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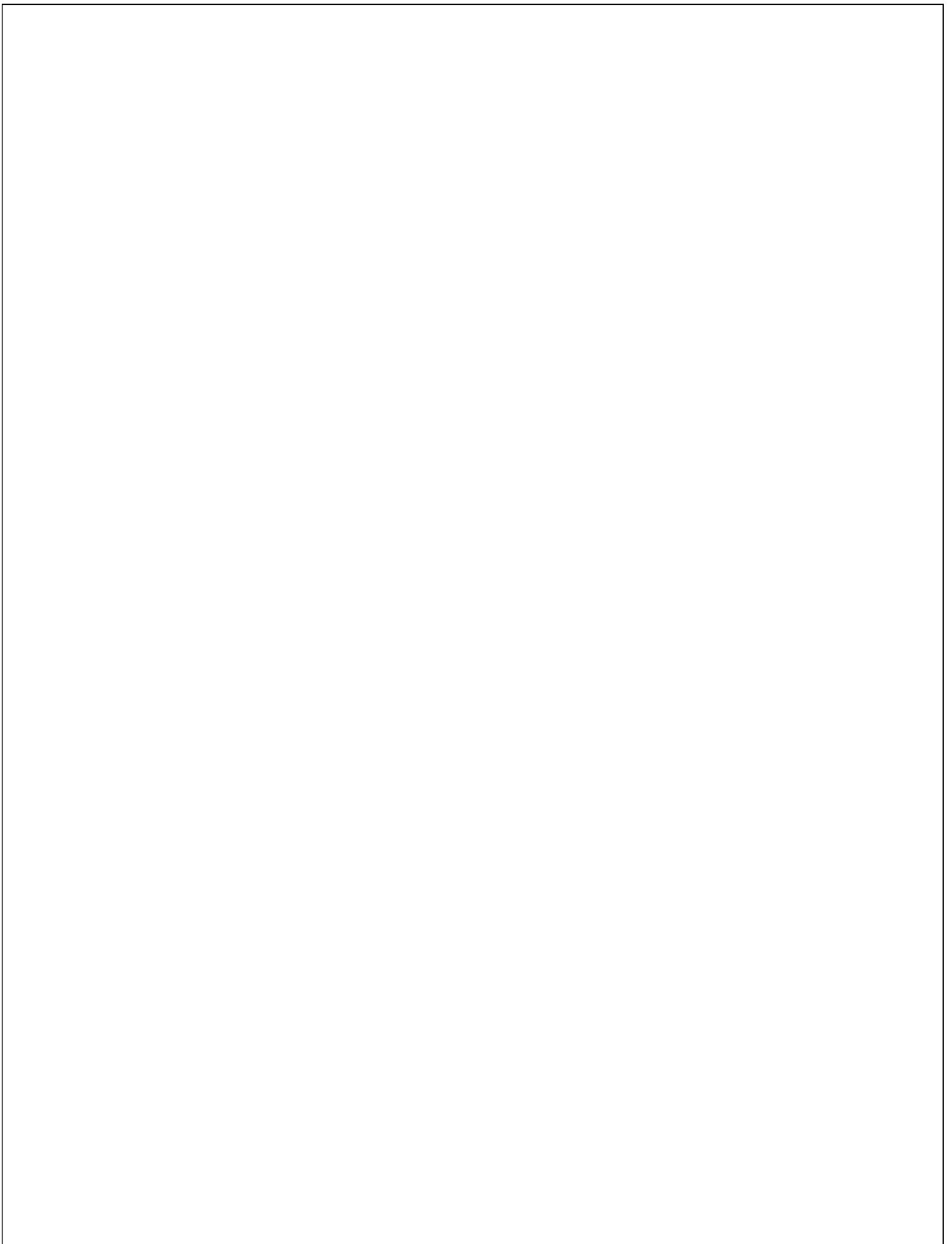
**TECH-ON-TOP
OCTOBER ISSUE**

E-JOURNAL

ON



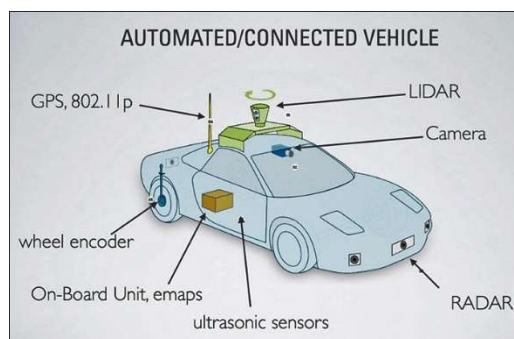
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AI FOR SELF-DRIVING CARS

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Self-driving cars, also referred to as autonomous cars, are cars which are capable of driving with little to no human input. For an automobile to be autonomous, it needs to be continuously aware of its surroundings—first, by perceiving (identifying and classifying information) and then acting on the information through the autonomous/computer control of the vehicle. Autonomous vehicles require safe, secure, and highly responsive solutions which need to be able to make split-second decisions based on a detailed understanding of the driving environment. Understanding the driving environment requires an enormous amount of data to be captured by myriad different sensors across the car, which is then processed by the vehicle's autonomous driving computer system. A self-driving car's AI system requires a continuous, uninterrupted stream of data and instructions in order to make real-time decisions based on complex data sets.



CYBERSECURITY CHALLENGES IN THE UPTAKE OF ARTIFICIAL INTELLIGENCE IN AUTONOMOUS DRIVING

The AI systems of an autonomous vehicle are working non-stop to recognise traffic signs and road markings, to detect vehicles, estimate their speed, to plan the path ahead. Apart from unintentional threats such as sudden malfunctions, these systems are vulnerable to intentional attacks that have the specific aim to interfere with the AI system and to disrupt safety-critical functions. Adding paint on the road to misguide the navigation, or stickers on a stop sign to prevent its recognition are examples of such attacks. These alterations can lead to the AI system wrongly classifying objects, and subsequently to the autonomous vehicle behaving in a way that could be dangerous. In order to improve the AI security in autonomous vehicles the following measures could be taken:

- Continuous risk assessment processes supported by threat intelligence which could enable the identification of potential AI risks and emerging threats related to the uptake of AI in autonomous driving.
- Proper AI security policies and an AI security culture should govern the entire automotive supply chain.
- Systematic validation of AI models and data is essential to ensure that the vehicle always behaves correctly when faced with unexpected situations or malicious attacks.

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AI IN AGRICULTURE

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INTRODUCTION:

The agricultural sector like the crop yield, irrigation, soil content sensing, crop- monitoring, weeding, crop establishment. Agricultural robots are built in order to deliver high valued application of AI in the mentioned sector. With the global population soaring, the agricultural sector is facing a crisis, but AI has the potential to deliver much-needed solution. AI- based technological solutions has enabled the farmers to produce more output with less input and even improved the quality of output, also ensuring faster go-to- market for the yielded crops.

USE OF WEATHER FORECASTING:

With the change in climatic condition and increasing pollution it's difficult for farmers to determine the right time for sowing seed, with help of Artificial Intelligence farmers can analyse weather conditions by using weather forecasting which helps they plan the type of crop can be grown and when should seeds be sown.



Soil and crop health monitoring system:

The type of soil and nutrition of soil plays an important factor in the type of crop is grown and the quality of the crop. Due to increasing, deforestation soil quality is degrading and it's hard to determine the quality of the soil.

A German-based tech start-up PEAT has developed an AI-based application called Plan tix that can identify the nutrient deficiencies in soil including plant pests and diseases by which farmers can also get an idea to use fertilizer which helps to improve harvest quality. This app uses image recognition-based technology. The farmer can capture images of plants using smartphones. We can also see soil restoration techniques with tips and other solutions through short videos on this application.

Similarly, Trace Genomics is another machine learning-based company that helps farmers to do a soil analysis to farmers. Such type of app helps farmers to monitor soil and crop's health conditions and produce healthy crops with a higher level of productivity.

Analysing crop health by drones: SkySquirrel Technologies has brought drone-based Ariel imaging solutions for monitoring crop health. In this technique, the drone captures data from



fields and then data is transferred via a USB drive from the drone to a computer and analysed by experts.

This company uses algorithms to analyse the captured images and provide a detailed report containing the current health of the farm

PRECISION FARMING AND PREDICTIVE ANALYTICS:

AI applications in agriculture have developed applications and tools which help farmers inaccurate and controlled farming by providing them proper guidance to farmers about water management, crop rotation, timely harvesting, type of crop to be grown, optimum planting, pest attacks, nutrition management. While using the machine learning algorithms in connection with images captured by satellites and drones, AI-enabled technologies predict weather conditions, analyse crop sustainability and evaluate farms.

Farmers without connectivity can get AI benefits right now, with tools as simple as an SMS-enabled phone and the Sowing App. With such IoT- and AI-driven solutions, farmers can meet the world's needs for increased food sustainably growing production and revenues without depleting precious natural resources.

CONCLUSION: Artificial Intelligence in agriculture not only helping farmers to automate their farming but also shifts to precise cultivation for higher crop yield and better quality while using fewer resources. Companies involved in improving machine learning or Artificial Intelligence-based products or services like training data for agriculture, drone, and automated machine making will get technological advancement in the future will provide more useful applications.

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AI IN CYBER SECURITY

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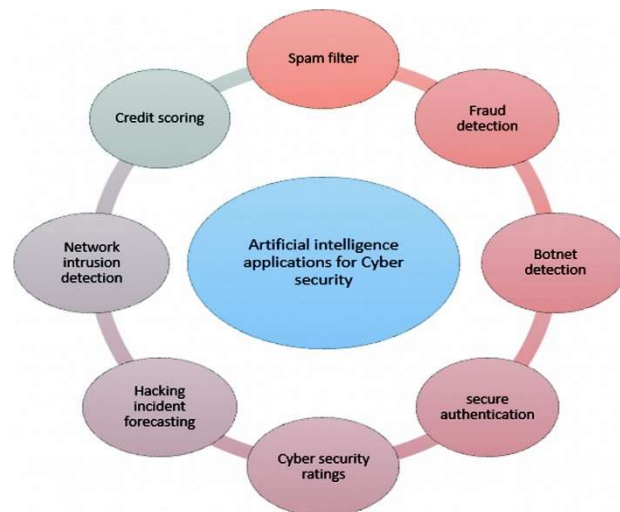
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INTRODUCTION

Cybersecurity is one of the multiple uses of artificial intelligence. A report by Norton showed that the global cost of typical data breach recovery is \$3.86 million. The report also indicates that companies need 196 days on average to recover from any data breach. For this reason, organizations should invest more in AI to avoid waste of time and financial losses and.

AI, machine learning, and threat intelligence can recognize patterns in data to enable security systems learn from past experience. In addition, AI and machine learning enable companies to reduce incident response times and comply with security best practices.

HOW AI IMPROVES CYBER SECURITY



THREAT HUNTING

Traditional security techniques use signatures or indicators of compromise to identify threats. This technique might work well for previously encountered threats, but they are not effective for threats that have not been discovered yet. Signature-based techniques can detect about 90% of threats. Replacing traditional techniques with AI can increase the detection rates up to 95%, but you will get an explosion of false positives. The best solution would be to combine both traditional methods and AI. This can result in 100% detection rate and minimize false positives. Companies can also use AI to enhance the threat hunting process by integrating behavioral analysis.

VULNERABILITY MANAGEMENT

20,362 new vulnerabilities were reported in 2019, up 17.8% compared to 2018. Organizations are struggling to prioritize and manage the large amount of new vulnerabilities they encounter on a daily basis. Traditional vulnerability management methods tend to wait for hackers to exploit high-risk vulnerabilities before neutralizing them. While traditional vulnerability databases are critical

to manage and contain known vulnerabilities, AI and machine learning techniques like User and Event Behavioral Analytics (UEBA) can analyze baseline behavior of user accounts, endpoint and servers, and identify anomalous behavior that might signal a zero-day unknown attack. This can help protect organizations even before vulnerabilities are officially reported and patched.

NETWORK SECURITY

Traditional network security has two time-intensive aspects, creating security policies and understanding the network topography of an organization.

- **Policies**—security policies identify which network connections are legitimate and which you should further inspect for malicious behavior. You can use these policies to effectively enforce a zero-trust model. The real challenge lies in creating and maintaining the policies given the large amount of networks.
- **Topography**—most organizations don't have the exact naming conventions for applications and workloads. As a result, security teams have to spend a lot of time determining what set of workloads belong to a given application.

DRAWBACKS AND LIMITATIONS OF USING AI FOR CYBERSECURITY

There are also some limitations that prevent AI from becoming a mainstream security tool:

- **Resources**—companies need to invest a lot of time and money in resources like computing power, memory, and data to build and maintain AI systems.
- **Data sets**—AI models are trained with learning data sets. Security teams need to get their hands on many different data sets of malicious codes, malware codes, and anomalies. Some companies just don't have the resources and time to obtain all of these accurate data sets.
- **Hackers also use AI**—attackers test and improve their malware to make it resistant to AI-based security tools. Hackers learn from existing AI tools to develop more advanced attacks and attack traditional security systems or even AI-boosted systems.

CONCLUSION

Artificial intelligence and machine learning can improve security, while at the same time making it easier for cybercriminals to penetrate systems with no human intervention. This can bring significant damage to any company. Getting some kind of protection against cyber criminals is highly recommended if you want to reduce losses and stay in business.

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AI IN E-COMMERCE

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INTRODUCTION

artificial intelligence in Ecommerce industry is being utilized by online retailers for providing chatbot services, analysing customer comments, and for providing personalized services to online shoppers. In fact, a 2019 Ubisend study found that 1 in every 5 consumers are willing to purchase goods or services from a chatbot, while 40% of the online shoppers are looking for great offers and shopping deals from chatbots.

While the global E-commerce sales are projected to touch \$4.8 billion by the year 2021, Gartner predicts that around 80% of all customer interactions will be managed by AI technologies (without any human agent) by the year 2020.



HOW IS ARTIFICIAL INTELLIGENCE TRANSFORMING SHOPPING EXPERIENCE?

The use of artificial intelligence in online shopping is transforming the E-commerce industry by predicting shopping patterns based on the products that shoppers buy and when they buy them. For example, if online shoppers frequently buy a particular brand of rice every week, then the online retailer could send a personalized offer to these shoppers for this product, or even use a machine learning-enabled recommendation for a supplementary product that goes well with rice dishes.

Ecommerce AI tools or AI-enabled digital assistants such as the Google Duplex tool is developing capabilities like creating grocery lists (from the shopper's natural voice) and even placing online shopping orders for them.

AI APPLICATION IN E-COMMERCE



1. Chatbots

E-commerce websites are using chatbots to improve the customer support service. Chatbots are providing 24/7 customer support to buyers. Visit any recognized E-commerce website. You will be prompted with a chat box asking what do you want or how can I help. You can tell your requirements in the chat box and you will be served with highly filtered results. Ever come across a situation where you liked any product or item but don't what it is called or what it is? Artificial intelligence service eases this task for you. The concept of image search is implemented in E-commerce websites with the application of artificial intelligence. Artificial intelligence has made it possible to understand images.

Artificial intelligence has also improved the cybersecurity of the E-commerce websites. It can prevent or detect any fraudulent activities. E-Commerce has to deal with a lot of transactions on daily basis. Cybercriminals and hackers can hack the user account to gain unauthenticated access. This can lead to the exposure of private data and online fraud. The reputation of the business also gets a big blow. To prevent this, Artificial intelligence and machine learning algorithms are developed that can mitigate the chances of fraud activities over the website.

CONCLUSION

As highlighted in this article, artificial intelligence in Ecommerce is playing a leading role in driving innovative solutions and customer experiences. Some the leading use cases of artificial intelligence in Ecommerce is in the area of personalized shopping, product recommendations, and inventory management.

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AI IN HEALTHCARE INDUSTRY FOR DOSING DRUG

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INTRODUCTION

Drug dosing driven by AI is becoming more prevalent in many areas of medicine, such as dialysis, cancer and transplant medicine. It is in these areas that dosing plays a critical role in achieving favorable outcomes.

Today, AI-powered dosing is particularly impactful in the dosing of drugs used to manage chronic conditions, as the potential for adverse events, as well as costs, increases over the months and years that patients are on these drugs.

AI can help determine the minimum dose required to achieve the desired therapeutic outcome. In the case of dosing medications used in chronic disease management, inefficient dosing can result in significantly higher than necessary drug exposure for the patient and cost of care. At the same time, dose adjustments must be made frequently, as patients' drug response changes over time.



AI-powered drug dosing empowers clinicians to deliver personalized care to their patients, maximizing therapeutic safety and efficacy while minimizing cost of care. It allows for a practical and consistent approach to solving the complex, multifactorial problems associated with dosing.

It also allows large quantities of data to be processed quickly, and algorithms to be improved over time with relative ease as more data becomes available. The advantages to this approach are clear and significant for patients, providers and payers.

CHALLENGES FACED BY AI.

AI faces some significant data challenges, such as the scale, growth, diversity, and uncertainty of the data. The data sets available for drug development in pharmaceutical companies can involve millions of compounds, and traditional ML tools might not be able to deal with these types of data. Quantitative structure-activity relationship (QSAR)-based computational model can quickly predict large numbers of compounds or simple physicochemical parameters, such as log P or log D.

PREDICTION OF TOXICITY.

The prediction of the toxicity of any drug molecule is vital to avoid toxic effects. Cell-based in vitro assays are often used as preliminary studies, followed by animal studies to identify the toxicity of a compound, increasing the expense of drug discovery.

PREDICTION OF BIOACTIVITY.

The efficacy of drug molecules depends on their affinity for the target protein or receptor. Drug molecules that do not show any interaction or affinity towards the targeted protein will not be able to deliver the therapeutic response.

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ARTIFICIAL INTELLIGENCE IN SOCIAL MEDIA

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MAHIMA I (20MCA21)

Today, consumers constantly interact with social media. Many of us may even say we are addicted to our screens. Companies are very eager to take advantage of our constant engagement with platforms such as Facebook, Twitter, and Snapchat. As a result, a growing number are incorporating Artificial Intelligence (AI) in social media to better connect with potential customers. Already, just a single click can impact what notifications pop up on our social media accounts posts, advertisements, friend suggestions and more because of AI products, such as recommendation engines and Chatbot. In addition, AI Technologies, including facial recognition and Natural Language Processing (NLP), are helping companies improve customer service and market their products more effectively.

ROLE OF AI IN SOCIAL MEDIA

Managing social media platforms flooded with innumerable users is not a child's play; it requires a lot of things to look upon. With Artificial Intelligence, social networking companies are analyzing voluminous data to find out what's trending, different Hashtags, and patterns. This analysis helps in understanding user's behaviour. With the help of various algorithms, Artificial Intelligence can keep an eye on unstructured user comments to offer a personalized experience and to recognize crisis. The technology can also assist in providing content analyzing different activities as well as demographics. Most of the top social networking companies have already adopted AI to scale up their processes and take their business to the next level.

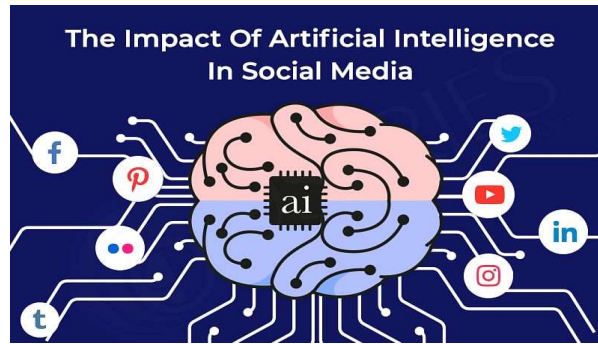
BENEFITS OF USING AI IN SOCIAL MEDIA

To Recognize Images: AI-powered image recognition software and tools helps in recognizing various images to understand the change in users behavior through complex algorithms, it can go through millions of images to bring out valuable information.

AI-powered Chabots: Business running over social media can use AI-powered chatbots to answer their customer's queries in no time.

Analyzing Sentiments: AI can analyze the nature or intent of a query or comment or something posted by a user. AI uses another subset known as natural language processing. NLP helps in finding out positive and negative words in a post or comment.

Increased Security: AI can help social media platforms to protect the user data and increase the privacy of their information. Through user authentication, pattern detection, fraud prevention, and other features, this technology can help users to improve the security of their social media accounts.



THE IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIAL MEDIA

Many customers are addicted to social media. Companies are very eager to take advantage of our constant engagement with platforms such as Facebook, Twitter and Snapchat. AI technologies which include facial recognition and natural language processing (NLP) are helping companies improve customer service and market their products and more effectively.

Sentiment Analysis: Ever wonder what happens when you tweet a complaint about your espresso from Starbucks? With the help of sentiment analysis, social media software can detect the negative words in your tweet, enabling Starbucks to understand how a customer feels toward their brand. Sentiment analysis uses natural language processing (NLP) to identify positive and negative words in posts and comments on social media. With this information, businesses can consistently, quickly, and accurately respond to customer complaints.

Efficiency and Entertainment with Image Recognition: When you post a group photo on Facebook, most of the faces in the photo are identified and automatically tagged with the help of facial recognition technology. Facial recognition requires multiple layers of neural networks, which use machine learning to identify the components of an object. Also, some social media apps, like Snapchat and LINE, offer animated lenses and filters that use facial recognition to change the appearance of users.

CONCLUSION

In the digital age, AI is constantly transforming social media, from augmenting user experience to finding more effective ways to market products. When we log on to our social media and upload a picture, notice an interesting advertisement, or comment on a post, keep in mind that with the help of AI, data about your activity is continuously being compiled and analysed and will impact what you see and engage with in the near future.

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AI IN SPACE EXPLORATION

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INDRODUCTION

Artificial intelligence has been making waves in recent years, enabling us to solve problems faster than traditional computing could ever allow. Recently, for example, Google's artificial intelligence subsidiary DeepMind developed AlphaFold2, a program which solved the protein-folding problem. This is a problem which has had baffled scientists for 50 years.



Advances in AI have allowed us to make progress in all kinds of disciplines – and these are not limited to applications on this planet. From designing missions to clearing Earth's orbit of junk, here are a few ways artificial intelligence can help us venture further in space.

ASTRONAUT ASSISTANTS

Do you remember Tars and Case, the assistant robots from the film Interstellar? While these robots don't exist yet for real space missions, researchers are working towards something similar, creating intelligent assistants to help astronauts. A recently developed virtual assistant can potentially detect any dangers in lengthy space missions such as changes in the spacecraft atmosphere – for example increased carbon dioxide – or a sensor malfunction that could be potentially harmful.



MISSION DESIGN AND PLANNING

Planning a mission to Mars is not an easy task, but artificial intelligence can make it easier. New space missions traditionally rely on knowledge gathered by previous studies. However, this information can often be limited or not fully accessible.

This means the technical information flow is constrained by who can access and share it among other mission design engineers. But what if all the information from practically all previous space missions were available to anyone with authority in just a few clicks. One day there may be a smarter system – similar to Wikipedia, but with artificial intelligence that can answer complex queries with reliable and relevant information – to help with early design and planning of new space missions.

SATELLITE DATA PROCESSING

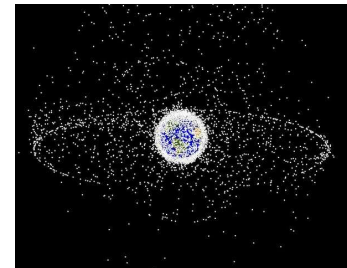
Earth observation satellites generate tremendous amounts of data. This is received by ground stations in chunks over a large period of time, and has to be pieced together before it can be analysed. While there have been some crowdsourcing projects to do basic satellite imagery analysis on a very small scale.



For the sheer volume of data received, AI has been very effective in processing it smartly. It's been used to estimate heat storage in urban areas and to combine meteorological data with satellite imagery for wind speed estimation.

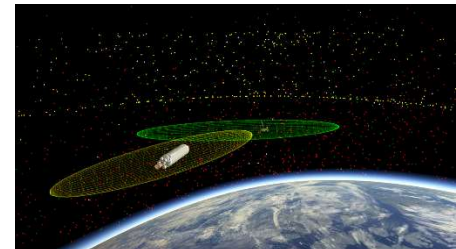
SPACE DEBRIS

One of the biggest space challenges of the 21st century is how to tackle space debris. According to ESA, there are nearly 34,000 objects bigger than 10cm which pose serious threats to existing space infrastructure. There are some innovative approaches to deal with the menace, such as designing satellites to re-enter Earth's atmosphere if they are deployed within the low Earth orbit region making them disintegrate completely in a controlled way.



NAVIGATION SYSTEM

On Earth, we are used to tools such as Google Maps which use GPS or other navigation systems. But there is no such a system for other extra-terrestrial bodies, for now. In 2018, a team of researchers from NASA in collaboration with Intel developed an intelligent navigation system using AI to explore the planets.



CONCLUSION:

AI and machine learning capabilities are making significant impacts in the space industry by creating efficiencies in mission planning and operations and providing scientists with the ability to explore the far reaches of space. While automation of tasks paves the way for the use of AI, the ability for spacecraft to become fully cognitive machines, capable of making critical decisions based on their current environment, without reliance on ground systems to perform essential functions will create more time for humans to spend on valued and more complex research activities.

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ARTIFICIAL INTELLIGENCE IN SURGERY AND HELPING PARALYZED PATIENTS

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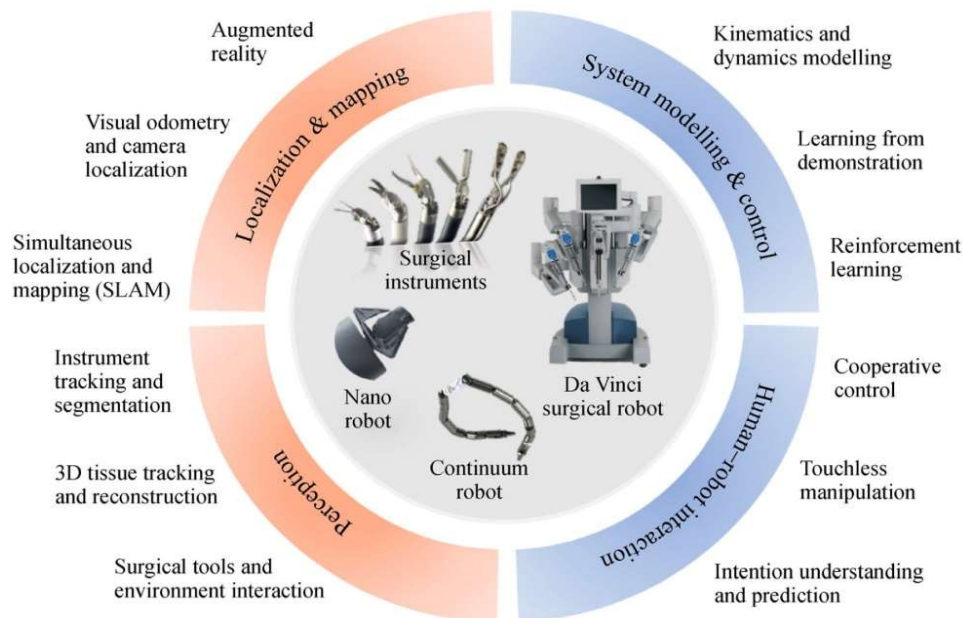
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AI IN SURGERY

Artificial intelligence is being applied to surgical robotics. Manufacturers see the need to use deep learning data to automate rather than behaviour programmed by an engineer that does not know all the scenarios. This deep machine learning data is collected from watching surgeons perform.

AI can determine patterns within surgical procedures to improve best practices and to improve a surgical robots' control accuracy to submillimeter precision. AI is also being used with machine vision to analyse scans and detect cancerous cases. Laparoscopic video analysis of surgeries, like sleeve gastrectomy procedures, helps to identify missing or unexpected steps in real time.

Surgeons are using robotic surgery platforms that use micro-instrumentation, flexible robotics, and other technologies for bronchoscopic procedures. Robotics improve outcomes for patients by accessing and treating disease through the body's natural openings. The platforms integrate endoscopes, instruments, and navigation into a single platform, allowing physicians to better conduct endoscopic interventions.



AI FOR PARALYZED PATIENTS

Spinal cord injuries have unpredictable outcomes. While some recover full movement, others suffer permanent paralysis, ranging from partial to full-body. Decades of research leading up to this point has shown that it is possible to reconnect some neural signals between the body and the brain.

At the beginning of October, Brown University announced a grant from DARPA to develop and test an intelligent read-write link for the spinal cord. This project will attempt to connect the neurological signals from above and below spinal cord injuries and aims to restore two-way communication in the spine. The project, known as BrainGate, uses implanted brain-recording electrodes to capture information from the motor cortex, sends the signal to a computer, and then uses that information to drive a cursor on a computer screen. In that landmark study, paralyzed patients - people who cannot move, but are awake and alert—could type an email or play a virtual piano using their minds.

The Centre for Neuroprosthetic and Brain Mind developed a brain-spine interface. In that study, they were able to record from the brain and use those signals to stimulate the spinal cord, bypassing a spinal injury. This ground-breaking system receives data from the leg area of the motor cortex and, similar to the computer-in-the-loop BrainGate system, relays that signal to a computer, which interprets whether the person wants to lift up the leg or put it down, and then relays that information to a Medtronic spinal cord stimulator that stimulates the non-functional limb.

Tetraplegia is defined as complete paralysis of all four limbs and torso. However, even in tetraplegic complete patients, there is often still a tissue connection at the lesion site, and previous research has demonstrated that it's possible to retrain neural pathways to use those remaining connections and regain some lost function.

The intelligent spinal interface will sit above and below the spinal cord lesion and stimulate across that gap, utilizing an AI-trained computer chip to decode signals recorded from the spinal cord, retrain the remaining networks, and initiate the correct intended behaviours. By leveraging knowledge of the spinal cord circuitry, they hope to train the artificial neural network so that it continues to learn over time.

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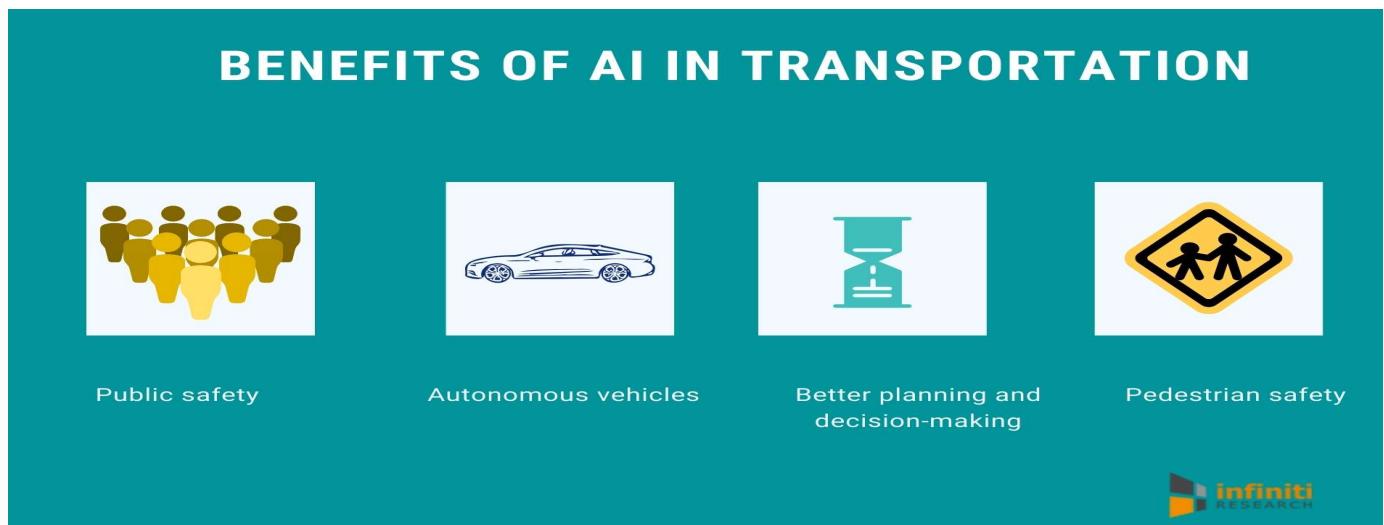
ARTIFICIAL INTELLIGENCE IN TRANSPORTATION

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Transportation is the industry that deals with the movement of commodities and passengers from one place to another. IT has gone through several studies, researches, trials, and refinements to reach where it is now. Technological advancements have helped the transportation sector progress in its journey of innovation and evolution. One such new-age technology that has contributed to the sector is AI. Leveraging AI in transportation helps the sector increase passenger safety, reduce traffic congestion and accidents, lessen carbon emissions, and also minimize the overall financial expenses.

AI can be defined as a technology that powers machines with human intelligence. The innovations introduced by AI include highly advanced computational methods that mimic the way the human brain works. The application of AI in the transport field is aimed at overcoming the challenges of an increasing travel demand, CO2 emissions, safety concerns, and environmental degradation. AI-powered systems exhibit human intelligence and learn with time. Realizing this unique potential of AI, the businesses in the transportation sector are making significant investments to improve revenue generation and stay ahead of their competitors. According to studies the global market for AI in transportation is expected to reach 3.5 billion dollars by 2023.



APPLICATIONS ON AI IN TRANSPORTATION :

1. **Self-driving vehicles :**

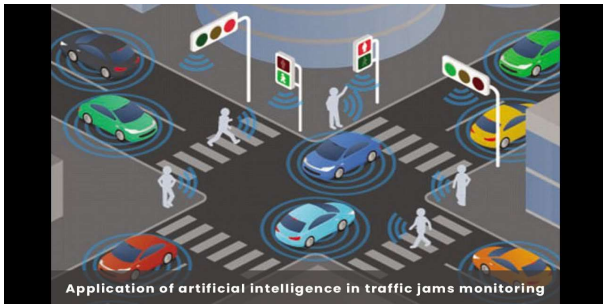
Autonomous vehicles, the concept that was once merely a sci-fi fantasy, has now become a practical reality. Although people were skeptical of this technology during its developmental stages, driverless vehicles have already made their entry into the transportation sector. Autonomous taxis have already



started operating in Tokyo. US logistics are embracing autonomous trucks to reap numerous benefits from it.

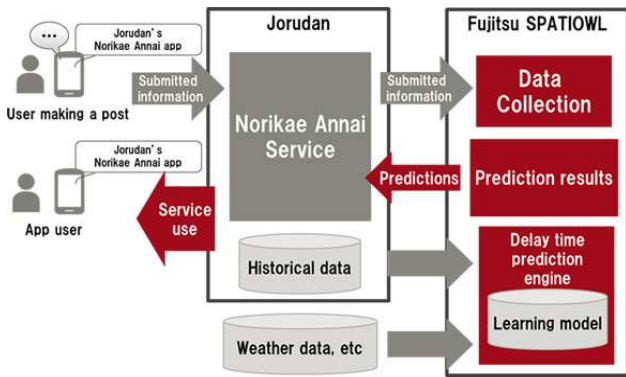
2. Traffic management :

Another transportation problem that people face on a daily basis is traffic congestion. Sensors and cameras embedded everywhere on roads collect the large voluminous amount of traffic details. Valuable insights like traffic predictions can be gleaned from data processing. People can also be notified about the shortest route to their destination, helping them travel without any hassles of traffic.



3. Delay predictions :

Another burning problem faced by air transport today is flight delays. AI comes to the air transport industry's rescue here. Leveraging data lake technology and computer vision, the industry can offer exceptional service to passengers in cutting down passenger's wait times and enhancing their journey experience. AI and machine learning components will process real-time airplane data, historical records, and also the weather information. This data can be forwarded to passengers, which can help them plan their schedule accordingly.



4. Drone taxis :

One of the most exciting and innovative AI applications in transportation is a drone taxi. Pilotless helicopters present a unique solution to combat the carbon emissions, eliminate traffic congestion, and reduce the need for expensive infrastructure construction plans. Drone taxis can indeed be the real recipe to solve all the concerns that these city planners are striving to deal.

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AI IN WEAPON SYSTEM

ANJU S M (20MCA03)

RACHANA K Y (20MCA28)

INTRODUCTION:

AI is going to be used in is going to be used in military applications to aid decision-makers. The automotive industry is already integrating AI into vehicles to analyze driving situations and provide augmented reality to drivers via heads-up displays to help avoid accidents. Such systems work by judging the deceleration of nearby vehicles, analysing the context of roadway markings, or using additional sensors to enhance navigation in low-visibility fog. Automakers have even integrated fail-safe technology that can brake the car to avoid collisions if the driver fails to act. This same type of technology will be deployed by the military to aid Soldier decision making.



AI TERMINOLOGY AND BACKGROUND:

1. Any artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight, or that can learn from experience and improve performance when exposed to data sets.

2. An artificial system developed in computer software, physical hardware, or other context that solves tasks requiring human-like perception, cognition, planning, learning, communication, or physical action.
3. An artificial system designed to think or act like a human, including cognitive architectures and neural networks.
4. A set of techniques, including machine learning that is designed to approximate a cognitive task.
5. An artificial system designed to act rationally, including an intelligent software agent or embodied robot that achieves goals using perception, planning, reasoning, learning, communicating, decision-making, and acting

AI APPLICATIONS FOR DEFENCE:

DOD is considering a number of diverse applications for AI. Currently, AI R&D is being left to the discretion of research organizations in the individual services, as well as to DARPA and the Intelligence Advanced Research Projects Agency (IARPA). However, DOD components are required to coordinate with the JAIC regarding any planned AI initiatives costing more than \$15 million annually.⁵⁵ In addition, the JAIC has been tasked with overseeing the National Mission

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ARTIFICIAL INTELLIGENCE IN ROBOTICS

S SWATHI [20MCA38]

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Artificial Intelligence or AI gives robots a computer vision to navigate, sense and calculate their reaction accordingly. Robots learn to perform their tasks from humans through machine learning which again is a part of computer programming and AI. A robot is a machine capable of sensing and interacting with its environment Artificial Intelligence is a computer program that mainly focuses on the development and analysis of algorithms which in other words means that AI is a computer program that is capable of creating a machine having its own intelligence and behaviour.

What do you call a machine that looks like a human and can even act like a human in certain situations? If you guessed Robot, you are correct!!! And Robotics is a field that deals with the creation and designing of these mechanical humans. And Robotics these days is not only restricted to the mechanical and electronics domain.

AI and computer vision technologies can help robots to identify and recognize objects they encounter help pick out details in objects and help with navigation and avoidance. AI-enabled manipulation and grasping. Long considered a difficult task for robots, AI is being used to help robots with grasping items.

Nowadays, robots are becoming 'smarter' and more efficient with the help of computer science. So, Artificial Intelligence has played a very major role not only in increasing the comforts of humans but also by increasing industrial productivity which includes the quantitative as well as qualitative production and cost-efficiency. This article gives a short insight regarding the importance of Artificial Intelligence in the field of robotics. Artificial Intelligence or AI gives robots a computer vision to navigate, sense and calculate their reaction accordingly. Robots learn to perform their tasks from humans through machine learning which again is a part of computer programming and AI.

Since the time John McCarthy has coined the term Artificial Intelligence in 1956, it has created a lot of sensation. This is because AI has the power to give life to robots and empower them to take their decisions on their own. Depending on the use and the tasks that the robot has to perform different types of AI is used. They are as follows: Weak Artificial Intelligence, Strong Artificial Intelligence, Specialized Artificial Intelligence.

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ARTIFICIAL INTELLIGENCE IN CIVIL ENGINEERING

NAME: SWATHI N

ROLL NO: 20MCA37



INTRODUCTION:

Artificial Intelligence (AI) is a specialized system to understand intelligent entities, construct them and make the process of decision making simple, quick and efficient. In the field of civil engineering it covers a vast area for human benefits especially in engineering design construction management and program decision-making and can solve complex problems to level of experts by imitating the experts. The traditional methods for design, modeling, optimizing complex structure systems and manual observation of activities are difficult, time-consuming and prone to error, so, AI helps in automated data collection and data analysis techniques to improve several aspects of construction engineering and management for productivity assessment, safe managements, idle time reduction, prediction, risk analysis. The artificial neural networks (ANNS) is efficient tool for engineering design, damage assessment, HPC strength prediction, optimization, planning, selection and estimation of construction projects.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN CIVIL ENGINEERING:

Artificial intelligence methods have extensively used in the fields of civil engineering applications e.g. construction managements, building, materials, hydraulic optimization. Over the past 20 years. The main constituents of soft computing are neural network, evolutionary algorithms, probability in the fields of civil engineering includes the use of ANNs in designing, buildings, dams and utilites.AI also helps in development of robots and automated. Even the role of AI is also reported in case of smart materials.

Role of Artificial Neural Networks (ANNS):

Neural Network System for modular Construction Decision Making: This model helps to make a decision whether to use a conventional “stick-built” method or to use some degree of modularization in particular project. This decision is based on the several decision attributes which are divided into 5 categories. Project location, environmental and organization, labor-related, project characteristics, and project risks.

Initial Design process using AI: The preliminary design model is of vital importance in the synthesis of finally acceptable solution. The network predicts a good initial design for given set of inputs parameters.

Planning of Construction projects: AI has its application to generate plans in all the stages of the projects, descriptions of actions along with their preconditions and efforts .and selection of new actions to inserted into project plan.

Construction Robot Fleet Management System prototype: The application of robotic equipment to the execution of construction tasks is gaining attention among researches and practitioners around the world.

Bridge planning Using GIS and Expert System Approach: In the planning process of new road network, possible locations of bridges and tunnels should be considered, The section of the best alignment imposes the needs to investigates the effect of location of each bridge on the bridge type the fits this location.

Artificial Neural Network Approach for Pavement Maintenance: The major objective is to assist decision makes in selecting an appropriate maintenance and repair action for a defected pavement.

Earthquake-induced Liquefaction: During the occurrence of earthquakes, numerous civil structures, such as building, highways embankments and retaining structures have been damaged or completely destroyed. So AI immensely helps in the design of structures to safeguard against the earthquakes.

CONCLUSION:

In many situations of civil engineering, various problems are encountered that are very complex and not well understood. The AI has number of significant benefits that make them power full and practical tool for solving many problems in the fields of civil engineering and are expected to be applicable in rear future by using sophisticated instruments based on the algorithms and database to reduce the efforts and cost of construction and management.

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ARTIFICIAL INTELLIGENCE IN TRAVEL AND NAVIGATION

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GOPIKA SUCHARITHA (20MCA11)

INTRODUCTION:

AI in travel helps to collect and analyse the user's data. This analysis will be helpful for travel agencies to find customer pricing preferences. The AI-powered systems can read customer reviews and analyse what they need. So, it reduces the time in tracking customer preferences and assist in generating more leads.

HOW AI IS CHANGING THE TRAVEL INDUSTRY?

Currently, AI has been incorporated into many areas of the travel and tourism industry, making lives easier for travellers around the globe. For instance, there are some widely used forms of AI in airports these days, such as facial recognition systems and airport security scanning devices.

AI ASSISTANTS FOR TRAVEL BOOKING:

Thanks to AI, travellers no longer need to visit travel agencies to book flights or search for accommodation. AI assistants and Intelligent chatbots have now taken the place of travel agents allowing travellers to book flights and accommodation and hire vehicles online. These chatbots are deployed in social media sites like Facebook messenger, skype, WhatsApp, and Viber to offer users a more personalized booking experience. The travel reservation giants like Booking.com, Skyscanner, and Expedia are utilizing such chatbots in their operations. Usually, you will be prompted to start the conversation with a chatbot by entering the details of your intended journey. Then the bot will search through the booking sites and find you the best deal.

HOW AI IS USED IN NAVIGATION:

This translates to evaluating the real-time conditions with optimum route guidance that helps driver avoid traffic amongst other road hazards. GPS navigation information for determining optimal route selection based on a shortest path algorithm. One disadvantage of this approach is that it does not have any memory. It does not automatically remember the actual time it took you to get there nor does it learn from that experience and use the actual measurements to improve future route selection. In addition to learning, these velocity profiles can also be used to extract features from environment which can then be used to further improve the accuracy of optimal route selection. It is assumed to be completely autonomous which means that it requires no user input or intervention.

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ARTIFICIAL INTELLIGENCE IN MARTECH

VIDYA RATHOD(20MCA42)

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INTRODUCTION:

The term “martech” is a portmanteau combining the terms “marketing” and “technology.” As such, martech represents the intersection of marketing and technology in today’s highly digital business world. Any type of technology that has a bearing on marketing operations can be called “martech” whether it is a part of an analysis platform, a device-facing benchmark tool, or any other type of digital or high-tech resource.

Marketers must know when and how to meet their customers, what content to show them, and how to keep consumers engaged. This is particularly true for B2B marketing since the targeted audience pool is much narrower and more focused. All of this requires real-time data insights along with strategies to successfully turn information into action.

UNDERSTAND AND ORGANIZE CUSTOMER DATA USING MARTECH

One of the most unique features of AI is its ability to gather and analyze data almost instantaneously. Martech tools can help organize key data from all points of the customer journey, such as:

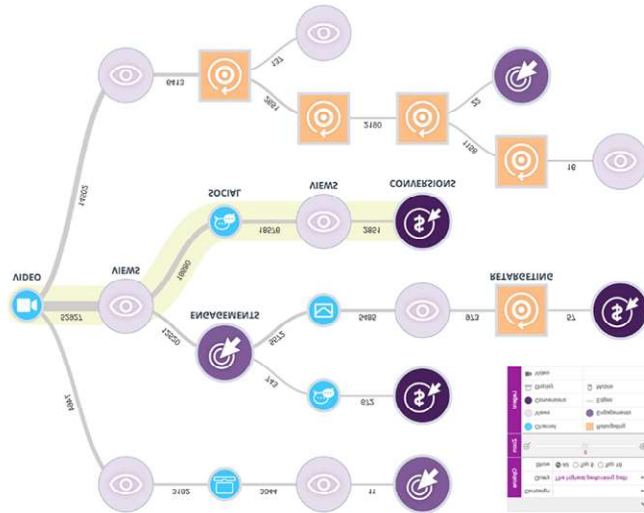
- Web and app interactions
- Customer service experiences
- Social media engagement
- Product usage – trials and post-purchase
- Returns or complaints
- Changes to a user profile or account information

This creates a full, robust picture of how customers get from point A to point B, along with all of the stops (and marketing opportunities) in between. This results in data unification for a more singular customer view which can help marketers truly understand their target audience.

PERSONALIZE ALL INTERACTION

Oftentimes, personalization is geared towards B2C strategies with customized ads, emails, or promotions. However, personalization is equally as important to B2B customers. Personalization is how AI affects the customer journey most directly. After all, customized experiences can only be created with loads of data to back them up.

Personalization improves the customer journey by making it easier for the lead to move towards a conversion.

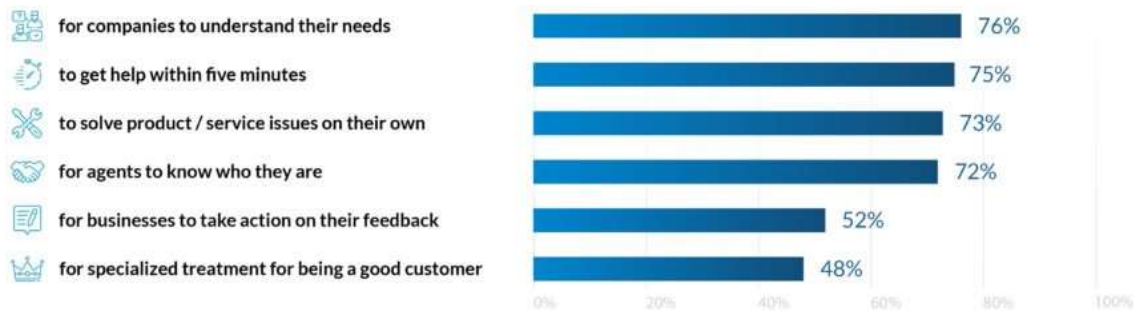


ANALYZE CUSTOMER FEEDBACK AND CONVERSATIONS

It is important to understand what your customers really think about your business and know what they want to improve the experience. According to one survey, 76% of customers stated that the most important thing that could improve their experience with a brand was for companies to “understand their needs.” Over half of the respondents also expected businesses to improve by following through and taking action on their feedback.

The most important customer expectations

Sources: Accenture, Salesforce, McKinsey, Microsoft, Bizreport



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ARTIFICIAL INTELLIGENCE IN THE AUTOMOTIVE INDUSTRY

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VIJAYALAKSHMI Y(20MCA43)

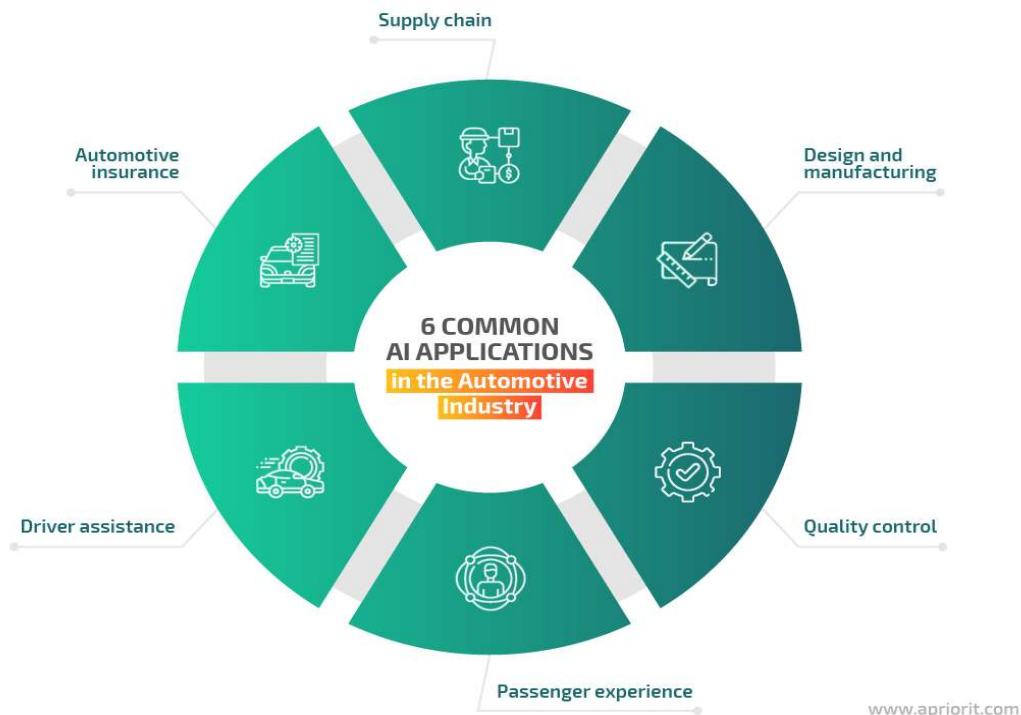
Artificial intelligence (AI) technologies have made the futuristic idea of self-driving cars a reality. Today, automotive industry leaders including BMW, Volvo, and Tesla leverage AI capabilities to improve manufacturing, increase supply chain efficiency, and make our driving experience safer, more comfortable, and more entertaining.

In this article, we discuss uses of AI and machine learning for the automotive industry. We go over some of the key tools you can use for building AI-powered automotive solutions and discuss the main challenges to expect along the way.

THE ROLE OF ARTIFICIAL INTELLIGENCE IN TODAY'S AUTOMOTIVE INDUSTRY

Car manufacturers are constantly looking for ways to speed up design, production, and manufacturing processes while improving vehicle quality. Customers want to see vehicles that offer pleasant, comfortable, and productive experiences rather than simply getting them from point A to point B.

Artificial intelligence (AI) may be the answer. AI technologies have enormous potential when applied both in production and manufacturing processes as well as within vehicles to power in-car functionality.



1. Design and manufacturing

AI-powered solutions and ML algorithms help vehicle manufacturers improve production processes, speed up data classification during risk assessments and vehicle damage evaluations, and do many other things. AI systems and robotics solutions relying on such technologies as computer vision, natural language processing, and conversational interfaces are widely applied in vehicle manufacturing.

2. Supply chain

It's vital for vehicle manufacturers to be able to monitor every stage of a component's journey and know exactly when to expect its arrival at the destination plant. That's why modern supply chains often rely on cutting-edge IoT, blockchain, and AI technologies.

3. Quality control

AI can enable timely detection of various technical issues. Based on data gathered by in-vehicle sensors, an AI system can inform a user that a certain component or system requires maintenance or needs to be replaced as early as the need arises. Manufacturers also use AI-powered quality control systems to detect possible flaws in parts before they get installed.

4. Passenger experience

To make sure all passengers are safe and satisfied, manufacturers enhance their vehicles with all kinds of AI-powered applications meant to upgrade the passenger experience.

Some systems use face recognition and emotion recognition methods to evaluate the state of the driver and passengers. Others deploy natural language processing and natural language generation methods to enable passengers to watch movies, listen to music, and even order goods and services while on the road.

5. Driver assistance

Of course, let's not forget about improvements to the driving experience offered by AI technologies. There are AI systems meant to assist drivers and ensure safety by warning them about traffic and weather changes, offering the most efficient routes, or paying for goods and services on the go.

6. Automotive insurance

AI-powered solutions have great potential in handling insurance claims. Such a system would need to combine smart data analytics, speech recognition, natural language processing, and text processing and generation. On the insurance provider's side, AI systems leveraging image processing and object detection technologies can be of great help for improving the accuracy of vehicle damage analysis.

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HYPER AUTOMATION AND DEEP ANALYTICS

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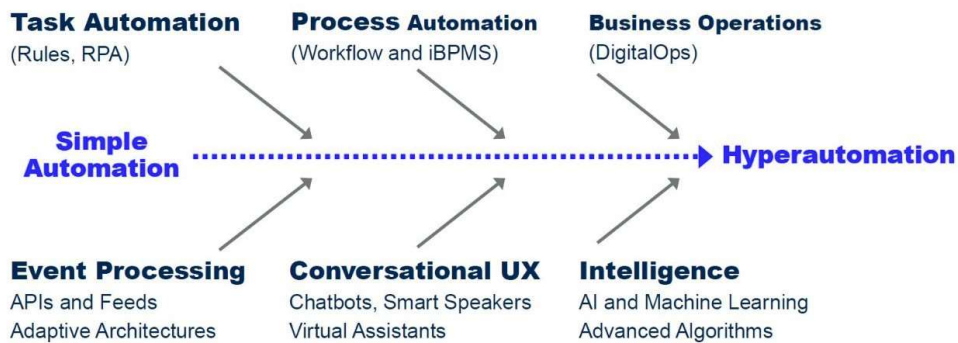
Hyperautomation brings together multiple components of process automation that stimulate the ability to automate work. It coalesces digital transformation technologies such as artificial intelligence (AI), NLP, deep learning, advanced analytics, vision/speech analytics and process mining, in addition to RPA at its core to automate complex processes.

Unlike automation that is the simple optimization of task processes, hyper automation has an extra layer of robotic intelligence capabilities making the processes even smarter. Analytics Insight here compiled top real-world use cases of hyper automation where it enables the industry on their automation journey.

HYPER AUTOMATION

Hyperautomation is the application of advanced technologies like RPA, artificial intelligence, machine learning (ML) and process mining to augment workers and automate processes in ways that are significantly more impactful than traditional automation capabilities. Hyperautomation is the combination of automation tools to deliver work.'

The Path to Hyperautomation



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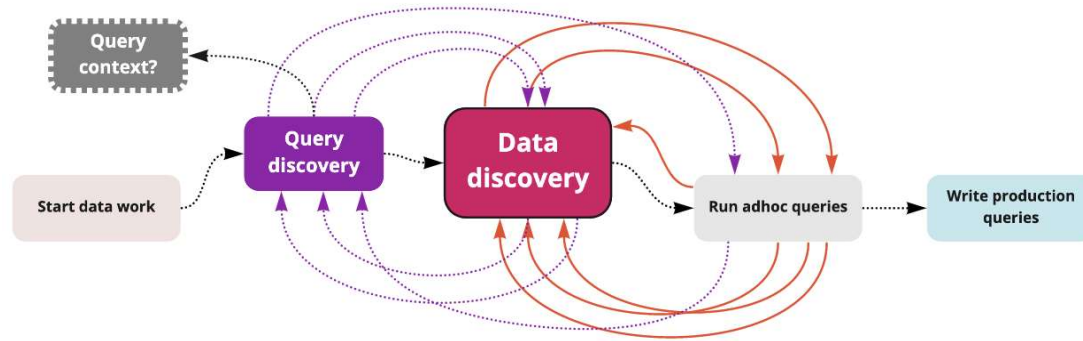
Gartner

DEEP ANALYTICS

Deep analytics is a process applied in data mining that analyses, extracts and organizes large amounts of data in a form that is acceptable, useful and beneficial for an organization, individual or analytics software application.

Deep analytics retrieves targeted information from data stores through data processing methodologies.

A typical deep analytics workflow looks like:



ADVANTAGES OF HYPER AUTOMATION

- A customer support centre can use chatbots to analyse their audience data and give necessary suggestions and quick solutions to problems based on past transactions and history. This can save the company costs for customer support.
- During the initial stages of the ongoing COVID-19 pandemic, Indian food delivery company Swiggy used Artificial intelligence to check if all the delivery partners were using masks and make them stop delivering non-essential items. The 2020 lockdown made e-commerce businesses quickly divide their functions between essential and non-essential items and services using natural language models. Restaurants and cafes had to update their menus as many had to change their approach towards food delivery which was possible thanks to computer vision models.
- Online pharmacies saw the spotlight by having AI read and authenticate prescriptions. Telemedicine and teleconsultations with health care workers were faster and easier thanks to artificial intelligence. With constant data input, the medical-use robots were able to give better patient insights to the doctors. AI algorithms were analysing large amounts of data from the electronic health records to prevent diseases and diagnose communicable diseases.
- The entertainment industry also saw many innovations. While watching a movie on OTT platforms like Netflix, Amazon Prime, and Apple TV, if you fancied an object or an outfit and wanted to know where to buy it from, it is now possible to know thanks to image recognition and search features.
- While Artificial intelligence and hyper-automation are essential to use today, businesses must prioritize the areas that need hyper-automation first. The foundation of a successful and effective hyper-automation process requires prerequisites like data acquisition, ingestion, cleaning, storage, governance, and protection backed up by futuristic AI technologies.

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NEUROMORPHIC COMPUTING

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SWETHA M 20MCA39

INTRODUCTION

Neuromorphic Computing, also known as neuromorphic engineering, is the use (VLSI) systems containing electronic analog circuits to mimic neuro-biological architectures present in the nervous system. A neuromorphic computer/chip is any device that uses physical artificial neurons (made from silicon) to do computations. In recent times, the term neuronorphic has been used to describe analog, digital, mixed-mode analog/digital VLSI, and software systems that implement models of neural systems (for perception, motor control, or multisensory integration). The implementation of neuromorphic computing on the hardware level can be realized by oxide-based memristors, spintronic memories, threshold switches, and transistors

NEUROLOGICAL INSPIRATION

Neuromorphic engineering is set apart by the inspiration it takes from what we know about the structure and operations of the brain. Neuromorphic engineering translates what we know about the brain's function into computer systems. Work has mostly focused on replicating the analog nature of biological computation and the role of neurons in cognition.

The biological processes of neurons and their synapses are dauntingly complex, and thus very difficult to artificially simulate. A key feature of biological brains is that all of the processing in neurons use analog chemical signals. This makes it hard to replicate brains in computers because the current generation of computers is completely digital. However, the characteristics of these parts can be abstracted into mathematical functions that closely capture the essence of the neuron's operations.

Sensors

The concept of neuromorphic systems can be extended to sensors an example of this is the event camera (neuromorphic camera).

OPEN ISSUES

The most important general issue that needs extensive research and is not clearly defined is how to integrate individual devices into a working (although limited) system ("accelerator") that will serve as a proof of concept. Moreover, this system should be potentially scalable, although the exact way to do this may not be known at present time. Below we list some of the open issues that arise when considering materials/devices and systems almost independently.

INTERMEDIATE STEPS

This section identifies the major milestones needed toward the development of a neuromorphic computer. We should highlight that every step must be based on earlier steps and connected to

eventual implementation of next steps. This can be considerably advanced through the construction of appropriate compact theoretical models and numerical simulations that are calibrated through experimentation. It is also important to point out that this field is in its earlier stages of development and therefore sufficient flexibility should be maintained at every stage. This should not be viewed as a well-defined development task but as a research project. Therefore, it is important that at every stage several competing projects are implemented to allow for the best solution to emerge. The key ingredients in these intermediate steps could be:

General Aim: As a general goal, it would be desirable to develop well-defined intermediate application such as needed in the fields of vision, speech, and object recognition to prove the reality of a program as described here.

Simulation: There are opportunities to leverage large-scale computing in the development of simulators for neuromorphic designs and to develop a deep understanding of materials and device. These simulations could be used to refine architectural concepts, improve performance parameters for materials and devices, and to generate test data and signals to help support accelerated testing as new materials, devices and prototypes are developed.

Devices: Development and engineering of novel devices perhaps based on some type of memristive or optically bistable property is needed. This should include incorporation into well-defined systems and be based on well-understood materials science.

Material Science: Synthesis, characterization and study of new functional, tunable materials with enhanced properties are needed to integrate into novel neuromorphic devices.

CONCLUSION

- Creating the architectural design for neuromorphic computing requires an integrative, interdisciplinary approach between computer scientists, engineers, physicists, and materials scientists
- Creating a new computational system will require developing new system architectures to accommodate all needed functionalities
- One or more reference architectures should be used to enable comparisons of alternative devices and materials
- The basis for the devices to be used in these new computational systems require the development of novel nano and meso structured materials; this will be accomplished by unlocking the properties of quantum materials based on new materials physics
- The most promising materials require fundamental understanding of strongly correlated materials, understanding formation and migration of ions, defects and clusters, developing novel spin based devices, and/or discovering new quantum functional materials

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PREDICTING BIRD SPECIES USING AI

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RAMYA S (20MCA30)



Deep Learning is a Machine Learning subfield which is in turn a subfield of Artificial Intelligence. Deep learning can be visualized as a platform where artificial, human brain- inspired neural networks and algorithms learn from large amounts of data. Deep Learning allows computers to solve complex problems even though they use a very diverse, unstructured, and interconnected data set. The more Deep Learning algorithms learn, the better they perform.

Nowadays, bird species identification is seen as a perplexing problem which often leads to confusion. Birds allow us to search for certain species within the ecosystem as they react rapidly to changes in the atmosphere; but collecting and gathering information on birds needs tremendous human effort. Many people visit bird sanctuaries to look at the birds, while they barely recognize the differences between different species of birds and their characteristics. Understanding such differences between species can increase our knowledge of birds, their ecosystems and their biodiversity. The identification of birds with bare eyes is based solely on the basic characteristics due to observer constraints such as location, distance and equipment, and appropriate classification based on specific characteristics is often found to be tedious. Ornithologists have also faced difficulties in distinguishing bird species. To properly identify a particular bird, they need to have all the specificities of birds, such as their distribution, genetics, breeding climate and environmental impact. A robust system is needed for all these circumstances that can provide processing of largescale bird information and serve as a valuable tool for scholars, researchers and other agencies. The identification of the bird species from the input of sample data therefore plays an important role.

Bird identification can generally be done with the images, audio, or video. The audio or video processing technique makes it possible to detect birds by analyzing audio and video signals; however, the processing of such information is made more complicated by mixed sounds such as insects and the presence of other real-world objects in the frame. People are typically more effective at finding images than audios or videos. Therefore, it is easier to use a picture over audio or video to identify birds.

To predict the birds in their natural habitats, we developed an interface to extract information from bird images using the Convolutional Neural Network (CNN) algorithm. First, a vast dataset of birds were gathered and localized. Second, CNN architecture was designed similar to the VGGNet Network. Now that the network was implemented, we trained the CNN model with the bird dataset using Keras, and subsequently the classified, trained data was stored on the disk to identify a target object. Ultimately, the client-server architecture navigates a sample bird image submitted by an end-user to retrieve information and predict the bird species from the qualified model stored on the disk. This method allows the autonomous identification of birds from the captured images and can provide important, useful knowledge about bird species.

BIRD SPECIES RECOGNITION USING SUPPORT VECTOR MACHINES: -

This paper examines automatic detection of bird species through their vocalization. Recognition is performed at each node in a decision tree with a Support Vector Machine (SVM) classifier that classifies between two species. Recognition is tested with two collections of bird species which have previously been studied using different methods. Recognition resulted in a better or equivalent output indicated by the proposed approach relative to then existing reference models.

IMAGE RECOGNITION WITH DEEP LEARNING TECHNIQUES: -

Deep Learning methodology has been used in this research work for the recognition of images. Two versions of deep learning neural networks were considered: Convolutional Neural Network (CNN) and Deep Belief Network (DBN). Caltecp01 dataset was chosen to train and test the above proposed models. The SVM-KNN algorithm was considered as the benchmark model, selected by the Caltecp01 database issuer. After several dataset pre-processing techniques, using the above proposed approach, a correct recognition score of 67.23% was obtained, which was an increase of 1% over the recognition score obtained by the chosen benchmark algorithm.

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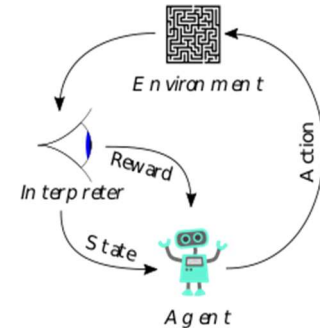
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REINFORCEMENT LEARNING

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In last few years, reinforcement learning has attracted significant attention from industry due to its success in solving some complex problems. Reinforcement Learning is definitely one of the evident research areas at present which has a good boom to emerge in the coming future and its popularity is increasing day by day. It is basically the concept where machines can teach themselves depending upon the results of their own actions. Reinforcement learning is a part of machine learning. The agents are self trained on reward and punishment mechanisms.

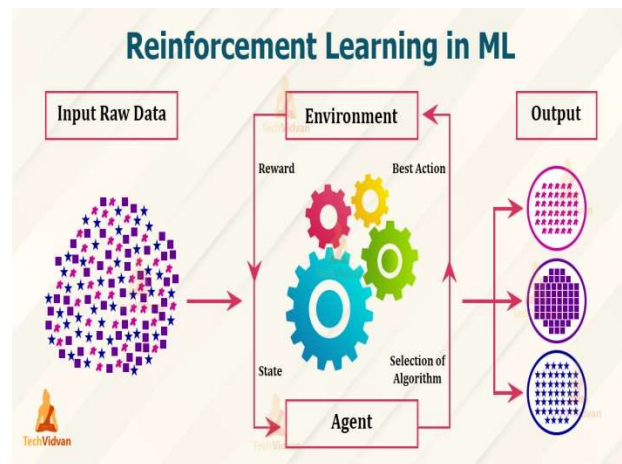
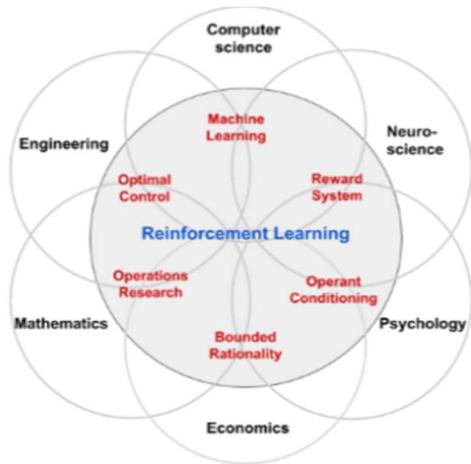


It is taking the best possible action or path to gain maximum rewards and minimum punishment through observations in specific situations. It acts as a signal to positive and interpret the environment in which is placed. It can take actions and interact with it.

A current use case includes but is not limited to be in the field of Gaming, resource management, personalized recommendations and robotics. Reinforcement learning is also used in operations research, information theory, game theory, control theory, simulation based optimization, multi agents systems, swarm intelligence, statistics and genetic algorithms. Gaming is the most common usage field for reinforcement learning. It is capable of achieving superhuman performance in numerous games. A common example is the game Pac-Man. In enterprise resource management, these algorithms can allocate limited resources to different tasks as long as there is an overall goal it is trying to achieve. A goal in this circumstance would be to save time or conserve resources. In robotics, this type of machine learning can provide robots with the ability to learn tasks a human teacher cannot demonstrate, to adopt a learned skill to a new task or to achieve optimization despite a lack of analytic formulation available. Let's look at some real world applications.

Robots learn novel behaviors through trial and error interactions. This unburdens the human operator from having to pre-program accurate behaviors. This is particularly important as we deploy robots in scenarios where the environment may not be known. The use of this learning can train robots that have the ability to grasp various objects; this can be used in building products in an assembly line. This is achieved by combining large scale distributed optimization and a variant of deep Q-Learning called QT-Opt. QT-Opt support for continuous action spaces makes it suitable for robotics problems. A model is first trained offline and then deployed and fine-tuned on the real robot

Industry automation with Reinforcement learning, here the learning is based on robots which are used to perform various tasks. The robots produce more efficiency than the humans, in most of the dangerous task. Deep mind to cool Google Data Center uses the AI agents which is one of the good example. The advantage of this is the reduction of the energy spent is almost 40% with the supervision from the data center experts. Reinforcement learning application can also be used in trading and finance which can be used to predict the stock marketing prices as well as the future sales. Reinforcement learning can decide on such task like to sell / hold / buy products. The Reinforcement Learning model is evaluated using the market benchmark standards in order to ensure that its performing optimally. The platform has ability to make finance trades and also computes the reward functions on the loss or profit of every financial transaction.



Reinforcement learning in Natural Language Processing can be used in text summarization, question answering and machine translation. It allows the machine and software agents to automatically determine the ideal behavior within a specific context, in order to maximize its performance.

Reinforcement learning is an area of Machine Learning; it's all about taking the suitable action to maximize the reward in the particular situation. It is employed by various software and machines to find the best possible behavior or path it should take in specific situation.

Types of Reinforcement learning: Primary Reinforcement, Secondary Reinforcement, Positive Reinforcement, Negative Reinforcement. Reinforcement learning is still a very active research area significant process has been made to advance the field and apply it in real life.

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VIRTUAL TRAVEL BOOKING AGENT

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INTRODUCTION:

Artificial intelligence is improving all the time, making it more reliable and more attractive as a business solution. In particular, businesses in the travel industry are taking advantage of AI in order to perform a variety of administrative and customer service tasks. Here, you will learn the uses and benefits of artificial intelligence, and explain how it is changing the way travel companies operate.

FEATURES AND BENEFITS:

AI in Customer Service

Actual robots are starting to appear in hotels and airports, offering concierge-type information. The Hilton, for example, will give you a number for Connie, its robot, so that you can text your questions. Connie serves up suggestions based on your known preferences.

Executives at Booking.com found that 80 percent of customers prefer self-service, so it's safe to say we'll see more AI interactions in travel. But not all travelers are not impressed. Many customers complain that the technology is not capable of understanding their requests as well as an agent or customer service representative.

There have been instances of bots struggling to discern between popular travel locations in different parts of the world with entirely different climates. For now, most chatbots are monitored by agents to ensure that the shift to AI goes smoothly.

One of AI's most useful aspects, thus far, is its ability to analyse massive amounts of data. This feature is used in industries from marketing to medicine but has value in travel as well.

One travel agency is called Well Traveled, has developed software that provides travel agents with helpful information in a client's travel preferences before their initial communication. The program gathers this information by tracking a person's web page visits and categorizing those sites. An agent with that data might gain insights about the traveler's needs.

#1. Personalized Trip Planning:

According to market reports, 30% of travelers use smartphones or systems to plan their upcoming trips. And, 50% of travelers are not bothering about a guide for their trips as smart travel apps guide them in their entire journey.

#2. Better customer Experience:

artificial intelligence is reforming the travel industry is primarily useful for helping travelers online. This application of AI in travel focuses on providing an improved experience to travelers. Compared to offline services (i.e., human-based), intelligent Chatbot offers 24*7 customer services. It can respond to traveler queries quickly and provide recommendations. USM develops artificial-intelligence powered travel apps like MakeMyTrip for booking tickets, hotels, and trips online. Get your free quote now!

#3. Data processing and Analysis:

ai in travel helps to collect and analyze the user's data. This analysis will be helpful for travel agencies to find customer pricing preferences. The AI-powered systems can read customer reviews and analyze what they need. So, it reduces the time in tracking customer preferences and assist in generating more leads. Thus, AI helps businesses to increase conversion rates.

#4. Improved productivity:

Many travel agencies are using artificial intelligence to reply to queries instantly and automatically. For instance, AI Chatbot in airlines helps passengers in finding flights at low prices. Hence, airlines can use their employees in doing other innovative tasks that need human intervention.



AI is improving all the time, making it more reliable and more attractive as a business solution. In particular businesses in the travel industry are taking advantage of AI in order to perform administrative and customer service tasks.

CONCLUSION:

Artificial intelligence in travel has slowly transformed the industry. Being as a travel guide, AI mobility solutions making users' trips enjoyable.

If you are a travel agency, get benefits from USM's travel mobility solutions. Provide a blissful trip experience to your customers through end-to-end travel supporting apps.

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VISUAL RECOGNITION

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INTRODUCTION:

The great evolution is that computers today cannot only automatically classify photos, but they can also describe the various elements in pictures and write short sentences describing each element. This evolution has major business consequences. This is done by the Deep Learning Network (CNN), which actually learns patterns that naturally occur in photos.

Indeed, the only way a computer recognizes an image is by comparing it to a vast database of data that it already has seen during its training sessions. The machine then computes the probability that the current image belongs to a specific category by comparing contours, shades, light, and more.

HOW VISUAL RECOGNITION WORKS:

A system sees rows of data it is trying to make sense of. This is where neural networks make a difference. These are sets of computational cells arranged in layers. Each cell processes information individually, the layer creates an output which it passes on to the next layer, and this procedure gets repeated over and over.

Each layer is, in fact, a set of filters, ranging from basic geometric filters to more sophisticated ones capable of detecting packaging and even brands. The result is a probability that the object in the picture belongs to a predefined class.

A neural network becomes better the more you use it, as it starts to learn from its past experiences that constitute actual training. Neural networks are, in fact, statistical models aimed at comparing matrices of pixels for similarities. For efficient training, there is a massive demand for labelled-training images. Otherwise, it is possible, depending on your project, to create synthetic data.

When you provide a neural network with many label examples of a specific kind of data, it'll be able to extract common patterns between those examples and transform it into a mathematical equation that will help classify future pieces of information.

For instance, creating a product recognition application with deep learning only requires you to develop or choose a pre-constructed algorithm and train it with examples of the products it must detect. Given enough examples, the neural network will be able to detect products without further instructions on features or measurements.

Deep learning is a very effective method to do computer vision. In most cases, creating a good deep learning algorithm comes down to gathering a large amount of labelled-training data and tuning the parameters such as the type and number of layers of neural networks and training epochs. Compared to previous types of machine learning, deep learning is both easier and faster to develop and deploy.

When we see something, our brain makes sense of it by labeling, predicting, and recognizing specific patterns. A computer using Convolutional Neural Networks (CNNs) processes information in a similar way, but it does so by leveraging numbers. Where we recognize patterns through our sense of sight, a CNN does so by breaking images down into numbers.

The inner workings of *CNNs* are obviously far more intricate and technical than just number patterns, but it's important to know what convolution is: the combination of two functions that produce a third function. A neural network that uses convolution is merging multiple sets of information, pooling them together to create an accurate representation of an image. After pooling, the image is described in lots of data that a neural network can use to make a prediction about what it is.

A neural network will learn over time if its predictions are accurate. Like with anything else, it takes a lot of training for computers to get their predictions right; they don't automatically know how to classify what objects are called in the real world.

HOW TO ANALYSE THE IMAGE:

Whereas in the past the process might take days or weeks or even months to chug through all the calculations required, today's ultra-fast chips and related hardware, along with a speedy, reliable internet and cloud networks, make the process lightning fast. Moreover, the willingness of many of the big companies doing AI research to share their work Facebook, Google, IBM, and Microsoft, notably by open sourcing some of their machine learning work, has helped a lot.

APPLICATIONS:

Computer vision can be used in several industries.

1. Industrial
Defects identification, Detection and counting of people and vehicles, etc.
2. Agriculture
Visual inspection, Properties classification, etc.
3. Insurance
Claims automation, Damage analysis, Property inspection, etc.
4. Web
Image search, Image retrieval, etc.

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