



**ARTIFICIAL
INTELLIGENCE(417)
CLASS IX**



- Artificial Intelligence is made up of two words. **Artificial** refers to something which is made or produced by human beings rather than occurring naturally, especially as a copy of something natural. **Intelligence** refers to the ability to acquire and apply knowledge and skills.
- EX: smartphones, smart televisions, smart calendars, smart cards etc. These appliances basically works on technology which is apart of Artificial Intelligence.
- **Definition of AI:** AI can be defined as the ability of computer systems i.e. hardware and software, to do tasks that normally required human beings to use intelligence.
- **Who coined the word Artificial Intelligence?** John McCarthy, who is one of the "founding fathers" of **artificial intelligence**, together with Alan Turing, Marvin Minsky, Allen Newell, and Herbert A. Simon in 1955.



According to various organizations

Artificial Intelligence is defined by different organizations in a different manners.

Niti Ayog: National Strategy for Artificial Intelligence

AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem-solving, and decision making. Initially conceived as a technology that could mimic human intelligence, AI has evolved in ways that far exceed its original conception. With incredible advances made in data collection, processing, and computation power, intelligent systems can now be deployed to take over a variety of tasks, enable connectivity, and enhance productivity.

World Economic Forum

Artificial intelligence (AI) is the software engine that drives the Fourth Industrial Revolution. Its impact can already be seen in homes, businesses, and political processes.

In its embodied form of robots, it will soon be driving cars, stocking warehouses, and caring for the young and elderly. It holds the promise of solving some of the most pressing issues facing society but also presents challenges such as inscrutable “black box” algorithms, unethical use of data, and potential job displacement.



European Artificial Intelligence (AI) leadership, the path for an integrated vision

AI is not a well-defined technology and no universally agreed definition exists. It is rather a cover term for techniques associated with data analysis and pattern recognition. AI is not a new technology, having existed since the 1950s.

While some markets, sectors and individual businesses are more advanced than others, AI is still at a relatively early stage of development, so that the range of potential applications, and the quality of most existing applications, have ample margins left for further development and improvement.



Applications of AI in our daily life

Smartphones: The smartphone has many applications that running and provided services with the help of AI. Ex. Google Assistant, Alexa, Apple Siri, etc.

Social Media:

- ❖ Social media websites like Twitter, Facebook, Instagram, or Snapchat sending notification and managing timelines by AI.
- ❖ AI takes all your past behavior, web searches, interactions, and everything else that you do when you are on these websites and tailors the experience just for you.

Music and Media streaming:

- ❖ Apps like Spotify, Netflix, or Youtube AI is making a decision for the users.
- ❖ AI records playlist history and generating some recommendations for watching or playing songs.

Video Games

- ❖ Video games companies are most earlier adopters of AI. AI generate random levels in video games.
- ❖ In many games, AI defeated world champions. PUBG, Dota 2, Fortnite all are AI integrated games.



Security and Surveillance

- ❖ Thousands of cameras keep monitoring at the same time by AI only.
- ❖ Object recognition and face recognition getting better and better day by day.

Smart Keyboard and Apps

- ❖ Smart Keyboards provide comfort for users while typing on the screen.
- ❖ It generates suggestions based on the writing style of users.
- ❖ It also displays a few words and emojis.

Smart Home

- ❖ Many smart home devices use AI to learn the behavior of the members of the family and can adjust settings accordingly.
- ❖ Smart voice assistants playing a vital role in smart homes.
- ❖ Smart thermostats used to adjust the temperature based on the user's preferences.
- ❖ Smart lights change the color and intensity of lights based on time and much more.



More applications of AI

E-Commerce

- Online shopping on Amazon and eBay like websites using chatbots to collect data of customers and building a good rapport with buyers.

Smart Email

- Modern email apps like spark provides the facility to get rid of spamemail and unwanted emails.
- It also categorizes email, so users can quickly read the important ones.
- The smart reply concept also giving a few suggestions with a reply text like in Gmail.

Healthcare

- ❖ With an introduction to AI-powered machines detection of disease and treatment becomes a bit easier and convenient.
- ❖ AI-powered machines make the process of treatment and management simplified research to cure some disease done by AI- based systems.



Smart Cars

- Tesla is a prime example of AI is impacting in our daily life.

Smart Drones

- Companies like Amazon and Walmart are heavily investing in drone delivery programs and it will become a reality far sooner than what you expect.

Banking and Finance

- The banking and finance industry relies on AI for providing customer services, protection against fraud, investment suggestions, and so on.
- While using the chat service of banks the chat is represented by Bots only. In the finance industry, AI is used to analyze data.

Online Ads Network

- AI just not tracking records of users but also serve the ads based on statistics.
- With the help of AI Ads network displaying random Ads online.

Navigation and Travel

- While traveling or enjoying rides like ola, uber, or any other services, google map navigation help to find a perfect route for the journey.
- Moreover, AI can give you real-time traffic data.



History of AI

1956 – Birth of AI Dartmouth Conference

1966 – First Chatbot “ELIZA”

1972 – First Intelligence “Robot WABOT – 1”

1974 – 1980 : First AI winner 1980 : Expert System

1987 – 1993 : Second AI Winner

1997 – IBM Deep blue “First computer to beat a world chess champion”

2002 – AI in Home “Roomba”

2011 – IBM Watson “Wins a Quiz show”

2012 – Google Introduce AI in their application

2014 – Chatbot Eugene Goostman “Wins a Turing test”

2015 – Amazon Echo



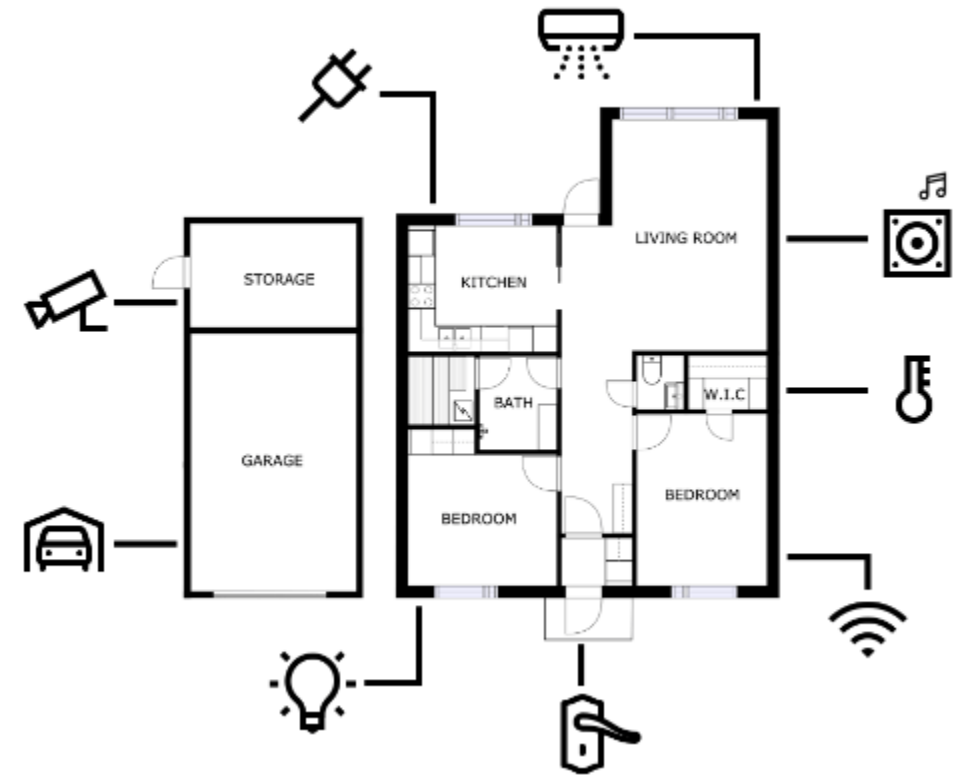
Ice Breaker Activity

ACTIVITY 1: Dream Smart Home

- Learners to design a rough layout of floor plan of

Rough Layout of the floor plan of a dream smart home
Think about how your dream smart home would look like?

What would be its features and amenities? What kind of gadgets and sensors would it have? Imagine looking at the home from above. How does it look? Draw it.





AI used in games

Game 1: Rock - Paper – Scissors (based on Data) (<https://rockpaperscissors-ai.vercel.app/>)

Write three things you learnt from the game?

List the different sources from where you can collect data?



AI used in games

Game 2: Semantris (based on Natural Language Processing - NLP) (<https://research.google.com/semantris/>)

Mention three things you understood about the game?

What is Natural Language Processing?



AI used in games

Game 3: Quick Draw (based on Computer Vision - CV) (<https://quickdraw.withgoogle.com/>)

Did you face any difficulty while playing this game? How did you overcome this?

What is Computer Vision?

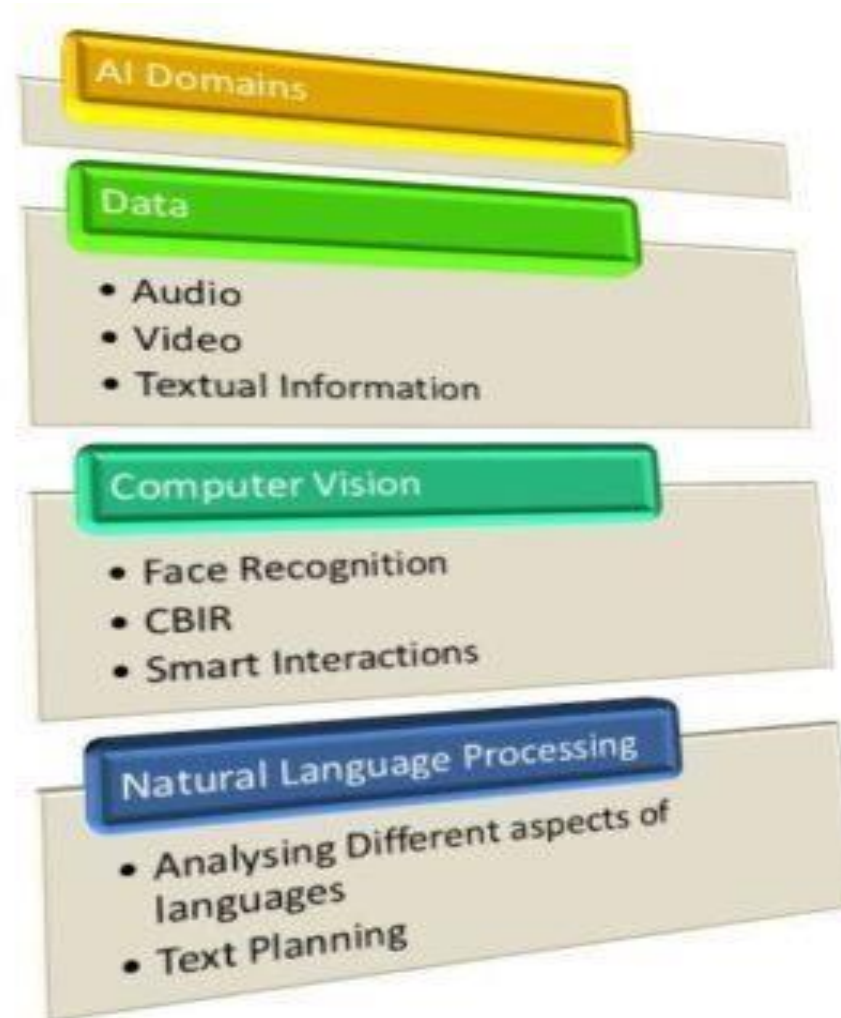


AI Domains

Human-Machines interactions: Human-machine interactions refer to the contact between humans and machines to fulfil a specific task or operation.

In AI human-machine interactions done through the following do

1. Data
2. Computer Vision (CV)
3. Natural Language Processing (NLP)





Data

- If a person thinks of automate any system or want a report or analysis of customers' feedback, data is required. For example: Taking student's daily attendance we need data of students like class, roll number, student name, etc.
- Data can be the backbone of AI. Almost 98% of AI systems are dependent on data. As system development grows processing of data also increases.
- This data can be in any form textual information, audio, video, big data like predictions, insights, forecasts, decision making, etc.

“Data science, is the field of study that involves collecting, analyzing, and interpreting large sets of data to uncover insights, patterns, and trends that can be used to make informed decisions and solve real-world problems”



Computer Vision (CV)

- It is a field of science that deals with how computers gain a high level of understanding from digital images or videos. It is a field that studies how the human visual system works.
- The computer vision includes the following methods to produce information:
 - ✓ Acquiring Images
 - ✓ Processing Images
 - ✓ Analyzing Images
 - ✓ Understanding Images



APPLICATIONS OF CV

- ❖ Computer Vision is mainly used for Face recognition systems to recognize the faces in images and videos. The application areas like google photos, spam chat, Facebook, Instagram etc.
- ❖ Content-Based Image Retrieval systems identify images based on image properties like composition, colour, texture etc. The application areas are search engines like google & bing, used in different CT scans and MRIs in hospitals, etc.
- ❖ Computer Vision also helpful in smart interactions to supply input to computers. It is mainly used in games, systems designed for differently-abled individuals, etc.
- ❖ Computer vision also helps in Environment Perception such as analyzing videos, images, or video feeds for identifying patterns and perceiving the environment. Application areas are Home security systems, Office security systems, Drone-based surveillance systems etc.



Natural Language Processing (NLP)

Natural language processing (NLP) is an area of artificial intelligence (AI) that focuses on assisting computers in understanding how humans write and communicate. This is a difficult task because of the large amount of unstructured data involved.

The programming languages work on their own principles, syntax, and keywords. The aim of NLP is developing such systems that work on humannatural language on oral as well-spoken language.

It has two main components:

Natural Language Understanding (NLU): NLU understands human language and converts it into data. It is used for spoken or written language to provide a link between natural language inputs and what they present. It analyses different aspects of language.

Natural Language Generation (NLG): NLG uses structured data and generates meaningful narratives out of it. It helps to produce meaningful phrases and sentences along with Text planning, Sentence Planning, and Text realization.

$NLP = NLU + NLG$



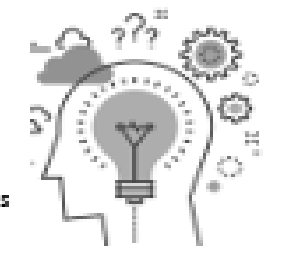
Activity: Letter to Future Self

Purpose: To capture students current mood and thoughts about their future with AI

Say: "I would like you to put on your reflective cap and write a letter to your future self. What do you want to tell yourself or remind yourself?"

Imagine the world in 2030 and write a letter to your future self. Be sure to mention things that you think your future self would probably be doing and experiencing in daily life.

Place _____
Date _____
Dear _____



It feels a little strange to be writing a letter to my future self, but it's also rather exciting!

At present I am very interested in _____ and am sure this is a hobby that has proved beneficial and I am now a skilled _____

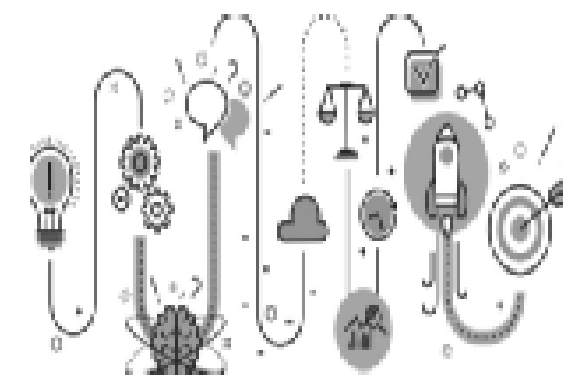
So tell me have things changed a lot? Do we still have a lot of _____?

Has Artificial Intelligence proved to be _____?

You must be so used to _____ while we struggle to _____

Is our Pet _____ doing well or have you replaced it with _____?

Ha! Ha! It's so much easier, right?!



How is your preparation for the new job? Must be really nice to be _____

Have you changed the _____?

Am sure things have turned out well for you in 2030. Great _____

It's been nice writing to you _____

Hope this letter brings back old memories...

Sincerely,
