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INFOLET

MAHAJANA EDUCATION SOCIETY ESTD. 1937

MONTHLY NEWSLETTER OF DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

VOLUME - 45 SEPTEMBER - 2024

Editorial

The purpose of computer education has opened up a wide arena of thoughtful process of thinking. It involves the process of thinking and also analysing the process of thinking. In the process evolving a solution to a problem we also try adapt a way of thinking. By instructing the machine to think we try to stand out in a plane which is very different from that of the machine or the solution itself. During this never-ending journey of codes, we come across face to face with the truth which tests the qualities of patience and perseverance in us. This marvellous process of facing the truth demands a high level of courage to accept the limitation of our thought process and at the same time never to accept a solution to be an ultimate as there could always be a possibility for a better solution. This quest for the better solution leads us through an infinite journey of 0's and 1's which is very much required for a computer professional. The thought of scaling up or scaling down to arrive at a solution surpasses the culture, tradition, language and all barriers to make the whole world a global village in a real sense, which is on the process of developing a strong community of users and solution provides who work relentlessly for the betterment of the human society in particular and the world in general.

\- Sri Radhesh A

John McCarthy

1927-2011

Father Of Artificial Intelligence [AI] & American Computer Scientist

IMPACT OF ARTIFICIAL INTELLIGENCE ON CLIMATE CHANGE

In this era of Technological revolution, role of AI is significant in every field. AI is a catch-all term for a group of technologies that can process information and, at least superficially, mimic human thinking. AI has proved itself to be a valuable tool for resolving many issues but also a challenge to the Environment as well. Importantly, beyond their global climate impact, the environmental effects of AI have significant implications at the local and regional levels.

Even putting aside, the environmental toll of chip manufacturing and supply chains, the training process for a single AI model, such as a large language model, can consume thousands of megawatt hours of electricity and emit hundreds of tons of carbon. This is roughly equivalent to the annual carbon emissions of hundreds of households in America. Furthermore, AI model training can lead to the evaporation of an astonishing amount of freshwater into the atmosphere for data centre heat rejection, potentially exacerbating stress on our already limited freshwater resources. The challenges of AI on the Environment are mentioned below.

Energy use and efficiency

AI chips, (i.e. GPUs) use more energy and emit more heat than traditional CPU chips. AI models with inefficiently implemented architectures, or trained on less efficient chips may use more energy. Since 1940, computation's energy efficiency has doubled every 1.6 years. Some skeptics argue that improvements in AI efficiency may only increase AI usage and therefore carbon footprint due to the Jevons paradox

Water usage

Cooling AI servers can demand large amounts of fresh water which is evaporated in cooling towers. By 2027, AI may use up to 6.6 billion cubic meters of water. One professor has estimated that an average session on ChatGPT, with 10–50 responses, can use up to a half-litre of fresh water. Training GPT-3 may have used 700,000 litres of water, equivalent to the water footprint of manufacturing 320 Tesla EVs.

E-waste

Electronic waste is the fastest-growing waste stream in the world, amounting to a staggering 57 million tons generated each year, about the same weight as the Great Wall of China.

E-waste due to production of AI hardware may also contribute to emissions. The rapid growth of AI may also lead to faster depreciation of devices, resulting in hazardous e-waste. Some applications of AI, such as for robot recycling, may reduce e-waste.

Climate solutions

AI has significant potential to help mitigate effects of climate change, such as through better weather predictions, disaster prevention and weather tracking Some climate scientists have suggested that AI could be used to improve efficiencies of systems, such as renewable-energy systems. AI could help mitigate some effects of climate change such as predicting floods or making traffic more efficient. Some algorithms may help predict the impacts of more severe hurricanes, measure the melting of polar ice, deforestation, and help monitor emissions from sources.

Finally, it is imperative for governments to consider the long-term impacts in setting up a regulatory frameworks and legislations in a way that would legally address transparency and sustainability in AI development.

Smt.Shruthy Poonacha
HoD Computer Science
&
Controller of Examinations

NETWORK SECURITY IN THE DIGITAL AGE

PROTECTING OUR SYSTEMS

SUPREETH R
III SEM BCA 'D'

In today's interconnected world, network security is a critical priority as businesses and individuals rely on digital platforms for communication, operations, and data storage. Securing networks against unauthorized access and cyber threats is essential to avoid serious consequences such as financial losses and compromised personal data. The increasing sophistication of cyberattacks has made safeguarding digital interactions more challenging. Common threats include malware, phishing, denial-of-service (DoS) attacks, man-in-the-middle (MitM) attacks, and ransomware. Malware, such as viruses, worms, and ransomware, aims to damage or steal data. Phishing tricks users into revealing sensitive information, while DoS attacks overwhelm a network with excessive traffic, causing system disruptions. MitM attacks intercept and manipulate data between parties, and ransomware encrypts critical data, demanding payment for its release.

To counter these threats, encryption and authentication are crucial. Encryption scrambles data, making it unreadable without a decryption key, while authentication verifies user identities. Multi-factor authentication (MFA) provides an added layer of security by requiring multiple credentials. These measures help prevent unauthorized access and ensure data integrity.

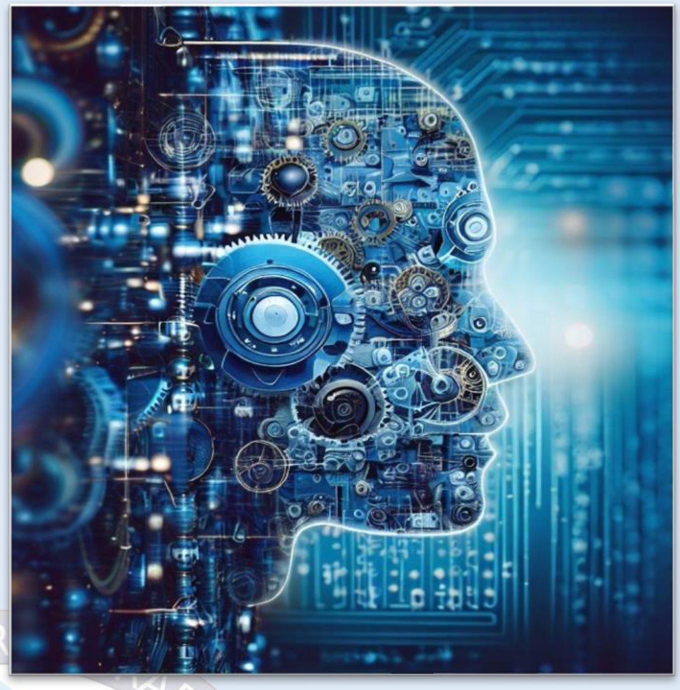
Maintaining strong network security involves continuous vigilance. Regular software updates are necessary to patch vulnerabilities, while firewalls and intrusion detection systems (IDS) help block unauthorized access and detect threats in real time. Virtual private networks (VPNs) secure remote access by encrypting traffic. Educating users on phishing, enforcing strong password policies, and adopting secure online practices further enhance security.

In addition, robust data backup and disaster recovery plans ensure swift recovery from cyberattacks or data loss, minimizing operational disruptions. Network security must remain a top priority to ensure safe and reliable digital interactions in today's evolving threat landscape.

CONCLUSION

With cyber threats constantly evolving, network security has never been more vital. By adopting best practices, staying informed about emerging threats, and leveraging advanced technologies like AI, organizations and individuals can safeguard their networks and protect valuable data. Prioritizing network security is essential for success in our digital world.

MACHINE LEARNING



Machine learning (ML) is a branch of artificial intelligence (AI) and computer science that focuses on the using data and algorithms to enable AI imitate the way that humans learn, gradually improving its accuracy.

Machine learning helps enterprises improve their threat analysis capabilities and how they respond to cyberattacks, hackers, and malware.

MACHINE LEARNING METHODS

1.Supervised machine learning:

Supervised learning, also known as supervised machine learning, is defined by its use of labelled datasets to train algorithms to classify data or predict outcomes accurately. Some methods used in supervised learning include neural networks, naïve bayes, linear regression, logistic regression, random forest, and support vector machine (SVM).

2.Unsupervised machine learning:

Unsupervised learning, also known as unsupervised machine learning, uses machine learning algorithms to analyse and cluster unlabelled datasets (subsets called clusters). Principal component analysis (PCA) and singular value decomposition (SVD) are two common approaches for this. Other algorithms used in unsupervised learning include neural networks, k-means clustering, and probabilistic clustering methods.

3.Semi-supervised learning:

Semi-supervised learning offers a happy medium between supervised and unsupervised learning. During training, it uses a smaller labelled data set to guide classification and feature extraction from a larger, unlabelled data set. Semi-supervised learning can solve the problem of not having enough labelled data for a supervised learning algorithm. It also helps if it's too costly to label enough data.

ANVITHA S
III SEM BCA 'B'

HOW DOES MACHINE LEARNING WORK?

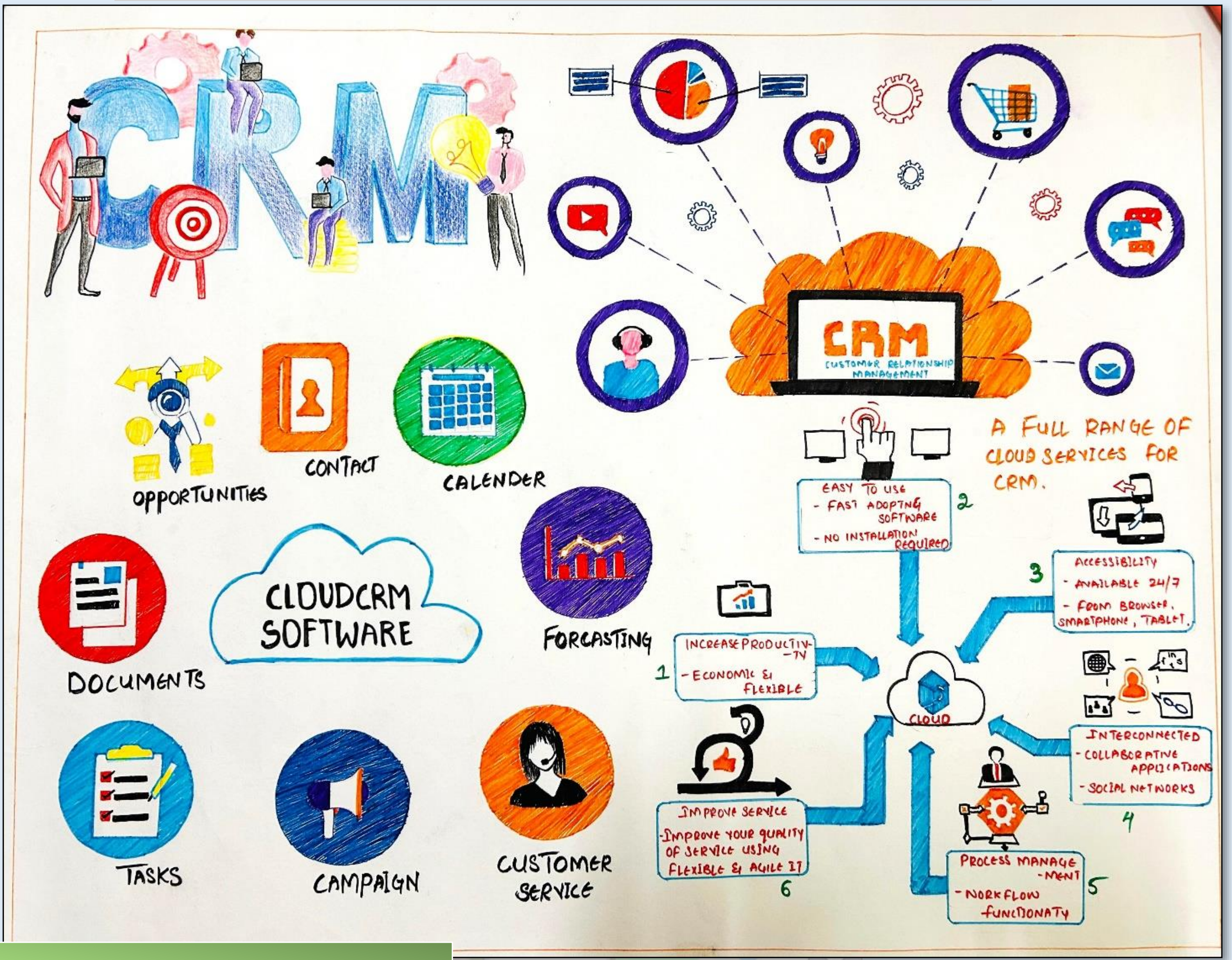
Machine learning algorithm are divided into three main parts:

1.A Decision Process: In general, machine learning algorithms are used to make a prediction or classification. Based on some input data, which can be labelled or unlabelled, your algorithm will produce an estimate about a pattern in the data.

2.An Error Function: An error function evaluates the prediction of the model. If there are known examples, an error function can make a comparison to assess the accuracy of the model.

3.A Model Optimization Process: If the model can fit better to the data points in the training set, then weights are adjusted to reduce the discrepancy between the known example and the model estimate. The algorithm will repeat this iterative "evaluate and optimize" process, updating weights autonomously until a threshold of accuracy has been met.

POSTER on Business & Consumer Application in CLOUD COMPUTING



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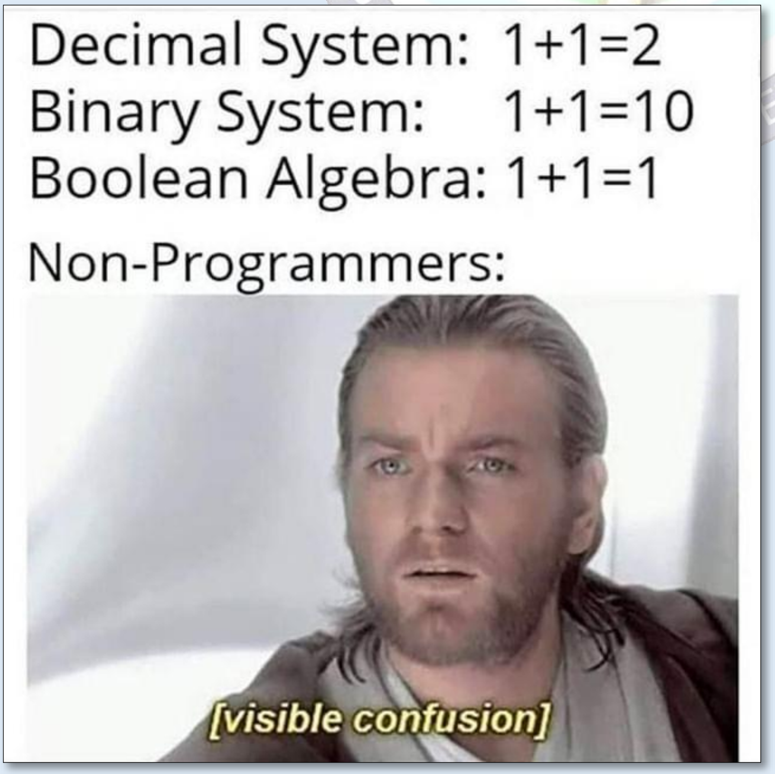

Boolean algebra is a branch of mathematics that deals with operations on logical values with binary variables.

Boolean variables are represented as binary numbers to represent truths:

1 = true and 0 = false.

Elementary algebra deals with numerical operations, whereas Boolean algebra deals with logical operations.

Smt.NANDINI K S
Department of Computer Science & Application

EDITORS MESSAGE

We at Department of Computer Science & Applications feel proud to bring out the Forty Fifth Edition of the Department Monthly Newsletter "INFOLET". The Wide Spectrum of Articles in Different Sections gives us a sense of Pride as they reflect the creative potential and talents of our Students and Teachers. Each Article is thought provoking, interesting and entertaining, I applaud the contribution for their over whelming response, stimulated thoughts and varied hues in articles contributed by them.

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