

SRM VALLIAMMAI ENGINEERING COLLEGE

COMPUTER SOCIETY OF INDIA

STUDENT BRANCH

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About SRMVEC CSI-SB :

SRM Valliammai Engineering College Student Branch was started in the year 2007. For the past 16 years, SRMVEC has organised various events and contributed many technical articles to CSI. It is one of the most active student branches of CSI. It has received the 'Best Accredited Student Branch Award' for four consecutive years since 2015 at Annual CSI Convention from Computer Society of India. Currently there are more than 370 Student members in the student branch.

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PREFACE

It gives us great pleasure to release the first issue of volume five 'LimeLight'. The SRMVEC CSI-SB members have been enthusiastic to show their talents. This magazine gives desired opportunity and platform to publish the students' thoughts and creativity. We strongly believe that the purpose of knowledge is fulfilled only when it is transferred to another person. In this manner, this magazine would serve as a collection of knowledge. With technology growing leaps and bounds day by day, people need to be aware of the ongoing development in technology. We appreciate every who stood with us in this venture.

Regards
SRMVEC CSI-SB Team



TABLE OF CONTENTS

SRMVEC CSI-SB Office Bearer 2022-2023.....1

Events.....2

SRMVEC CSI-SB Team

THE RISE OF METAVERSE: Redefining Connectivity and Digital Presence.....4

Ms. R. Manjushree

Advancing the next wave of Biocomputers using Brain Organoids.....7

Ms. R. Shamita

Explainable Artificial Intelligence.....10

Mr. B. Sathishkumar

Digital Twin.....13

Ms. V. Vaishnavi, Ms. J. Roja

Monolithic Architecture.....17

Ms. KM. Veera aakash

The Rise of Immersive Experience with Augmented Reality.....20

Ms. V. Dhanushya

Machine minds.....22

Ms. J. Hemamalini

Virtual Reality.....22

Mr. B. Harish Govind

Renewable Energy.....23

Ms. K. Narmatha

Robot.....23

Mr. B. Harish Govind

Word fun.....24



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EVENTS

CSI DAY CELEBRATION & MINI PROJECT EXPO

The SRM Valliammai Engineering College CSI – Student conducted CSI Day celebration and Mini Project Expo for the benefit of the students. It is organized on 20th March 2024 from 12:30 PM to 3.30 PM. All the students from various colleges attended the event. Dr. M. Senthil Kumar, HOD / CYS & CSI SB Coordinator coordinated this event.



1st place - Arul Dayanand from SRM University KTR

2nd place - Venkataraman from Sri Sairam Engineering College

3rd place - Arulkumaran from SRM Valliammai Engineering College

Prominent alumni from our college graced the occasion and gave motivational talk on CSI day. Current students found resonance in their statements, which provided insightful information about their experience after graduation. Our CSI SB coordinator gave awards for the alumni at the event.



The Mini Project Expo was conducted with great enthusiasm, showcasing a myriad of innovative projects by our talented students. In a heartening moment, our esteemed alumni and judges, impressed by the quality of work, awarded the deserving winners, encouraging them to continue their pursuit of excellence.



EVENTS

THIRD ANNUAL AWARD CEREMONY OF KANCHEEPURAM CHAPTER OF COMPUTER SOCIETY OF INDIA

The third annual award ceremony of the Computer Society of India, Kancheepuram Chapter was held at SRM Valliammai Engineering College in a grand manner. Dr. M. Murugan, Principal, SRM Valliammai Engineering College and immediate past Chairman of Computer Society of India - Kancheepuram Chapter delivered the welcome address. The chief guest of the event was Mr. Naveen Karunakaran, Technical Manager, HCL Technologies inaugurated the event and delivered a keynote address.



In his speech, he emphasized that various innovations in technological development should be brought out through such computer community system. The event was coordinated by Dr. M. Senthilkumar, Student Branch Counsellor of CSI.



The highlight of the function was recognition of outstanding achievers and contributions in the field of technology. Awards were presented in various categories such as Kancheepuram division best performance award, best technical works award at the college level and also the office-bearers of Computer Society of India Kancheepuram Division for the year 2024-2025 were announced. Dr. M. Senthil Kumar, who was elected as the new Chairman of the Kancheepuram Division, thanked the participants and supporters who made the event a great success.



THE RISE OF THE METAVERSE:

Redefining Connectivity And Digital Presence

Introduction to the metaverse

The rapid advancement of digital technologies has accelerated the virtualization of human environments, with augmented reality (AR) and virtual reality (VR) playing pivotal roles. While AR and VR can immerse users in simulated environments, the metaverse concept extends this by integrating these immersive technologies into an interconnected virtual world that mirrors real-life experiences. The metaverse is essentially a digital space where users create avatars and interact through the internet, offering an authentic online experience.



Fig 1.1:-Metaverse

History and development of the metaverse

Although the metaverse might seem like a new concept, its roots go back to 1992 when the term was coined. However, the idea dates further back to 1838, when Sir Charles Wheatstone introduced binocular

vision, laying the groundwork for 3D imaging. In 1935, American science fiction writer Stanley Weinbaum envisioned a fictional world in his book "Pygmalion's Spectacles," where goggles allowed characters to explore virtual realms.

The journey continued with Morton Heilig's creation of the first VR machine, Sensorama, in 1956, which simulated experiences like motorcycle riding. The 1960s saw the development of the first head-mounted display, combining 3D visuals with stereo sound. In the 1970s, the

Aspen Movie Map offered a computer-generated tour, pioneering VR applications in tourism. By the early 1990s, Sega had introduced VR arcade machines, expanding VR's use in gaming and entertainment.



Fig 1.2:-Development of Metaverse

Major milestones include Facebook's acquisition of Oculus VR in 2014 and Microsoft's release of the HoloLens headset

THE RISE OF THE METAVERSE: Redefining Connectivity And Digital Presence

in 2016, which provided a mixed reality experience. Today, companies like Apple are working on advanced headsets that could potentially replace smartphones by integrating them with the metaverse.



Fig 1.3: Advanced Technologies

Technologies required - Hardware and software

Key hardware for the metaverse includes head-mounted displays (HMDs), which must offer high resolution, wide field of view, and low latency. Other essential hardware includes hand-based or non-hand-based input devices and motion sensors. Critical software components encompass scene and object recognition, scene generation, sound and speech recognition, and motion rendering. The core of the metaverse lies in its content.

Current trends in metaverse

The development of the metaverse relies heavily on Web 3.0, enabling users to control their identities and data. It involves

three-tier technology, or spatial computing, blending physical and digital worlds. By 2030, the metaverse is expected to contribute approximately \$5 trillion to the global economy. Digital twins also allow virtual testing and prototyping in safe environments. The metaverse is set to revolutionize onboarding, training, and HR tasks by replicating real-world offices.

Real-world applications of the metaverse

- Customer Service: Digitalized customer
- Gaming: Immersive experiences.
- Training and Meetings: Virtual environments for learning and collaboration.
- Prototyping: Testing without physical models.
- Stock Market: Virtual trading platforms.
- Healthcare: Monitoring patient data in real-time.
- Real Estate: Connecting clients with virtual tours.
- Tourism: VR tours enhancing travel experiences.
- Military: Synthetic training environments.
- Education: Bridging gaps between students and resources.



THE RISE OF THE METAVERSE: Redefining Connectivity And Digital Presence

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ADVANCING THE NEXT WAVE OF BIOCOMPUTERS USING BRAIN ORGANOIDS

Artificial Intelligence is the upcoming revolution in the tech world, but the progress won't halt there. Scientists have already hinted at the future with organoid intelligence showcased by Johns Hopkins University, potentially leading to faster, more efficient, and more powerful computers than current Artificial Intelligence.

Have you ever wondered about a brain cell playing games, storing data, or restoring a disabled part of our body? Yes, it is feasible

that lab-grown brain cells can learn to play games on computers. To make this even more interesting a nine-year-old Macaque (small monkey) who had a Neuralink implanted in each side of his brain, has learned to interact with computers. We can interact with Neuralink implanted in the macaque simply through an iPhone like connecting our phone to other devices through Bluetooth. These Neuralinks are related to organoid intelligence, and we will look deep into OI or Organoid Intelligence in this article.



ADVANCING THE NEXT WAVE OF BIOCOMPUTERS USING BRAIN ORGANOIDS

What is organoid intelligence?

An Organoid is a 3-D cell culture that resembles or mimics the structure and function of a specific organ. This research aims to develop biocomputers powered by human brain cells and introducing a completely new intelligence domain. Organoids are designed in a certain way from stem cells or tissue cells to form a structure and function of real organs, making tools for studying organ development, disease modelling, drug testing, and personalized medicine.



Fig 2.1:-Organoid Intelligence

What is particular about stem cells to be used in this experiment?

Stem cells have the ability to develop from different cell types in the body. Custom-built devices will capture neural activity from the organoid and send instructional information to it. A crucial aspect of our vision is to ensure that OI advances in an ethically and socially responsible manner.

What is neuralink?

Neuralink is a company established by Elon Musk in 2016 that is working on a brain-computer interface known as "the Link," a surgically implanted neural-chip device implanted to decode and energize brain functions. In simple terms, Neuralink is a technology company working on a device aimed at connecting human brains directly to computers. The Neuralink chip the size of a coin, is surgically implanted under the skull. It receives information through neural threads that run into different sections. These threads contain sensors capable of recording and controlling motor skills.

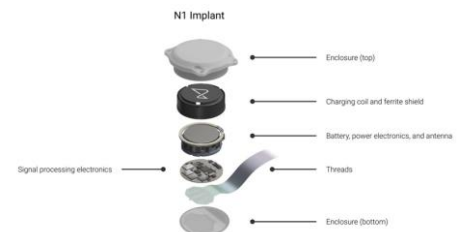


Fig 2.2:-Neural Link

How does neuralink work?

The link functions by implanting a neural chip in the brain, containing thousands of electrodes to record, stimulate neural activity. These electrodes capture signals from neurons in the brain, which are decoded by algorithms to extract meaningful information.

ADVANCING THE NEXT WAVE OF BIOCOMPUTERS USING BRAIN ORGANOIDS

This data controls external devices, enabling individuals to interact through thoughts. The chip is surgically implanted using robotic surgery to minimize tissue damage. Following implantation, it wirelessly transmits signals for real-time processing.

This process starts with the surgery on the skull. The link device is implanted into the skull through a highly precise robot for steadier hands. This robot contains microneedles that insert the 64 electrodes which are thinner than the hair into the brain. Once inserted, these threads capture the brain activity by electrodes. In simple it measures the brain activity and interprets it as an action. And the battery in the link is charged through external devices.

Advanced learning algorithms interpret neural data, facilitating precise device control. Neuralink's technology could revolutionize the treatment of disorders such as paralysis, epilepsy, and Parkinson's. It represents a ground-breaking advancement in neurotechnology, providing new possibilities for human-machine interaction and brain enhancement.

First human implantation

In 2023, the Neuralink company announced it had won FDA approval to run its first clinical trial in humans. It began recruiting paralyzed volunteers to study. The first human Neuralink implantation was

on a paralysed adult and was performed at Barrow Neurological Institute. The surgery went extremely well, and the participant's recovery was very noticeable.

This implant includes 1024 electrodes across 64 threads. Neuralink company releases a nine-minute video of this paralysed patient, who appears to move the cursor across the laptop screen with nothing but his thoughts, playing chess, and turning off the laptop's music.

It has been stated that the patient is Noland Arbaugh and he said that he's 29 years old and that he lost all movement and sensation in his arms and legs after a diving accident about eight years ago.

In January 2024, Elon Musk said that Neuralink had implanted a device in its first human subject in the trial. He also stated, "Imagine if Stephen Hawking could communicate faster than a speed typist or auctioneer. That is the goal". But helping paralyzed people is not the end goal.



Fig 2.3:-Human Implantation



ADVANCING THE NEXT WAVE OF BIOCOMPUTERS USING BRAIN ORGANOIDS

Researchers are hopeful that by scaling up the production of brain organoids and training them with artificial intelligence, the system could revolutionize various fields. Brain-computer interface or BCI technology, helped a paraplegic man Gert Jan Oskam who had been in a motorbike accident, to walk again using brain implants and AI.

However, a concern regarding organoid intelligence is the potential for creating enhanced intelligence. As these mini brains are designed to mimic the structure and function of the human brain. There is a possibility that they could develop superior intelligence surpassing human intelligence in some areas.

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Explainable Artificial Intelligence (XAI)

Introduction

Explainable AI, or XAI, refers to techniques and methods that make the decisions of AI systems understandable to humans. As AI becomes more integrated into our daily lives, it's essential for us to understand how these systems work and why they make certain decisions.

Need for XAI

1. **Trust:** When we understand how AI makes decisions, we're more likely to trust it. For instance, if a doctor uses an

AI to help diagnose diseases, both the doctor and the patient would want to know how the AI arrived at its conclusion.

2. **Accountability:** If an AI system makes a mistake, we need to be able to trace back and understand what went wrong. This is especially important in fields like finance or law, where decisions can have serious consequences.

3. **Fairness:** AI systems can sometimes reflect biases present in their training data. By understanding how AI makes decisions,



Explainable Artificial Intelligence (XAI)

we can identify and correct these biases to ensure fair outcomes.

Working of XAI

XAI uses various techniques to make AI systems more transparent. Here are a few common methods:

Simple Models: Some AI models are naturally easy to understand. For example, decision trees use a tree-like structure to make decisions, which can be easily followed and explained.

Model-Agnostic Methods: These methods can be applied to any AI model to help explain its decisions. Two popular techniques are:

- **LIME (Local Interpretable Model-agnostic Explanations):** This technique creates a simpler model that mimics the AI's behavior in a specific instance, helping us
- **SHAP (SHapley Additive exPlanations):** This method uses concepts from game theory to show how each feature (input) contributes to the final decision.

Applications in healthcare

XAI finds its applications in various facets of healthcare, such as:

- **Diagnostic Imaging:** XAI aids radiologists by providing insights into AI's analysis of medical images,

highlighting areas of interest and explaining features that led to a particular diagnosis.

- **Personalized Treatment Plans:** By understanding the factors influencing AI's recommendations, clinicians can tailor treatments to individual patient needs, fostering personalized medicine.
- **Risk Assessment:** XAI can explain the risk factors and their contributions to predictions, helping clinicians identify patients at high risk and take preventative measures.

Pivotal roles of explainable ai in financial services

- **Enhancing Risk Evaluation:** XAI plays a pivotal role in demystifying the criteria used by AI in assessing the potential risks associated with investment opportunities or credit applications.
- **Refining Investment Strategies:** XAI empowers investors by shedding light on the logic behind AI-generated investment advice, facilitating decisions that resonate with individual financial objectives and risk appetites.
- **Combating Financial Deception:** XAI stands at the forefront of the battle against economic fraud, clarifying the justifications for AI-generated warnings, thus aiding financial analysts in discerning authentic threats from innocuous activities.



Explainable Artificial Intelligence (XAI)

- **Deciphering Creditworthiness:** XAI acts as a window into the workings of AI-based credit evaluation systems, granting both creditors and debtors insight into the determinants of creditworthiness assessments.
- **Market Trend Interpretation:** XAI is instrumental for market experts and traders, providing transparency in AI's intricate analysis of financial market dynamics and investment prospects.

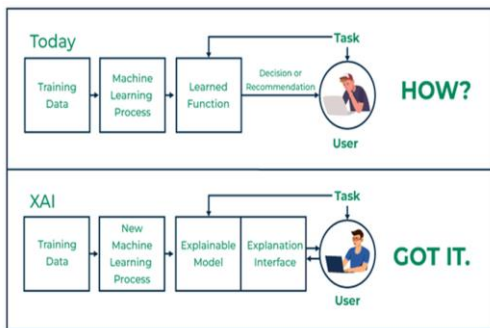


Fig 3.1:-Working of XAI

- **Data Integrity Issues:** Flawed or prejudiced data can skew XAI's explanations, leading to potentially unreliable interpretations.
- **User Understanding:** XAI's success hinges on users' ability to grasp and utilize the provided explanations, a task that can be daunting for those without expertise.

Conclusion

Explainable AI is crucial as AI systems become more prevalent in our lives. As we continue to rely on AI for various tasks, XAI will play a vital role in making sure these systems are used responsibly and effectively.

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XAI'S Limitations

- **Complexity vs. Clarity Dilemma:** Striking a balance between the sophistication of AI models and their interpretability remains a hurdle. Advanced models like deep learning offer high accuracy but at the cost of transparency.
- **Uniformity Absence:** The lack of a standardized approach to XAI results in varied and sometimes inconsistent explanation methodologies.



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DIGITAL TWIN

Introduction

Scholars and practitioners are taking an interest in digital twins. These days, a wide range of industries employ the technology to create realistic virtual items and operational process simulations. According to a 2019 Gartner poll, enterprises were starting to deploy digital twins more frequently. By 2020, 75% of Internet of Things (IoT) enterprises are expected to either utilize or plan to deploy Digital Twin technologies . Furthermore, according to Gartner's projections, more than 40% of global large corporations will be utilizing digital twins in their projects to boost sales by 2027 .

Furthermore, according to Global Market Insight, the \$8 billion Digital Twin market is projected to increase at a compound annual growth rate of almost 25% by 2022.

Technologies for digital twins

Data modeling, data application, and data collecting are the three primary facets of digital twins . Four technologies are used by Digital Twin to gather and store real-time data, gather information to offer insightful analysis, and generate a digital twin of a physical thing. These technologies comprise cloud computing, artificial intelligence (AI), extended reality (XR), and the Internet of Things. Additionally, the degree to which Digital

Twin employs a specific technology varies based on the kind of application.

1. INTERNET OF THINGS (IOT): An enormous network of interconnected "things" is referred to as IoT. There is a relationship between things and things, people and people, or people and people. IoT is the main technology used by digital twins in all of their applications. By 2027, almost 90% of all IoT devices

2.CLOUD COMPUTING: The delivery of hosted services via the Internet is referred to as cloud computing. Data is efficiently stored and accessed across the Internet by the technology . Cloud computing offers cloud data storage and data processing capabilities to Digital Twins. With cloud computing, Digital Twins with massive data volumes can store data in a virtual cloud and retrieve it with ease from any location.

3.ARTIFICIAL INTELLIGENCE (AI): AI is a branch of computer science that aims to imitate the building blocks of intelligence in order to build a new intelligent machine that can converse with humans in a similar way. Robotics is one of the study areas for AI. Virtual reality (VR), augmented reality (AR), and mixed reality (MR) are examples of immersive technologies that fall under the general term "extended reality" (XR). These innovations have the power to expand our perception of reality by fusing the actual and virtual realms. XR generates virtual objects that coexist and communicate with real-world objects in real-time.



DIGITAL TWIN

Use cases and applications for digital twins

Digital twins are mostly used in manufacturing and engineering nowadays to create precise virtual replicas of real-world products and operational process simulations. Related publications address the use of digital twins in operations and supply chain management, with a focus on how they can be used for operations traceability, transport maintenance, remote support, asset visualization, and design modification. In other industries, such as the automotive, aerospace, construction, agricultural, mining, utilities, retail, healthcare, military, natural resources, and public safety sectors, the technology is ready to fulfill its many promises. The technology has captivated the interest of academics, administrators, and professionals across the globe.



Fig 4.1:-Uses of Digital Twin

Challenges and drivers of digital twins

The primary factor enabling the current pace is the declining cost of technologies that improve the Digital Twin and IoT.

Additionally, Digital Twins have been utilizing essential commercial applications in recent years, and it is anticipated that the technology will grow to include more use cases, applications.

For instance, Google Cloud unveiled a supply chain Digital Twin solution in January 2022 to give the industrial sector visibility into the activities taking place within their supply chains.

The deployment of Digital Twin technology has surged across a range of applications with the introduction of Industry 4.0 and IoT. Innovative production techniques and cutting-edge technologies—like cloud computing, IoT, analytics, digital twins, digital scanning, 3D printing, and AI—are used in Industry 4.0. An important component of Industry 4.0 activities is digital twin technology. Digital twin solutions are being actively used by an increasing number of industries for product and asset lifecycle management. Technology enables businesses to produce. As this article explains, digital twin technology has many benefits. Nevertheless, it now confronts similar obstacles to AI and IoT technologies. These include obstacles to its deployment and the transformation of old systems, as well as data standardization, administration, and security. The literature also lists the necessity to update outdated IT infrastructure, the difficulties with connectivity, sensitive data security and privacy, and the absence of a consistent modeling approach.



DIGITAL TWIN

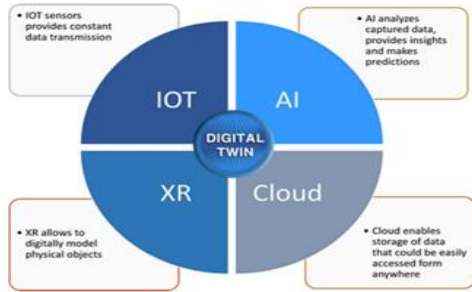


Fig 4.2:-Digital Twin

The high implementation costs, rising power and storage needs, difficulties integrating the digital twin with current systems or proprietary software, and the intricacy of its design are some of the major obstacles that are anticipated to impede the market's growth. Digital Twins solution implementation is expensive and requires substantial investment in infrastructure development, upkeep, data quality assurance, security solutions, and technological platforms (sensors, software). Additionally, it might be expensive to maintain the Digital Twin infrastructure, requiring a substantial operational investment. The introduction of Digital Twin technologies is anticipated to be slowed considerably by the high fixed costs and intricate architecture of Digital Twins.

Conclusion

Digital twin technology has attracted a lot of interest from academics and industry in recent years.

The word "this technology" has multiple definitions in the literature since it is used to refer to different areas of study within different academic fields. The smooth data integration of a virtual and physical machine in both directions can be defined as the idea of a "digital twin." The first application of digital twin technology was in the NASA used the domains of astronautics and aerospace for the Mars Rover Curiosity and the moon exploration mission Apollo 13. According to the literature review, digital twins are becoming more and more widespread and impactful, making them a rapidly expanding IT solution across a range of businesses.

The majority of publications published in academic journals address the use of Digital Twin solutions in manufacturing, especially in the context of Industry 4.0, as this study explains. Production planning and control, which are essential to integrating all data into a production system, are the focus of research on Digital Twin solutions in manufacturing. Another area where digital twin use cases are addressed in the literature is supply chain management. There is an increasing number of use cases in the construction and healthcare sectors. Within the construction sector, the as-built vs. as-designed project at any given time can be more accurately represented with the aid of wearables, mobile devices



DIGITAL TWIN

and the Digital Twin idea on a building site. Additionally, by enabling the return of current data to the field, it reduces the amount of errors and reworks.

The elements that are expected to cause the increased demand for automation are the expanding need for automation across a range of industries.

The Digital Twin platform during the anticipated time frame. As the epidemic recedes, digital twin solutions are set to become more and more significant across a range of businesses. The advantages of developing a digital twin solution are too numerous to be fully investigated. Even if there are obstacles to overcome in terms of data security and quality, rising energy and storage needs, and interaction with current infrastructures, digital twin solutions are booming in order to bring about a highly sophisticated digital revolution and improve the lot of humanity. Digital twins will be used in more sectors and application cases in the future. The solutions will integrate with additional technologies, such as augmented reality (AR), to provide an immersive experience, and with artificial intelligence (AI) capabilities to improve analytics, connections, and insights. Furthermore, we may employ Digital Twin solutions thanks to advancements in technology,

which eliminates the necessity to verify the "real" object. Further opportunities for the use of Digital Twin technologies in intricate processes arise from these exponentially greater insights and analytics.



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MONOLITHIC ARCHITECTURE

The monolithic operating system is a very basic operating system in which device, memory, file, and process management are all directly controlled by the kernel. The kernel has access to every resource in the system. In monolithic systems, the kernel houses every component of the operating system. Operating systems with a monolithic design first appeared in the 1970s.

The monolithic operating system is also known as the monolithic kernel. Banks use this antiquated operating system for routine tasks like batch processing and time-sharing. The monolithic kernel, acting as a virtual machine, controls every piece of hardware.

It's not the same as a microkernel, which has fewer tasks. A microkernel's two portions are referred to as kernel space and user.

Diving into monolithic software

In this architecture, every component, along with its associated parts, must coexist for the code to execute and the software to function. While this approach offers advantages such as improved throughput and simplified testing, it presents its own complexities.

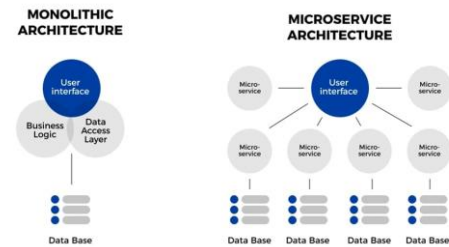


Fig 5.2:-Microservice Architecture

Microservices architecture is an alternative approach to the development of applications.

This allows for updating, testing, deployment, and scaling that is individual to each service and creates manageable complexity.

All operating system functions, such as memory management, process scheduling, device drivers, and file systems, are provided by the operating system kernel in a monolithic architecture as a single, big binary. This implies that there is no division between kernel and user-level processes and that all code executes in

Monolithic Architecture

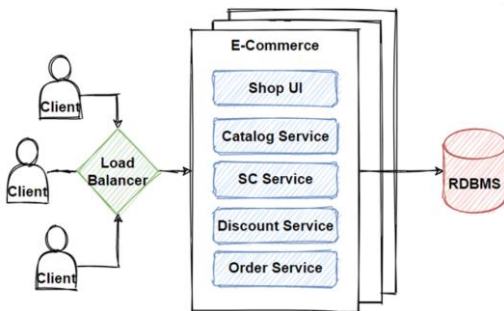


Fig 5.1:- Monolithic Architecture

MONOLITHIC ARCHITECTURE

kernel space. The primary benefit of a monolithic design is its high performance, which stems from the ability to make system calls directly to the kernel, eliminating the need for message passing between processes at the user level. Since a single binary provides all operating system services, the design is also simpler.

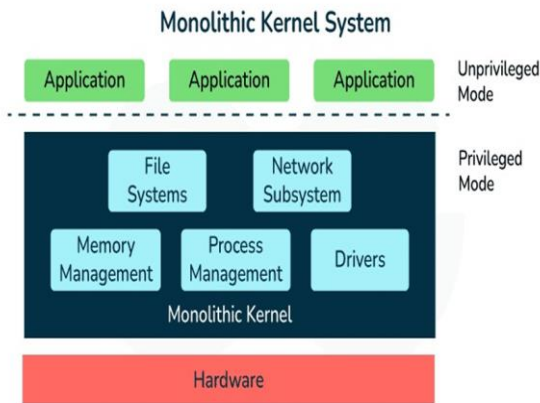


Fig 5.3:-Monolithic Kernel System

Important elements in monolithic architecture

The following are the main elements of a monolithic architecture:

User Interface (UI): This part is in charge of informing users and obtaining their feedback via buttons, forms, and other interactive features.

Application Logic: Often referred to as the business logic layer, this part houses

the essential features of the application. It handles user interface requests, modifies data, and carries out any computations or other tasks that are required. Interactions with the database or other data storage systems are managed by the data access layer. It ensures that the program can retrieve and alter data as needed by including functions for querying, inserting, updating, and deleting data.

Database: The application's data is kept in a structured fashion in the database.

Features of architecture in monolithic form

One executable file is used to package and distribute the complete application. Every module and component is packed together.

Tight Coupling: The application's modules and constituent parts are closely related to and reliant upon one another. Modifications to one component could necessitate adjustments to other sections of the program.

Shared Memory: The memory space used by all the application's components is shared. They have immediate access to and control over shared data structures. Deploying an application in a monolithic manner involves deploying it as a single entity.



MONOLITHIC ARCHITECTURE

Redeploying the complete monolith is necessary whenever the application is updated or modified.

Centralized Control Flow: Usually, a major function or central module is in charge of overseeing the application's control flow.

Monolithic architecture's advantages

A list of advantages of employing monolithic architectures may be found here:

Easy to create

Any engineering team has the necessary skills and experience to create a monolithic application as long as it follows the conventional procedure for creating apps. This indicates that, in contrast to microservices design, it is comparatively simpler and easier to create.

Simpler testing and debugging

Comparing monolithic programs to microservices architecture, the former are considerably simpler to test and troubleshoot. The single code base of a monolithic application allows for significantly faster end-to-end testing.

Conclusion

Monolithic architecture offers simplicity and performance advantages, making it a suitable choice for small projects or teams with limited resources. Despite the limitations, monolithic architecture can still be a suitable choice for various real-life scenarios, particularly for smaller projects or situations where simplicity and ease of development and maintenance are more important than scalability or agility



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THE RISE OF IMMERSIVE EXPERIENCE WITH AUGMENTED REALITY

Augmented Reality (AR) is transforming the way we experience the world around us. From entertainment to education, AR technology is providing an immersive experience like never before. Let's dive into the world of AR and explore its impact on society.

What is Augmented Reality?

Augmented Reality (AR) is a technology that superimposes computer-generated images onto the user's view of the real world, thus providing a composite view. Unlike Virtual Reality, which creates a completely digital environment, AR enhances the user's perception of reality. This technology can be experienced through special glasses, smartphone apps, and other devices.



Fig 6.1:- Augmented reality

Devices and Hardware

AR Glasses like HoloLens and Magic Leap provide immersive AR experiences.

Smartphones and Tablets have become common AR devices, bringing AR technology to a wider audience. AR Devices like Google Glass offer hands-free AR experiences.

Development and Design

User Experience (UX) and User Interface (UI) design play a crucial role in creating intuitive AR interactions. 3D Modeling and Animation are essential for bringing virtual objects to life in AR. Prototyping in AR helps developers test and refine their AR concepts before final implementation.

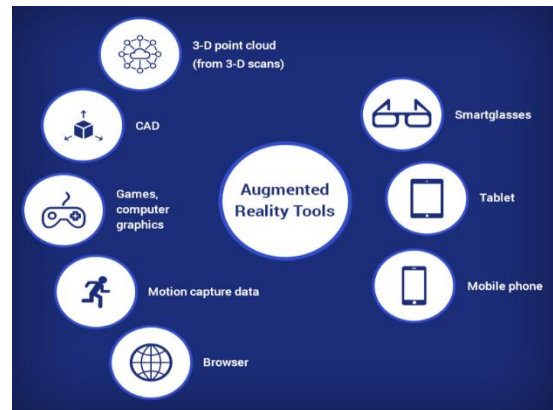


Fig 6.2:- Tools

Immersive Experience with AR has the power to blur the lines between the physical and digital worlds. It allows users to interact with virtual objects as if they were part of the real world.



THE RISE OF IMMERSIVE EXPERIENCE WITH AUGMENTED REALITY

Education and Training

One of the most significant applications of AR technology is in education and training. By providing an immersive experience, AR can make learning more engaging and effective. For example, students can explore the human body in 3D, dissecting organs and gaining a deeper understanding of anatomy. In the field of medicine, AR can be used for training surgeons and medical professionals to perform complex procedures with precision.

Entertainment and Gaming

AR has revolutionized the entertainment industry by offering new and exciting ways to engage with content. Games like Pokemon Go have brought AR into the mainstream, allowing players to interact with virtual creatures in the real world. Theme parks are incorporating AR technology into their attractions, enhancing the visitor experience with interactive elements and immersive storytelling.

Marketing and Retail

In the world of marketing and retail, AR is transforming the way businesses interact with customers. By offering immersive experiences, companies can

create personalized shopping experiences and showcase products in a unique way.

The Future of AR

As AR technology continues to evolve, the possibilities are endless. From advancing education and training to revolutionizing the entertainment industry, AR has the potential to transform the way we interact with the world around us.

In conclusion, Augmented Reality (AR) is revolutionizing the way we experience the world by providing immersive experiences that blur the lines between the physical and digital worlds

So, embrace the immersive experience with AR and discover a world of endless possibilities at your fingertips!



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Machine minds



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Virtual reality



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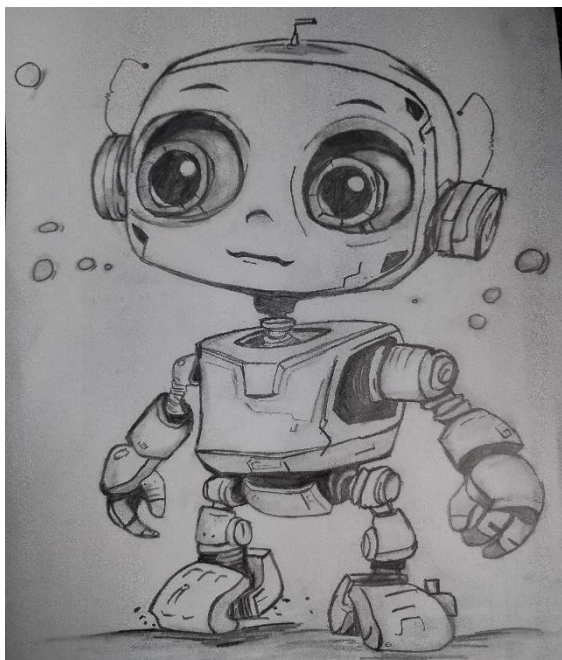
Renewable energy



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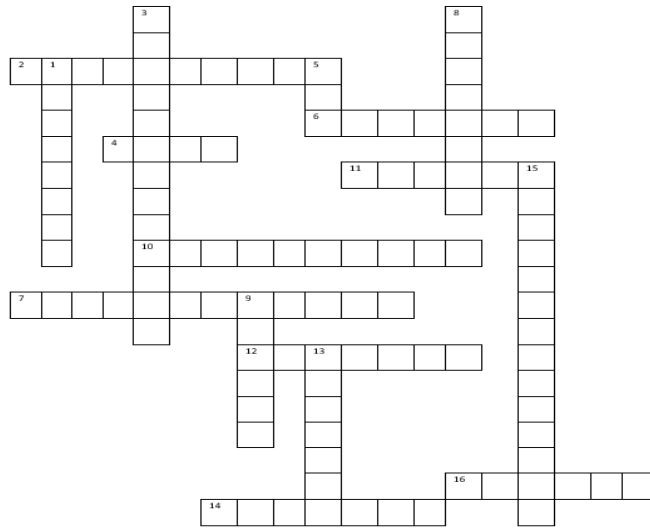
Robot



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Word fun



*Answer will be revealed in the next issue.

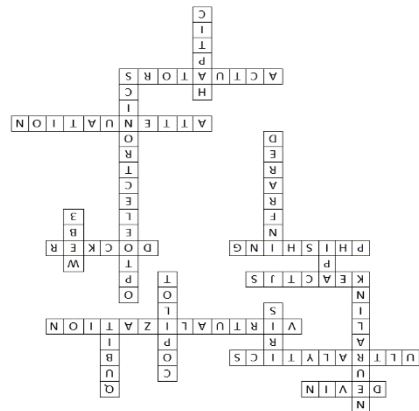
Across:

2. The process of changing ciphertext into plaintext.
4. A famous real-time object detection algorithm.
6. Process of selectively removing unnecessary parts in tree data structure.
7. Process of converting sensitive data into tokens.
10. An open source platform designed to automate deployment of applications.
11. A blueprint that defines the structure of data within a database.
12. A process of breaking down data based on its grammatic structures.
14. A visual representation of correlations within dataset.
16. A programming language used for developing logic-based AI applications.

Down:

1. A LAN which connects network devices in a physical space.
3. A malware which is used to mine cryptocurrency.
5. A ML technology that enables machine to understand human language.

8. A software tool that converts source code into machine code.
9. A special program that is embedded in the web page to generate dynamic content.
13. A malicious software used to gain access to a computer.
15. Process of confirming the identity of a user through password.



Answers for previous
issue:



To submit article for next issue

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01/09/2024 (Sunday)

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