



What is intelligence? What makes humans intelligent beings? How to classify a machine as intelligent?

All these questions would pop up in your mind when you hear the word *Artificial Intelligence* or *AI*. In this lesson, we will look at the answer to all these questions along with the various applications of AI.

Topic Covered in the Lesson

1. Human Intelligence
2. Artificial Intelligence
3. Applications of AI
4. Advantages of AI

Key Learning Outcomes

At the end of the lesson, you will be able to:

1. Understand what is the difference between human intelligence and artificial intelligence.
2. Appreciate the advantages of using AI.
3. Correlate with the real-world applications of AI to generate an AI mindset.

Let's begin!

What is Intelligence?

Have you ever thought about why or when you are called intelligent? One can safely say that you have. Even if not, here are some of the situations in which you would feel proud of your intelligence:

- When you get all questions correct in a tough exam
- When you solve a challenging puzzle in record time
- When you beat your sibling in a difficult stage of Contra
- When you can recognize and remember the names of all the players of your favorite football team
- When you get a laugh from all your friends on a joke you cracked
- When you remember the lyrics of one of your favorite songs from the past



But what exactly *is* intelligence?

Intelligence is one's capacity for logic, understanding, self-awareness, learning, emotional knowledge, planning, creativity, and problem-solving.

Human Intelligence



Human intelligence can be described as

1. The ability to perceive, understand and analyze information.
2. The ability to learn and increase knowledge.
3. The ability to make decisions based on knowledge.

Human & Animal Intelligence

How Are Animals Different from Humans?

You might have heard that animals are not intelligent. This is actually not true.

Animals are intelligent but they are not as good as humans. In most animals, their skills and abilities are restricted to survival. Here are some examples of intelligent animals:

1. Dolphins: Dolphins are extremely sociable creatures with a highly developed ability to adapt to their habitat. They help one another when injured or ill and, thanks to their individually distinct calls, they're able to pass on their knowledge to others.



2. Parrots: These birds have an incredible ability to recognize different human faces and have a high aptitude for communication. Besides these, parrots have an excellent memory which helps them solve complex problems (like how to

remember your best friend's birthday).



3. Elephants: Elephants boast the largest brain of all land animals. These animals are renowned for their ability to socialize and can express a wide range of emotions, including happiness and compassion, as well as pain and grief. They display acts of altruism and self-awareness. With a greater memory than even us humans, an elephant truly never forgets!



Artificial Intelligence

Are Computers Intelligent?

After attempting the previous quiz, you would have realized the answer to this question. Let's have a look at it again:

Computers are used to:

1. Store information in their memory like documents, images, and videos, which you can access immediately.
2. Run programs that interact with the user to help solve his problems like going calculations, etc.
3. Play games.
4. Watch movies and videos.
5. Surf on the Internet.

In all the above examples, the task is defined and computer run programs to get the result. E.g., while watching movies, the computer reads the file from the hard disk and displays it on the screen using a video player.

This is not termed as intelligence because there is no learning process involved in this. Computers are just following some set of predefined instructions.

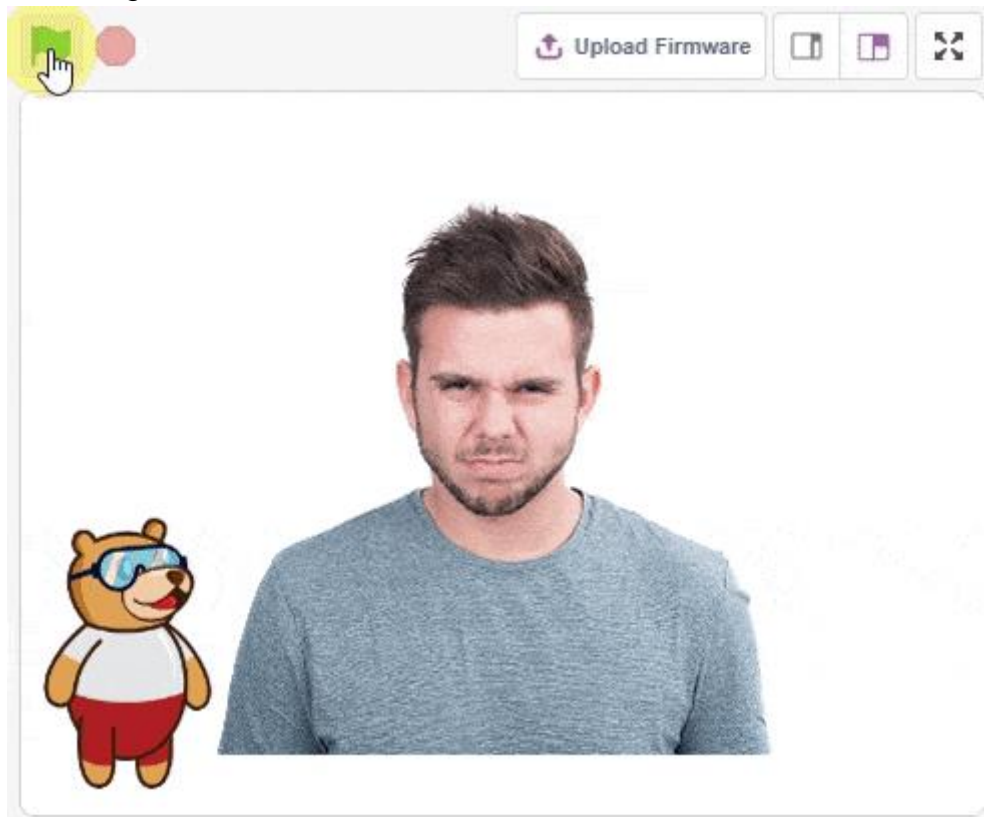
But when computers are equipped with a program that learns and acts based on their environment, they can be termed as intelligent.

Let's see some examples:

1. Self Driving Cars: They can recognize their environment and act accordingly.



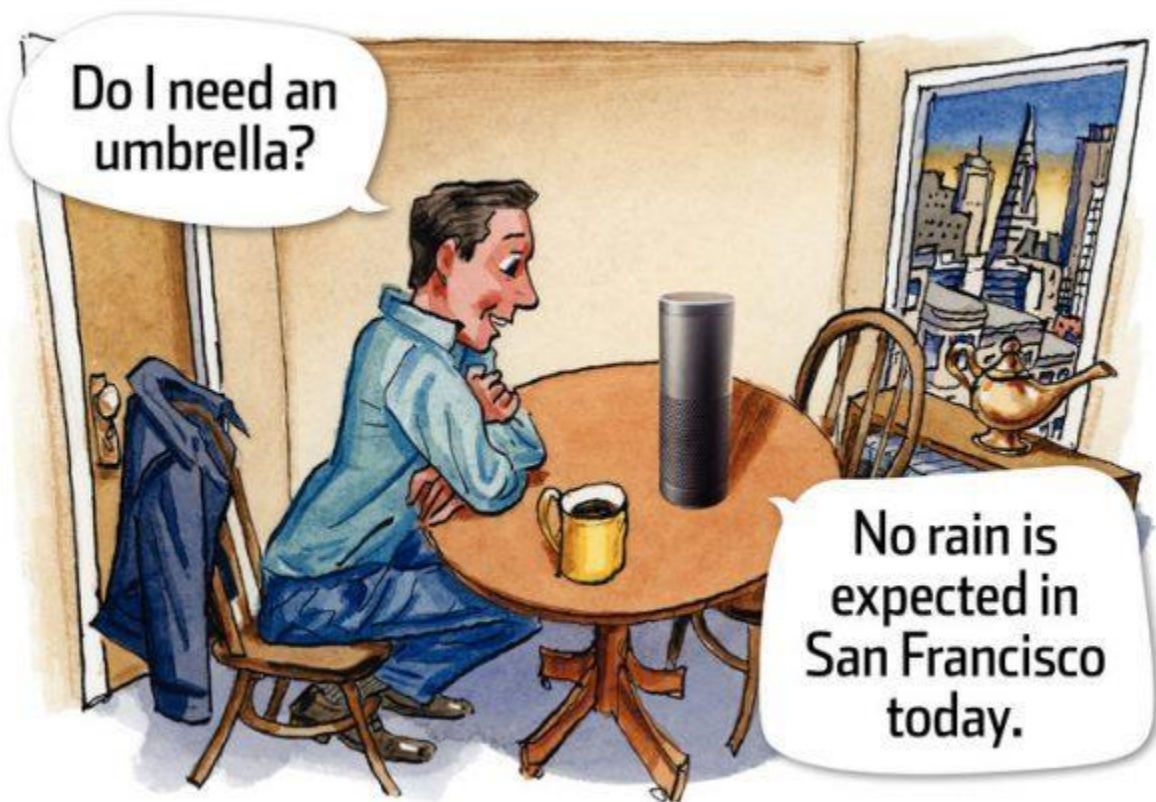
2. Emotion Identifiers: They can identify the emotion of the human using their knowledge.



3. AI Bots In-Game: They can play the game as if a human is playing.



4. Alexa or Homepod (Siri): It recognizes what you say and reacts accordingly.



In all of the above cases, the computer uses its knowledge to get information and act accordingly.

Artificial Intelligence – Definition

Artificial Intelligence is the study and design of intelligent agents (computers) which have the ability to analyze the environments and produce actions which maximize success.

A computer is termed as intelligent if it has the ability for gathering information, analyzing it to make decisions, and acting to complete a task automatically with very little to no human intervention.

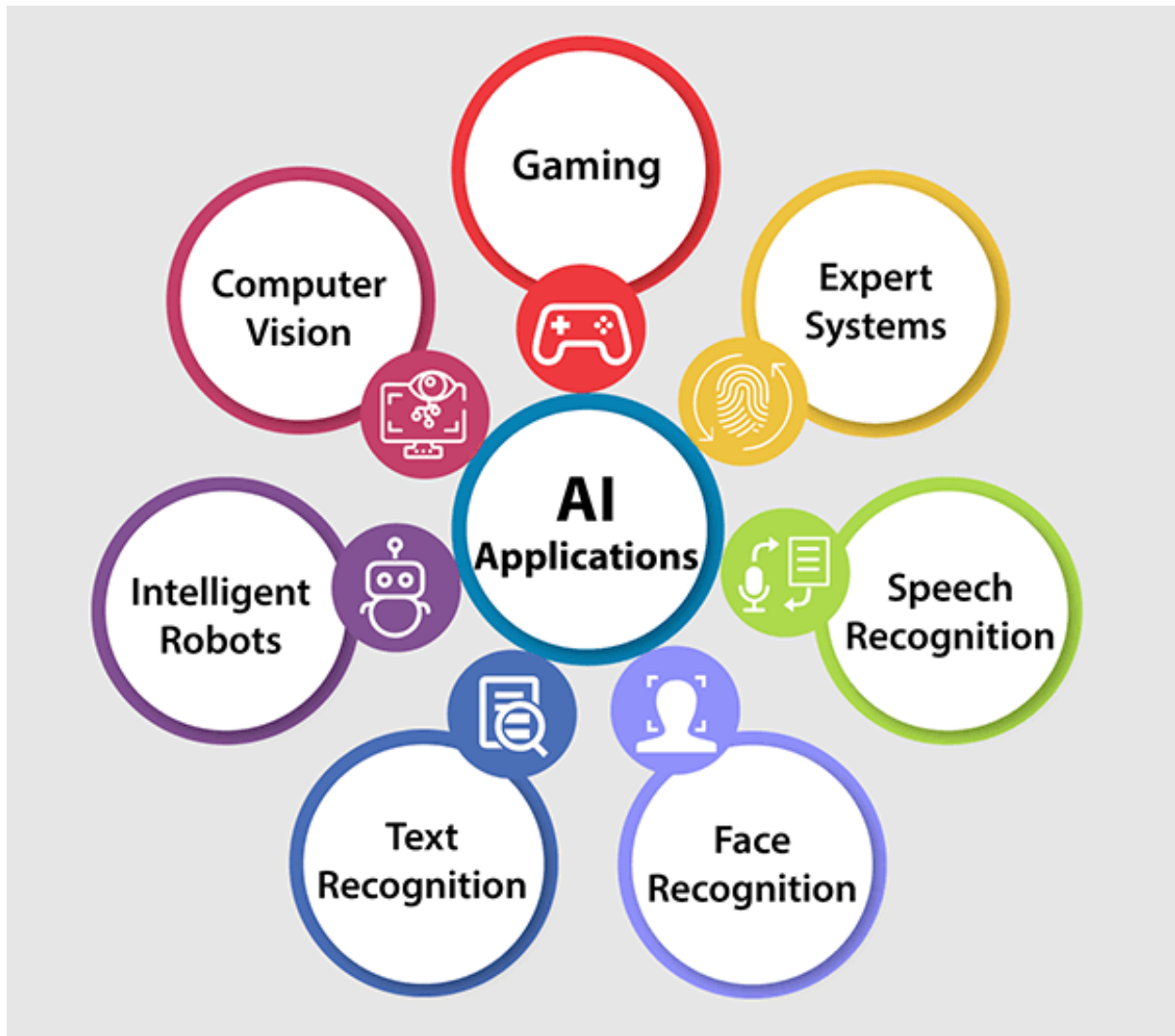
Advantage of AI

There are many advantages that an AI machine has over humans. Some of them are:

1. **Speed of execution:** Computers have better memories. They can be fed a large amount of information and can retrieve it almost instantaneously. While a doctor makes a diagnosis in ~10 minutes, an AI system can make a million in the same duration.
2. **They are not lazy:** Computers don't require sleep the way humans do. They can calculate, analyze, and perform tasks tirelessly and round the clock without wearing out.
3. **Accuracy:** Computers have a very high accuracy in some tasks.
4. **Less Biased:** Computers are not affected or influenced by emotions, feelings, wants, needs, and other factors that often cloud our judgment and intelligence.

Created by human intelligence	Evolutionary process
Process information faster	Slower
Highly objective	May be subjective
More Accurate	May be less accurate
Cannot adapt to changes well	Easily adapt to changes
Cannot multitask that well	Easily multitask
Below average social skills	Better social skills on average
Optimization	Innovation
Cheap	Expensive
Biased	Biased

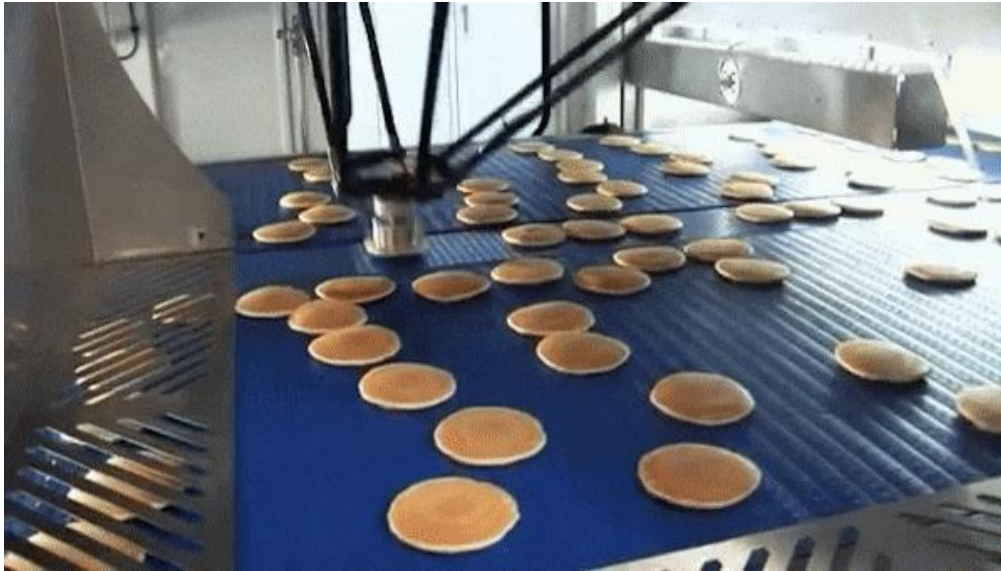
Applications of AI



AI has many applications, which continue to grow by the day. Some of them are:

Computer Vision

AI is used in many popular object recognition systems like self-driving cars, security systems, industrial robots, etc. In this example, the robot identifies the position of the pancakes and segregate using a robotic arm.



Face Recognition

AI is widely used to detect and recognize faces from images. Facebook uses it to identify people in photos and tag them.



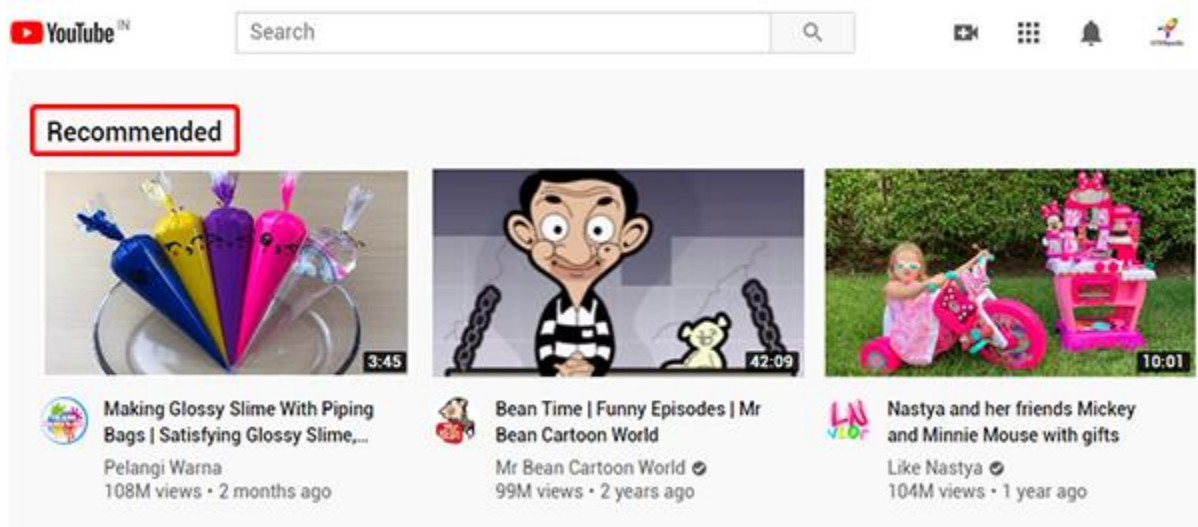
Gaming

AI plays an important role in helping a machine think of a large number of possible positions based on deep knowledge in strategic games such as chess or PUBG. An AI system called AlphaZero taught itself from scratch how to master the games of Chess, Shogi and Go.



Expert Systems

Machine or software that imitates the decision-making ability of humans and uses it to provide explanations and advice to the users, e.g. Youtube uses it to recommend you new videos.



Speech Recognition

Some AI-based speech recognition systems can 'hear' others, 'express' in the form of speech and understand what a person tells it, e.g., Siri, Alexa, and Google Assistant.



Text Recognition from Image

The handwriting recognition software reads the text written on paper and recognizes the shape of the letters and converts them into editable text.



Intelligent Robots

These robots can perform the instructions given by a human in an interactive manner.

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