare Industries are applying AI to make a better and faster diagnosis than humans. AI can help doctors with diagnoses and can inform when patients are worsening so that medical help can reach to the patient before hospitalization.

- 3. AI in **Gaming**

AI can be used for gaming purpose. The AI machines can play strategic games like chess, where the machine needs to think of a large number of possible places.

- 4. AI in **Finance**

AI and finance industries are the best matches for each other. The finance industry is implementing automation, chatbot, adaptive intelligence, algorithm trading, and machine learning into financial processes.

- 5. AI in **Data Security**

The security of data is crucial for every company and cyber-attacks are growing very rapidly in the digital world. AI can be used to make your data more safe and secure. Some examples such as AEG bot, AI2 Platform,are used to determine software bug and cyber-attacks in a better way.

- 6. AI in **Social Media**

Social Media sites such as Facebook, Twitter, and Snapchat contain billions of user profiles, which need to be stored and managed in a very efficient way. AI can organize and manage massive amounts of data. AI can analyze lots of data to identify the latest trends, hashtag, and requirement of different users.

- 7. AI in **Travel & Transport**

AI is becoming highly demanding for travel industries. AI is capable of doing various travel related works such as from making travel arrangement to suggesting the hotels, flights, and best routes to the customers. Travel industries are using AI-powered chatbots which can make human-like interaction with customers for better and fast response.

- 8. AI in **Automotive Industry**

Some Automotive industries are using AI to provide virtual assistant to their user for better performance. Such as Tesla has introduced TeslaBot, an intelligent virtual assistant.

Various Industries are currently working for developing self-driven cars which can make your journey more safe and secure.

- 9. AI in **Robotics:**

Artificial Intelligence has a remarkable role in Robotics. Usually, general robots are programmed such that they can perform some repetitive task, but with the help of AI, we can create intelligent robots which can perform tasks with their own experiences without pre-programmed.

Humanoid Robots are best examples for AI in robotics, recently the intelligent Humanoid robot named as Erica and Sophia has been developed which can talk and behave like humans.

- 10. AI in **Entertainment**

We are currently using some AI based applications in our daily life with some entertainment services such as Netflix or Amazon. With the help of ML/AI algorithms, these services show the recommendations for programs or shows.

- 11. AI in **Agriculture**

Agriculture is an area which requires various resources, labor, money, and time for best result. Now a day's agriculture is becoming digital, and AI is emerging in this field. Agriculture is applying AI as agriculture robotics, solid and crop monitoring, predictive analysis. AI in agriculture can be very helpful for farmers.

- 12. AI in **E-commerce**

AI is providing a competitive edge to the e-commerce industry, and it is becoming more demanding in the e-commerce business. AI is helping shoppers to discover associated products with recommended size, color, or even brand.

- 13. AI in **education:**

AI can automate grading so that the tutor can have more time to teach. AI chatbot can communicate with students as a teaching assistant.

AI in the future can be work as a personal virtual tutor for students, which will be accessible easily at any time and any place.

- **14. speech Recognition**

United Airlines has replaced its keyboard tree for flight information by a system using speech recognition of flight number and city names.

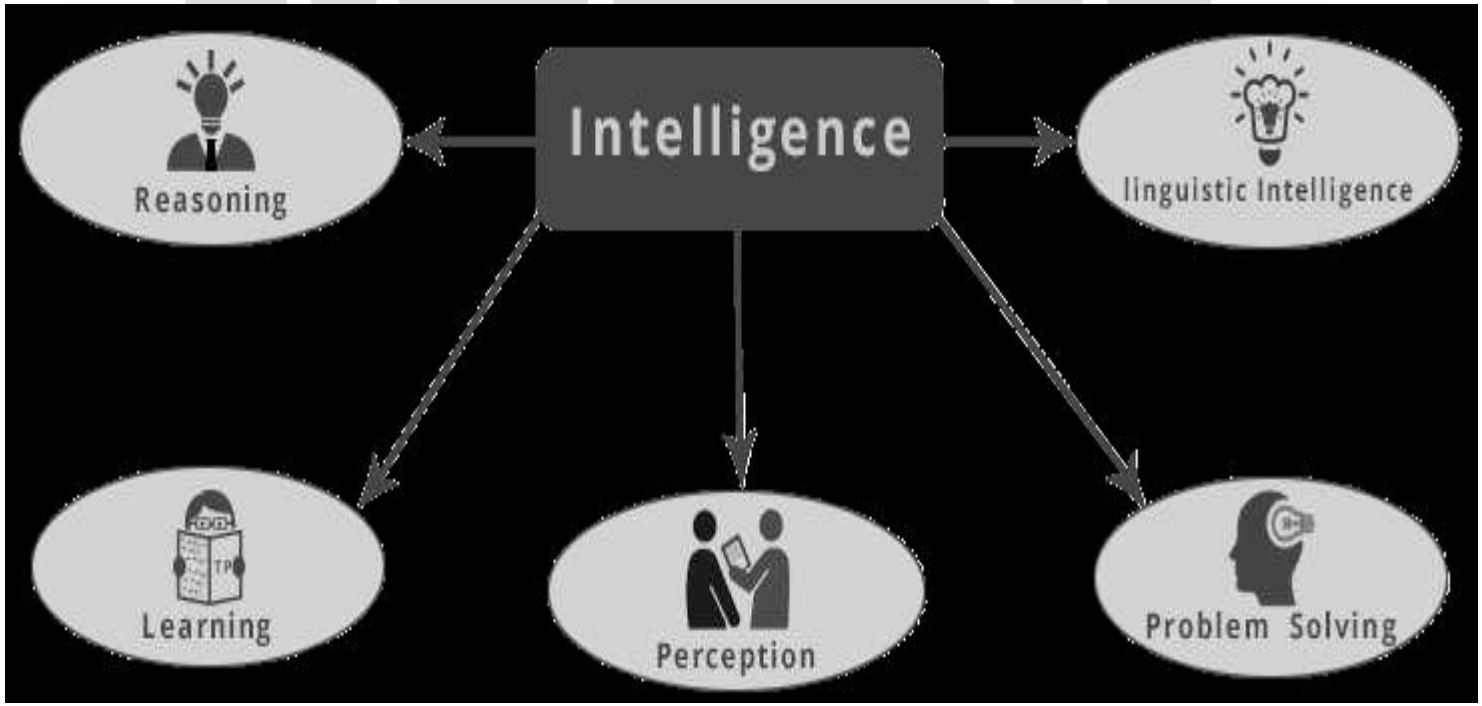
It is quit convenient .on the other hand, while it is possible to instruct some computer using speech, most users have gone back to the keyboard and the mouse as still more convenient.

- **15. Handwriting Recognition**

The handwriting recognition software reads the text written on paper by a pen or on screen by a stylus. It can recognize the shapes of the letters and convert it into editable text.

What is Intelligence Composed of?

The intelligence is intangible.



- **1. Reasoning:** It is the set of processes that enables us to provide basis for judgment, making decisions, and prediction. There are broadly two types:

Inductive Reasoning	Deductive Reasoning
It conducts specific observations to makes broad general statements.	It starts with a general statement and examines the possibilities to reach a specific, logical conclusion.
Even if all of the premises are true in a statement, inductive reasoning allows for the conclusion to be false.	If something is true of a class of things in general, it is also true for all members of that class.
Example: “Nita is a teacher. All teachers are studious. Therefore, Nita is studious.”	Example: "All women of age above 60 years are grandmothers. Shalini is 65 years. Therefore, Shalini is a grandmother."

- **2. Learning:** It is the activity of gaining knowledge or skill by studying, practicing, being taught, or experiencing something. Learning enhances the awareness of the subjects

of the study.

The ability of learning is possessed by humans, some animals, and AI-enabled systems.

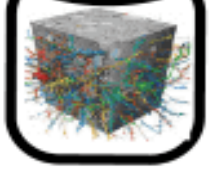
- **3. Problem solving:** It is the process in which one perceives and tries to arrive at a desired solution from a present situation by taking some path, which is blocked by known or unknown hurdles.

Problem solving also includes **decision making,** which is the process of selecting the best suitable alternative out of multiple alternatives to reach the desired goal are available.

- **4. Perception:** It is the process of acquiring, interpreting, selecting, and organizing sensory information. Perception presumes **sensing**. In humans, perception is aided by sensory organs. In the domain of AI, perception mechanism puts the data acquired by the sensors together in a meaningful manner.
- **5. Linguistic Intelligence:** It is one's ability to use, comprehend, speak, and write the verbal and written language. It is important in interpersonal communication.

History of AI

1943



Evolution of Artificial neurons

1950

Turing Machine

1956

Birth of AI: Dartmouth Conference

1966

First Chatboat : ELIZA

1972

First Intellgence Robot : WABOT -1

1974-1980

First AI winer

1980

Expert Ststem

1987-1993

Second AI Winer

1997

IBM Deep blue : first computer to beat a world chess champion

2002

AI in Home: Roomba

2011

IBM s Watson : Wins a quiz show

2012

Google now

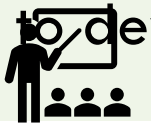
2014

Chatbot Eugene Goostman:Wines a "Turing test

2015

Amazon Echo

Speech Recognition	Voice Recognition
The speech recognition aims at understanding and comprehending WHAT was spoken.	The objective of voice recognition is to recognize WHO is speaking.
It is used in hand-free computing, map or menu navigation	It analyzes person's tone, voice pitch, and accent, etc., to identify a person.
Machine does not need training as it is not speaker dependent.	The recognition system needs training as it is person-oriented.
Speaker independent Speech Recognition systems are difficult to develop.	Speaker-dependent Speech Recognition systems are comparatively easy to develop.



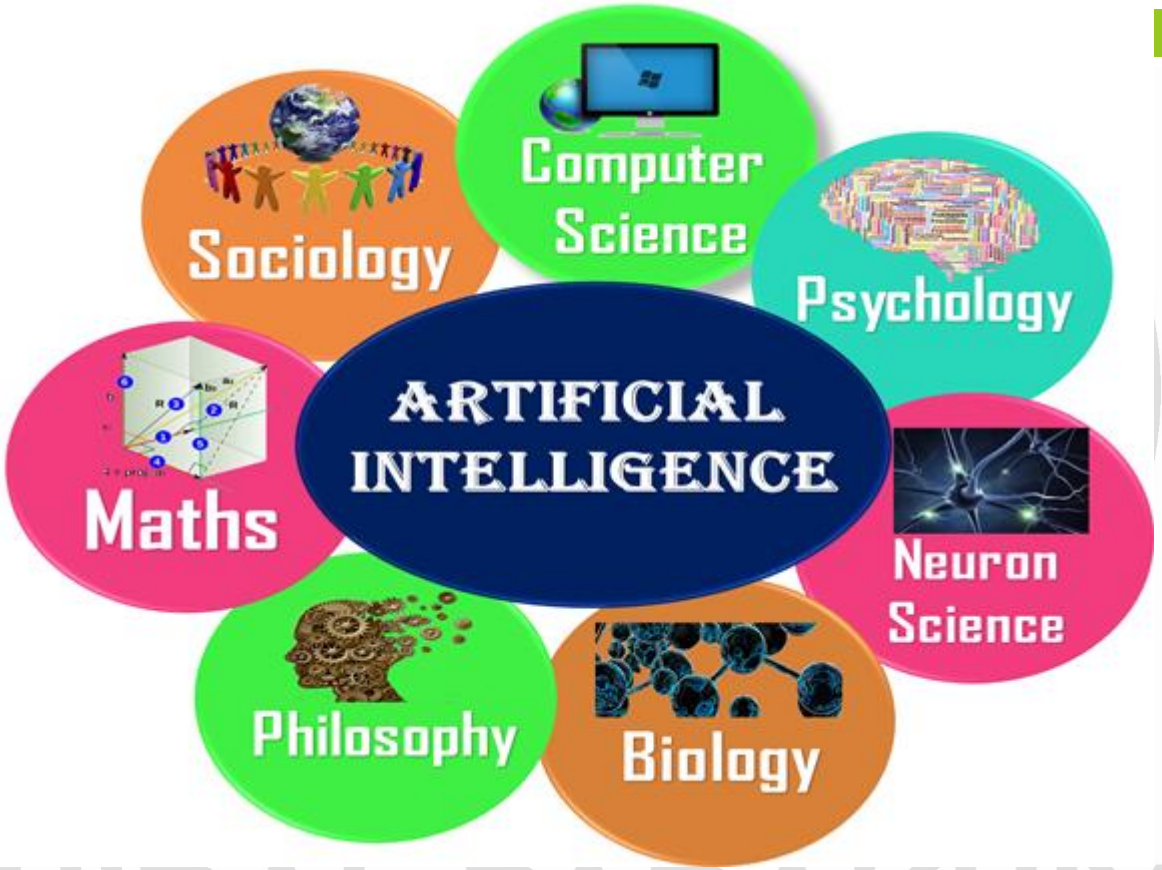
- 1. Siri :
- 2. Alexa
- 3. Telsa
- Amazon.com
- Netflix

Goals of Artificial Intelligence

Following are the main goals of Artificial Intelligence:

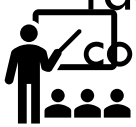
- Replicate human intelligence
- Solve Knowledge-intensive tasks
- An intelligent connection of perception and action
- Building a machine which can perform tasks that requires human intelligence such as:
  - Proving a theorem
  - Playing chess
  - Plan some surgical operation
  - Driving a car in traffic
- Creating some system which can exhibit intelligent behavior, learn new things by itself, demonstrate, explain, and can advise to its user.

What Comprises to Artificial Intelligence?



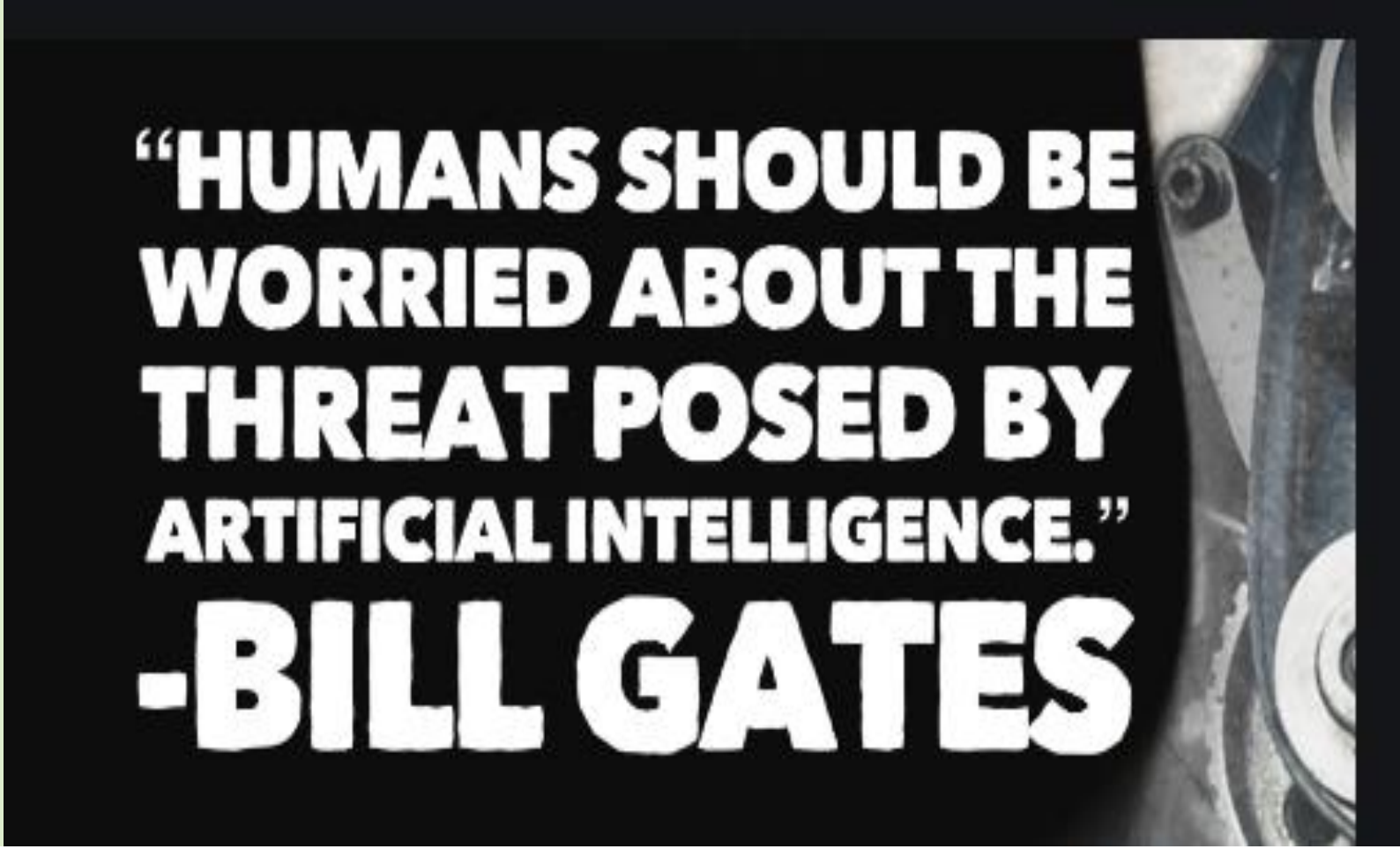
Advantages of Artificial Intelligence

- **High Accuracy with less errors:** AI machines or systems are prone to less errors and high accuracy as it takes decisions as per pre-experience or information.
- **High-Speed:** AI systems can be of very high-speed and fast-decision making, because of that AI systems can beat a chess champion in the Chess game.
- **High reliability:** AI machines are highly reliable and can perform the same action multiple times with high accuracy.
- **Useful for risky areas:** AI machines can be helpful in situations such as defusing a bomb, exploring the ocean floor, where to employ a human can be risky.
- **Digital Assistant:** AI can be very useful to provide digital assistant to the users such as AI technology is currently used by various E-commerce websites to show the products as per customer requirement.
- **Useful as a public utility:** AI can be very useful for public utilities such as a self-driving car which can make our journey safer and hassle-free, facial recognition for security purpose, Natural language processing to communicate with the human in human-language, etc.



Disadvantages of Artificial Intelligence

- **High Cost:** The hardware and software requirement of AI is very costly as it requires lots of maintenance to meet current world requirements.
- **Can't think out of the box:** Even we are making smarter machines with AI, but still they cannot work out of the box, as the robot will only do that work for which they are trained, or programmed.
- **No feelings and emotions:** AI machines can be an outstanding performer, but still it does not have the feeling so it cannot make any kind of emotional attachment with human, and may sometime be harmful for users if the proper care is not taken.
- **Increase dependency on machines:** With the increment of technology, people are getting more dependent on devices and hence they are losing their mental capabilities.
- **No Original Creativity:** As humans are so creative and can imagine some new ideas but still AI machines cannot beat this power of human intelligence and cannot be creative and imaginative.



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