Volume10|Issue2

TESLATECH

CHANGE THE WORLD MIND

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

INSIDE

Strength

Mr. Ghule D.K.(HOD)

Ms. Landge P.P.(Lecturer)

Ms. Jokar S. J.(Lecturer)

Ms. Khalsode A.D.(Lecturer)

Ms. Jamale B. V.(Lecturer)

Ms. Udane A. B.(Lecturer)

Ms. Mujawar S.Y. (Lecturer)

Ms. Jadhav S.S.(Lecturer)

Mr. Shelar O.D.(Lab Ass.)

Ms. Sutkar P. B.(Lab Ass.)

15th August 2024

ABOUT OUR DEPARTMENT

We started our journey in the year of 2008.To produce highly qualified, well rounded and motivated diploma candidates who can meet new technical challenges, contribute effectively as team members and be innovators in Electronics & Telecommunication Engineering field. To pursue creative research and new technologies in Electronics & Telecommunication Engineering disciplines in order to serve the needs of industry, government, society and scientific community. To inculcate strong ethical values and responsibility towards society. This has been achieved by the collective and responsive effort of the faculty, the supporting staff and the students. Department of Electronics & Telecommunication Engineering is one of the latest branches of Engineering in modern era of technology.

Skill development program in our department is one of the most unique activities. Technical, professional, social, interpersonal aspects of student personality are some of the key attributes that are honored at our department. Excellent curricular, co-curricular, extra-curricular and extension activities are our performance indicators. The journey of student learning from fundamentals to advances in mechanical engineering at our department is accompanied by several value-added activities

Vision- Mission:-

VISION:-

- **To produce skill based technical manpower as per requirements of modern industry in the field of Electronics & Telecommunication Engineering**

MISSION:-

- **To Impart High quality technical skills to satisfy the needs of modern industries .**
- **To build a strong foundation to enable students to face challenges in the relevant field.**
- **To import moral ethical and social values to bring out responsible humans.**

Message From HOD :-

Message from the Head of Department

It brings me immense joy & pleasure to introduce the Second edition of the academic year 2024-2025 departmental newsletter TESLATECH. The newsletter invites a wider readership in the Institution. My heartfelt congratulations to the editorial team. The Odd semester of 2024-25 has been full of exciting activities for the students,and staff in the Department Electronics &Telecommunication Engineering at B.M.Polytechnic Solapur.

Mr. Ghule D.K.

HOD

Memorandum of Understanding:

Wehave signed the MOU with following industries:

- ***PMS Robotics***
- ***Shams Energy***
- ***Siddhanath sugar Mills***

Our Department had signed an MOU with the above -mentioned Industries for the effective implementation of the curriculum. Activities are conducted such as Guest Lecture, Industrial Visit and Industrial Training at respective Industries.

Expert Lecture

The department has conducted the Expert Lecture program under the Experts from various Industries for 3rd and 5th semester students. Which imparted the required skill set to efficiently increase the employability and about social oriented preparation of the students.

1. PROGRAMMABLE CONTROLLER

BY PITAMBAR BHOSALE (INSTRUMENT ENGINEER) SIDDHANATH SUGAR MILL,TIRHE

2. DIGITAL COMMUNICATION:-

ARVIND MANE (ASSISTANT ENGINEER) AKASHVANI SOLAPUR

3. **PROJECT REPORT & PRESENTATION**

BY SHIVANI WAIKAR(SENIOR TECHNICAL WRITER)ODESSA TECHNOLOGIES,PUNE

Industrial Visit :

1. Industrial Visit of Second and Third Year Students conducted at **Siddhanath Sugar Mills, Tirhe,Solapur**

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Department of Electronics & Telecommunication Engineering,

2.Industrial Visit of Second and Third Year Students conducted at **Sathe Industry ,Bale Solapur**

Students are familiar with the electronic equipment like Transformer, Inverters, high power supply

The various processes involved for making of transformer like winding, lamination e**tc**

Electric Vehicle :-

Prof. Jokar S.J.

I. INTRODUCTION :-

Electric vehicles (EVs) use electricity as their primary fuel or to improve the effciency of conventional vehicle designs. EVs include all-electric vehicles, also referred to as battery electric vehicles (BEVs), and plug-in hybrid electric vehicles (PHEVs). In colloquial references, these vehicles are called electric cars, or simply EVs, even though some of these vehicles still use liquid fuels in conjunction with electricity. EVs Other types of electric-drive vehicles not covered here include hybrid electric vehicles, which are powered by a conventional engine and an electric motor that uses energy stored in a battery that is charged by regenerative braking, not by plugging in, and fuel cell electric vehicles, which use a propulsion system similar to electric vehicles, where energy stored as hydrogen is converted to electricity by the fuel cell. All-Electric Vehicles All-electric vehicles do not have conventional engines but are driven solely by one or more electric motors powered by energy stored in batteries. The batteries are charged by plugging the vehicle into an electric power source and can also be charged through regenerative braking. All-electric vehicles produce no tailpipe emissions, although there are “life cycle” emissions associated with the electricity production. All-electric vehicles typically have shorter driving ranges per charge than conventional vehicles have per tank of gasoline. Most new BEVs are designed to travel between 110 and over 300 miles on a fully charged battery, depending on the model. For context, 90% of all U.S. household trips cover less than 100 miles.1 An all-electric vehicle’s range varies according to driving conditions and driving habits. Extreme temperatures tend to reduce range because energy from the battery powers climate control systems in addition to powering the motor. Speeding, aggressive driving, and heavy loads can also reduce range.

Plug-In Hybrid Electric Vehicles:- PHEVs use batteries to power an electric motor and use another fuel, such as gasoline, to power a conventional engine. The batteries are typically charged by

plugging the PHEV into an electric power source, although they can also be charged by the conventional engine and through regenerative braking. PHEVs have an all-electric driving range of about 15 to 60+ miles, depending on the model. As long as the battery is charged, a PHEV can draw most of its power from electricity for typical daily driving. The engine will then power on when the battery is mostly depleted, during rapid acceleration, at high speeds, or when intensive heating or air conditioning is required. When running on battery power alone, PHEVs produce no tailpipe emissions. Even when the conventional engine is running, PHEVs typically consume less gasoline and produce fewer emissions than similar conventional vehicles.

How Much Do the Vehicles Cost? EVs are generally more expensive than their conventional counterparts. However, lower fueling and maintenance costs can make them a competitive option. For example, electric drivetrains are more efficient, making BEVs (and PHEVs operating in electric mode) more than three times as efficient. Electricity is also less expensive than gasoline or diesel on an energy-equivalent basis.

IMPORTANCE OF ROBOTIC TECHNOLOGY IN DIFFERENT FIELDS

Prof.Khalsode A.D.

Introduction

- Although robotics as science was only developed in the twentieth century, the history of robots and humans invented automation has a considerably longer history. Indeed, the ancient Greek engineer Hero of Alexandria wrote two works, Pneumatica and Automata, which attest to the existence of hundreds of various types of "wonder" devices capable of automatic movement. Of course, the evolution of robots in recent years has been fascinating. Then what was the origin of the term "robot"? In his 1941, fiction story "Liar!" by science fiction novelist Isaac Asimov unknowingly came up with the term robotics. Science

fiction authors have been fascinated by man's potential to create self-motivating machines and lifeforms. A robot is essentially a reprogrammable mechanism capable of movement in the execution of a task. Robots have unique code that distinguishes them from other machines and machine tools, such as CNC. Due to their sturdy resistance capabilities and precision function, robots have found applications in a wide range of industries. Simple automatons were created by the ancient Greeks and Romans for use as tools, toys, and in religious ceremonies. Predating modern industrial robots, the Greek God Hephaestus was said to have developed automatons to serve him in a workshop. Regrettably, none of the early automatons survive. Automatons were common in the Middle Ages in both Europe and the Middle East as elements of clocks and religious events. Al-Jazari (1136- 1206), an Arab polymath, left manuscripts detailing and demonstrating his mechanical gadgets, which included a huge elephant clock that moved and sounded at the hour, a musical robot band, and a waitress automaton that served drinks. Many additional automata depicting moving animals and humanoid figures that ran on simple cam systems were built, but by the 18th century, automata had become well understood and technology had improved to the point where much more intricate pieces could be built. The first successful biomechanical automaton, a human figure playing the flute, is credited to French engineer Jacques de Vaucanson. With the arrival of the Roomba robotic cleaner in 2003, robots started working in households. By 2009, autonomous industrial vehicles were well on their way, and robotic arms were becoming mobile in the industrial area by the turn of the decade. Collaborative robots, or COBOTS, were established in 2013, and they are intended to operate with humans. AMRs, or Autonomous Mobile Robots, were working in warehouses by the following year. Omron Electronics purchased Adept Technologies in 2015, a firm with origins in Unimation, the first robot manufacturer. Throughout the rest of the decade, similar large purchases would occur. Robots have found a home in a variety of fields during the previous half-century, involving toys and entertainment, military weaponry, search and rescue aids, and a variety of other roles. Essentially, as programming and technology advance, robots will be able to perform many tasks that were previously too dangerous, monotonous, or difficult for people to complete

- **II**. **CLASSIFICATION OF ROBOTS:-**Based on the degree of movement, there are two basic categories of robots: Fixed – robots do not move with respect to specific aspects of their surroundings. Mobile - Robots can move about their surroundings utilizing a variety of locomotion techniques. Fixed robots are ones that are fixed to a point and execute tasks with manipulators such as arms. Fixed robots are used in manufacturing, where they are employed for a number of functions including spray painting, welding, assembling, and quality check.Mobile robots are becoming increasingly widespread. Robotics and computer science engineering are commonly regarded to be subfields of mobile robotics. Mobile robots could move from one location to other using wheels, legs, or crawling. Mobile robots transfer items from

one location to another in hospitals and warehouses. Robotics research is an interdisciplinary field that includes sensors, remote controllers, and automation.

COMPONENTS OF A ROBOT

- A robot is composed of following main elements or components:
- Control System
- Power Supply
- Arm
- Actuators
- End Effectors
- Sensor

1.**CONTROL SYSTEM :-** Humans and other creatures, at their most basic level, rely on a concept known as feedback to live. Humans are aware of their surroundings and react appropriately. The control system of a robot employs feedback in the same way that the human brain does. A robot's brain, on the other hand, is made up of a silicon chip called a central processing unit, or CPU, which is comparable to the chip that operates your computer. Based on data from our five senses, our brains decide what to do and how to react to the world. The CPU of a robot accomplishes the same thing, using data acquired by sensors.

2. POWER SUPPLY :- Power is required for a robot to function. Food is the source of energy for humans. Our cells break down and transform the food we eat into energy after we eat it. The majority of robots are powered by electricity. Stationary robotic arms, such as those used in auto plants, maybe plugged in just like any other device. Batteries are commonly used to power robots that move around. Solar electricity is frequently collected by our robotic space probes and satellites.

3. ARM :- A robot's arm is a key component of its robotic architecture. The majority of robotic arms have fingers, wrists, and elbows, just like human hands. The arms are controlled by a servo motor. A serial robot arm is made up of a series of links that are moved by joints controlled by motors. An end-effector, often known as a robot hand, can be connected to the chain's end. Robot arms, like other robotic devices, are usually characterized by the number of degrees of freedom they have.

4. ACTUATORS :- A device must have a body that can move in response to inputs from its sensors to be designated a robot. Metal, plastic, and other comparable materials are used to construct robot bodies. Actuators, which are miniature motors, are found inside these bodies. To move sections of the robot's body, actuators imitate the motion of the human muscle. The most basic robots are just an arm with a tool attached for a specific purpose. Robots with more sophisticated capabilities may be able to move about on wheels or treads. Humanoid robots have arms and legs that move in the same way as humans do.

5. END EFFECTORS :- Robots are connected with end effectors, which allow them to interact with their surroundings and complete tasks. These differ depending on the tasks that the robot was created to perform. Paint sprayers and welding torches, for example, are interchangeable equipment for robotic manufacturing employees. Universal grippers, which imitate the function of the human hand, are commonly seen on mobile robots such as probes sent to distant planets or bomb disposal robots.

6. SENSORS :- The sensors function as a converter, converting a physical quantity into a signal that can be interpreted by an observer. Vision sensors (camera), touch and proximity sensors, line sensors, temperature sensors, light sensors, and sound sensors are all utilized in robots. Sensors that replicate human senses, such as video cameras or light-dependent resistors that act as eyes or microphones that behave as ears, provide input to robots. Touch, taste, and smell are all senses that some robots have.

Role Of electronics and Communication Engineering (ECE) in Technological

Prof. Udane A,B.

Introduction

Electronic and communications engineering is the utilization of science and math applied to practical problems in the field of communications. Can we imagine our daily life without mobile phone, laptop (computer), television, tablets, digital watch, internet banking, ATM cards, Wi-Fi, internet connection, microwave Owen and many more gadgets and communication systems. No, we cannot. All these are possible due to Electronics & Communication Engineering (ECE). As we look into future, robots will also be part of our lives very soon and embedded electronics which is a sub branch of electronics play an important role in this. All of this makes ECE an interesting field to study and work.[1] ECE: Electronics & Communication Engineering deals with the electronic devices, circuits, communication equipments like transmitter, receiver, integrated circuits (IC). It also deals with basic electronics, analog and digital

transmission & reception of data, voice and video (Example AM, FM, DTH), microprocessors, satellite communication, microwave engineering, antennae and wave progression Intoduction:

I. **Scope**: The Scope is very wide open because the world is moving in the field of technology and developments. 1. It has scope in almost every industry like oil, energy, agriculture as every industry and so many other important sectors of economy deal with electronics and computers. 2. Defense, space and other organizations, which undertake research on a large scale basis, employ electronics engineers in developing and designing systems and devices for telecommunication and signal processing. 3. Scope of ECE in various Specializations like VLSI Design, Embedded System, Communication Engineering, Signals and System, Microwave Communications etc.,

II. **ECE plays a vital role in Technology Revolution**: ECEis one of the largest and fastest growing fields of engineering. The present Global Technology revolution is changing the world and is offering challenging opportunities to specifically Engineers. ECE is a subfield of core Electrical Engineering. graduate level.

III. The basic aim of ECE: The basic aim is to produce products that are smaller, smarter and multi-functional.The ability of electronic devices to act as switches makes digital information processing possible It covers a wide range of applications which make our life easier and enjoyable such as Television, Radio, computers, telecommunication etc.When Alexander Graham Bell invented the telephone and Marconi developed the radio in 19th century, no one dreamt that these two distinct technologies together would create another wonderful product that is Cell Phone which is now part of everybody's life. In 1969, Ted Hoff conceived the commercial microprocessor at Intel and thus the development of the personal computer was made.

IV Application Of ECE:-

Electronics has made tremendous advancement during last few decades and our day to day life involves the use of electronic devices.This can be proved with the following application of electronics:

- Wireless Communication
- Smart Phones
- Bluetooth
- General Packet Radio Service (GPRS)
- Wi-Fi
- Laser Communications

Student Artical:-

What is cloud computing?

Ms. Laxmi Jadhav

EJ5I

WHAT IS CLOUD COMPUTING ?

- The cloud computing model offers customers greater flexibility and scalability compared to traditional on-premises infrastructure.Cloud computing plays a pivotal role in our everyday lives, whether accessing a cloud application like Google Gmail, streaming a movie on Netflix or playing a cloud-hosted video game.Cloud computing has also become indispensable in business settings, from small startups to global enterprises. Its many business applications include enabling remote work by making data and applications accessible from anywhere, creating the framework for seamless omnichannel customer engagement and providing the vast computing power and other resources needed to take advantage of cutting-edge technologies like generative AI and quantum computing.Compared to traditional on-premises IT that involves a company owning and maintaining physical data centers and servers to access computing power, data storage and other resources (and depending on the cloud services you select) When adopting cloud computing architecture, there is no one-size-fits-all. What works for another company may not suit you and your business needs. In fact, this flexibility and versatility is one of the hallmarks of cloud, allowing enterprises to quickly adapt to changing markets or metrics.
- **Cloud computing offers many benefits,including the following:**

Cost-effectiveness

Cloud computing lets you offload some or all of the expense and effort of purchasing, installing,

configuring and managing mainframe computers and other on-premises infrastructure. You pay only for cloud-based infrastructure and other computing resources as you use them.

Increased speed and agility

With cloud computing, your organization can use enterprise applications in minutes instead of waiting weeks or months for IT to respond to a request, purchase and configure supporting hardware and install software. This feature empowers users—specifically DevOps and other development teams—to help leverage cloud- based software and support infrastructure.

Unlimited scalability

Cloud computing provides elasticity and self-service provisioning, so instead of purchasing excess capacity that sits unused during slow periods, you can scale capacity up and down in response to spikes and dips in traffic. You can also use your cloud provider's global network to spread your applications closer to users worldwide.

Enhanced strategic value

Cloud computing enables organizations to use various technologies and the most up-to- date innovations to gain a competitive edge. For instance, in retail, banking and other customer-facing industries, generative AI-powered virtual assistants deployed over the cloud can deliver better customer response time and free up teams to focus on higher- level work. In manufacturing, teams can collaborate and use cloud-based software to monitor real-time data across logistics and supply chain processes.

Cloud security

Traditionally, security concerns have been the primary obstacle for organizations considering cloud services, mainly public cloud services. Maintaining cloud security demands different procedures and employee skill sets than in legacy IT environments.

Some cloud security best practices include the following:

- Shared responsibility for security:
- Data encryption
- Collaborative management
- Security and compliance monitoring

Types of cloud computing deployment models

1. Public cloud
    - Public cloud are run by third-party cloud service providers. They offer compute, storage, and network resources over the internet, enabling companies to access shared on-demand resources based on their unique requirements and business goals.

2. Private cloud
    - Private cloud are built, managed, and owned by a single organization and privately hosted in their own data centers, commonly known as “on-premises” or “on-prem.” They provide greater control, security, and management of data while still enabling internal users to benefit from a shared pool of compute, storage, and network resources.
3. Hybrid cloud

- Hybrid cloud combine public and private cloud models, allowing companies to leverage public cloud services and maintain the security and compliance capabilities commonly found in private cloud architectures.

- **What are the types of cloud computing services?**

- There are three main types of cloud computing service models that you can select based on the level of control, flexibility, and management your business needs:

- **Infrastructure as a service (IaaS)**

- Infrastructure as a service (IaaS) offers on-demand access to IT infrastructure services, including compute, storage, networking, and virtualization. It provides the highest level of control over your IT resources and most closely resembles traditional on-premises IT resources.

- **Platform as a service (PaaS)**

- Platform as a service (PaaS) offers all the hardware and software resources needed for cloud application development. With PaaS, companies can focus fully on application development without the burden of managing and maintaining the underlying infrastructure.

- **Software as a service (SaaS)**

- Software as a service (SaaS) delivers a full application stack as a service, from underlying infrastructure to maintenance and updates to the app software itself. A SaaS solution is often an end-user application, where both the service and the infrastructure is managed and maintained by the cloud service provider.

Quantum Computing

Mr. Krishna Chavan

EJ5I

A quantum computing chip serves as the processor for quantum computers. These quantum computing chips contain quantum bits, or “qubits" — quantum’s key advantage over classical computing.

History :-While the concept of quantum computing was introduced in 1959, the industry is in its infancy. The 21st century has brought on many vital advancements for quantum computing, but a major hurdle will continue to be commercially-scalable quantum computing. Quantum computing technologies have the potential to reshape some of the biggest industries in the world, but only if the scaling process continues to advance.

Modern trends :-In 2024, businesses will leverage quantum sensor tools and applications for environmental monitoring, medical diagnostics, and mineral exploration to gather actionable insights and make informed decisions based on highly accurate data.

Implications of Quantum Computing:-

The implications of quantum computing are far-reaching and have the potential to revolutionize many industries. For example, quantum computing could help improve security by facilitating the development of codes that are impossible to hack. Quantum computing can also speed up artificial intelligence, more effectively analyze large datasets, and make more accurate weather predictions.Quantum computing can also have a significant impact on the medical field, such as providing faster ways to search through genetic sequences to find potential treatments for diseases. Finally, quantum computers could enable scientists to simulate complex quantum systems in real-time, leading to accelerated discoveries in chemistry and physics.How Are Companies Already Using Quantum Computing?

Quantum computing continues to make strides forward with advancements in technology and research. Recent breakthroughs have made it possible for quantum computers to process data more quickly and efficiently than ever before, allowing them to tackle problems that were previously too complex or time-consuming to solve.Companies like Google, Microsoft, and IBM are investing heavily in quantum computing research, finding new ways to leverage this powerful tool for both theoretical and practical applications.

What is the Difference between Quantum Computing and Classical Computing?

- The main difference between classical and quantum computing is that while conventional computers only use 0s and 1s, quantum computers employ qubits. This means that they can perform many calculations at once since qubits can represent both 0s and 1s simultaneously. Furthermore, qubits make quantum computers more reliable for complex applications like AI because they are not prone to the same errors as classical computers. This makes them more suitable for use in artificial intelligence applications.
- Quantum computing is intended to support and enhance the capabilities of classical computing. Quantum computers are expected to complement, rather than replace, classical computers by supporting their specialized functions, such as system boosts. They are designed to perform tasks much more accurately and efficiently than classical computers, giving developers a new tool for specific applications.

The Positive Impact of Quantum Computing on Artificial Intelligence

1. Data can be processed faster by quantum computers than by conventional computers. In other words, AI systems will be able to learn and improve faster. If quantum entanglement is utilized, algorithms may also be able to exploit correlations between variables more easily.
2. Quantum computers can handle complex optimization problems that traditional computers cannot handle, making AI algorithms run better. This could lead to artificial intelligence that is more powerful and intelligent than anything we have ever seen since quantum computing does not follow classical physics laws.
3. Many AI applications, such as planning and scheduling, can benefit from quantum computing because it helps explore viable solutions to problems.
4. AI architectures can be developed more efficiently and at a larger scale using quantum computers.
5. There are certain calculations that quantum computers can perform that traditional computers cannot solve, leading to the development of new AI algorithms. For example, Shor's algorithm can be used to factor large numbers, and quantum computers can simulate quantum systems more efficiently than classical computers.
6. By using quantum annealing, problems that cannot be solved classically can be solved using quantum computers. The use of quantum computers can verify the results of AI algorithms to ensure that they are correct and error-free.
7. In quantum computers, AI systems can learn faster and be better prepared for real-world situations by creating powerful simulation environments. Quantum computers, for example, do not forget things catastrophically like classical neural networks do. Because of this, they are better at lifelong learning since they can learn new things without forgetting how to do old things.

EJ Department "STAR"

FIRST YEAR :

MR. SHUBHAM BHAVI	*MS. AKANKSHA PASKANTI*	*MR.SUYASH YADAV*
		
First Rank	*Second Rank*	*Third Rank*
80.54 %	*79.45 %*	*76.54 %*

SECOND YEAR :

MS.LAXMI JADHAV	*MR. KRISHNA CHAVAN*	*MS.SRUSHTI GUND*
		
First Rank	*Second Rank*	*Third Rank*
89.84 %	*87.72 %*	*83.5 %*

THIRD YEAR:

MS. NISHA PAWAR	*MS. NITA PAWAR*	*MR. SHUBHAM MALAV*
		
First Rank	*Second Rank*	*Third Rank*
90.18 %	*88.82 %*	*79.18 %*

Editorial

On the occasion of 78th Independence Day it gives us a great pleasure to present the third edition of Academic Year 2024-2025 of our departmental newsletter TESLA TECH to you which gives us the opportunity to put forth the achievements of our department. In this issue, we have covered different activities carried out at the Department of Electronics & Telecommunication Engineering. We are thankful to all the faculties & students who have contributed to this newsletter. All the events conducted throughout the year were perfectly planned & executed & the overwhelming response it received said it all! I am grateful for all the support “TESLA TECH” has received throughout the year in every possible way from the faculties & Students. I hope the readers of the newsletter have a wonderful reading experience & wish this year's edition to receive your love.

Prof.Khalsode A.D.