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Artificial Intelligence and Machine Learning Application

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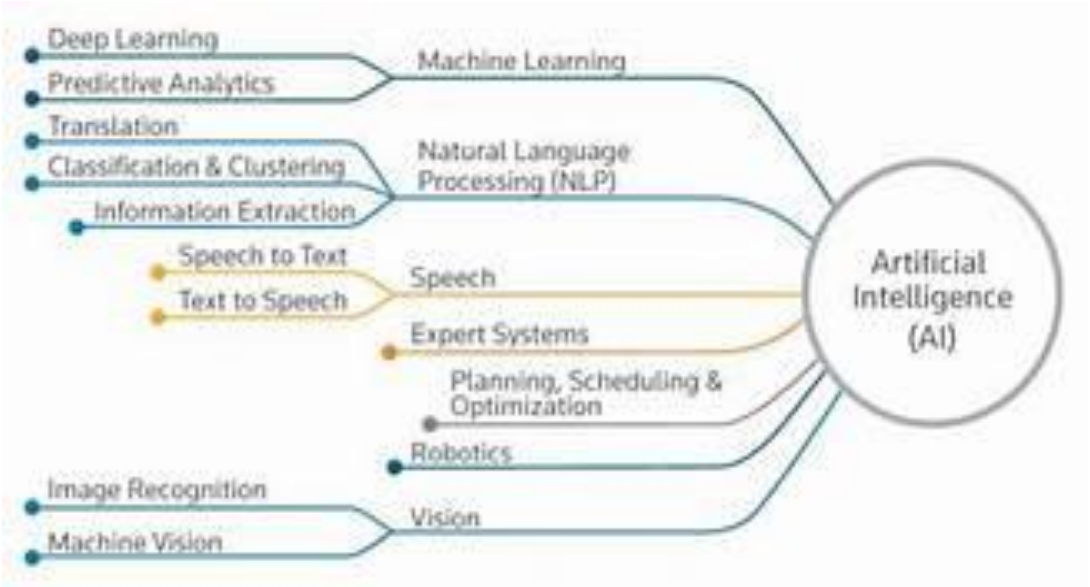
Abstract: Artificial intelligence (AI) and machine learning (ML) have the potential to significantly improve particle accelerator operations, with applications in diagnostics, control, and modelling. Experimentally testing AI/ML methods before deployment to user facilities remains a challenge. The capacity to swiftly generalise and adapt these algorithms to different operational configurations inside or between facilities remains a difficulty, requiring a combination of model-independent adaptive feedback and classic machine learning technologies. These techniques can also be used to detect, classify, and avoid operational abnormalities that can result in accelerator damage or excessive beam loss during atypical operations. Broadening AI/ML approaches for early identification of a wide variety of accelerator component or subsystem problems is an opportunity. The optimization of a large number of connected accelerators is required in modern accelerator architecture.

INTRODUCTION:

From an algorithmic perspective, AI is divided into two categories: symbolic AI and machine learning. Symbolic AI is a set of methods for arranging algorithms in a way that is understandable to humans. GOFAI stands for "good old-fashioned AI," and it was the paradigm of AI research until the late 1980s. Artificial intelligence is still employed to solve issues where the number of possible outcomes is limited, processing capacity is limited, or human explain ability is required. Building a model based on a limited set of rules in healthcare, however, is exceedingly difficult, if not impossible, because problems are complicated, not always fully understood, and involve a large number of explanatory variables.



The current paradigm is machine learning (ML), which was coined by Arthur Samuel in 1952. The primary distinction between ML and symbolic AI is that in ML, models learn from examples rather than from a set of rules created by humans. Machines can learn from prior models and enhance their behaviour when new data is provided by using a combination of statistical and probabilistic methods. This could take the shape of making predictions, discovering new patterns, or categorising new data. supervised learning (used for classification or prediction based on a known outcome), unsupervised learning (identifying hidden patterns and structures with unknown consequences), and reinforcement learning.

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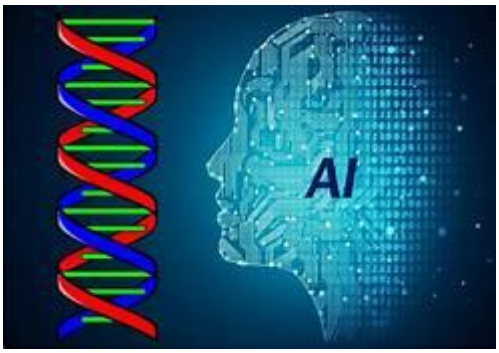
Data mining algorithms are similar to those used in machine learning. Data mining uses algorithms to find new links or trends in historical data, assisting practitioners in making better decisions in their everyday practise and enhancing care quality. For example, a doctor could utilise existing disease data to teach a machine to make predictions regarding the diagnosis or prognosis of patients who have never been seen before.

Scoping reviews have become more popular in recent years, with studies published in a variety of social science and healthcare sectors. Orthodontics has been a latecomer to this field. Scoping reviews are particularly useful when a body of literature has not yet been thoroughly evaluated or when the body of literature is huge, complex, or heterogeneous, making a more-full systematic assessment impossible.

The current orthodontic literature is abundant with research that record numerous applications of AI and ML, although in isolation, applying the various sorts of algorithms outlined above. No previous study has attempted to systematically organise the existing literature in order to examine current AI and ML applications in orthodontics, identify the types of algorithms used, and give a thorough mapping of studies undertaken in this subject. As a result, the goal of this scoping review is to present an overview of the existing information regarding how far prior AI and ML developments in orthodontics have translated into clinical fruition, as well as the limits that have hampered their growth. The authors aimed to (1) chronicle the evolution of AI in the orthodontic field over time, and (2) investigate the use of AI in the field.

Applications: Artificial intelligence is in high demand. Many freshers and aspiring working professionals are interested in changing careers in this field. In response to this demand, various institutes around the country have increased the number of Artificial Intelligence courses they offer.

Artificial Intelligence in Medical Research



Artificial Intelligence, namely Machine Learning in medical research, is a field with a lot of potential.
The availability of medical data for machine learning is one of the main reasons behind this.
All medical data on illnesses and their course is recorded in patient records at hospitals and research centres.
We've made limited use of this information, such as employing X-Ray imaging to discover Covid positive instances.
In the healthcare sector, the future holds even bigger and better prospects for AI.
In the health-care industry, AI will have the greatest impact on drug discovery.
Recently, a component in common toothpaste was discovered to help treat Malaria.
Artificial intelligence was used to make this finding.
In the coming years,
AI can help drive drug development innovation, resulting in cures for diseases that are now unavailable.

Artificial Intelligence in Cyber Security

The finest artificial intelligence course is probably in the field of cybersecurity.
If you look at the amount of security breaches year after year, artificial intelligence hasn't had much of an impact in the field of cybersecurity.
This is about to change.
Threats may be recognised and stopped in their tracks with AI-powered security, saving millions of dollars in damages.

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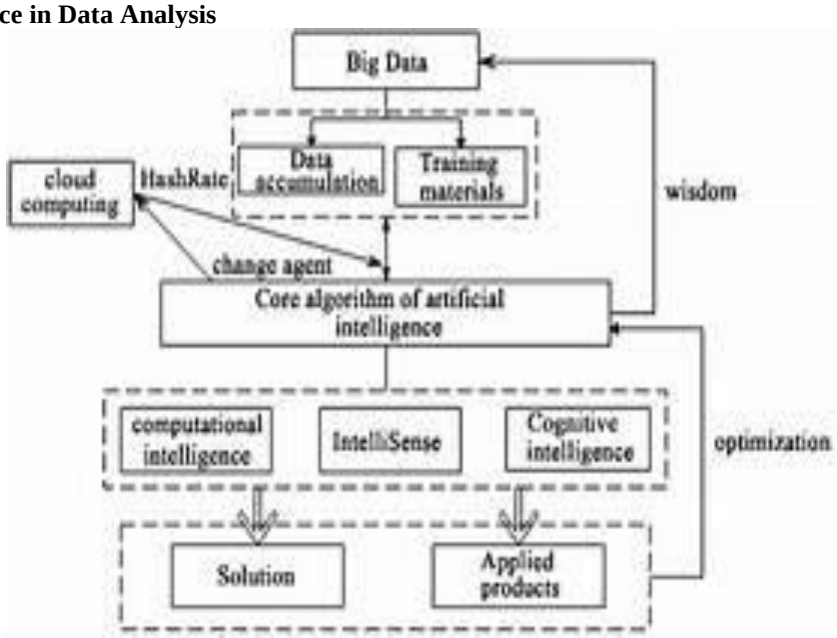
Security systems may educate their machine learning-

Based systems how to detect risks and take corrective action using data from all over the world.
Recurrent Neural Networks can analyse a large number of transactions to determine if they are trustworthy or not.
This can assist raise red flags for fraudulent transactions and prevent money from being lost.

Artificial Intelligence in Data Analysis



Artificial intelligence can find patterns and links in large data sets without the need for human interaction.
This is because data analysis technologies based on Artificial Intelligence can sift through enormous data sets in minute s or hours and run algorithms that find classifications and correlations.
In the future, tools may identify data relationships that data analysts can investigate further.

In the future, a natural language question will yield the appropriate results.
This eliminates the need to perform sophisticated SQL queries to get the data you need.
Analytics solutions based on artificial intelligence can create predictive models that can provide you with reasonably ac curate business projections.

Artificial Intelligence in Transport

Autonomous vehicles powered by artificial intelligence are revolutionising the transportation industry.

Autonomous taxis will be able to operate in the actual world without any assist-ance.

It is now being evaluated in the United States.

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This technology has the potential to take over the entire globe if it is used succ-essfully.
Delivery is another part of transportation.
AI-powered drones will be widely employed in logistics for last-
mile deliveries in the future, greatly decreasing traffic on the ground.

Artificial Intelligence at home

By introducing smart speakers and helpers, Artificial Intelligence has already established its proper position in household.
These voice-
activated assistants can interpret human language and do a variety of tasks similar to robots, but without the physical form.
These AI-powered intelligent home automation gadgets can now do a variety of functions, including online shopping.

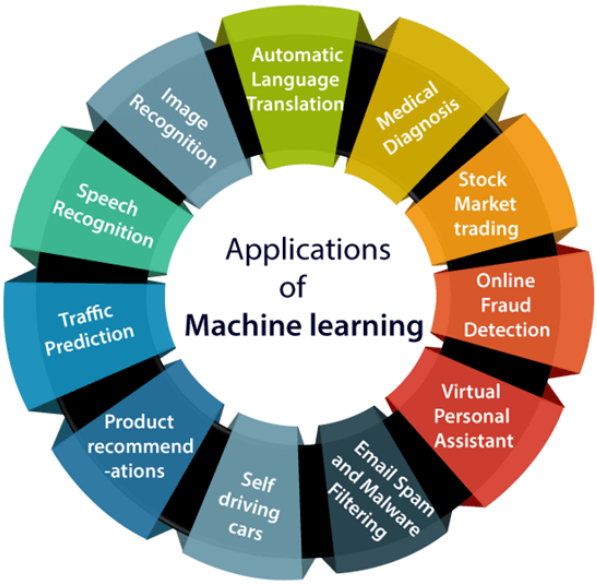
These AIpowered home devices will be critical in the future for efficiently running a home.

This will include things like efficient power management, inventory management, temperature control, and air circulation control, among other things.

AI in Healthcare
In healthcare, AI-
powered devices are keeping tabs on severely ill patients and minimising the need for regular nurse monitoring.
This permits the nurses to focus on considerably more serious and emergency
cases.

Artificial intelligence has the potential to bring healthcare to patients' homes in the near future, minimising the need for them to frequent clinics and hospitals.
In the future, AI powered robots will perform precision procedures under the supervision of a competent surgeon.
In the future, we may be able to conduct remote procedures with the surgeon sitting at home.

Applications of Machine learning
Machine learning is a hot topic in today's technology, and it's evolving at a breakneck pace. We use machine learning in our daily lives without even realising it, for example, in Google Maps, Google Assistant, and Alexa. The following are some of the most popular realworld Machine Learning applications:



1. Image Recognition:
One of the most common uses of machine learning is image recognition. It's used to identify things like people, places, and digital photographs. Automatic buddy tagging suggestion is a common use of picture recognition and facial identification.

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Facebook has an automatic friend tagging recommendation feature. When we submit a photo with our Facebook friend s, we get an automatic tagging recommendation with their names, which is powered by machine learning's face identifi cation and recognition algorithm.
It is based on the "Deep Facial" Facebook project, which is in charge of face recognition and individual identification i n photos.

2. Speech Recognition
When we use Google, we have the option to "Search by voice," which falls under speech recognition and is a common machine learning application.

Speech recognition, often known as "Speech to text" or "Computer speech recognition," is the process of turning voice i nstructions into text.
Machine learning techniques are now widely used in a variety of speech recognition applications.
Speech recognition technology is used by Google Assistant, Siri, Cortana, and Alexa to obey voice commands.

3. Traffic prediction:
When we want to go somewhere new, we use Google Maps, which offers us the best path with the shortest route and an ticipates traffic conditions.
It uses two methods to anticipate traffic conditions, such as whether traffic is clear, sluggish moving, or extremely cong ested:

1. Vehicle position in real time using Google Maps and sensors
2. The same time has been taken on previous days.

Everyone who uses Google Map contributes to the app's improvement.
It collects data from the user and sends it back to its database in order to improve performance.

4. Product recommendations:
Machine learning is commonly utilised for product suggestion by e-commerce and entertainment companies such as Amazon, Netflix, and others.
Because of machine learning, whenever we look for a product on Amazon, we begin to receive advertisements for the s ame goods while browsing the internet on the same browser.

Google uses multiple machine learning algorithms to identify user interests and then recommends products based on th ose interests.
Similarly, when we use Netflix, we receive recommendations for entertainment series, movies, and other content, whic h is also based on machine learning.

5. Self-driving cars:
Selfdriving cars are one of the most interesting applications of machine learning.
In self-driving automobiles, machine learning is extremely important.
Tesla, the most well-known automobile manufacturer, is developing a self-driving vehicle.
It trains automobile models to recognise people and objects while driving using an unsupervised learning method.

6. Email Spam and Malware Filtering:
When we receive a new email, it is immediately categorised as important, routine, or spam.
Machine learning is the technology that allows us to receive essential messages in our inbox with the important symbol and spam emails in our spam box.
Gmail employs the following spam filters:

1. Content filter
2. Header filter
3. Blacklist filter
4. Rules-based filters
5. Filters for permissions

For email spam filtering and malware identification, machine learning algorithms such as Multi-Layer Perceptron, Decision Tree, and Nave Bayes classifier are utilised.

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7. Virtual Personal Assistant:

We have Google Assistant, Alexa, Cortana, and Siri, among other virtual personal assistants.
They assist us in discovering information using our voice commands, as the name implies.
These assistants can aid us in a variety of ways simply by following our voice commands, such as playing music, callin g someone, opening an email, scheduling an appointment, and so on.

Machine learning algorithms are a crucial aspect of these virtual assistants.
These assistants record our vocal commands, transfer them to a cloud server, where they are decoded using machine lea rning techniques and acted upon.

8. Online Fraud Detection:

By detecting fraud transactions, machine learning makes our online transactions safer and more secure.
When we conduct an online transaction, there are several methods for a fraudulent transaction to occur, including the us e of phoney accounts, fake identification, and the theft of funds in the middle of a transaction.
To detect this, the Feed Forward Neural Network assists us by determining whether the transaction is genuine or fraudu lent.

The output of each valid transaction is translated into some hash values, which are then used as the input for the next ro und.
There is a certain pattern for each genuine transaction that changes for the fraud transaction, thus it detects it and makes our online transactions more safe.

9. Stock Market trading:

In stock market trading, machine learning is commonly used.
Because there is always the possibility of share price fluctuations in the stock market, a machine learning long short ter m memory neural network is utilised to forecast stock market trends.

10. Medical Diagnosis:

Machine learning is used to diagnose disorders in medical science.
As a result, medical technology is rapidly evolving, and 3D models that can predict the exact location of lesions in the brain are now possible.
It facilitates the detection of brain cancers and other brain-related illnesses.

11.Automatic Language Translation:

Nowadays, visiting a new place and not knowing the language is not an issue; machine learning can help us with this b y transforming the text into our native languages.
This capability is provided by Google's GNMT (Google Neural Machine Translation), which is a Neural Machine Lear ning that automatically translates text into our native language.
A sequence-to-
sequence learning method, which is combined with picture recognition and translates text from one language to another , is the technology behind automatic translation.

CONCLUSION

Machine learning and artificial intelligence are no longer science fiction or scenes from Hollywood films; its applicatio ns can be found all over our daily lives.
Machine learning, like any other innovation, has both positive and harmful aspects.
Though we focused on the good aspects of machine learning in this post, it can also be exploited for evil.
Deep learning systems, such as Deep Fakes, have a significant impact on people's lives and privacy.
As a developing field of study and applications, strong data governance is becoming increasingly important.

REFERENCES:

1. Gupta,N.A.Literature Survey on Artificial Intelligence.2017 . Available online:

2. https://www.ijert.org/research/a-literature-survey-on-artificial-intelligence-IJERTCONV5IS19015.pdf (accessed on 7 January 2020).

DOI: 10.17148/IJARCCE.2022.114153

3. McCarthy, J.; Minsky, M.L.; Rochester, N.; Shannon, C.E. A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence. AI Mag. 2006, 27, 12.

4. Moore, A. Carnegi Mellon Dean of Computer Science on the Future of AI. Available online: https://www.forbes.com/sites/peterhigh/2017/10/30/carnegie-mellon-dean-of-computer-science-on-the-future-of-ai/a283c652197 (accessed on 7 January 2020).

5. Becker, A.; Bar-Yehuda R.; Geiger, D. Randomised algorithms for the loop cutset problem. J. Artif. Intell. Res.2000, 12, 219–234.

6. Singer, J.; Gent, I.P.; Smaill, A. Backbone fragility and the local search cost peak. J. Artif. Intell. Res. 2000, 12, 235–270.

7. Wang, S.; Wang, Y.; Du, W.; Sun, F.; Wang, X.; Zhou, C.; Liang, Y. Amulti-approaches-guided genetic Algorithm with application to peron prediction. Artif. Intell. Med. 2007, 41,151–159.

