



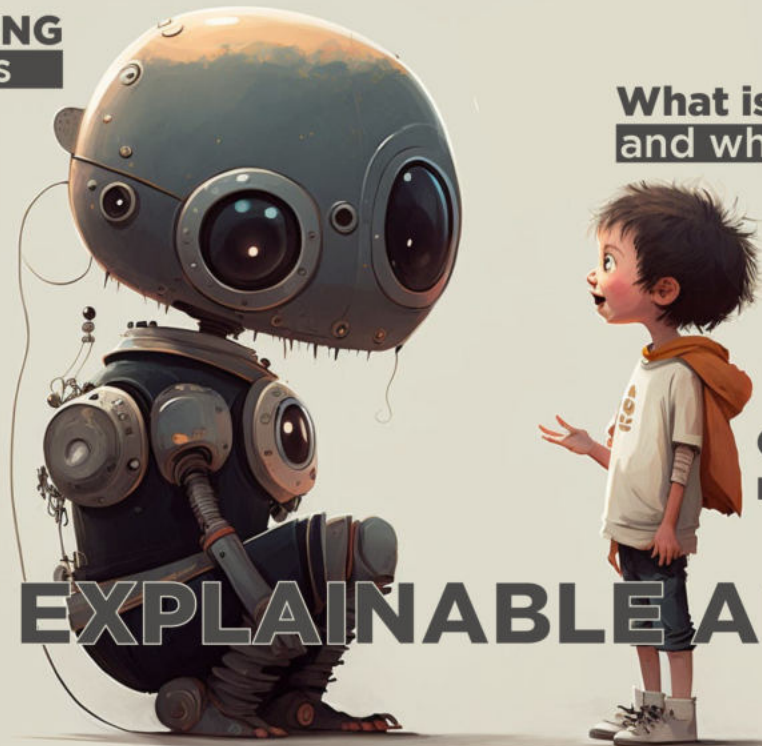
CODE EX VOL 3

HUMAN CLONING
pros and cons

What is ChatGPT
and why does it matter?

**Genetically
modified food**

EXPLAINABLE AI





Vision.

Creating socially committed engineers with professional competency and excellence in Computer Science and Engineering through quality education.



Mission.

1. To achieve technical proficiency by adopting effective teaching-learning strategies which promote innovation and professional expertise.
2. To facilitate skill development of students through additional training by collaborating with industry to broaden their knowledge.
3. To promote excellence in research, development and consultancy services rooted in ethics, in order to emerge as responsible engineers.



Program Specific Outcomes.

1. Analyse and design computation systems by applying the attained knowledge in programming language and algorithms, system software, database management, data communication, networking and allied areas of Computer Science and Engineering.
2. Apply software engineering principles and practices to develop efficient software solutions for real world computing problems.



Program Educational Objectives.

- CSE Graduates, within three-five years of graduation should
1. Demonstrate their expertise in solving contemporary problems through design, analysis and implementation of hardware and software systems.
 2. Adapt to a constantly changing world through professional development and continuous learning.
 3. Develop teamwork, leadership and entrepreneurship skills required to function productively in their profession.

EXECUTIVE DIRECTOR'S MESSAGE



Rev. Fr. John Paliakkara



It is with a sense of great pride that I pen down a message for the magazine “CODEX” being released by our Department of Computer Science and Engineering. This department has been consistently registering the maximum admission count over the past couple of years in our institution. What this indicates is not just the prospects in the career market but also the teaching-learning practices we have in place here. The following maxim is therefore very apt with regards to the above observation - “We cannot always build the future for our youth but we can build our youth for the future”. The last couple of years has seen the Computer Science and Engineering Department evolve by leaps and bounds in terms of the value being added to its students’ profile. May this department continue to march ahead with sustained all round growth. My prayers and best wishes are with this magazine to achieve its intended objectives.

PRINCIPAL'S MESSAGE



Dr. Sajeev John



Our Department of Computer Science & Engineering has been consistently implementing a variety of strategies and group dynamics alongside the academic framework to bring about holistic growth and to secure a bright career for its students. All these quality initiatives are taking shape due to the cohesiveness between the Staff and Students. The participation and enthusiasm of the CS students in all these activities is definitely heartening to see. Today the world is changing at an accelerated rate and Computer technology is at the forefront of this change. I sincerely wish that our CS students, after receiving and developing the foundational skills here, may go on to provide solutions to real-life problems thereby making a positive difference to the society. May all their endeavours, including this magazine 'CODEX', bear abundant fruits.

HOD'S MESSAGE



Dr. Remya K Sasi



It is a great privilege and immense honour to inform you that the Department of Computer Science and Engineering is publishing its Third Annual Technical Magazine CODEX. This technical magazine is a platform to exhibit the technical and literary skills of the students and staff of Computer Science and Engineering Department. This magazine have been made possible by the extraordinary vision of Fr. John Paliakkara, Executive Director of the College, Fr. Joy Payyappilly, Fr. Antony Pottokaran Joint Director of the College, Principal Dr. Sajeew John and Vice Principal Dr. V.D John. We thank them for the valuable advice and support for making this possible.

I take this opportunity to congratulate the Chief Editors Sr. Reema Jose and Ms. Nighila Ashok, Designers Christo Paul(S8 CS), Karthik Kannan(S8 CS), Noel Tony (S8 CS) and Student Editors for bringing out this magazine as per schedule, which in itself is an achievement considering the effort and time required.

I would like to thank all editorial team members for providing students a platform for creative thoughts and knowledge expansion. I express my considerable appreciation to all the authors of the articles in this magazine. Once again I express my gratitude to all for their involvement, encouragement, support and guidance.

Our Team



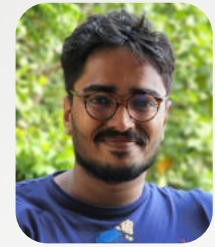
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We would like to express our gratitude to all those who have contributed to the production of this year's technical magazine. Without your support, this would not have been possible. We would like to thank our editorial team for their hard work and dedication in bringing together this wonderful publication. We also extend our appreciation to our Executive Director Rev. Fr. John Paliakkara CMI, Principal Dr. Sajeev John, H.O.D (CSE) Dr. Remya K Sasi, magazine incharges Sr. Reema Jose and Ms. Nighila Ashok, President (CODe) Enric S Neelamkavil, who have contributed their valuable insights and expertise. We are grateful to our staffs and students, who have submitted their articles, artwork, and photographs, which have added color and vibrancy to this magazine. "CODeX" (2022-23), the technical magazine of the Computer Science and Engineering Department of Christ College of Engineering, this will be a medium for transfer of knowledge, technologies and ideas between faculties and students. The articles will enlighten you on various technological and ingenious themes. Finally, we would like to thank our readers, for their continued support and interest in our magazine. Your feedback and encouragement are what drive us to continue producing this publication. Thank you all once again for your contributions, and we look forward to your continued support in the future.



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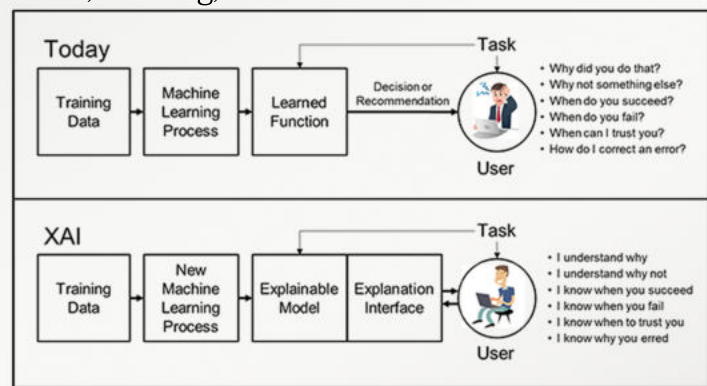


Ajil Ibrahim
S8 CSE

Explainable AI: Understanding the Black Box

From self-driving cars and tailored treatment to automated financial trading and fraud detection, artificial intelligence (AI) is changing the way we live. The decision-making processes of AI, however, have the potential to become opaque, unpredictable, and even biased as it gets more pervasive and complicated. This has raised questions about AI systems' accountability, transparency, and fairness, particularly in high-stakes industries like healthcare, banking, and law.

An emerging field called Explainable AI (XAI) tries to overcome these difficulties by giving people the ability to comprehend, evaluate, and believe AI systems' judgements. The goal of XAI is to explain how AI models operate, the data they utilise, the assumptions they make, and the variables that affect their results. Designing AI systems that can clearly, succinctly, and appropriately convey their reasoning and uncertainty to humans is the goal of XAI, which goes beyond simply providing infographics or dashboards.

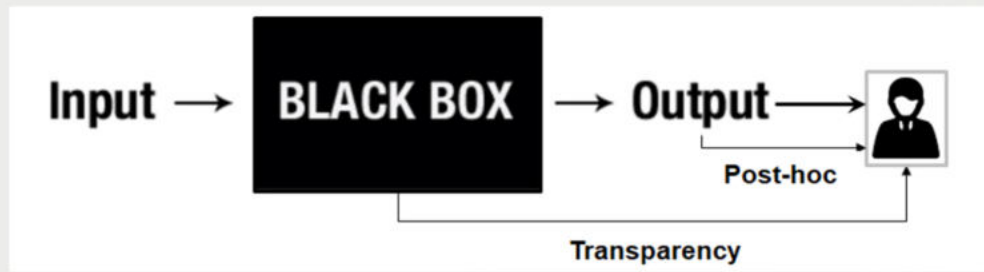


Why is XAI crucial? First, by identifying and addressing biases, errors, and vulnerabilities, XAI may help AI models be more accurate and robust. By making it easier for non-experts to interact with AI systems, XAI can also improve their usability and accessibility. By letting consumers evaluate and audit the decisions made by AI systems and offer comments and suggestions for improvement, XAI can help promote trust and accountability in AI.

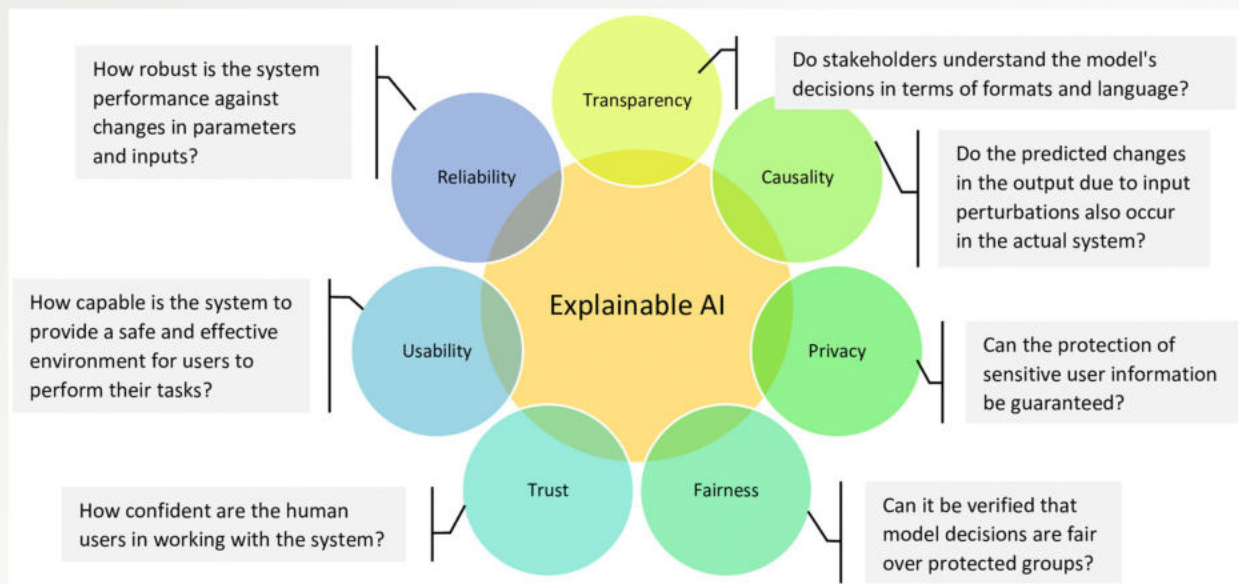
How does XAI function? There are various XAI methodologies, each with distinct advantages and disadvantages. Certain XAI techniques, such as decision trees, rule-based systems, or natural language generation, are predicated on producing visual or textual explanations of the inputs, features, weights, and outputs of the AI model. Other XAI techniques, including sensitivity analysis, adversarial attacks, or counterfactual reasoning, are based on perturbing the input data or model parameters and detecting the changes in the output. Other XAI strategies, including active learning, human-in-the-loop, or collaborative filtering, are predicated on giving the user interactive or adaptive input.

Did you know?

Artificial intelligence may one day allow computers to understand what dogs are thinking.



What are XAI's potential and challenges? The trade-off between accuracy and interpretability must be balanced in XAI, as certain AI models may sacrifice performance for simplicity or vice versa. Another difficulty is guaranteeing the confidentiality and privacy of the data that AI models use, particularly when delicate or private information is involved. Also, XAI must consider the various requirements and preferences of many users and stakeholders, including patients, physicians, regulators, and investors.



Yet, because it brings together scholars, practitioners, and policymakers from all fields and disciplines, XAI also presents a number of chances for innovation and collaboration. By offering insights into the underlying causes and effects of complex phenomena, XAI can enable novel applications of AI in fields like education, social welfare, and environmental sustainability. By enabling people to take part in the creation, assessment, and governance of AI systems, XAI can help promote a more diverse and democratic AI environment.

In conclusion, because it enables humans to comprehend and manage the AI black box, XAI is a crucial part of responsible and ethical AI development and deployment. In a range of fields, XAI can serve to strengthen human-AI collaboration and to increase the dependability, transparency, and fairness of AI systems. XAI is a process of ongoing learning and improvement as new possibilities and problems arise rather than a panacea. As a result, XAI calls for a multidisciplinary and inclusive strategy that includes not just technical know-how but also ethical, statutory, and social issues.

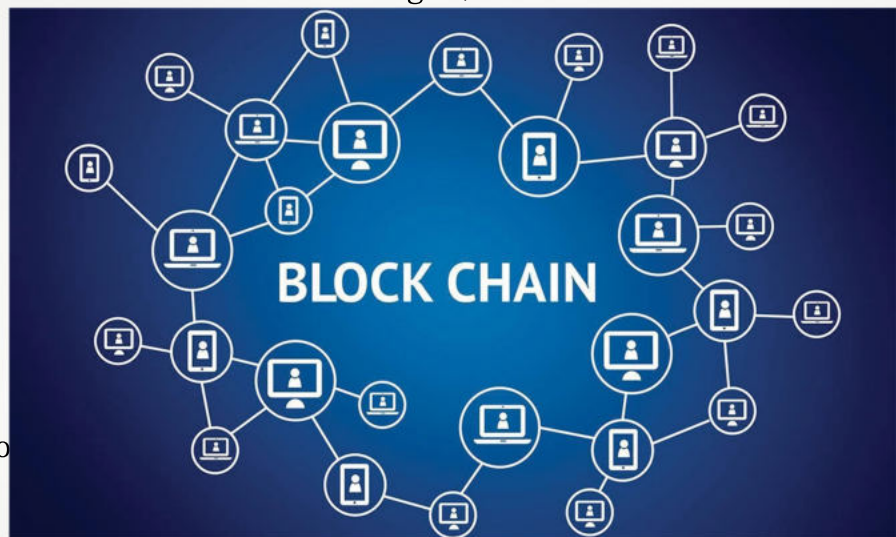
Exploring Blockchain Technology



Blessymaria Shaju
S4 CSE

A blockchain is a distributed database or ledger that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format. One key difference between a typical database and a blockchain is how the data is structured. A blockchain collects information together in groups, known as blocks that hold sets of information. Blocks have certain storage capacities and, when filled, are closed and linked to the previously filled block, forming a chain of data known as the blockchain. All new information that follows that freshly added block is compiled into a newly formed block that will then also be added to the chain once filled.

The goal of blockchain is to allow digital information to be recorded and distributed, but not edited. In this way, a blockchain is the foundation for immutable ledgers, or records of transactions that cannot be altered, deleted, or destroyed. This is why blockchains are also known as a distributed ledger technology (DLT). Here are a few real life implementations of blockchain. By integrating blockchain into banks, consumers can see their transactions processed in as little as 10 minutes—basically the time it takes to add a block to the blockchain, regardless of holidays or the time of day or week.



With blockchain, banks also have the opportunity to exchange funds between institutions more quickly and securely. By spreading its operations across a network of computers, blockchain allows Bitcoin and other cryptocurrencies to operate without the need for a central authority. This not only reduces risk but also eliminates many of the processing and transaction fees. Healthcare providers can leverage blockchain to securely store their patients' medical records. These personal health records could be encoded and stored on the blockchain with a private key, so that they are only accessible by certain individuals, thereby ensuring privacy.

Did you know?

Per year, Google receives 1.2 trillion search requests, which translates to about 40,000 every second and 3.5 billion each day.

If you have ever spent time in your local Recorder's Office, you will know that the process of recording property rights is both burdensome and inefficient. Blockchain has the potential to eliminate the need for scanning documents and tracking down physical files in a local recording office. If property ownership is stored and verified on the blockchain, owners can trust that their deed is accurate and permanently recorded. A smart contract is a computer code that can be built into the blockchain to facilitate, verify, or negotiate a contract agreement. Smart contracts operate under a set of conditions to which users agree. When those conditions are met, the terms of the agreement are automatically carried out. As reported by Forbes, the food industry is increasingly adopting the use of blockchain to track the path and safety of food throughout the farm-to-user journey.



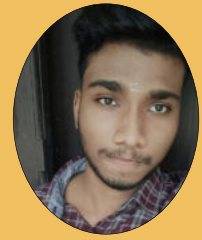
The bottom line is that with many practical applications for the technology already being implemented and explored, blockchain is finally making a name for itself in no small part because of bitcoin and cryptocurrency. As a buzzword on the tongue of every investor in the nation, blockchain stands to make business and government operations more accurate, efficient, secure, and cheap, with fewer middlemen.

As we prepare to head into the third decade of blockchain, it's no longer a question of if legacy companies will catch on to the technology—it's a question of when. Today, we see a proliferation of NFTs and the tokenization of assets. The next decades will prove to be an important period of growth for blockchain.

Did you know?

With over 746 million active users, China boasts the world's largest internet population.

ChatGPT



Bimal Dev T K
S6 CSE

ChatGPT is a cutting-edge language model designed by OpenAI, a research organization founded by several leading figures in the technology industry, including Elon Musk, Sam Altman, and Greg Brockman. The model is based on the GPT-3.5 architecture and is designed to generate human-like responses to text-based prompts.

ChatGPT is one of the most advanced language models available today, and it has been trained on a massive dataset that includes a wide range of text-based content, including books, articles, and web pages. This training has enabled the model to develop a deep understanding of language and to generate responses that are often indistinguishable from those produced by human beings.

One of the key features of ChatGPT is its ability to understand the context of a conversation and to generate responses that are appropriate and relevant. This is accomplished through a process known as "contextualization," which involves analyzing the entire conversation history to determine the appropriate response.

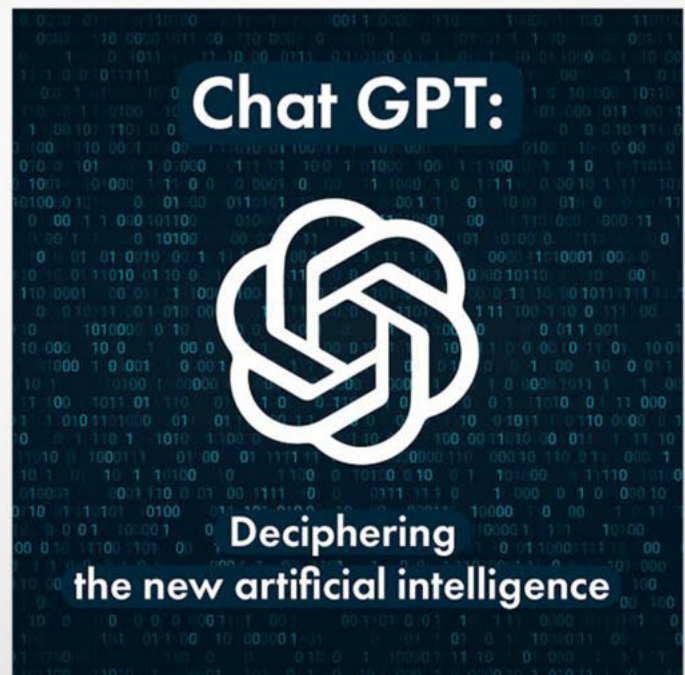
Another important aspect of ChatGPT is its ability to learn and adapt over time. As it interacts with more users, the model becomes more sophisticated and is able to generate more nuanced and accurate responses. This process is facilitated by a feedback loop, where the model is constantly learning from its interactions and adjusting its responses accordingly.

ChatGPT has a wide range of applications, including customer service, chatbots, and virtual assistants. It can also be used to generate creative writing, such as poetry or fiction, and to assist with language translation and summarization.

Despite its impressive capabilities, ChatGPT is not without its limitations. One of the biggest challenges facing language models like ChatGPT

is their tendency to perpetuate biases that exist in the data they are trained on. This means that the responses generated by ChatGPT may reflect societal biases and stereotypes, which could have negative consequences for certain groups of people.

In conclusion, ChatGPT represents a major breakthrough in the field of natural language processing and has the potential to revolutionize the way we interact with machines. As the technology continues to advance, we can expect to see even more sophisticated language models emerge, with the potential to transform a wide range of industries and fields.





Dr. Vince Paul
Prof., CSE

Agents in Adhoc Networks

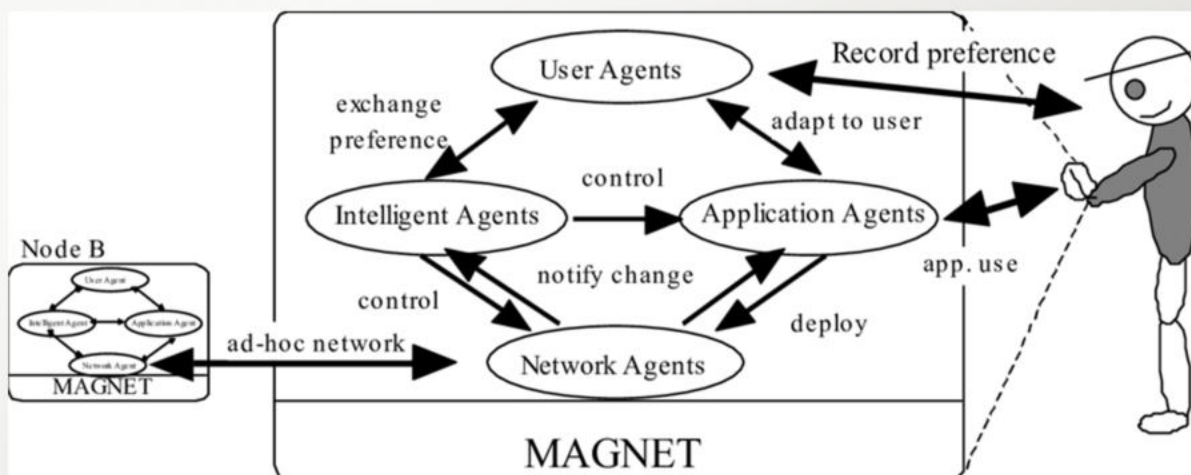
Ad hoc networks, also known as mobile ad hoc networks (MANETs), are networks in which wireless devices communicate with one another without relying on a fixed infrastructure. In such networks, devices act as both end nodes and routers, forwarding data packets to other devices in the network, which in turn relay them further.

Agents, in the context of ad hoc networks, are software entities that operate on behalf of a user or an application to perform tasks such as routing, data dissemination, and network management. Agents can be designed to operate autonomously or in a collaborative manner with other agents to achieve specific goals.

Agents in ad hoc networks can be classified into two categories: mobile agents and static agents.

Mobile agents are software entities that can migrate from one device to another within the network. They can be programmed to perform a variety of tasks, such as data collection, monitoring, and analysis. Mobile agents are well suited for ad hoc networks as they can move from device to device to collect and disseminate information, making the network more efficient and resilient.

Static agents, on the other hand, are software entities that are deployed on specific devices within the network and remain stationary. They can be designed to perform specific tasks, such as routing or network management. Static agents are useful in ad hoc networks as they can be used to provide a more stable infrastructure for the network.



Did you know?

The worldwide retail Artificial Intelligence industry is expected to reach \$110 billion by 2024, according to International Data Corporation (IDC).

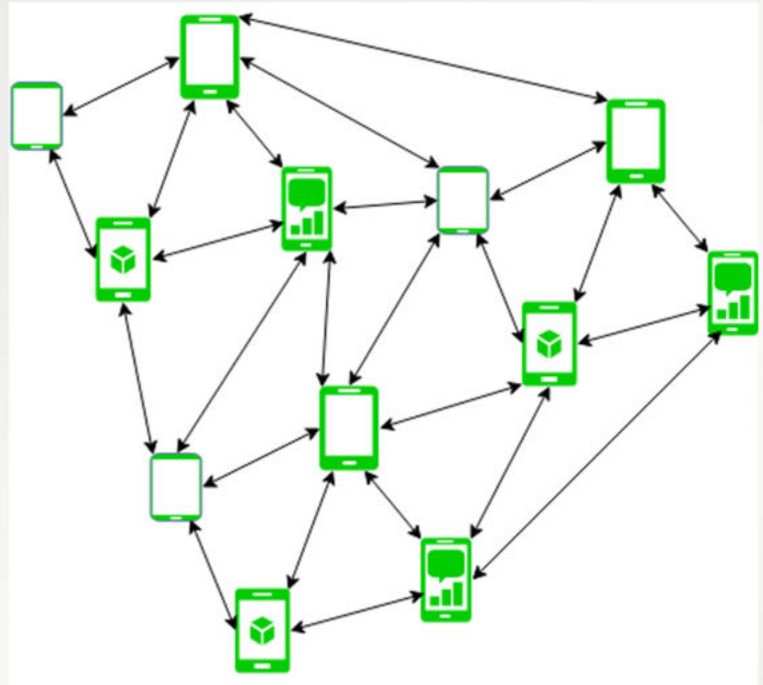
One of the main advantages of using agents in ad hoc networks is their ability to operate autonomously. Agents can be programmed to make decisions based on local information, without requiring centralized control. This makes ad hoc networks more resilient, as agents can adapt to changing network conditions and continue to function even if some devices fail.

Another advantage of using agents in ad hoc networks is their ability to collaborate with one another. Agents can be designed to communicate with other agents within the network and work together to achieve specific goals. For example, agents can collaborate to perform tasks such as routing and data dissemination, making the network more efficient and reliable.

However, there are also challenges associated with using agents in ad hoc networks. One of the main challenges is designing agents that can operate efficiently in a resource-constrained environment. Ad hoc networks often have limited bandwidth and processing

power, which can make it difficult for agents to perform complex tasks. Another challenge is ensuring the security and privacy of the network. Agents can be vulnerable to attacks, such as malware and denial of service attacks, which can compromise the integrity of the network.

In conclusion, agents have the potential to improve the performance and efficiency of ad hoc networks. By operating autonomously and collaborating with one another, agents can adapt to changing network conditions and perform tasks such as routing and data dissemination more efficiently. However, designing agents that can operate efficiently in a resource-constrained environment and ensuring the security and privacy of the network are important challenges that need to be addressed.



Did you know?

The overall global storage is projected to reach 175 zettabytes by the end of 2025.

EEG-Based BCI Applications for Industry 4.0



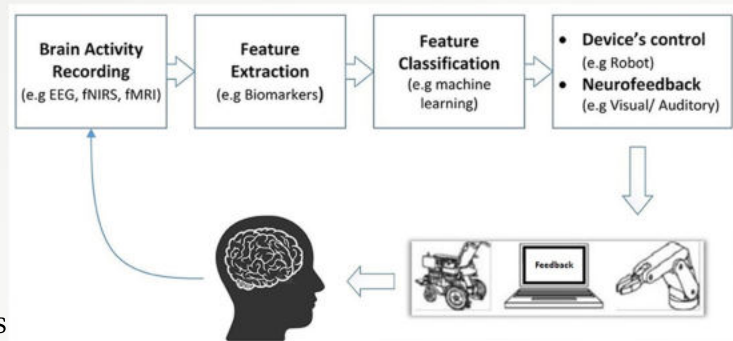
Karthik Kannan
S8 CSE

An EEG-based BCI (Brain-Computer Interface) system uses electrical signals generated by the brain to control technology without the use of physical movement. In the context of Industry 4.0, these systems can have significant applications in areas such as manufacturing, automation, and robotics. Advantages of EEG-based BCIs include non-invasiveness, ease of use, and real-time control capabilities. The technology can be integrated into existing systems to enhance human-machine interactions and improve efficiency. Some other advantages include:

1. Non-invasive and safe
2. Real-time monitoring and control
3. Increased efficiency and productivity
4. Enhanced user experience

One example of EEG-based BCI in Industry 4.0 is the use of BCIs in wearable devices to control machinery in a factory setting. The technology can also be used to control robots

in hazardous environments, reducing the need for human intervention. Another application is in human-robot collaboration, where the EEG signals are used to control the actions of a robot in real-time, allowing for a more intuitive and effective collaboration between humans and machines.



Applications of EEG BCI in Industry 4.0:

1. Human-Machine Interfaces for control and monitoring of industrial processes.
2. Augmented Reality and Virtual Reality systems for immersive experiences.
3. Monitoring of operator fatigue and stress levels in hazardous environments.
4. Predictive maintenance and safety measures in industrial settings.

EEG-based BCIs also have potential in the medical field, such as in the development of prosthetics controlled by the user's thoughts or in the rehabilitation of individuals with motor disabilities. Despite the potential benefits, the implementation of EEG-based BCI systems in Industry 4.0 is still in its early stages and faces challenges such as high cost, and the need for individualized calibration for each user.

Some of the other challenges include:

1. Signal Noise and Interference
2. Scalability and Standardization
3. Lack of widespread adoption and commercialization
4. User training and accessibility

EEG based BCI systems hold a lot of potential in the field of Industry 4.0. However, further research and development is needed to address the challenges and improve the accuracy and reliability of these systems. As the technology advances, EEG BCI is expected to play a significant role in shaping the future of industrial processes and operations.



Gladwin Alappat
S2 CSE

The Ethos in Computing

Every human action is being supervised today by a human-made Informational Technology (IT), which is fast becoming competent to the Supreme power. IT has widely grown into a huge structure that has become ubiquitous in the lives of people across the globe. IT specifies the components that are used to store, fetch, and manipulate the information at the minimum level with the server having an operating system. It has a wide area of applications in education, business, health, industries, banking sector, and scientific research at a large level. Moreover, services are used to record, communicate, synthesize or organize information through the use of computer technologies. Information itself can be understood as any useful data, instructions, or meaningful message content. IT ethics raises new and unique moral problems because it has brought in a dramatic, social, political, and conceptual change. This is because information technology affects not only how we do things but how we think about them. It challenges some of the basic organizing concepts of moral life such as property, privacy, the distribution of power, basic liberties, and moral responsibility.

The morality involved in the development of new technology posits whether it is always, never, or contextually right or wrong for professionals to invent and implement a technological innovation. Humans are inherently technological beings or tool users. We are creative beings who use technology to complement, enhance, or disburden ourselves. Technology has, without a doubt, become a central part of the human condition. It influences us, just as much as we influence it, in our daily lives, also as moral and ethical beings. Engaging in the process of technological innovation and the art of making brings forth a desirable cultural transformation, which in turn reveals its teleology. The ethical questions that are augmented by the ways in which technology extends or curtails the power of individuals give the certain speculations like the moral responsibilities of IT professionals and those who are to blame when a software failure causes harm, etc.

We have built a global society where the dependence on technology grows daily. The emerging science of human-machine systems seeks to maximize the benefit derived from technology while exercising a continual vigilance over its darker side and its dangerous potentialities. Humans use technology in a task-oriented exploration and manipulation of their environment. According to W. T. Powers, the flow of control of human activity is bi-directional, with control flowing upward from the lower-order systems as much as it does downward in the higher-order systems. Human activity is thus characterized as an inner loop of skilled manual control and perceptual processing embedded within an outer loop of control. The temporal and spatial scales of perception-action can serve to frame human exploration.

Did you know?

Physical money accounts for just around 10% of global cash, while the rest is stored on computers.

The limit of human perception has always exceeded human action. For example, we might be able to see more than 40 kilometres of distance on a clear day, and yet, without any technical assistance we can only exercise control over a few feet of land that surrounds us. Technological innovations often generate a dual effect. That is, new technologies increase the range of our actions while simultaneously expanding the range of our perception. Our environment is measured in the basic metrics of space and time. The exploration of space and time is motivated by personal and collective goals that can be expressed as our desire for certain future states of the world. Therefore, technology serves to broaden the horizon through transformation to achieve goals. Responsible computing depends on humans, and it is clear that humans are moral agents and that computational systems are not. Humans experience a diminished sense of agency, human dignity is eroded, and individuals consider themselves to be largely unaccountable for the consequences of their computer use.

Technology is evolving at a rapid pace, enabling faster change and progress, causing an acceleration of the rate of change. Open-Source Applications is a method for software licensing and distribution designed to encourage the use and improvement of software written by volunteers by ensuring that anyone can copy the source code and modify it freely. The quantum leap of the user-friendly AI application, ChatGPT has become the talk of the town. As an AI language model, ChatGPT has several advantages that make it a valuable tool for various applications. It has been trained on a large corpus of text data, making it knowledgeable about a wide range of topics. ChatGPT can respond to queries quickly and efficiently, allowing for fast-paced conversations. The basic feature of the model is that it uses advanced natural language processing techniques to understand and respond to user queries accurately. It can communicate in multiple languages, making it accessible to a global audience. Moreover, it can handle large volumes of data and conversations, making it suitable for businesses and organizations of all sizes.

Meanwhile, ChatGPT may also become a threat to the public by many technical glitches in the software's industry. It might generate responses that are factually incorrect or misleading if the training data it was trained on includes incorrect information. This could lead to spreading misinformation or false claims in certain scenarios. In the wrong hands, it can be used to generate convincing fake news, spam messages, or phishing scams. This could lead to social engineering attacks or other types of cyber threats. To mitigate these risks, it is essential to ensure that language models are trained on diverse and representative data, and that their responses are regularly monitored for accuracy, fairness, and ethical considerations. Overall, ChatGPT's ability to understand and respond to natural language makes it a versatile and valuable tool for a wide range of applications, including customer support, education, research, and more.

Summing up, the future burgeoning and findings are uncertain. But amidst all uncertainties, novel inventions are making a great breakthrough in the IT industry. Information technology is not the panacea for every problem. It is only a tool and not a solution to many problems.

Whereas, rapid reliance on information technology has also created a digital divide among the generations. This lacuna is a considerable factor among different classes of people causing many anomalies. It is the duty of humans to use the advancements diligently in a sustainable approach. Every innovation is an acquaintance to humans. It must never become the paramount cause to the innovation. As an ethical innovator, it must be our responsibility to make the world an assisted world rather than a controlled world.

Did you know?

The IBM 1311, which only had a 5-megabyte capacity and looked like a washing machine, was the first disk drive to employ removable media.

Nanosensors and Internet of NanoThings(IoNT)

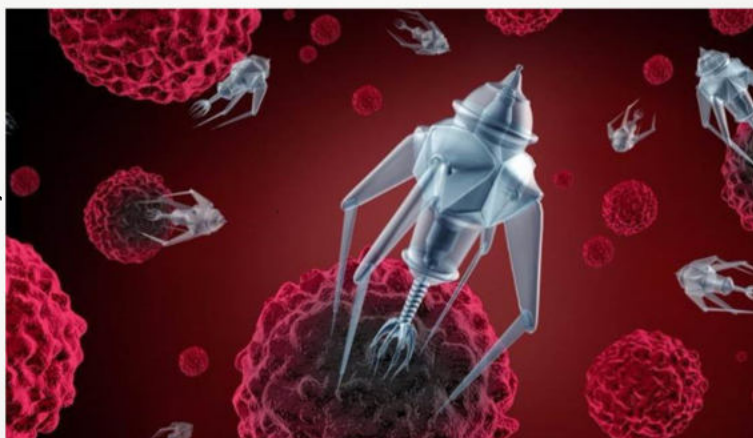


Roshan Paul
S8 CSE

Nanosensors are the latest breakthrough in the field of sensing technology. These tiny devices, which are often no larger than a few nanometers in size, can be used to detect a wide range of chemical and physical parameters, including the presence of nanoparticles, the concentration of chemical species, and even temperature. With their small size and ability to detect signals at the nanoscale, nanosensors are poised to play a crucial role in many applications, from medical and environmental monitoring to industrial and consumer products.

Nanosensors are a special type of sensor that are designed to work on the nanoscale. Unlike traditional sensors, which are typically larger and designed to detect signals and parameters in macroscale systems, nanosensors are much smaller and more sensitive. They are capable of detecting and measuring physical and chemical parameters at the nanoscale, such as the presence of nanoparticles, chemical species, and temperature, among others.

One of the unique features of nanosensors is their size, which is often in the range of a few nanometers to several micrometers. This small size allows for the integration of sensing capabilities into a wide range of devices, from handheld devices and wearable technologies to industrial machinery and medical instruments. This also allows for the integration of sensing capabilities into a wide range of devices, from handheld devices and wearable technologies to industrial machinery and medical instruments. Furthermore, the small size of nanosensors allows for the creation of highly sensitive and precise sensors that can detect even trace amounts of chemicals or other substances, making them useful in a wide range of applications. Nanosensors can be designed to detect a wide range of parameters, including chemical and biological species, temperature, pressure, and more.



The Internet of Nano Things (IoNT) is the next step in the evolution of nanosensor technology. It represents a new frontier in the field of sensing and communication technology. The IoNT involves the integration of nano devices with existing networks, allowing the creation of a new class of smart devices capable of transmitting data and communicating with each other on a nanoscale.

Did you know?

The first webcam was used to monitor a coffee maker, allowing users to save returns to an empty pot.

This allows for the exchange of data and information between devices, creating new opportunities for innovation and discovery. This also has the potential to revolutionize the way we communicate and interact with devices, providing new and innovative solutions to a range of problems.

A nano machine is a device that is integrated with nano components to perform specific tasks. It operates in a similar manner to the Internet of Things (IoT), which connects everyday devices and objects to the internet, but with one major difference: the IoNT allows for the interconnection of nano components, which is not possible with the IoT. This opens up new opportunities for communication and data exchange on a smaller scale.

The Internet of Nano Things (IoNT) is an extension of nanosensor technology, and involves the integration of nanoscale devices with existing networks. This allows for the creation of a new class of smart devices that can communicate with each other on a nanoscale, enabling the exchange of data and information between devices. The IoNT has the potential to revolutionize a wide range of industries and applications, from medical and environmental monitoring to industrial and consumer products.

The IoNT can have a significant impact on a range of industries and applications. For example, in the medical field, nanosensors and the IoNT can be used to develop new diagnostic tools and therapies. In the environmental sector, the IoNT can help monitor and detect pollutants and other harmful substances in real-time.

One of the key benefits of the IoNT is its ability to provide real-time monitoring and control of systems and processes. For example, in the medical field, nanosensors and the IoNT can be used to develop new diagnostic tools and therapies that can monitor and respond to the health of patients in real-time. In the industrial sector, the IoNT can be used to develop smart and efficient machines that can monitor and respond to their environment in real-time, improving productivity and reducing waste.

While the Internet of Nano Things is still in its early stages, it is expected to have a profound impact on a range of industries and applications. From medical and environmental monitoring to industrial and consumer products, the IoNT has the potential to bring about significant advancements in areas such as electronics, communication, and robotics. As the technology continues to evolve, the possibilities for innovation and discovery will only continue to expand.

In conclusion, nanosensors and the Internet of Nano Things represent a major breakthrough and a leap forward in the field of sensing and communication technology. With their small size and ability to detect signals at the nanoscale, they are poised to play a critical role in many applications, from medical and environmental monitoring to industrial and consumer products and they have the

Did you know?

To communicate and run a program, the first computers could only comprehend 0s and 1s.

Deep learning models in the diagnosis of COVID-19



Ms. Nighila Ashok
Asst. Prof., CSE

The SARS-CoV-2 virus is the source of the contagious sickness known as coronavirus disease (COVID-19). The COVID-19 outbreak has grown to become one of the most serious public health problems in recent memory. The virus multiplies hastily. It mainly affects the lungs. The main challenge faced by the doctors was the symptoms of COVID-19 were similar to that of normal virus infections like Flu, Throat infection, sneezing, fever, and cough. When the infection is severe, it may result in pneumonia, breathing problems, multiple organ failure, and even death. Mainly pain killers, paracetamol tablets, and other antibiotics were prescribed to the patients. These medicines were prescribed based on the symptoms alone. A commonly used test was reverse polymerase chain reaction (RT-PCR) which was time-consuming. By the time the result is obtained the infected person might have transmitted the virus to several other people.

COVID-19 has spread quickly throughout the world due to its severity and ease of transmission. Still, COVID-19 is considered to be a deadly disease due to the inability to diagnose it in an early stage. Numerous researchers found that people with COVID-19 symptoms had a few hazy, darker patches in their lungs. These spots assisted in identifying COVID-19-infected patients from those who weren't. The researchers believe that X-Rays or CT scans can be used to effectively detect and follow up on COVID-19 cases. Chest x-ray produces pictures inside the chest by using a small dosage of ionization radiation. It is an effective tool for diagnosing and monitoring a wide variety of lung disorders. Chest X-rays are useful for quick and simple diagnosis and treatment in emergency situations. Since most symptoms of COVID-19 matches with that of pneumonia, many COVID-19 patients were wrongly diagnosed to have pneumonia and vice versa. Hence, to improve prediction accuracy, Artificial Intelligence may be incorporated along with radiography images. The majority of disease identification may be automated as a result of AI developments.

Machine learning models are created that can learn from a variety of sample data sets and then decide how to proceed appropriately. The major objective of deep learning, a subset of machine learning, is the automatic extraction and classification of visual data. Simple semantic processing, artificial intelligence, biology, and epidemiology are among the fields where deep learning has applicability. It broadens the spectrum of possible outcomes, spots odd data patterns, or interprets common sense. The elimination of erroneous positive and negative results is made possible by incorporating deep learning with COVID-19 radiological image processing, which suggests patients an extraordinary chance to receive quick, affordable, and secure diagnostic services.

It was observed that the usage of a convolution neural network (CNN) was very effective in the prediction of the disease. CNN when combined with several other methods like Squeezenet, Darknet, ResNet, and many more improved the accuracy even further. Also, the images obtained may be further segmented to have a good focus on the area being affected. It may be suggested that all the deep learning models may be analyzed and combined with a cough sound segmentation method to enhance the accuracy of prediction to a great extent.

Detection of Tor Traffic using Deep Learning



Ajo Thomas
S8 CSE

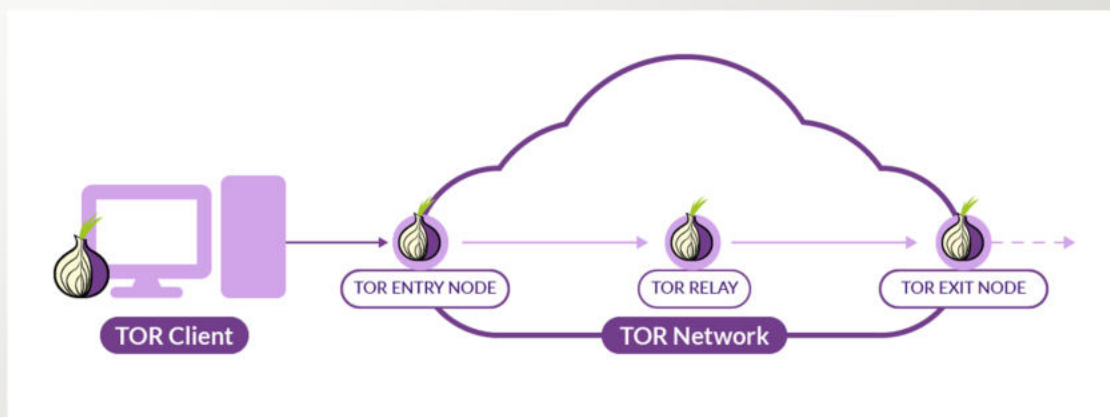
Tor is a free and open-source software that allows users to communicate anonymously on the internet. It is often used by journalists, activists, and individuals who are concerned about their privacy and want to protect their online activities from surveillance. Tor is also used in countries with strict censorship laws to access blocked websites and online content.

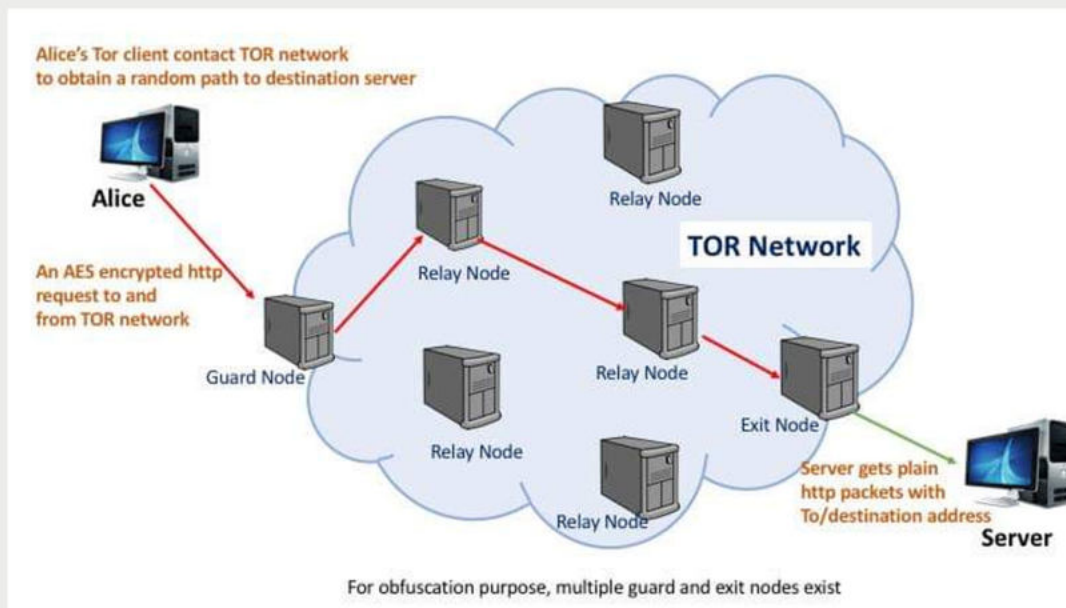
While Tor is primarily used for legitimate purposes, it has also been used by cybercriminals to conduct illicit activities, such as selling illegal goods and services on the dark web. For this reason, Tor traffic has become a target for network security professionals who need to detect and prevent cyber attacks.

The DNN classifier presented in the research paper is designed to identify and classify Tor traffic by analyzing the packet headers of network traffic. Packet headers contain information about the source and destination of the traffic, as well as other metadata that can be used to identify patterns and distinguish between different types of traffic.

The researchers used a large dataset of network traffic to train the DNN classifier, which is a type of machine learning model that can learn to recognize patterns in data. The DNN classifier uses multiple layers of artificial neurons to analyze the packet headers and extract relevant features that can be used to distinguish between Tor and non-Tor traffic.

The researchers found that the DNN classifier was able to achieve a high level of accuracy in identifying Tor traffic, with a classification accuracy of 99.89% on the UNB-CIC Tor network dataset. The system was also able to classify different types of Tor traffic with an accuracy of 95.6%, which is 6.2% higher than previous work on the same dataset.





One of the challenges in detecting Tor traffic is that it is often encrypted, which makes it difficult to analyze the content of the packets. However, by focusing on the packet headers, the DNN classifier was able to identify patterns that are characteristic of Tor traffic. For example,

the system was able to identify that Tor traffic often involves large numbers of small packets, which is a result of the way that Tor encrypts and fragments data.

Another challenge in detecting Tor traffic is that it can be disguised to look like legitimate traffic. For example, a hacker might use a technique called “domain fronting” to make Tor traffic appear to be traffic to a legitimate website. To address this challenge, the researchers used a combination of deep packet inspection and machine learning techniques to identify and classify Tor traffic.

Overall, the research presented in the paper demonstrates the potential of deep learning approaches for detecting and classifying Tor traffic. By using machine learning techniques to analyze packet headers and extract relevant features, it is possible to identify patterns that are characteristic of Tor traffic and improve the accuracy of intrusion detection and prevention systems. However, it is important to note that this is an ongoing challenge, and cybercriminals are constantly developing new techniques to evade detection. Therefore, network security professionals must stay up-to-date with the latest research and techniques for detecting and preventing cyber attacks.

Did you know?

Deep Blue, an IBM supercomputer 1997, defeated the world-renowned chess master Garry Kasparov through a critical move that came from an unexpected bug in the software.

Metaverse



Melwin Anto
S8 CSE

The metaverse is a concept that has captured the attention of the tech industry and the wider public in recent years. It refers to a virtual world where people can interact with each other and digital objects in a three-dimensional space, creating a new kind of online experience that goes beyond the current limitations of social media and video games.

The metaverse is not a new idea. It has been explored in science fiction literature and movies for decades, with notable examples including William Gibson's "Neuromancer" and the movie "The Matrix". However, recent technological advancements, such as virtual reality, augmented reality, and blockchain, have made the metaverse a realistic possibility. The potential of the metaverse is vast. It could become a new economy, where people can buy and sell virtual goods and services, such as virtual real estate, digital art, and even virtual experiences. It could also offer new opportunities for entertainment, education, and social interaction, allowing people to connect with each other in ways that were previously impossible.

One of the most obvious applications of the metaverse is gaming. Virtual worlds could become more immersive and interactive than ever before, creating a new form of entertainment that goes beyond the current limitations of video games. In a metaverse, players could interact with each other and the environment in ways that are impossible in traditional video games, allowing for new forms of gameplay and social interaction. The metaverse could also have significant applications in education. Virtual classrooms could provide students with access to new learning experiences that are not possible in the real world. For example, students could explore ancient civilizations, learn about science and technology, and interact with other students from around the world in a shared virtual space. However, the metaverse also raises important questions and challenges. How will it be governed? Who will own the virtual space and the digital assets within it? How will privacy and security be ensured? These are all complex issues that will require careful consideration and collaboration between governments, businesses, and individuals.

Access to the necessary technology and infrastructure to participate in the metaverse could be expensive and exclusive, leaving many people behind. There are also concerns about the potential for addiction and the impact on mental health, as people become more immersed in a virtual world.

Despite these challenges, the metaverse remains an exciting and intriguing concept. It has the potential to revolutionise the way we interact with each other and the digital world, opening up new possibilities and opportunities for innovation and creativity. It is a topic that will undoubtedly continue to generate interest and discussion in the years to come.



IoT



Liya Mary Francis
S4 CSE

IoT or the Internet of Things is a system of interrelated computing devices, mechanical and digital machines that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. IoT is changing the way we live, work, and interact with the world around us. In this article, we will discuss the basics of IoT and its implications.

IoT refers to the network of physical objects or “things” that are embedded with sensors, software, and other technologies that allow them to collect and exchange data with other devices over the internet. These devices range from simple household appliances such as smart thermostats, refrigerators, and light bulbs to more complex industrial equipment such as manufacturing machines and oil rigs. The data collected by these devices can be used to monitor and control various processes, track performance, optimize operations etc. IoT devices are connected to the internet via wireless or wired networks. IoT has the potential to revolutionize various industries, including healthcare, transportation, manufacturing, agriculture, and energy. Here are some of the key benefits of IoT:



- **Improved Efficiency:** IoT devices can help optimize operations and improve efficiency by automating tasks, monitoring performance, and providing real-time insights.
- **Enhanced Safety:** IoT devices can be used to monitor and control hazardous environments, reducing the risk of accidents and injuries.
- **Cost Savings:** IoT devices can help reduce costs by minimizing downtime, improving asset utilization, and reducing maintenance and repair costs.
- **Improved Customer Experience:** IoT devices can be used to personalize products and services, providing a more engaging and satisfying customer experience.

Despite the many benefits of IoT, there are also several challenges that need to be addressed:

- **Security:** IoT devices are vulnerable to cyber attacks, which can compromise data and cause physical harm.
- **Privacy:** IoT devices collect a large amount of data, which can be used to track and profile individuals, raising privacy concerns.
- **Interoperability:** IoT devices often use different protocols and standards, making it difficult to integrate and exchange data between them.
- **Scalability:** As the number of connected devices grows, managing and scaling IoT networks becomes increasingly complex.

IoT is transforming the way we live and work, creating new opportunities and challenges. By leveraging the power of connected devices, organizations can improve efficiency, productivity, safety, and customer experience. However, to fully realize the potential of IoT, it is important to address the challenges of security, privacy, interoperability, and scalability. As IoT continues to evolve, it will be interesting to see how it shapes the world around us.

Exploring the World of Non-Fungible Tokens (NFTs)



Anoop
S8 CSE

A brand-new class of digital asset has emerged recently in the realm of blockchain technology: Non-Fungible Tokens (NFTs). NFTs are distinctive digital assets that reflect ownership of a particular object or piece of content, such as artwork, films, music, and other kinds of creative expression, as opposed to cryptocurrencies, which are interchangeable and can be broken into smaller parts.



Using blockchain technology has made it possible to generate, purchase, and sell NFTs in a secure and open manner. In order to make sure that the ownership of NFTs is verifiable, transparent, and immutable, transactions are recorded on a public ledger. As a result, producers may now maintain ownership of their works and sell them directly to their followers, cutting out conventional

middlemen, creating a new method of monetizing digital goods.

The ability of NFTs to enable the development of new revenue streams for producers of digital content is one of their most important advantages. This is crucial for musicians, artists, and other creative professions who have had difficulty making a living off of their work in the digital age. With NFTs, they can now earn just recompense for their works and exercise more influence over how those works are used and distributed.

Older digital assets that were previously viewed as "dead" or lacking in value have also been given new life by NFTs. Video games, for instance, that previously could only be purchased on physical media are now able to be tokenized and sold as NFTs, giving them new value and opening them up to a new generation of players.

Did you know?

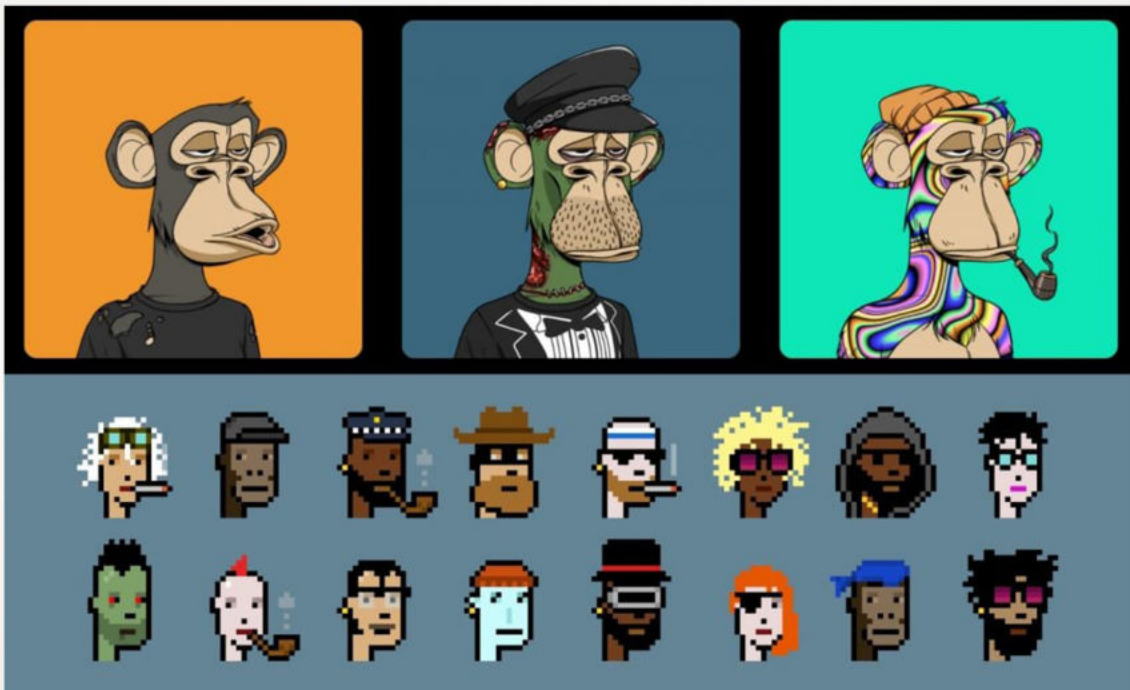
It is actually possible to operate a computer without a running operating system!

NFTs are still in their infancy and face a number of difficulties despite the potential advantages. Scalability is one of the main issues because the infrastructure is not yet ready to handle the high volume of transactions that would be needed if NFTs are widely used. NFTs' potential negative effects on the environment are also a concern because they can demand a significant amount of energy to produce and maintain.

The lack of standardisation and compatibility across many platforms and application cases is another problem. The lack of a standard for the development and administration of NFTs makes it challenging for developers and users to locate tools and platforms that work well together. The potential of NFTs may be constrained as a result, and their chances of becoming widely used may be increased.

Despite these obstacles, the future of NFTs is promising, and a vibrant community of innovators, developers, and financiers is trying to surmount these obstacles and further the advancement of this revolutionary new technology. The potential for NFTs to transform the way that digital assets are valued and traded is enormous, whether it be through new standards, more effective algorithms, or improved infrastructure.

In conclusion, NFTs are a revolutionary technology that could completely alter how we perceive digital assets. NFTs have the potential to revolutionize the creative industries and open up new options for artists and content producers by enabling creators to monetize their work and giving digital assets new value. NFTs have a bright future, and while there are still many issues to be solved, we can anticipate continuing development and innovation in this fascinating new industry.



Did you know?

Researchers from the University of Manchester produced the first computer software in 1948.

The Evolution of Programming Languages



Anne Paul
S2 CSE

Programming languages have evolved greatly since the first high-level language was introduced in the 1950s. To help developers program more efficiently and easily, programming languages have been created and improved. Each language has its own syntax and features, and each has been developed to meet specific programming needs. Today's languages have been influenced by those that came before them, and they pave the way for those that will follow.

IBM released Fortran in 1957, the first high-level programming language. Fortran was designed to do complex mathematical computations, and it was widely used in scientific and engineering applications. After Fortran came to COBOL, which was used for business applications. These two languages formed the basis of the first generation of programming languages.

As the demand for new languages grew, the second generation of programming languages was introduced. In the 1960s and 1970s, languages such as BASIC, Pascal, and C were developed. BASIC was designed to be a simple language that could be used by beginners to learn to program. Pascal was designed for teaching computer science students and was used for the development of desktop software applications. C, on the other hand, was designed to be a system programming language that can interface with hardware and control memory management.

The third generation of programming languages was developed in the 1980s and 1990s. These languages were created to make programming even simpler and more powerful. Some of the more popular languages of this time period include C++, Java, and Python. C++ was an extension of the C language, adding object-oriented programming to the language. Java was created to be a programming language for distributed networks, and it supported garbage collection and automatic memory management. Python, on the other hand, was a language designed to be easy to read and write and was often used for scripting and automation.

In the late 1990s and early 2000s, the fourth generation of programming languages emerged. These languages were designed to be even more user-friendly, giving non-programmers the ability to create applications. They were also designed to be more agile and support rapid application development. Examples of fourth-generation languages include Visual Basic, Ruby, and PHP.

Today, programming languages are still evolving. Popular languages include JavaScript, Swift, and Kotlin. JavaScript is used for web development, and Swift and Kotlin are used for developing mobile applications. These modern languages are being developed to meet the demands of modern software development.

In conclusion, throughout the past few decades, programming languages have evolved to become more powerful, more user-friendly, and easier to learn. The evolution of programming languages has been driven by developer's demands for more complex and sophisticated software applications. As technology continues to evolve, so will programming languages, and we can expect to see more innovations in the years to come.

Did you know?

In 1833, Charles Babbage devised all of the components that make up a modern computer.



Anmary Shybu
S8 CSE

Cloud Computing

Cloud computing has become an integral part of the modern technology landscape. It enables organizations to access computing resources on-demand, such as servers, storage, databases, applications, and other services, over the internet. This article will provide a beginner's guide to cloud computing, including its benefits, types, and key features.

Cloud computing refers to the delivery of computing services over the internet, including servers, storage, databases, software, analytics, and more. These services are provided on-demand, meaning that users can access them whenever they need them, and only pay for what they use. Cloud computing has revolutionized the way businesses access and manage technology, making it more efficient, scalable, and cost-effective.



There are three main types of cloud computing:

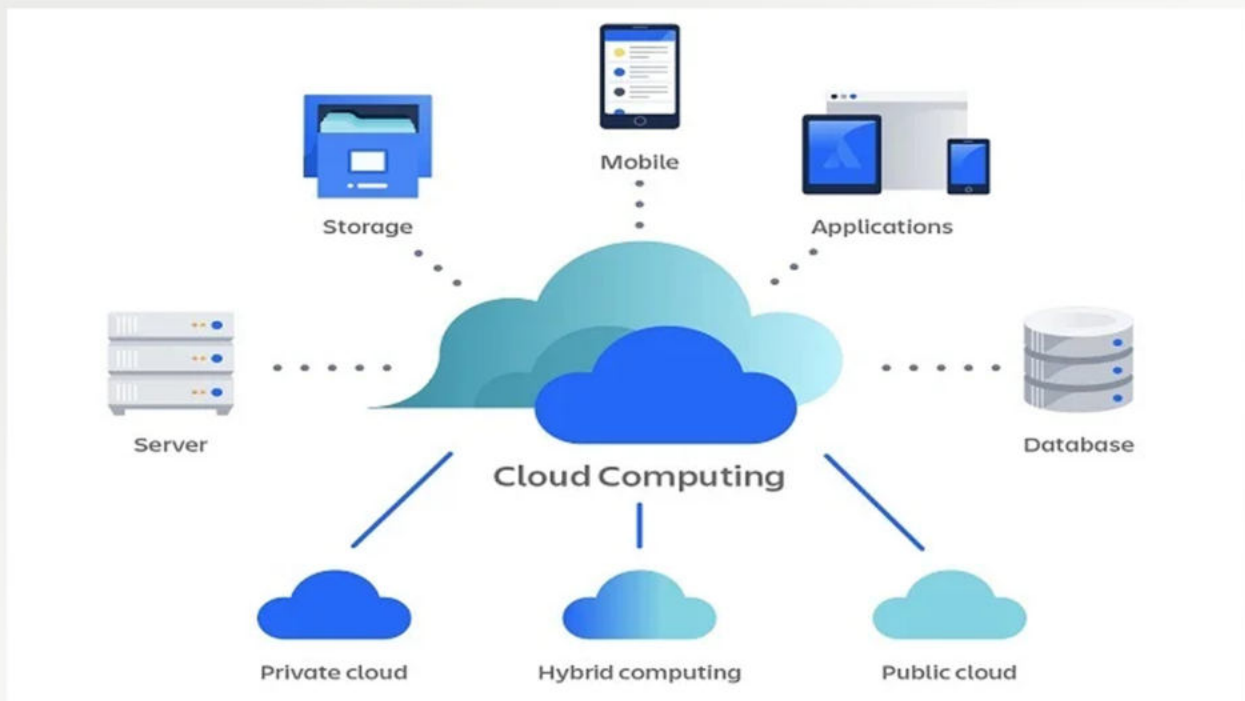
1. Infrastructure as a Service (IaaS): Provides virtualized computing resources, such as servers, storage, and networks, over the internet.
2. Platform as a Service (PaaS): Provides a platform for developers to build, run, and manage applications, without the need for managing the underlying infrastructure.
3. Software as a Service (SaaS): Provides fully functional applications over the internet, such as email, customer relationship management (CRM), and enterprise resource planning (ERP) software.

Some of the key features of cloud computing include:

1. On-Demand Self-Service: Users can provision computing resources, such as servers and storage, without the need for human interaction.
2. Broad Network Access: Cloud computing services can be accessed from anywhere with an internet connection.
3. Resource Pooling: Cloud providers can pool resources, such as servers and storage, to serve multiple users, reducing the overall cost of computing.
4. Rapid Elasticity: Cloud computing services can be scaled up or down quickly, in response to changing demands.
5. Measured Service: Cloud providers can monitor resource usage and bill customers based on their actual usage.

There are several benefits of using cloud computing, including:

1. **Flexibility:** Cloud computing services can be scaled up or down as needed, providing businesses with the ability to adapt to changing demands.
2. **Cost Savings:** Since cloud computing services are delivered over the internet, businesses can avoid the upfront costs of purchasing and maintaining hardware and software.
3. **Increased Collaboration:** Cloud computing allows for easier collaboration between employees, partners, and customers, regardless of their location.
4. **Increased Security:** Cloud providers typically have robust security measures in place to protect user data and prevent unauthorized access.



Cloud computing is a powerful technology that has transformed the way businesses access and manage computing resources. By providing on-demand computing services over the internet, cloud computing has enabled organizations to become more efficient, scalable, and cost-effective. With the three main types of cloud computing - IaaS, PaaS, and SaaS - and key features like on-demand self-service, broad network access, and rapid elasticity, cloud computing offers a range of benefits for businesses of all sizes.

Did you know?

The original Google Storage was made up of ten 4 GB hard drives that were cased in Legos and totaled 40GB.

Cryptocurrency



Bisty Bijoy
S2 CSE

A cryptocurrency is a digital currency, which is an alternative form of payment created using encryption algorithms. The use of encryption technologies means that cryptocurrencies function both as a currency and as a virtual accounting system. To use cryptocurrencies, you need a cryptocurrency wallet. BITCOIN, the most well-known type of cryptocurrency, was released in 2009 and first started trading on exchange platforms in 2010.

There have been considerable critics of cryptocurrency, one of them is whether it is a form of an asset currency. In its current form, having the ability to perform monetary transaction, according to Kim, bitcoin and cryptocurrencies are much closer and meet the definition of currency.

Throughout history, people have been using different kind of transaction. As early as a trading system the barter system had got the business going. As the time changes, the money was designed for people to trade. As the world enters 21st century, the cryptocurrency has taken the market by storm.

As the current cost of transaction cryptocurrency and bitcoin transaction charges are lower compared to other currencies. Here the trading occurs when end to end users agree and then will remittance of money be made. It is also suitable for the internet saving without having to fork out additional cost that comes with using other payment system.

ADVANTAGES OF CRYPTOCURRENCY:

1. No Restrictions on Payment : There is freedom of payment. For individuals living under the tyranny of governments, Bitcoin can work as a significant financial tool to use as a medium of exchange without a single entity or government having control over it.

2. Use of Complex Algorithm : Since Bitcoin uses a complex algorithm, it cannot be manipulated by any individual, organization, a country as some crazy serious skill is required to make digital heist.

3. No Third-Party Involvement : Cryptocurrencies are also gaining popularity as there is no third party involvement or approval required. It removes delay in payment.



Did you know?

The earliest computer was an abacus, a counting device made of thread and beads that were invented in Babylon in 500 BC.

DISADVANTAGES OF CRYPTOCURRENCY:

1. Lack of Awareness/Knowledge : People are still unaware that digital currencies like Bitcoin exists. They have no or very few background knowledge regarding cryptocurrency.
2. Use of Complex Technique : It is true that the use of complex algorithms makes it rare to create digital heists, but what is the point if the worker does not know about the usefulness of this very well. It becomes very difficult for customers as well as the service providers to understand and use cryptocurrencies for transactions.
3. Highly Volatile in Nature : It is unpredictable and risky to invest without understanding possible risk factors. As there is a limited amount of coins and the demand for them is increasing by each passing day. As a result, people become skeptical if they should invest in it or not.



The Future of Cryptocurrency Despite its potential drawbacks, many experts believe that cryptocurrency could be the future of digital currency. players in this new industry.

The future outlook for bitcoin is the subject of much debate. While the financial media is proliferated by so-called crypto-evangelists, Harvard University Professor of Economics and Public Policy Kenneth Rogoff suggests that the “overwhelming sentiment” among crypto advocates is that the total “market capitalisation of cryptocurrencies could explode over the next five years, rising to \$5-10 trillion.

Did you know?

E-mail was first launched before the Internet.



Arun Joseph
S8 CSE

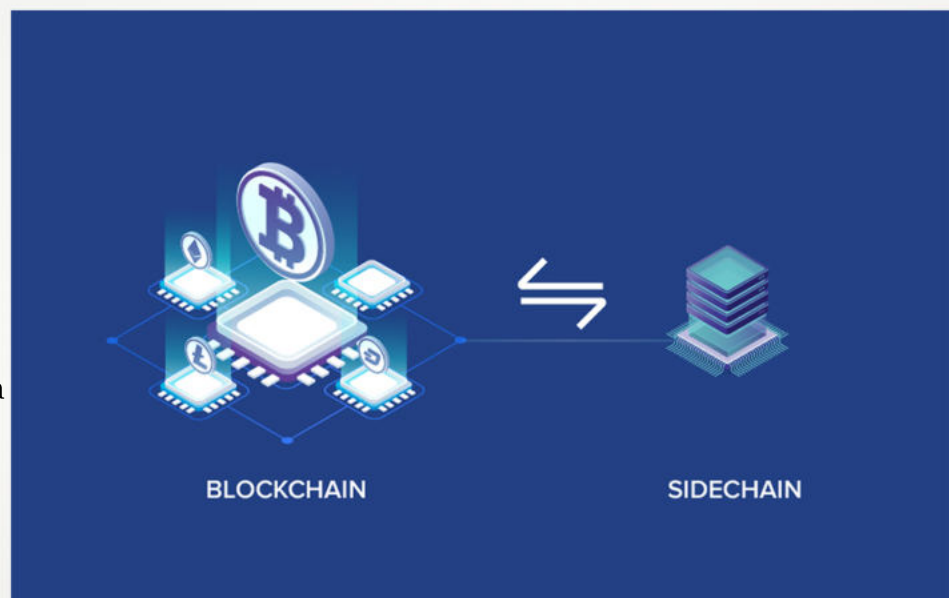
Sidechain

Sidechains were introduced to address some of the limitations of traditional blockchain technology, such as scalability, flexibility, and interoperability. Some of the reasons for the introduction of sidechains are:

1. **Scalability:** Sidechains can offload some of the workload from the main chain, improving its overall scalability and performance.
2. **Experimentation:** Sidechains provide a platform to experiment with new ideas and technologies without affecting the main blockchain.
3. **Interoperability:** Sidechains can facilitate the transfer of assets and data between different blockchains, improving interoperability between different networks.
4. **Customization:** Different sidechains can have different rules, consensus mechanisms, and security protocols, allowing for customization and adaptation to specific use cases.

Advantages of sidechains:

1. **Scalability:** Sidechains can help to improve the scalability of the main blockchain by offloading some of the workload.
2. **Experimentation:** Sidechains provide a platform to experiment with new ideas and technologies without affecting the main blockchain.
3. **Interoperability:** Sidechains can facilitate the transfer of assets and data between different blockchains, improving interoperability between different networks.
4. **Customization:** Different sidechains can have different rules, consensus mechanisms, and security protocols, allowing for customization and adaptation to specific use cases.
5. **Security:** Sidechains can improve security by keeping sensitive information off the main chain.

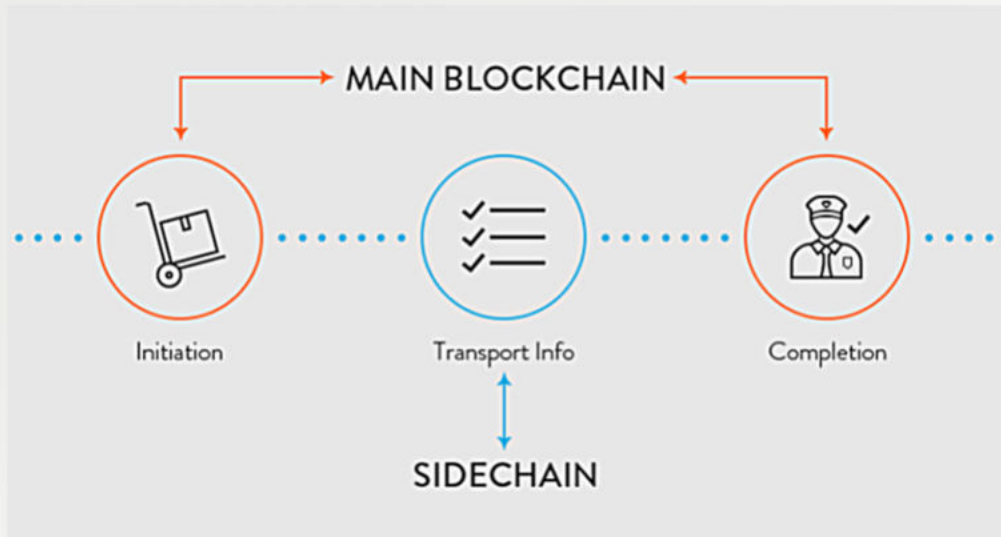


Did you know?

An automated system developed at MIT can recognize the difference between happy and faked smiles.

Disadvantages of sidechains:

1. Complexity: Sidechains can be complex to implement and manage, and they may require specialized knowledge and resources.
2. Integration: Integrating sidechains with the main blockchain can be challenging and may require significant technical expertise.
3. Limited adoption: Sidechains may not have widespread adoption, and they may not be compatible with existing systems and processes.
4. Centralization: If a sidechain is controlled by a single entity, it may increase the risk of centralization, undermining the decentralized nature of blockchain technology.



Sidechains were introduced as a solution to address some limitations of traditional blockchain technology, such as scalability, flexibility, and interoperability. They provide a platform to experiment with new ideas and technologies, and they can facilitate the transfer of assets

and data between different blockchains. The concept of sidechains has been widely accepted and is gaining momentum in the blockchain community.

In the future, sidechains are likely to play an increasingly important role in the development and adoption of blockchain technology. They will be used to develop new applications, improve scalability and performance, and provide more customization and flexibility. With the growing interest in blockchain technology and the increasing demand for more sophisticated and flexible solutions, it is likely that sidechains will play a significant role in shaping the future of blockchain technology. However, their success will depend on the ability to overcome the challenges of complexity, integration, limited adoption, and centralization.

Did you know?

Mosaic was the original browser, released in 1993 way before the mainstream ones such as Mozilla or Chrome Explore.

Video Game as Solution to World Problems



Mohammed Jasrin
S6 CSE

Video gaming has been a favorite pastime for people of all ages for several decades now. It is a multi-billion dollar industry that has revolutionized the way we consume entertainment. In recent years, video gaming has also emerged as a powerful tool to address some of the world's most pressing problems. From education to healthcare and environmental sustainability, video gaming is being used to address several critical global issues.

One of the significant advantages of video gaming is its ability to provide immersive experiences that are difficult to replicate through traditional media. Games provide players with a safe and controlled environment to experiment, learn and explore, making them an ideal medium to educate and train individuals on complex topics. For instance, video games are being used to teach children about science, technology, engineering, and math (STEM) in a fun and engaging way. Educational games such as Minecraft: Education Edition and Kerbal Space Program allow players to learn about coding, space exploration, and engineering while having fun.

Video gaming is also being used to address mental health issues. Games such as Journey and Gris have been designed to provide a calming and meditative experience that helps reduce stress and anxiety. Additionally, video games are also being used to treat post-traumatic stress disorder (PTSD) in veterans. Researchers have found that virtual reality games that simulate combat scenarios can help veterans overcome the trauma of war by providing a controlled and safe environment to relive traumatic experiences.

In the field of healthcare, video games are being used to treat a range of physical and mental health conditions. Games such as Re-Mission, designed for young cancer patients, help them understand their disease, treatment options, and medication management. Other games such as Sparx and MoodGYM have been developed to treat depression and anxiety by providing cognitive-behavioral therapy (CBT) through video game mechanics.

In addition to addressing social and health issues, video gaming is also being used to promote environmental sustainability. Games such as Eco and Sustainaville simulate real-world scenarios and allow players to experiment with different environmental policies and their outcomes. By providing players with an understanding of the impact of their actions on the environment, these games can help promote sustainable behaviors in the real world.

In conclusion, video gaming has emerged as a powerful tool to address several critical global issues. From education to healthcare and environmental sustainability, games provide immersive experiences that can educate, train, and inspire individuals to take action. As the world continues to face complex challenges, video gaming is proving to be a valuable solution to help us address these issues in innovative and engaging ways.

Did you know?

Hard drives are very sensitive to vibration, and even yelling at them or tapping the device causes them to slow down.

Web3.0: The Future of the Internet



Aswin K Suresh
S6 CSE

The internet has come a long way since its inception, and it continues to evolve rapidly. The latest iteration of the internet, commonly known as Web3.0, promises to revolutionize the way we interact with the digital world. In this article, we'll explore what Web3.0 is, why it's important, and how it differs from previous iterations of the internet.

Web3.0 is a term used to describe the next generation of the internet, which is characterized by a more decentralized and secure architecture. It builds on the principles of Web2.0, which emphasized user-generated content, social networking, and interactive web applications.

However, Web3.0 takes these concepts to a new level by introducing technologies such as blockchain, decentralized apps (dApps), and smart contracts. These technologies enable a more decentralized and secure internet, where users have greater control over their data and digital identities.



Web3.0 has the potential to address many of the shortcomings of the current internet, which is dominated by a small number of centralized platforms and is vulnerable to security breaches and data breaches. Here are some of the key benefits of Web3.0:

Decentralization: Web3.0 is designed to be more decentralized than previous iterations of the internet. This means that data is distributed across multiple nodes rather than being stored on a single centralized server. Decentralization makes the internet more resilient and less vulnerable to attacks.

Security: Web3.0 uses cryptographic protocols to secure data and transactions, making it much harder for hackers to steal sensitive information. It also enables users to control their digital identities, reducing the risk of identity theft.

Privacy: Web3.0 is designed to give users greater control over their data and protect their privacy. Users can choose which data they share and with whom, and they can revoke access to their data at any time.

Did you know?

YouTube actually started as a dating website.

Innovation: Web3.0 enables new forms of innovation, such as decentralized apps (dApps) and smart contracts. These technologies enable developers to create new applications that are more secure, more transparent, and more decentralized than traditional web applications.

Web3.0 builds on the principles of Web2.0, but it introduces several key differences. Here are some of the main differences between Web3.0 and Web2.0:

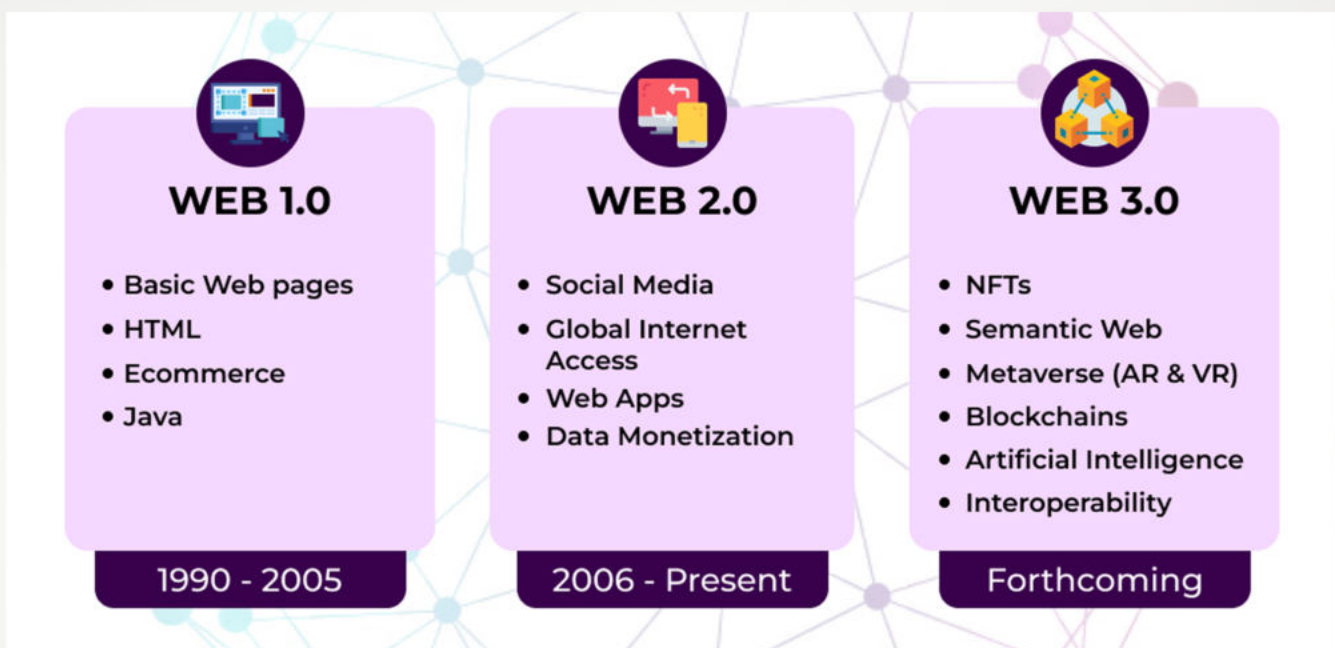
Decentralization: Web3.0 is more decentralized than Web2.0. This means that data is distributed across multiple nodes rather than being stored on a single centralized server. Decentralization makes the internet more resilient and less vulnerable to attacks.

Blockchain: Web3.0 uses blockchain technology to create a more secure and transparent internet. Blockchain is a decentralized digital ledger that records transactions in a secure and transparent manner.

Smart contracts: Web3.0 uses smart contracts to automate the execution of transactions. Smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code.

Decentralized apps (dApps): Web3.0 enables the creation of decentralized apps (dApps), which run on a blockchain rather than a traditional server. DApps are more secure and more decentralized than traditional web applications.

Web3.0 is the future of the internet, and it promises to revolutionize the way we interact with the digital world. It is more decentralized, more secure, and more innovative than previous iterations of the internet. By introducing technologies such as blockchain, decentralized apps, and smart contracts, Web3.0 is enabling new forms of innovation and creating a more transparent and trustworthy internet.



Did you know?

Since August 1998, Google's workforce of designers and artists has created over 2000 doodles for the company's homepage dedicated to significant events.

Quantum Computing



Tony K Siby
S4 CSE

Quantum computing is a new paradigm of computing that is based on the principles of quantum mechanics. It uses quantum bits, or qubits, to represent information, and can perform certain types of calculations much faster than classical computers.

The power of quantum computing comes from its ability to utilize a unique property of quantum mechanics called superposition. In classical computing, a bit can only be in one of two states, 0 or 1. In quantum computing, a qubit can exist in a superposition of both states at the same time. This means that a quantum computer can perform multiple calculations simultaneously, which makes it much faster than a classical computer for certain tasks.

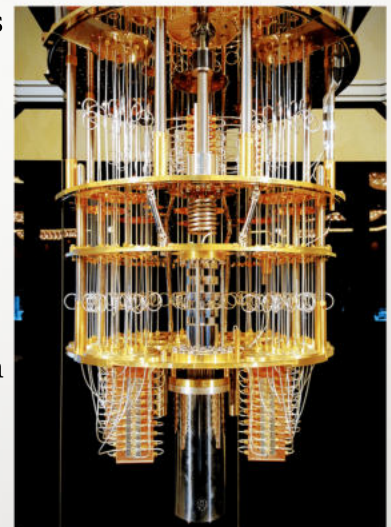
Another important concept in quantum computing is entanglement. When two qubits are entangled, they are inextricably linked, so that the state of one qubit is dependent on the state of the other, even if they are physically far apart. This allows quantum computers to perform certain calculations in a more efficient manner than classical computers, and has the potential to revolutionize fields such as cryptography and data analysis.

Quantum computing has the potential to solve many problems that are currently impossible to solve using classical computers. For example, quantum computers can simulate the behaviour of large molecules and chemical reactions, which is useful in drug design and materials science. They can also be used to optimize complex systems, such as traffic flows or supply chains, and to break modern encryption methods.

Despite the potential of quantum computing, there are still many challenges to overcome. One of the main challenges is developing qubits that are stable enough to perform calculations. Qubits are notoriously fragile and can easily be disturbed by their environment, causing errors in calculations. This makes it difficult to build large-scale quantum computers with many qubits.

Another challenge is developing algorithms that can take advantage of the unique properties of quantum systems. Many of the algorithms used in classical computing are not well-suited for quantum computing, so new algorithms need to be developed to fully realize the potential of quantum computers.

In recent years, there have been significant advances in quantum computing, with companies and research institutions investing heavily in the development of quantum hardware and software. While it is still early days for quantum computing, it has the potential to revolutionize many fields and to become an important part of the future of computing.



Did you know?

An automated system developed at MIT can recognize the difference between happy and faked smiles.



Enric S Neelamkavil
S6 CSE



BEACH HACK 5, the much-awaited fifth edition of the beach hackathon putting an end to the two-year wait was held on Dec 29 and 30 at Abideep's Paradise, Vadanappilly. This event conducted by Community Of Developers (CODE) in collaboration with CSI CCE Student Chapter, had students participating from all over South India. Beach Hack 5 was set to bring ingenious students to find

innovative solution to the problems we face in our society. We had 15 teams from prestigious institutions of India. The theme of the competition was Marine & Fisheries. The Hackathon aimed to focus on problems faced on the theme and to produce a technical solution for the same within a limited span of time.

BEACH HACK 5 aimed to provide college students with insight and perspective on various problems faced by the society and to help them to improve their critical and creative thinking. All the participants were informed to report at the registration desk after which, the 24-hour hackathon started at around 12 pm on 29 December. Students worked on designs and wireframes of their projects with their allocated mentors acting as guides. The



participants were reported to pitch their initial idea to their respective mentors around 3 PM. Judges visited each team at regular intervals to evaluate, encourage and support them. A gaming Hub was setup near the venue for the competitors, to cope up with the stress and pressure during the coding competition. On the first day of Hackathon, we conducted other games like Beach Volleyball. There was a huge participation for the event and winners were awarded with cash prize. The dazzling lights and the decoration at the venue attracted a huge crowd.

On the second day, after several rounds of evaluation, the coding competition ended at 11AM. 6 out of 15 teams got shortlisted to the final round, the presentation. Each team got 10 minutes to present their solution. Our seniors Lazar Tony, Sarath Ithikkatt & Anand Antony along with Mr. Antony T Jose (Assistant Professor, Christ College of Engineering), Dr. Vince Paul (Professor, Christ College of Engineering) and Pranav Madhu, the Technical Lead of BEACH HACK 5 were the judges of the event. The



valedictory ceremony was held around 3 PM with chief guest Fr. John Paliakara CMI who addressed the participants and volunteers and gave away prizes.



Aazim Anish, Abdulla Sameer, Abhinand D, Harshed Abdulla & Abhinav C V of CUSAT bagged the first prize for developing Tidal Tracker, an All-in-one app for fishermen community to navigate safely, rent equipment, and exclusive chatting feature to build their own community and Aldrin Jenson, Hanna Salam, Jithin Jagadeesh, Mrinalini Nair Ani & Subramani Easwaran from Model Engineering College Thrikkakara, Kochi emerged as the runners up for developing the Aqua Harvest app,

promoting fish farm cultivation in an easily accessible and sustainable manner while allowing the farmer to minimise risks and increase profits.



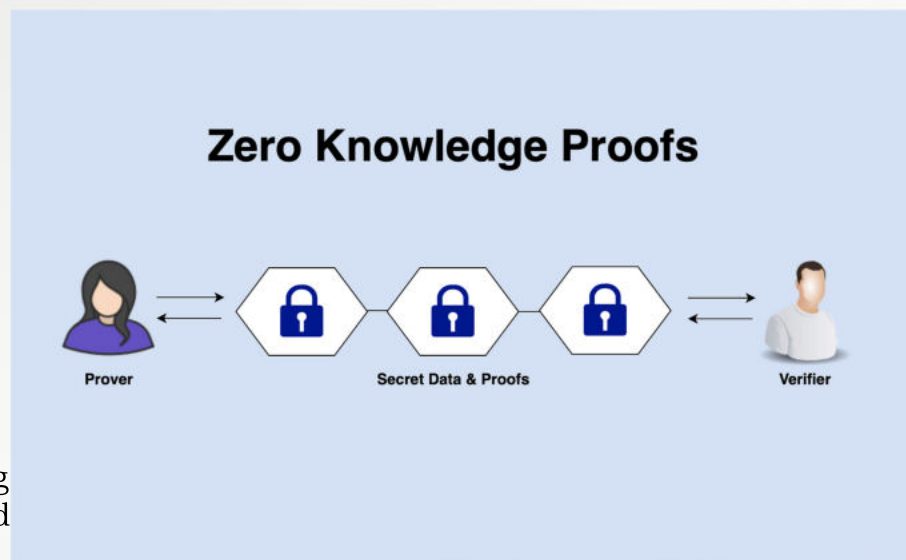


Neeraj K G
S8 CSE

Zero Knowledge Proof

ZKP, or zero-knowledge proof, is a technique for authenticating data without revealing the source to the verifier. It enables information authentication without disclosing the information to the party doing the verification. This indicates that the information being validated is still private. The idea of ZKP is to demonstrate that someone has specific knowledge without disclosing what that knowledge is. Mathematical operations and cryptographic methods are used to accomplish this.

Digital signatures, transactions that protect user privacy, and secure multi-party computing are just a few uses for ZKP. In blockchain and cryptocurrency applications where anonymity and security are crucial factors, it is very helpful. Three parties participate in the ZKP process: the prover, the verifier, and a reliable third party (TTP). The verifier is interested in knowing if the information being verified by the prover is accurate. The



TTP serves as an impartial party and aids in streamlining the verification procedure.

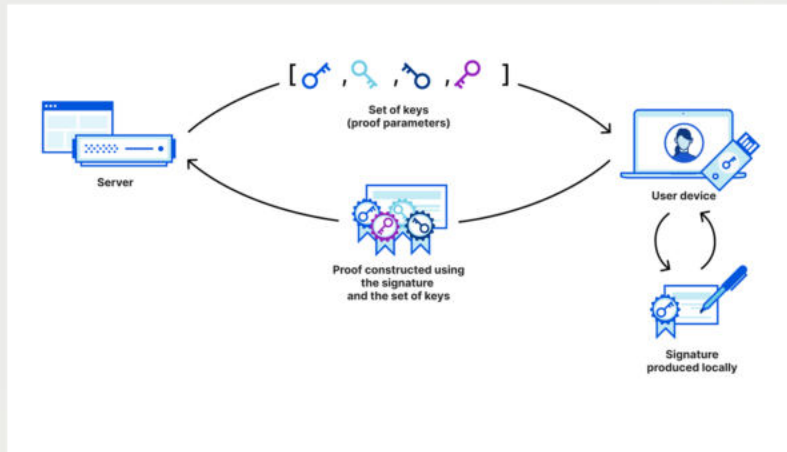
In a ZKP, the prover develops and the verifier validates a mathematical proof. If the evidence is valid, the verifier knows the information is accurate even though they are not aware of what it is. This protects privacy while yet ensuring the truthfulness of the data.

In conclusion, ZKP is an effective tool for guaranteeing the security and privacy of data in a variety of applications. It is perfect for usage in circumstances where privacy is an issue since it enables information to be verified without disclosing it. Compared to conventional techniques of information verification, ZKP provides a number of benefits. To establish their identification, a person could, for instance, be required to provide their entire name, address, and other private information via a conventional approach. Yet with ZKP, just the information's veracity as evidence needs to be made public, not the information itself. This gives the individual whose information is being checked a high level of privacy protection.

Did you know?

A single computer program detects over half of all Wikipedia vandalism with more than 90% precision.

The prover and verifier do not need to directly communicate with one another since ZKP is a non-interactive procedure. Because the prover's information cannot be intercepted or changed during the verification process, it is more secure than other approaches. The fact that ZKP is an effective method of information verification is another benefit. Compared to previous approaches, the verification procedure has a significantly reduced computing cost since only a small quantity of data must be delivered. ZKP is therefore perfect for usage in high-traffic applications where it is necessary to swiftly and effectively verify massive volumes of data.



ZKP is also very adaptable since it can be used to validate a variety of data kinds, including public keys, digital signatures, and even complicated data like polynomial equations. ZKP is a useful tool for assuring the security and privacy of information overall. Because to its efficiency, lack of interaction, and versatility compared to conventional approaches, it is the perfect choice for usage in a variety of applications.

ZKP is currently being studied and developed, and new uses and applications are always being found. The use of ZKP to validate the veracity of data without disclosing it to the data analyst is one interesting application in the field of privacy-preserving data analytics. The application of ZKP in voting systems, where the confidentiality and security of the voting process are of the utmost significance, is another area of interest. ZKP can be used to confirm that a vote was cast properly without disclosing how it was done. This could improve voting systems' fairness and openness.

Decentralized identification systems, in which users can validate their identities without disclosing their personal information, are also being developed using ZKP. Individuals may experience greater privacy and security as a result, and it may also be simpler for them to use services and applications that require identity verification.

In addition to these purposes, ZKP has a wide range of additional possible applications, such as secure messaging, safe storage, and secure transactions. ZKP has several benefits, but it also has some drawbacks. The requirement for a trusted third party (TTP), which is a crucial aspect of the ZKP process, is one of the main obstacles. Because any security lapse or TTP penetration might have an impact on the entire ZKP process, the TTP must be extremely reliable and secure.

The computational expense of the ZKP procedure, which can be time- and resource-consuming, is another difficulty. Due to this, it may be difficult to deploy ZKP in high-volume applications where the verification process's speed is crucial. ZKP is a strong and adaptable tool for maintaining the security and privacy of information, to sum up. When utilising ZKP in practical applications, it's crucial to thoroughly analyse its drawbacks and limitations.

Did you know?

The first-ever microprocessor, 4004, was designed for calculators.

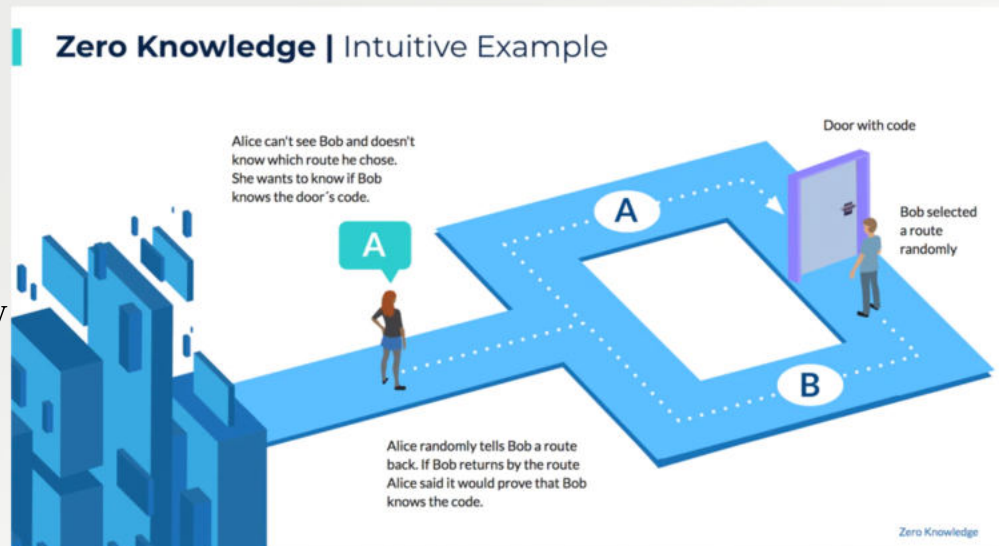
A zero-knowledge proof of knowledge is one type of ZKP that demonstrates the prover's knowledge of a certain piece of information without exposing the information itself. One may, for instance, demonstrate their knowledge of a password without giving it to the verifier. A zero-knowledge proof of identification is another type of ZKP that entails demonstrating the prover's ownership of a specific piece of information without disclosing the information itself. This can be helpful when the prover has to validate their identity without disclosing any personal information, like when they want to log into a secure system.

A zero-knowledge succinct non-interactive argument of knowledge (zk-SNARK) is another ZKP variant that can be used to quickly and non-interactively demonstrate the veracity of information. It is therefore perfect for usage in blockchain and cryptocurrency applications where a quick and effective

verification process is required. ZKP can also be utilised in multi-party computations, which need several participants to carry out a computation together secretly. ZKP can be used to guarantee that the inputs of each party are kept private while yet allowing the computation to be done. The fact that ZKP enables reliable information sharing without disclosing the information itself is one of its main benefits. In circumstances where information authenticity is crucial, such as during financial transactions or while gaining access to sensitive systems, this can help to increase confidence.

ZKP also has the benefit of enabling the creation of private and secure digital signatures. The ability to use ZKP to sign a document without disclosing one's private key can aid in reducing fraud and boosting the security of digital signatures.

In conclusion, ZKP is a flexible tool with a wide range of possible applications, such as safe voting systems, privacy-preserving data analytics, and secure digital signatures. ZKP has drawbacks including the requirement for a reliable third party and the computational expense of the verification process, but these drawbacks can be resolved with proper planning and design.



Did you know?

In 1990, the first search engine was invented by Allan Emtage, who named it "Archie Query Form," from the word "archive."

DevOps



Amal Paul
S6 CSE

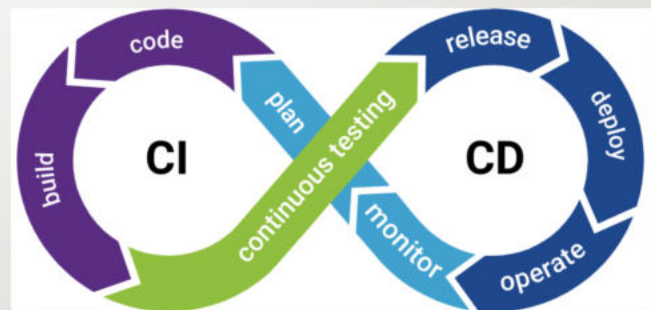
DevOps has emerged as a critical aspect of software delivery in today's fast-paced environment. DevOps engineering involves a collaborative approach between development and operations teams to deliver high-quality software faster and more efficiently. A DevOps engineer plays a crucial role in ensuring that the software delivery process runs smoothly from start to finish. In this article, we will explore how a DevOps engineer helps in the process of delivering software to users and the tools and technologies they use, including automation, CI/CD, containerization, and deployment.

Automation:

One of the most important aspects of a DevOps engineer's role is automation. They use tools like Ansible, Chef, and Puppet to automate repetitive tasks such as provisioning, configuration management, and deployment. By automating these tasks, DevOps engineers can save time and reduce errors, ensuring that software delivery is fast and efficient. Automation tools also help to improve collaboration between teams, ensuring that everyone is working towards a common goal.

CI/CD:

Continuous integration and continuous deployment (CI/CD) is another key aspect of the DevOps engineer's role. CI/CD pipelines ensure that software applications are tested, built, and deployed automatically, resulting in faster delivery times and fewer errors. DevOps engineers use tools such as Jenkins, Travis CI, and CircleCI to implement CI/CD pipelines. These tools enable them to automate the build, test, and deployment processes, resulting in faster delivery



Did you know?

Since 2005, no human has defeated a high-powered computer in a tournament standard chess match.

to automate the build, test, and deployment processes, resulting in faster delivery times and higher-quality software.

Containerization:

DevOps engineers use containerization technologies such as Docker and Kubernetes to package software applications into containers. Containers make it easier to deploy applications in different environments, as they provide a consistent and isolated environment for the application to run. Containerization also enables DevOps engineers to manage applications at scale and improve collaboration between teams. Containers can be easily deployed, updated, and scaled, making them an essential part of the DevOps engineer's toolkit.

Deployment:

Deployment is the final step in the software delivery process. DevOps engineers are responsible for ensuring that software applications are deployed quickly and efficiently. They use automation tools, CI/CD pipelines, and containerization technologies to streamline the deployment process. DevOps engineers monitor software applications in production environments, identifying and resolving issues as they arise. They use tools such as Nagios, Zabbix, and Prometheus to monitor system performance, log files, and application metrics.

Software development lifecycle:

The software development lifecycle consists of several stages, including planning, analysis, design, development, testing, deployment, and maintenance. DevOps engineers are involved in several of these stages, including planning, development, testing, and deployment. They work closely with development and operations teams to ensure that software applications are delivered quickly and efficiently. DevOps engineers use automation, CI/CD, containerization, and deployment tools to improve collaboration between teams, reduce errors, and improve software quality.



Conclusion:

Did you know?

ILOVEYOU is widely believed to be the most deadly worm virus ever developed.



Conclusion:

In conclusion, the role of a DevOps engineer is critical in the process of delivering software touters. DevOps engineers are responsible for bridging the gap between development and operations teams and ensuring that software applications are delivered quickly, efficiently, and without compromising on quality. They use automation, CI/CD, containerization, and deployment tools to streamline the software delivery process and improve collaboration between teams. The increasing demand for DevOps engineers is driven by the need for faster software delivery, greater collaboration between development and IT operations teams, and the rise of cloud computing. By understanding the role of a DevOps engineer and the tools and technologies they use, organizations can improve their software delivery processes and deliver higher-quality software.



Did you know?

Intel's 1 KB RAM memory chip was the biggest memory chip available in 1969.

Docker And Containers, The Future of Microservices



Julien K Jules
S8 CSE

Docker and containers have revolutionised the way applications are developed, deployed, and managed. They offer a lightweight and efficient way to package and distribute software, making it easier to move applications between different environments. Containers provide a consistent and reproducible environment, which helps to reduce the complexity and potential for errors in the deployment process.

Containers play an even larger importance in the realm of microservices. Applications are segmented into tiny, autonomous, loosely coupled components called microservices. These microservices may be independently created, deployed, and maintained. Each component is packed into a container, and these containers are subsequently installed on a platform for container orchestration, such as Kubernetes. The use of Docker and containers is becoming more widespread, and this development is only expected to continue. It's becoming obvious that containers are here to stay as more businesses implement containerization and microservices.

The adaptability and flexibility that containers offer are some of the main factors behind such an expansion. Organizations can build, test, and deploy applications much more quickly and effectively with containers. As a result, it is able to react swiftly to evolving corporate needs and client demands. The capacity of containers to enhance team cooperation between development and operations is another crucial aspect. With containers, operations teams can easily manage the deployment and scaling of containers, while development teams can work in a consistent and segregated environment. This encourages a DevOps culture where development and operations teams collaborate to provide high-quality software more rapidly and helps to remove the "throwing over the wall" approach.

Organizations should have a clear plan for managing containers and the infrastructure that supports them as the use of containers advances. This entails managing their lifetime as well as deploying and scaling containers, as well as keeping track of their performance and security. Trying to ensure the apps and data operating in the containers are secure is one of the biggest problems in managing containers. This entails protecting both the containers themselves and the supporting infrastructure. Organizations should make sure, for instance, that the images used to create containers come from reliable sources and that the containers are patched and updated often to fix any security flaws.

Did you know?

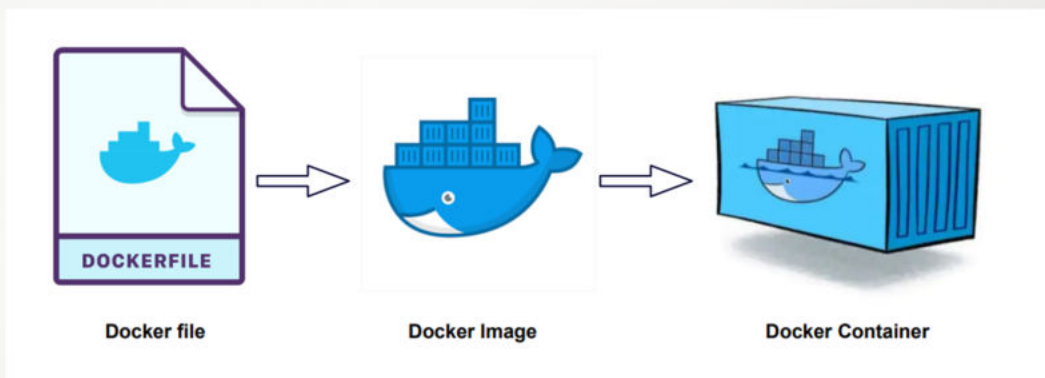
The term "bug" became ubiquitous in computer technology after a moth triggered the Mark II computer to malfunction.

Auditing container performance and making sure they have the resources they require to function properly are key components of container management. This entails keeping an eye on the resource usage of containers as well as the functionality and availability of the apps that operate inside them. Organizations can make sure that containers are operating properly and that any problems are swiftly found and fixed by putting the proper tools and processes in place. Managing the lifespan of containers is another aspect of container management. It also covers backing up and restoring containers and the data they hold, as well as creating, updating, and removing containers.

Beyond software development and deployment, containers have several advantages. Containers can aid businesses in cost-cutting and financial improvement. Organizations may use containers to lower

hardware expenditures, accelerate infrastructure management, and enhance the overall performance and scalability of their applications. A new generation of platforms and tools to handle the deployment and scaling of containers is also becoming necessary as a result of the uptake of containers and microservices. Kubernetes, an open-source platform for managing the deployment, scaling, and administration of containers, is one example of such a platform.

For managing containers, Kubernetes offers a number of capabilities, such as self-healing, rolling updates, and autonomous scaling. Organizations may use Kubernetes to automate the deployment and scaling of containers, assuring the performance and availability of their applications. Organizations can manage their container infrastructure more easily thanks to Kubernetes' unified administration and monitoring platform. Making sure that the data being used in the containers is backed up and secured is another crucial component of container management. This is crucial for apps that run inside containers and depend on data to function. The process of backing up and restoring containers and their data may be automated with the use of technologies like backup and disaster recovery solutions, which can be used by enterprises to handle this issue. Better container management solutions are required as a result of the expansion of containers and microservices.



In conclusion, the benefits of Docker and containers are clear, and it's no wonder that they are rapidly becoming the standard for developing and deploying modern applications. Organizations need to ensure that their container infrastructure is secure, performant, and well-managed, and that

they have the tools and processes in place to support the lifecycle of containers. By investing in the right tools and processes, organisations can ensure that they are well-prepared to take advantage of the many benefits that containers and microservices have to offer. As technology continues to evolve and organizations continue to adopt microservices, containers are likely to become even more important in the future.

Privacy Enhancing Computation



Ancy Paul
S8 CSE

Privacy Enhancing Computation refers to the design and development of methods, technologies and techniques that protect privacy while enabling computation to be performed on data. The main objective is to prevent unauthorized access or disclosure of sensitive information while still allowing computation to be performed on the data.

With the rise of big data, machine learning, and cloud computing, privacy has become a growing concern. People are increasingly worried about their personal information being used for purposes they did not consent to, and being subject to unwanted surveillance and profiling. In response, privacy enhancing computation has become an important area of research and development that has the potential to revolutionize the way that computation is performed on sensitive data. In this article, we will provide an overview of privacy enhancing computation and its applications, as well as discuss some of the most important techniques used to enhance privacy.

Privacy enhancing computation has a range of applications across a number of industries and domains, including:

Healthcare - In healthcare, privacy enhancing computation can be used to protect patient information while still enabling data analysis to be performed. This can help to improve patient outcomes and reduce healthcare costs, while still ensuring that patient privacy is protected.

Finance - In finance, privacy enhancing computation can be used to protect financial information while still enabling financial transactions to be performed. This can help to prevent fraud and improve financial stability, while still ensuring that financial privacy is protected.

Marketing - In marketing, privacy enhancing computation can be used to protect consumer information while still enabling data analysis to be performed. This can help to improve marketing effectiveness and reduce the risk of privacy breaches, while still ensuring that consumer privacy is protected.

Cybersecurity - In cybersecurity, privacy enhancing computation can be used to protect sensitive information from cyber attacks and data breaches. This can help to improve cybersecurity and reduce the risk of cyber attacks, while still ensuring that sensitive information is protected.

Government - In government, privacy enhancing computation can be used to protect citizens' information while still enabling government agencies to perform their functions. This can help to improve government efficiency and reduce the risk of privacy breaches, while still ensuring that citizens' privacy is protected.

Did you know?

NASA computers were hijacked by a 15-year-old, resulting in a 21-day halt.

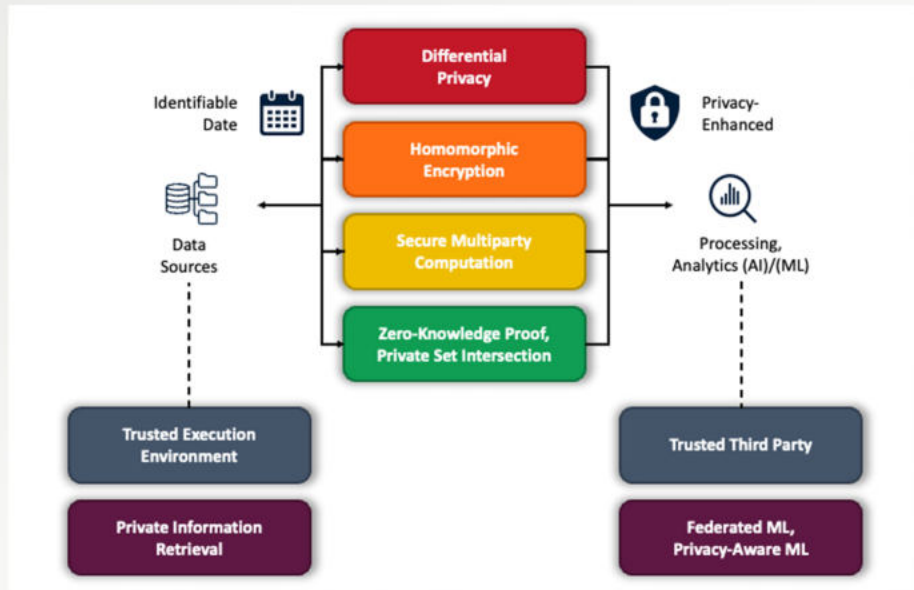
There are several approaches to privacy enhancing computation, including:

Homomorphic Encryption:

Homomorphic encryption is a technique that allows computation to be performed on ciphertext, rather than plaintext, so that the original data remains encrypted and protected. With homomorphic encryption, the encryption process is designed so that the encrypted data can be manipulated and processed without first being decrypted. The main advantage of homomorphic encryption is that it enables computation to be performed on encrypted data, without revealing the data to the computation parties. This makes it possible to perform data analysis, machine learning and other data-intensive computations, while still preserving privacy.

Secure Multiparty Computation (SMC):

Secure multiparty computation (SMC) is an approach that allows multiple parties to jointly perform computation on shared data without revealing the inputs of any individual party. SMC works by using cryptographic techniques to encrypt data and perform computations on the encrypted data. The main advantage of SMC is that it enables multiple parties to jointly perform computations



on shared data without revealing their inputs to each other. This makes it possible to perform data analysis, machine learning and other data-intensive computations, while still preserving privacy.

Differential Privacy:

Differential privacy is a technique that adds noise to the data in order to prevent the identification of individual records. The idea behind differential privacy is that by adding noise to the data, it becomes more difficult to differentiate between records, thus making it more difficult to identify individuals. This makes it possible to perform data analysis, machine learning, and other data-intensive computations, while still preserving privacy. Differential privacy can be achieved through several methods, including adding random noise to the data, aggregating data before analysis, or using data transformations.

Zero-Knowledge Proofs:

Zero-knowledge proofs are a technique that allow one party to prove to another party that they have a certain piece of information without revealing what that information is. This can be used to perform data analysis and other computations without revealing sensitive information. In the context of privacy enhancing computation, zero-knowledge proofs can be used to verify the validity of data, such as proving that a data record belongs to a specific individual, without revealing the actual data. This makes it possible to perform data analysis and other data-intensive computations, while still preserving privacy.



Arjun P Manoj
S2 CSE

AI in Cybersecurity

Artificial intelligence (AI) has been transforming various industries by automating and optimizing processes, enhancing decision-making capabilities, and improving overall efficiency. One such area that has been impacted by AI is cybersecurity. With the growing number of cyber threats, AI has become a critical tool for detecting and preventing cyber attacks. In this article, we will explore the role of AI in cybersecurity and its potential applications.

Cybersecurity threats have become increasingly sophisticated, and traditional cybersecurity solutions are no longer enough to protect against them. As a result, cybersecurity professionals have turned to AI to improve their threat detection and response capabilities. AI-based systems can analyze vast amounts of data and detect patterns and anomalies that would be difficult for humans to detect.

Applications of AI in Cybersecurity:

Threat Detection: AI-based systems can analyze vast amounts of data from multiple sources to identify patterns and anomalies that could indicate a potential cyber attack. These systems can also use machine learning algorithms to learn from past incidents and improve their threat detection capabilities.

Malware Detection: AI can detect malware by analyzing its behavior and identifying suspicious patterns. This enables AI-based systems to detect previously unknown malware and prevent it from infecting systems.

Fraud Detection: AI can detect fraud by analyzing large volumes of data to identify patterns and anomalies that could indicate fraudulent activity. This is particularly useful in the financial industry, where fraudulent activities can have severe consequences.

Network Security: AI can be used to monitor network traffic and detect any abnormal behavior. This can help identify potential threats and prevent them from infiltrating the network.



Challenges in Implementing AI in Cybersecurity

Lack of Data: AI systems require large amounts of data to function effectively. However, in cybersecurity, the data available is often limited, and it can be challenging to collect enough data to train the AI systems.

False Positives: AI-based systems can sometimes generate false positives, i.e., they flag a legitimate activity as a potential threat. This can lead to unnecessary alarms and waste resources.

Adversarial Attacks: Hackers can use AI-based tools to create sophisticated attacks that can evade AI-based detection systems. This can make it challenging to detect and prevent cyber attacks.

Here is some additional information about AI in cybersecurity:

Behavioral Analytics: Behavioral analytics uses machine learning algorithms to analyze user behavior and identify any anomalies that could indicate a potential threat. By monitoring user behavior, AI-based systems can detect and prevent insider threats, such as employees who may be attempting to steal data.

Predictive Analytics: Predictive analytics uses machine learning algorithms to identify patterns and trends in data to predict future outcomes. In cybersecurity, predictive analytics can be used to identify potential threats before they occur and take proactive measures to prevent them.

Cyber Threat Intelligence: Cyber threat intelligence (CTI) is the collection and analysis of information about potential cyber threats. AI-based CTI systems can collect and analyze data from multiple sources to identify potential threats and provide recommendations for remediation.

In conclusion, AI has revolutionized the field of cybersecurity by providing advanced threat detection, prediction, and response capabilities. AI-based systems can analyze vast amounts of data and detect patterns and anomalies that would be difficult for humans to detect. However, the implementation of AI in cybersecurity also poses several challenges, such as the need for large amounts of data, false positives, and the potential for adversarial attacks. As AI technology continues to evolve, it will undoubtedly play an increasingly important role in protecting our digital assets.



Did you know?

Before they could progress as staple brands, Microsoft, HP, and Apple began manufacturing computers in their garages.

Genetically Modified Food As a Solution to World Hunger



Theresa T S
S6 CSE

World hunger is one of the most pressing global issues of our time. According to the United Nations, over 820 million people suffer from hunger worldwide. This is a staggering number, and it calls for immediate action. One solution that has gained a lot of attention in recent years is genetically modified food.

Genetically modified (GM) food is created by altering the genetic makeup of plants and animals through genetic engineering. This technology allows scientists to insert specific genes into an organism's DNA to give it new traits, such as resistance to pests, diseases, or environmental stresses.



GM crops have been shown to be more productive and resilient than their non-modified counterparts. This makes them ideal for farming in areas that are prone to droughts, floods, or other extreme weather conditions. Additionally, GM crops can be designed to have enhanced nutritional value, which can help combat malnutrition.

The benefits of GM food are not just theoretical. In fact, GM crops have already made significant contributions to reducing hunger in some parts of the world. For example, GM crops have been used to increase yields in India, where they have helped to raise the incomes of small farmers and reduce poverty.



Moreover, GM crops have been instrumental in reducing the use of harmful pesticides and herbicides. This, in turn, has reduced the environmental impact of agriculture and improved the health of farmers and consumers.

Despite these benefits, some people remain wary of GM food. They worry about the potential long-term health effects of consuming genetically modified crops, as well as the impact on biodiversity and ecosystems. However, extensive testing and research have shown that GM crops are safe for human consumption and do not pose any significant threats to the environment.

To address these concerns, it is important to continue monitoring the use of GM crops and ensure that they are subject to proper regulation and oversight. Governments, NGOs, and other organizations must work together to ensure that the benefits of GM food are maximized while minimizing any potential risks.



In conclusion, genetically modified food offers a promising solution to the world's hunger problem. With their increased productivity, resilience, and nutritional value, GM crops can help to ensure that everyone has access to a sufficient and healthy food supply. While there are valid concerns about the safety and environmental impact of GM crops, these can be addressed through proper regulation and oversight. As such, GM food should be embraced as an essential tool in the fight against hunger.

The Pros and Cons of Human Cloning



Alan Shibu
S6 CSE

Human cloning is a controversial issue that has been debated for decades. Cloning refers to the process of creating genetically identical copies of a living organism. While cloning has been successfully achieved in animals, the idea of human cloning raises ethical, social, and scientific concerns. In this article, we will explore the pros and cons of human cloning.

Pros of Human Cloning:

1. **Reproductive Cloning for Infertile Couples:** One of the most compelling arguments in favor of human cloning is that it can help infertile couples have children. Cloning technology can enable a couple to have a genetically related child, even if one of the partners is infertile or suffers from a genetic disorder.
2. **Medical Advancements:** Human cloning has the potential to revolutionize the field of medicine. Cloning technology can be used to create stem cells, which can be used to treat a variety of medical conditions such as Parkinson's disease, spinal cord injuries, and heart disease. Cloning technology can also help researchers develop new treatments and cures for various diseases.
3. **Reproduction of Endangered Species:** Cloning technology can be used to preserve endangered species by producing genetically identical copies of them.
4. **Customized Offspring:** Cloning technology can be used to create custom-made offspring by selecting desirable traits such as physical appearance, intelligence, and personality. This could be beneficial for parents who want to have a child with specific traits.



Cons of Human Cloning:

1. **Ethical Concerns:** Human cloning raises serious ethical concerns, as it involves creating life in a laboratory. Critics argue that it is unethical to manipulate human life and that it violates the sanctity of human life.
2. **Safety Concerns:** There are safety concerns associated with human cloning. It is not yet clear what the long-term health effects of cloning are, and there is a risk that cloned individuals may have genetic abnormalities that could lead to health problems.

Did you know?

In 1936, Russians developed a computer that functioned on water.

3. Discrimination: Cloning technology could lead to discrimination against people who are not genetically engineered. This could create a new form of inequality, where those who are cloned are considered superior to those who are not.

4. Lack of Genetic Diversity: Cloning technology could lead to a lack of genetic diversity, as everyone would have the same genes. This could make the human population more vulnerable to disease and environmental changes.



Human cloning is a controversial issue that raises ethical, social, and scientific concerns. While there are potential benefits to human cloning, such as the ability to help infertile couples have children and to develop new medical treatments, there are also significant risks and drawbacks. Ultimately, the decision about whether to pursue human cloning is a complex one that should be based on a careful consideration of the pros and cons.



Did you know?

You may heat a room with Gaming PCs more effectively than a heater.

AI Art: The New Era of Art



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S2 CSE

Have you ever wondered creating a magnificent artwork just by typing a text on the screen?

Well, here's AI art, that makes this possible.

AI (Artificial Intelligence) art is technically any artwork made with the assistance of artificial intelligence. It can be a work created autonomously by an AI system or a work that is done with the collaboration between a human and an AI system.

An AI art can easily be created by anyone through platforms like DALL-E, Deepdream, Starryai, Artbreeder, Craiyon, StyleGAN, CycleGAN and many other software. Most of them are available free to users among which some of them provide users to get full usage rights to commercialize the images they create including the right to reprint, sell and merchandise.

It's quite simple to create an AI art. The text commands are given to the software and the paintings or artworks that you have been looking for is there on your screen within minutes whereas it may take more time for an artist or a designer to create the similar artwork.

Well, how do they create these super realistic images that makes us think, we might start needing disclaimers to tell us whether it is human or AI generated? The answer is pretty obvious. AI generators rely on databases of already existing art and text. As some artists get inspirations from other masterpieces, here these generators create the artwork taking reference from billions of images that have been scraped from the internet. One of the most exciting things about AI created art is that it is constantly evolving. As AI technology gets better and better, we can expect to see even more amazing works of art created by artificial intelligence.

The first AI art to be sold is the 'Portrait of Edmund De Belamy' that made it's way to be sold at a major auction house and fetched nearly half a million dollars. The Portrait of Edmund De Belamy was sold for around \$432,500.

The AI art generators use machine learning algorithms and deep neural networks to generate art. The process of generating AI art typically involves data set selection, training, generation and refinement. The very first step include basically selecting a dataset of existing artwork that is used to learn the style and patterns of the art followed by training the images in dataset. It involves feeding the images through a neural network thus learning the features and patterns common to the dataset. Finally, these data

are used to generate new art based on the input commands which is then refined using additional algorithms and techniques to make the final image more aesthetically pleasing.



Did you know?

The Internet was created in the 1960s with the primary aim of sharing resources.

While the new field of digital art is stretching the boundaries of creativity, many popular controversies have been arising among people depicting the wiping out of human artists by the rise of AI art. Many people have come out with the concerns of theft of artwork from artists and designers where AI take references from. It has been debated that AI tends to mimic the unique styles of artists and the style being incorporated into AI without the knowledge of them.

The ethical dilemma claiming AI art is “not real” arises mainly due to the usage of existing human created art by AI and scanning it to create an output. Artists around the globe have united their voices to defend the growth of AI art and it is one of the topmost discussions happening today.

The knee-jerk reaction for any new technology is often fear, resentment or criticism. During the covid pandemic, the fear that arose of vanishing of the offline schools is quite similar to the controversies arising on the internet regarding AI art.

As real-human teachers are very necessary in a child’s education, human artists are really important to the society. AI art just makes the work more easy and efficient but never replaces the artworks of real-time artists. AI does not hold the essence of imagination, creativity and human perspective. Hence, it is never a threat to the careers and livelihoods of artists regardless being a tool designed to process data and perform specific tasks as instructed by the user.

The development of such a creative technology definitely requires brilliant and sparkling brains whose effort should really be appreciated. The amount of hardwork and determination dedicated by the brains behind these technologies is inspiring and a remarkable achievement.

AI art is definitely a way of creating new forms of artistic expression that are impossible with traditional techniques. It is a massively impactful technology which is not to be afraid of but something that could make our lives easier.



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