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What is Mean by Artificial Intelligence?

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Abstract: *This research paper on "What is Artificial Intelligence Today" examines the current state of Artificial Intelligence (AI) by defining its components, discussing advancements in algorithms, and discussing its applications in healthcare, finance, autonomous vehicles, and natural language processing. It also addresses ethical concerns like privacy and job displacement, and outlines future prospects and challenges for AI .Aim of this research paper is to provide a comprehensive understanding of AI's different capabilities and limitations.*

Keywords: Artificial Intelligence

I. INTRODUCTION

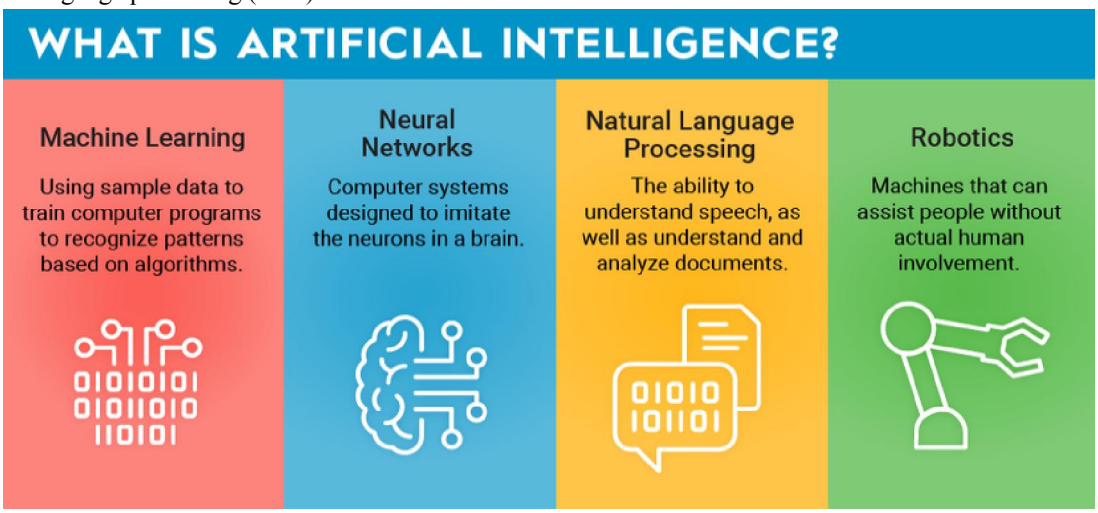
AI, or Artificial Intelligence, refers to the development of computer systems or machines that can perform tasks that would typically require human intelligence. These tasks can include problem-solving, reasoning, learning, language understanding, perception, and even decision-making. AI systems are designed to simulate human intelligence and can be highly specialized in specific areas or more general-purpose. These systems are typically developed using techniques such as machine learning, deep learning, natural language processing, and computer vision. AI has wide-ranging applications in various industries, including healthcare, finance, transportation, and entertainment.

Art Intelligence (AI) is a rapidly developing branch of computer science that enables machines to simulate human intelligence and perform tasks that typically require human intelligence, such as problem-solving, decision-making, and language understanding. AI works by utilizing a combination of algorithms, data, and computing power.

At its core, AI involves creating computer programs that can process and analyze large amounts of data to extract patterns, learn from experience, and make intelligent decisions.

DIFFERENT AI TECHNIQUES:

AI is an umbrella term that encompasses a wide variety of technologies, including machine learning, deep learning, and natural language processing (NLP).



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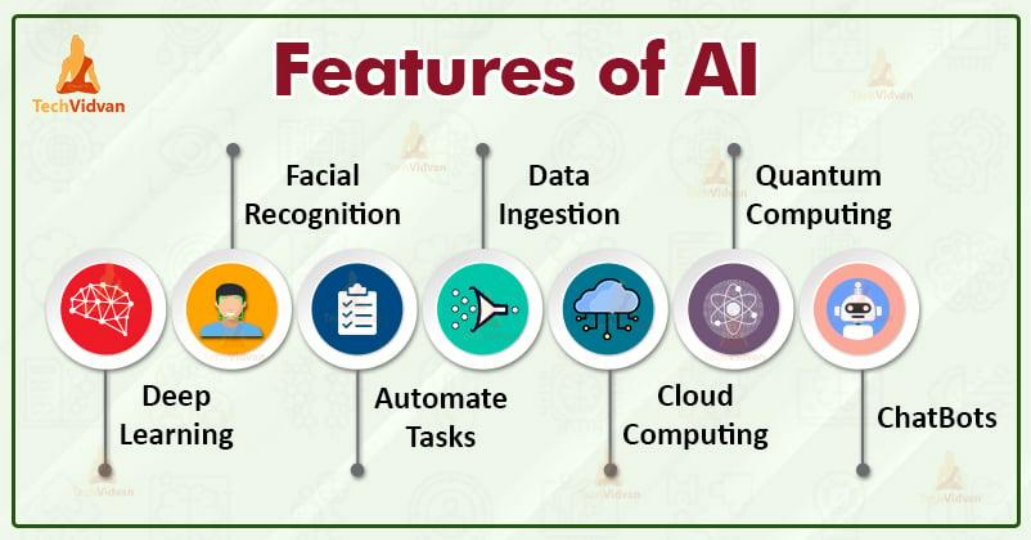
1. Machine Learning: It's a branch of AI that focuses on enabling machines to learn and improve from data without explicit programming. It includes algorithms like decision trees, neural networks, and support vector machines.
2. Natural Language Processing (NLP): NLP allows machines to understand, interpret, and generate human language. It involves tasks like language translation, sentiment analysis, and Chabot's.
3. Computer Vision: Computer vision enables machines to understand and interpret visual information from images or videos. It involves tasks like object recognition, image classification, and facial recognition. These techniques play a crucial role in various AI applications and contribute to advancements in fields like healthcare, finance, transportation.

FEATURES OF AI:
There are many features of Artificial Intelligence (AI). Here are some of the key features:



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1. Deep Learning:
Artificial intelligence is when machines can execute tasks that would typically need human intelligence. Deep learning, on the other hand, is a subset of machine learning in which artificial neural networks have several (deep) layers that allow learning so that the algorithm repeats a task, slightly adjusting it each time to improve the output.
2. Facial Recognition:
Face recognition is one of the powers of Computer Vision Technology, which is based on neural network algorithms. The target to find, recognize and differentiate faces are the goals of this technique.
The incorporation of artificial intelligence (AI) into facial recognition systems is one such advancement. Intelligent AI-based software can scan databases of faces in real-time and compare them to one or more faces observed in a situation. You can receive 99.5 percent accuracy rates in a matter of seconds on standard data sets.
Face recognition software is being developed by a number of well-known companies who are constantly developing and improving it. Deep Vision AI, which is now in the lead, excels in facial recognition software. It has the rights to powerful computer vision technology that can automatically understand photos and movies. It then converts the visual output into real-time analytics, providing extremely useful information.
3. Prevent Natural Disasters:
We are all friendly with using AI for our businesses, for our gaming profiles, and more such purposes. Now it is our turn to take AI one step ahead and hone it, so that governments can use it in disaster management.
Artificially intelligent systems, when fed with data about thousands of previous disasters, AI can accurately predict the future relating to the disasters that might occur.
Today, with the help of features of artificial intelligence like these scientists are studying more than a lack of previously occurred earthquakes and similar disasters like tremors and volcanic eruptions, to create a ***neural network.***

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The mechanism of this network was tested on about 30,000 events, and the predictions of the system came out to be more precise as compared to the traditional techniques.

4. Data Ingestion:

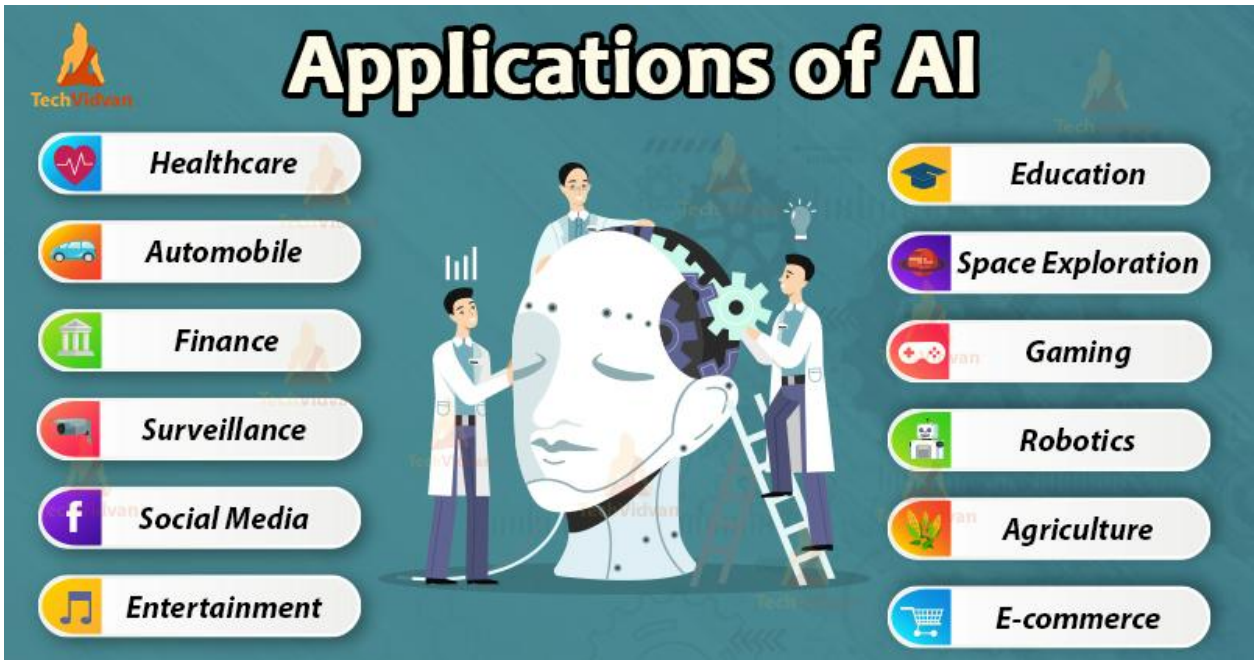
It is the process of transferring data from many sources of raw data into storage media. Data analysts and scientists may access, use, and evaluate this data.

If you've ever looked at the long tally sheets of the economic gains of any business, you'll understand why ingesting and normalizing them into a database requires an artificial intelligence technique. If done manually, it would be a massive undertaking, not to mention the potential of countless blunders. However, by using enough log data to train algorithms with the help of neural networks, this task provides an ideal example for using data science to dramatically improve integrity management processes.

5. Imitates Human Cognition:

Artificial intelligence is defined as the ability of machines to simulate human intellect through behaviors including cognitive ability, memory, learning, and decision making.

APPLICATION AREAS OF AI:



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1. Healthcare:

AI is used in medical imaging for accurate diagnoses, drug discovery, and personalized medicine. A device, as common as a Fitbit or an iWatch, collects a lot of data like the sleep patterns of the individual, the calories burnt by him, heart rate and a lot more which can help with early detection, personalization, even disease diagnosis.

This device, when powered with AI can easily monitor and notify abnormal trends. This can even schedule a visit to the closest Doctor by itself and therefore, it's also of great help to the doctors who can get help in making decisions and research with AI.

2. Automobile:

At this stage where automobiles changing from an engine with a chassis around it to a software-controlled intelligent machine, the role of AI cannot be underestimated.

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The goal of self-driving cars, during which **Autopilot by Tesla** has been the frontrunner, takes up data from all the Tesla's running on the road and uses it in machine learning algorithms. The assessment of both chips is later matched by the system and followed if the input from both is the same.
AI are often witnesses working its magic through robots producing the initial nuts and bolts of a vehicle or in an autonomous car using machine learning and vision to securely make its way through traffic.

3. Banking and Finance
One of the early adopter of Artificial Intelligence is the Banking and Finance Industry.
From Chabot's offered by banks, for instance, **SIA** by depository financial institution of India, to intelligent **robot-traders by Adyar** and **Nomura Securities** for autonomous, high-frequency trading, the uses are innumerable.
Features like AI bots, digital payment advisers and biometric fraud detection mechanisms cause higher quality of services to a wider customer base.
The adoption of AI in banking is constant to rework companies within the industry, provide greater levels useful and more personalized experiences to their customers, reduce risks as well as increase opportunities involving financial engines of our modern economy.
4. Surveillance:
AI has made it possible to develop face recognition Tools which may be used for surveillance and security purposes.
As a result, this empowers the systems to monitor the footage in real-time and can be a pathbreaking development in regards to public safety.
Manual monitoring of a **CCTV camera** requires constant human intervention so they're prone to errors and fatigue. AI-based surveillance is automated and works 24/7, providing real-time insights.

5. Social Media:
Social Media is not just a platform for networking and expressing oneself. It subconsciously shapes our choices, ideologies, and temperament.
All this due to the synthetic Intelligence tools which work silently within the background, showing us posts that we "might" like and advertising products that "might" be useful based on our search and browsing history.
For example, recently **Instagram** revealed how it's been using AI to customize content for the Explore Tab.
This helps with social media advertising because of its unprecedented ability to run paid ads to platform users based on highly granular demographic and behavioral targeting.
Did you know, we also have AI tools that will actually write Facebook and Instagram ads for us? Another huge benefit of AI in social media is that it allows marketers to analyze and track every step that they take.

6. Entertainment:
The show business, with the arrival of online streaming services like **Netflix** and **Amazon Prime**, relies heavily on the info collected by the users.
This helps with recommendations based upon the previously viewed content. This is done not only to deliver accurate suggestions but also to create content that would be liked by a majority of the viewers.
With new contents being created every minute, it is very difficult to classify them and making them easier to search.
AI tools analyze the contents of videos frame by frame and identify objects to feature appropriate tags. AI is additionally helping media companies to form strategic decisions.

7. Education:
In the education sector also, there are a number of problems which will be solved by the implementation of AI.
A few of them being automated marking software, content retention techniques and suggesting improvements that are required.
This can help the teachers monitor not just the academic but also the **psychological, mental and physical wellbeing** of the students but also their all-round development. This would also help in extending the reach of education to areas where quality educators can't be present physically.

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For Example, Case-based simulations offered by Harvard graduate school is one such use.

8. Space Exploration:
AI systems are being developed to scale back the danger of human life that venture into the vast realms of the undiscovered and unraveled universe which is a very risky task that the astronauts need to take up.
As a result, unmanned space exploration missions just like the Mars Rover are possible due to the utilization of AI.
It has helped us discover numerous exoplanets, stars, galaxies, and more recently, two new planets in our very own system.
NASA is also working with AI applications for space exploration to automate image analysis and to develop autonomous spacecraft that would avoid space debris without human intervention, create communication networks more efficient and distortion-free by using an AI-based device.

9. Gaming:
In the gaming industry also, computer game Systems powered by AI is ushering us into a replacement era of immersive experience in gaming.sss
AI is employed to get responsive, adaptive or intelligent behaviors primarily in **non-player characters (NPCs)** almost like human-like intelligence in video games. It serves to enhance the game-player experience instead of machine learning or deciding.
AI has also been playing a huge role in creating video games and making it more tailored to players' preferences.
Matthew Guzdial from the University of Alberta and his team are working towards leveraging AI's power to assist video gamers create the precise game that they need to play.

10. Robotics:
With increasing developments within the field of AI, robots are becoming more efficient in performing tasks that earlier were too complex.
The idea of complete automation are often realized only with the assistance of AI, where the system can't just perform the specified task but also monitor, inspect and improve them without any human intervention.
AI in robotics helps the robots to learn the processes and perform the tasks with complete autonomy, without any **human intervention.** This is because robots are designed to perform repetitive tasks with utmost precision and increased speed.
AI has been introducing flexibility and learning capabilities in previously rigid applications of robots. These benefits are expected to reinforce the market growth.

11. Agriculture:
Artificial Intelligence is changing the way we do one among our most primitive and basic professions which is farming.
The use of AI in agriculture are often attributed to agriculture robots, predictive analysis, and crop and soil monitoring.
In addition, drones are also used for spraying insecticides and detecting weed formation in large farms. This is getting to help firms like **Blue River Technologies**, better manage the farms.
AI has also enhanced crop production and improved real-time monitoring, harvesting, processing and marketing.
12. E-Commerce:
This is one of the Artificial Intelligence Applications that's found to be widely used.
Different departments of E-commerce including logistics, predicting demand, intelligent marketing, better personalization, use of chatbots, etc. are being disrupted by AI.
The E-Commerce industry, a prominent player being **Amazon** is one among the primary industries to embrace AI. This may experience a good use of AI with time.
E-commerce retailers are increasingly turning towards chatbots or digital assistants to supply 24×7 support to their online buyers. Built using AI technologies, chatbots are becoming more intuitive and are enabling a far better customer experience.

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LIMITATIONS OF AI:

Artificial Intelligence (AI) has made remarkable strides in transforming various aspects of our lives, from automating routine tasks to enhancing decision-making processes. However, despite its impressive capabilities, AI has its limitations. We must be aware of these constraints as we continue to harness its power to ensure responsible and effective use. Here are the top 5 limitations of artificial intelligence.

Lack of Understanding and Common Sense: While AI excels in processing and analyzing large volumes of data, it often needs help comprehending context, nuance, and the common-sense reasoning that humans possess effortlessly. AI models need a true understanding of the world, making them prone to misinterpretation and generating inaccurate or nonsensical results.

Data Dependency and Bias: AI algorithms heavily rely on the data they are trained on. The AI system's outputs can inherit these flaws if the training data is incomplete, biased, or unrepresentative. This leads to biased decisions, reinforcing stereotypes, and perpetuating societal inequalities. Efforts to eliminate bias and fairness in AI models are ongoing but remain a significant challenge.

Narrow Focus and Lack of Generalization: Most AI systems are designed for specific tasks and need the ability to generalize their knowledge to new and different situations. For instance, a model trained to play chess won't be able to comprehend natural language conversations. Developing AI that can learn across domains and adapt to new challenges is a complex problem that researchers are actively addressing.

Ethical and Moral Dilemmas: As AI becomes more integrated into our lives, it raises ethical concerns. Machines making decisions that impact human lives can lead to moral dilemmas. Questions about responsibility, accountability, and the potential for AI to make decisions counter to human values are complex and need careful consideration.

Limitations in Creativity and Intuition: AI can mimic certain creative processes, such as generating art, music, or text. However, it needs humans' genuine creativity, originality, and intuition. AI-generated outputs are often based on patterns and data it has learned from, limiting its ability to innovate in the same way human minds can truly. This apparent lack of creativity limits the potential applications of AI, and makes it difficult for the technology to be used in fields that require original thinking, such as art, music, and literature, although I have seen examples of AI being successfully used to write new songs in the style of famous singers, and doing a pretty good job - presumably because it's learnt that style/tone/pace and is regurgitating it.

Requires Monitoring

Algorithms operate similarly to an engine, but someone still needs to turn the key. The marketer is still crucial to the planning, creation, and execution of the marketing effort. They are the supplier of fresh data to the artificial intelligence required for learning in the first place. One of the main challenges in developing a more human-like AI as per researchers is that this type of supervised learning does not replicate how humans learn organically.

II. CONCLUSSION

It appears that AI research has a bright future! The goal of explainable AI is to increase the transparency and comprehensibility of AI systems. In addition to ensuring moral decision-making, this will assist foster trust. Another area of interest is AI for social good, which uses AI to solve societal issues like healthcare, education, and poverty. The possible effects on society, such as lost jobs and privacy issues, must be taken into account. For AI to be beneficial to all, it is imperative that there be continuous conversations and restrictions.

It is true that three essential AI approaches are computer vision, natural language processing, and machine learning. From healthcare to driverless cars, they have transformed a number of industries. Allowing robots to comprehend human language, learn from data, and interpret!

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