Introduction To Artificial Intelligence

Course Name: Artificial Intelligence

Course code: CSE-403 [SECTION - A]

Reference Book(s):

Artificial Intelligence: a modern approach - Stuart Jonathan Russell, Peter Norvig

Prerequisites:

Programming language: python

Data structure basics(stack,queue,bfs,dfs etc)

Topics will be covered:-

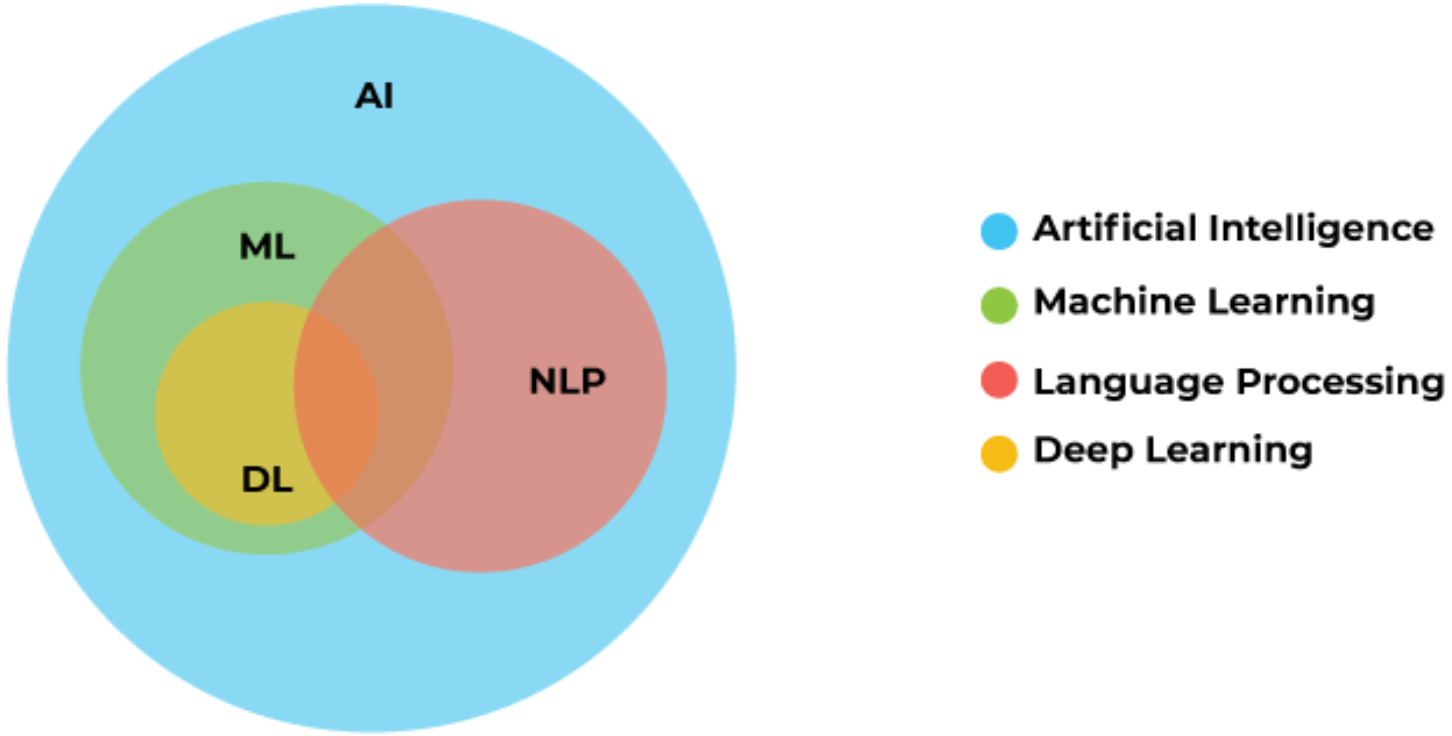
1. What Is AI?
2. Why Artificial Intelligence?
3. Goals Of Ai
4. Uses/Applications Of Artificial Intelligence
5. Advantages Of Artificial Intelligence
6. Disadvantages Of Artificial Intelligence
7. Real Life Examples Of AI

Overview of AI: What is AI?

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and act like humans. It involves the development of algorithms and computer programs that can perform tasks that typically require human intelligence such as visual perception, speech recognition, decision-making, and language translation.

Intelligence is composed of:

- Reasoning
- Learning
- Problem-Solving
- Perception
- Linguistic Intelligence



Why Artificial Intelligence?

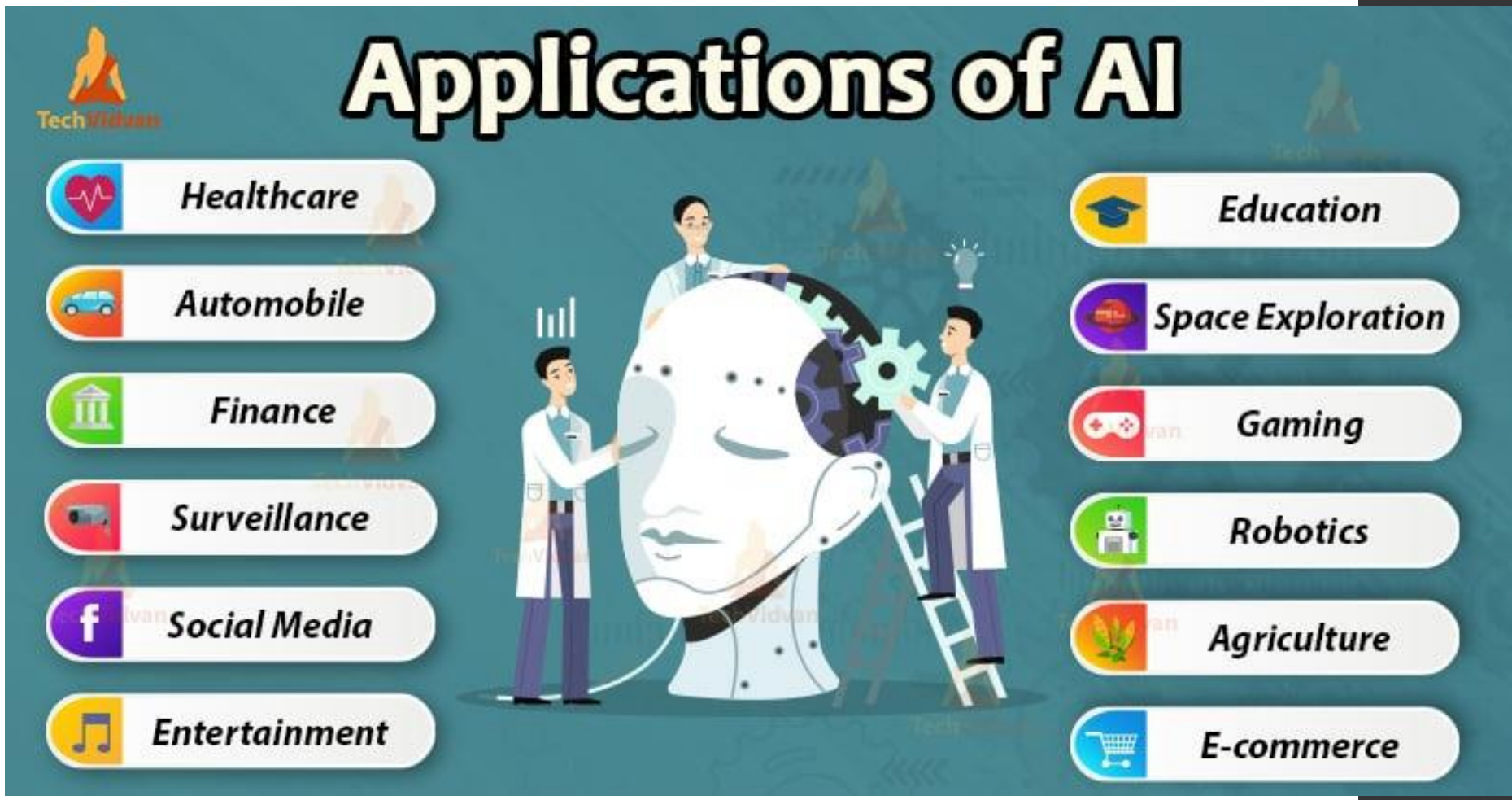
- With the help of AI, you can create such software or devices which can solve real-world problems very easily and with accuracy such as health issues, marketing, traffic issues, etc.
- With the help of AI, you can create your personal virtual Assistant, such as Cortana, Google Assistant, Siri, etc.
- With the help of AI, you can build such Robots which can work in an environment where survival of humans can be at risk.

Goals of AI

- The main focus of artificial intelligence is towards understanding human behavior and performance.
- **To Create Expert Systems** – The systems which exhibit intelligent behavior, learn, demonstrate, explain, and advice its users.
- **To Implement Human Intelligence in Machines** – Creating systems that understand, think, learn, and behave like humans.

Uses/Applications of Artificial Intelligence :

1. **Healthcare:** AI is used for medical diagnosis, drug discovery, and predictive analysis of diseases.
2. **Finance:** AI helps in credit scoring, fraud detection, and financial forecasting.
3. **Retail:** AI is used for product recommendations, price optimization, and supply chain management.



Uses/Applications of Artificial Intelligence :

4. Manufacturing: 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.

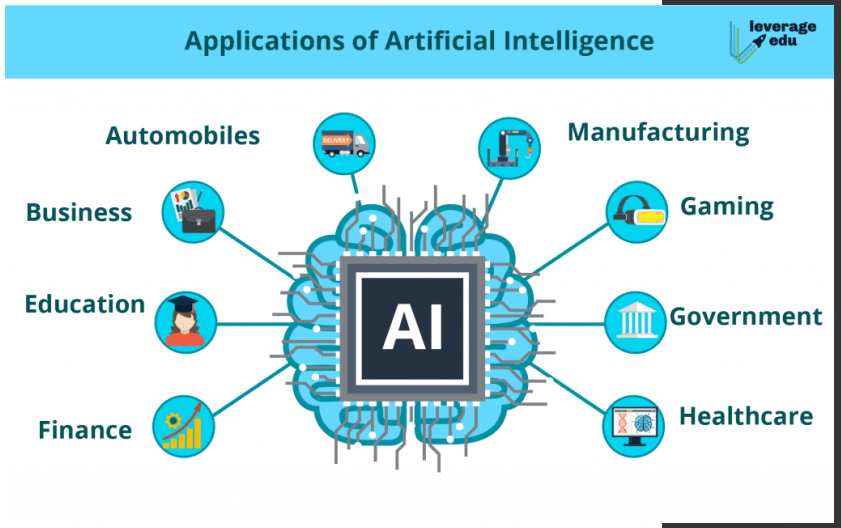
5. Transportation: AI is used for autonomous vehicles, traffic prediction, and route optimization.

6. Customer service: AI-powered chatbots are used for customer support, answering frequently asked questions, and handling simple requests.

7. Security: AI is used for facial recognition, intrusion detection, and cybersecurity threat analysis.

8. Marketing: AI is used for targeted advertising, customer segmentation, and sentiment analysis.

9. Education: AI is used for personalized learning, adaptive testing, and intelligent tutoring systems.



Uses/Applications of Artificial Intelligence :

10. **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.

11. **AI in Gaming:** The AI machines can play strategic games like chess, where the machine needs to think of a large number of possible places.

12. **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.

13. **AI 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.

14. **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.

15. **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.

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.

Top Real-World Examples of Machine Learning