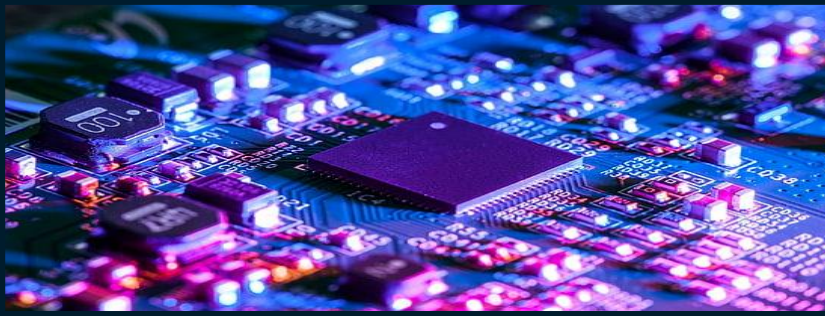


**COMPUTER  
ENGINEERING  
DEPARTMENT  
&  
INFORMATION  
TECHNOLOGY  
DEPARTMENT**



**Present's**

**TECHNICAL MAGAZINE**

**2023-2024**

**COMPIT**



# **INSTITUTE VISION MISSION**

## **VISION**

To provide quality technical education in rural area

## **MISSION**

1. To impart eco-friendly, advanced engineering knowledge.
2. To inculcate ethical and moral values among budding engineers.
3. Establishment of mentoring system for all-round personal and professional enhancement.
4. To make students aware social and national responsibilities.
5. To encourage students to pursue higher education and take competitive and career enhancement courses.
6. To create technology based society which is the need of modern era.



# **INFORMATION TECHNOLOGY DEPARTMENT**

## **VISION**

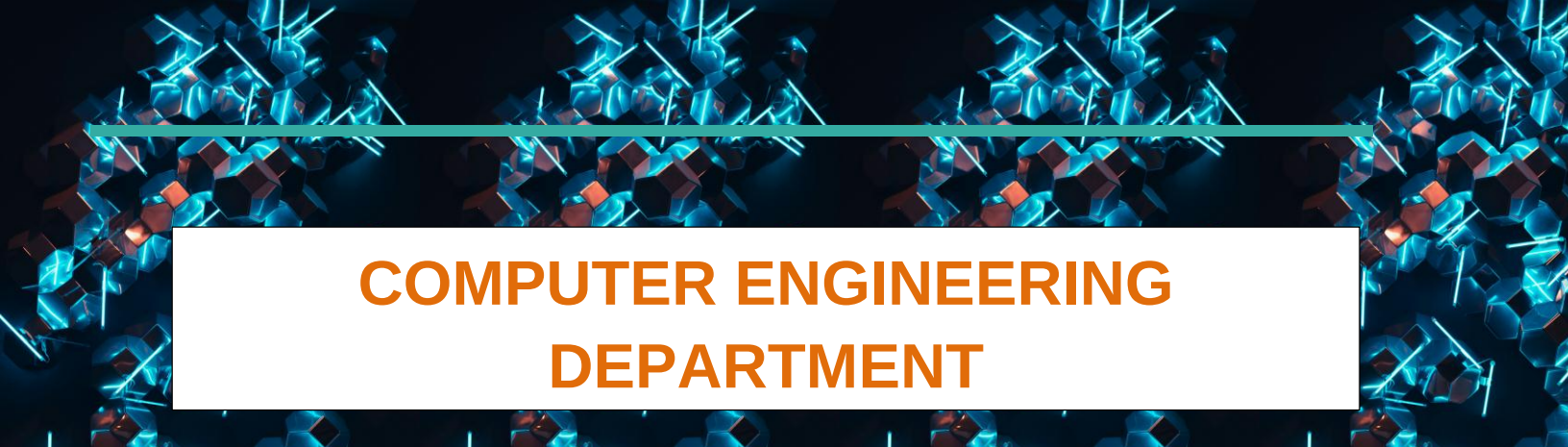
To inspire rural students of the region through quality education in Information Technology.

## **MISSION**

M1: To maintain state-of-the-art facilities and resources where students can enhance their understanding of technology.

M2: To provide students with a computational environment for continuous learning in which they can explore, apply, and transfer knowledge.

M3: To provide continuing education programmes in Information Technology field for the benefit of stakeholders.



# **COMPUTER ENGINEERING DEPARTMENT**

## **VISION**

To provide competent knowledge in the field of computer technology.

## **MISSION**

M1: To provide conceptual as well as practical knowledge to adapt changing technology in computer field.

M2: To provide the quality education to meet needs of profession & society by arranging seminars, workshops and interactive sessions.

M3: To prepare for interpersonal skills, leadership qualities, ethical values, lifelong learning skills, and higher education of budding engineers.

## Editorial Team

- Mr.Lokare A.P.
- Mr.Kazi A. S. M.
- Mr.Chavan A.Y.
- Mr.Osmani F.W.
- Ms. Swami Sakshi Nilappa (CO2Y)
- Ms. Alat Sayali (CO3Y)
- Mr.Shinde Sumit Girish (IF2Y)





# Augmented Reality (AR) and Virtual Reality (VR): Transforming the Digital Landscape

## INTRODUCTION

In the rapidly evolving technological landscape, **Augmented Reality (AR)** and **Virtual Reality (VR)** have emerged as groundbreaking innovations. These immersive technologies have transformed the way humans interact with digital content by blurring the boundaries between the physical and virtual worlds. AR and VR have grown beyond their initial applications in gaming and entertainment, finding significant roles in healthcare, education, retail, and even industrial applications.

The adoption of AR and VR has been fueled by advancements in hardware, such as high-resolution displays, motion-tracking sensors, and powerful computing devices. Additionally, the integration of artificial intelligence (AI) and machine learning (ML) has enhanced the capabilities of these technologies, making them more intuitive and interactive. With the increasing demand for remote collaboration, training, and virtual experiences, AR and VR are no longer just futuristic concepts but essential tools shaping modern industries.

Furthermore, tech giants like Apple, Google, and Meta are investing heavily in AR/VR research and development, pushing the boundaries of what these technologies can achieve. Whether it's experiencing a virtual world through a headset or using AR overlays to assist in real-world tasks, the potential of AR and VR is vast and continues to expand.



## Understanding AR and VR

**Augmented Reality (AR)** enhances the real-world environment by overlaying digital elements such as graphics, sounds, or haptic feedback. AR applications are commonly seen in mobile apps, smart glasses, and heads-up displays in industries like retail and navigation.

**Virtual Reality (VR)**, on the other hand, creates a completely immersive digital environment. Using VR headsets, users can experience simulated worlds, whether for gaming, training simulations, or virtual tourism. Unlike AR, VR replaces the physical surroundings with a digital one.



## Key Technologies Powering AR and VR

### 1. Hardware Components:

- **AR:** Uses smart glasses, smartphones, and tablets with depth-sensing cameras and LiDAR for precise digital overlays.
- **VR:** Requires head-mounted displays (HMDs) like Oculus Quest and HTC Vive, along with motion controllers and haptic feedback devices for full immersion.

### 2. Software and Frameworks:

- **AR:** Platforms like ARKit (Apple), ARCore (Google), and Vuforia enable object tracking and spatial mapping.
- **VR:** Game engines like Unity3D and Unreal Engine provide real-time rendering and physics simulations for creating realistic VR environments.

### 3. Artificial Intelligence (AI) & Machine Learning (ML):

- AI enhances AR/VR through **computer vision, gesture recognition, and voice commands**, making interactions seamless.
- ML-driven **adaptive rendering** improves VR performance by optimizing frame rates and reducing latency.

### 4. Networking and Cloud Computing:

- **5G and edge computing** enable real-time AR/VR streaming with minimal lag.
- Cloud-based solutions reduce the need for high-end local hardware, making AR/VR experiences more accessible.



## Applications of AR and VR

### 1. Gaming and Entertainment

AR and VR have revolutionized the gaming industry with interactive experiences like **Pokémon GO (AR)** and **Beat Saber (VR)**. The entertainment industry also utilizes VR for immersive storytelling and virtual concerts.

### 2. Healthcare

VR simulations aid in medical training, surgical procedures, and therapy sessions, while AR assists in diagnostics and real-time patient monitoring.

### 3. Education and Training

Educational institutions leverage AR/VR for interactive learning, virtual field trips, and skill-based training, such as flight simulations for pilots.

### 4. Retail and E-Commerce

AR allows consumers to try products virtually, such as **IKEA Place**, which lets users visualize furniture in their homes before purchasing.

### 5. Manufacturing and Engineering

VR enables engineers to design and prototype in a virtual space, reducing errors and improving efficiency. AR is used in industrial maintenance, providing step-by-step instructions through smart glasses.



## Future of AR and VR

The future of AR and VR is incredibly promising, with advancements set to redefine industries and everyday experiences. **5G connectivity** will enhance real-time streaming of AR/VR content, reducing latency and improving interactive experiences. **AI and machine learning** will continue to refine AR/VR applications, enabling **smarter object recognition, gesture-based controls, and predictive analytics** in various fields.

**Lightweight AR/VR wearables** are expected to replace bulky headsets, making these technologies more accessible and user-friendly. The rise of **metaverse applications** will create virtual spaces for work, education, and social interaction, providing new dimensions of human engagement.

Additionally, **haptic feedback and brain-computer interfaces (BCIs)** will elevate AR/VR experiences, allowing users to interact with virtual environments in more intuitive and immersive ways. **Enterprise adoption** will grow, with businesses leveraging AR/VR for remote collaboration, training, and design prototyping.

As these technologies evolve, AR and VR will seamlessly blend with everyday life, bridging the gap between the digital and physical worlds and unlocking unprecedented opportunities for innovation and connectivity.



## CONCLUSION

AR and VR are no longer futuristic concepts but are actively shaping industries and human experiences. As hardware becomes more affordable and software more sophisticated, the adoption of these technologies will continue to rise, unlocking new possibilities for innovation and engagement.

### Author:

- 1.Kharabe Kiran Sudhakar (CO2Y)
- 2.Swami Sakshi Nilappa (CO2Y)
- 3.Halkude Shweta Surendra(IF2Y)



# ROBOTICS

## ROBOTICS :

Robotics is a branch of engineering that involves the conception, design, manufacture and operation of robots. The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways.

Robotics can take on a number of forms. A robot may resemble a human, or it may be in the form of a robotic application, such as robotic process automation (RPA), which simulates how humans engage with software to perform repetitive, rules-based tasks.

While the field of robotics and exploration of the potential uses and functionality of robots have grown substantially in the 20th century, the idea is certainly not a new one.

## HISTORY OF ROBOTICS

The term robotics is an extension of the word robot. One of its first use came from Czech writer Karel Čapek, who used the word in his play, Rossum's Universal Robots, in 1920.

Perhaps about the year 2020 the process will have produced the first broadly competent "universal robots" with lizardlike minds that can be programmed for almost any routine chore.

By 2030 second-generation robots with trainable mouselike minds may become possible. Besides application programs, these robots may host a suite of software "conditioning modules" that generate positive- and negative reinforcement signals in predefined circumstances.



By 2040 computing power should make third-generation robots with monkeylike minds possible. Such robots would learn from mental rehearsals in simulations that would model physical, cultural, and psychological factors.





Robots have a wide range of uses and applications across different industries and fields including:

**Manufacturing and production:** Robots are widely used in the manufacturing sector for tasks such as assembly, inspection, and packaging. They can work in hazardous or repetitive environments, reducing the risk of injury to human workers and increasing productivity.

**Healthcare:** Robots are used in the healthcare for various purposes, such as assisting in surgery, rehabilitation, and elderly care. For example, surgical robots can perform precise movements and reduce the risk of human error during operations.

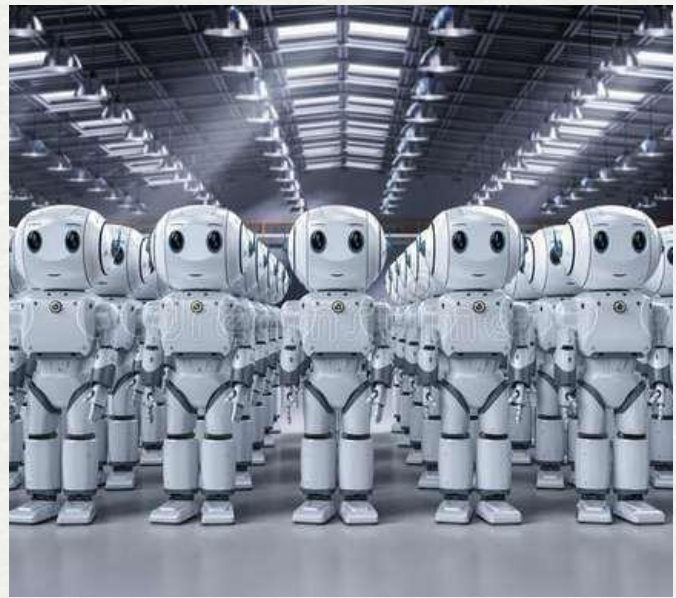
**Agriculture:** Agricultural robots are used for tasks such as planting, harvesting, and monitoring crops. They can help increase efficiency and reduce the need for manual labor in agriculture.

**Retail and logistics:** Retail and logistics robots are used for tasks such as inventory management, order fulfillment, and customer service. They can help increase efficiency and reduce costs in these industries.

**Space exploration:** Robots are used for space exploration, including missions to Mars and other planets. They can perform tasks such as collecting and analyzing data, drilling for samples, and mapping the terrain.

**Search and rescue:** Robots are used in search and rescue operations, where they can access dangerous or difficult-to-reach areas to search for survivors or provide assistance.

**Military:** Robots are used in military operations for tasks such as reconnaissance, surveillance, and bomb disposal.



## A D V A N T A G E

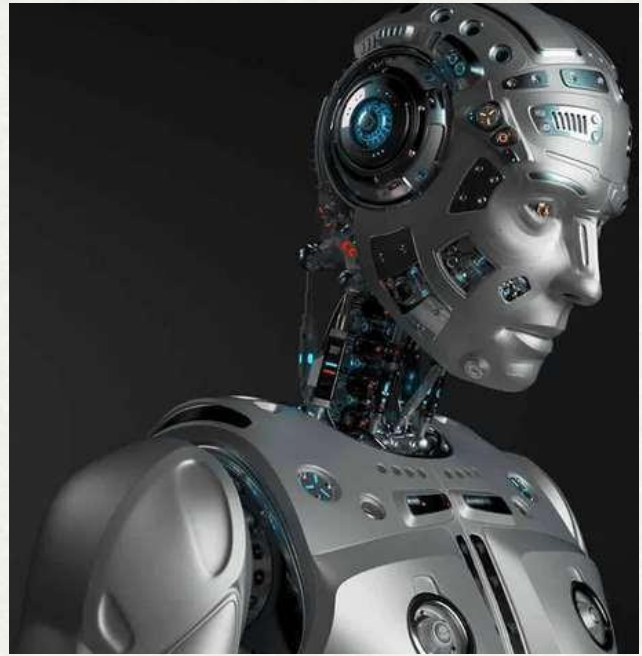
There are several advantages of robotics, some of which are:

1. **Precision:** Robots can perform tasks with high precision, accuracy, and repeatability that is difficult for humans to achieve. They can carry out tasks with consistent quality and precision without getting tired or making mistakes.
2. **Efficiency:** Robots can work continuously without taking breaks or getting tired, leading to increased productivity and efficiency. They can also perform tasks that are too dangerous or tedious for humans to undertake.
3. **Cost Savings:** Robots can help organizations reduce labor costs by automating various tasks. They can also help reduce production costs by minimizing scrap and rework.
4. **Flexibility:** Robots can be programmed to perform a wide range of tasks, making them highly adaptable to changing production needs. They can also perform tasks in hazardous or difficult-to-reach areas.



## DISADVANTAGES :

1. **High Cost:** One of the major disadvantages of robotics is the high cost of design, manufacturing, and implementation. The advanced robotics technology is expensive in every aspect, from purchasing to maintenance, and requires a significant financial investment.
2. **Lack of Flexibility:** Robots are designed to perform specific tasks, and are not easily adaptable when it comes to new, non-standard jobs. They need to be reprogrammed or redesigned to make changes within their function, unlike human workers who can easily adapt to new challenges.
3. **Job Loss:** The rise of robotic technology has led to a decrease in job opportunities for human workers, particularly in industries such as manufacturing, where robots can perform tasks more efficiently and for longer hours without fatigue.
4. **Technical Issues:** Robotics systems are complex and require a high level of technical expertise to design, develop, and repair.



## CONCLUSION

Today we find most robots working for people in industries, factories, warehouses, and laboratories. Robots are useful in many ways. For instance, it boosts economy because businesses need to be efficient to keep up with the industry competition. Therefore, having robots helps business owners to be competitive, because robots can do jobs better and faster than humans can, e.g. robot can build, assemble a car. Yet robots cannot perform every job; today robots roles include assisting research and industry. Finally, as the technology improves, there will be new ways to use robots which will bring new hopes and new potentials.

### Author:

1. Chame Abhishek Rameshwar(CO2Y)
- 2 Panchal Rajnandini Pralhad(CO2Y)
- 3 Gudle Arjun Manoj(IF2Y)



# CLOUD COMPUTING

## CLOUD COMPUTING

Cloud computing is a relatively new approach in the field of information technologies. It involves storing and accessing data and applications over the internet, rather than through a physical server or computer. As one of its core implementations, cloud technology has gained a lot of attention in recent years. It represents the very core of modern IT infrastructure and development. This article is meant to provide a brief introduction to the fundamental concepts of cloud computing, including its key components and benefits.

## INTRODUCTION

Cloud computing and its associated technologies have begun to shape and define new aspects in the computer science and information technology fields. The need for flexible and scalable computing resources has been growing rapidly, and in the past decade, cloud computing has emerged as a viable solution.

While there are still debates about the best ways to use cloud technology and its potential risks, one thing is certain: it has brought something revolutionary to the world, and it is up to the users to decide how to leverage it.

Some will take advantage of cloud computing to develop their own applications for solving various problems in society, while others will invest in cloud-based solutions or simply use cloud services to improve their business operations.



## ESSENTIALS -

Cloud computing is a digital technology designed to work as a flexible and scalable computing infrastructure that allows for the exchange of data and applications over a network that is not reliant on any central authority, such as a government or bank, to uphold or maintain it.

It is a decentralized system for processing and storing data, eliminating the need for traditional intermediaries, such as physical servers, when resources are being used between two entities. Individual data ownership records are stored in a digital ledger, which is a computerized database using strong cryptography to secure transaction records, control the creation of additional data, and verify the transfer of data.



Despite its name, cloud computing is not considered to be computing in the traditional sense, and while varying treatments have been applied to it, including classification as a service, platform, and infrastructure, cloud computing is generally viewed as a distinct technology class in practice. Some cloud schemes use validators to maintain the infrastructure. In a pay-as-you-go model, users pay for the computing resources they use on a per-use basis. Generally, these users get additional computing resources over time via network upgrades, software updates, or other such reward mechanisms. Cloud computing does not exist in physical form (like a computer or server) and is typically not controlled by a central authority. Cloud computing typically uses decentralized control as opposed to a centralized server model. When a cloud infrastructure is set up, it can be considered centralized if managed by a single provider. When implemented with decentralized control, each cloud infrastructure works through distributed technology, typically a network of interconnected servers, that serves as a public computing resource database. Traditional computing models, as well as technological factors, have modest exposures to cloud computing returns. The first mainstream cloud provider was Amazon Web Services, which was first released as a public service in 2006. As of March 2022, there were more than 100 cloud providers in the marketplace, of which more than 10 had a market share exceeding \$1 billion.



## CLOUD COMPUTING TECHNOLOGY

Cloud computing is a type of computing model that relies on a network of remote servers hosted on the internet to store, manage, and process data. It eliminates the need for local servers and physical storage devices. Cloud computing offers several advantages, including cost savings, scalability, and flexibility.

There are three main types of cloud computing: public, private, and hybrid. Public clouds are owned and operated by third-party providers, while private clouds are managed by the organization that uses them. Hybrid clouds combine elements of both public and private clouds. The key components of cloud computing are virtualization, software-defined networking, and automation. Virtualization enables multiple operating systems to run on a single physical machine, while software-defined networking allows for more flexible and efficient network management. Automation streamlines processes and reduces manual labor, making it easier to manage large-scale cloud infrastructure.

"There is no cloud it is just someone else's computer."



As more organizations migrate their data and applications to the cloud, ensuring the security of these resources has become a top priority. While cloud providers typically have robust security measures in place, customers still need to take steps to ensure the security of their data and applications. One of the key considerations for securing data and applications in the cloud is implementing strong access controls, which includes limiting access to only those who need it, using strong passwords or two-factor authentication, and regularly reviewing access logs to identify potential security risks. Another important step is encrypting sensitive data both in transit and at rest, which can help protect data from interception or theft, even if it falls into the wrong hands. In addition to access controls and encryption, organizations should also monitor for potential security breaches, including regularly reviewing logs and network traffic to identify potential threats.



Moving on to cloud computing, it is a model of providing on-demand access to shared computing resources over the internet. It enables users to access data, applications, and services from anywhere in the world, without the need for physical hardware. There are several benefits of cloud computing such as scalability, cost-effectiveness, flexibility, and increased efficiency. Cloud computing can be categorized into three main service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

Authors :

1. Ghotale Aniket (CO3Y)
2. Baile Pragati Mahadev (CO2Y)
3. Kamble Yashshree Anil (IF2Y)
4. Salgar Akanksha Madhav(IF2Y)



# INDUSTRIAL VISIT 2023-24



Visit at Operand Technologies & I T Solutions LLP, Latur







2023/10/05 11:07

Latur, India

♥ GB ♥

## Visit at INGenious Technohub Pvt Ltd., Latur



2023/10/05 11:46

Latur, India

♥ GB ♥



माझे बाबा

खिशात पैसे नसतानाही मागेल ते पुरवणार  
घरातल्यांना खाऊ घालून उपाशी ते बसणार

फाटलेला शर्ट आनंदाने घालणार  
मुलांना मात्र नवाच घेऊन देणार

दिवसभर थकलेले असतानाही खाऊ आणणारच घराकडे  
अशा बाबांची थोरवी गायला शब्द नाहित माझ्याकडे

शिक्षणाला लागणारा खर्च ते कष्टाने कमावतात  
माझी मुले यशस्वी झाली यातच ते आनंद शोधतात

मुलांच्या भविष्यासाठी त्यांनी केले रक्ताचे पाणी  
अशे बाबा माझ्या जिवनी हिच माझी पुण्याई

जिवनाचा आनंद त्यांनी शोधला मुलांमध्ये  
म्हणुनच तर बाबा श्रेष्ठ मानतात सर्व देवांमध्ये

कष्टाविना फळाची प्राप्ती होत नाही  
बाबांन शिवाय तर जिवनाच गणितच सुटत नाही

जिवनात आलेली दुःख ते घालवतात भागाकार करून  
आणि सुखाचा साठा करतात बेरीज करून

बाबांनवर लिहायला गेल तर कमी पडतील पान  
मुलांची झालेली किर्ती हाच त्यांच्यासाठी खरा सन्मान

म्हणुनच तर म्हणतात ना, आईविना घर अपूर्ण असत  
पण बाबांन शिवाय तर पुर्ण आयुष्यच अर्धवट असत

-Pranita Patil(COZY)