GEETHANJALI INSTITUTE OF SCINCE AND TECHNOLOGY

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NAAC A+

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ELE-TIMES

Creative Tech magazine of the year 2021-2022

Volume I

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VISION:-

To become a reputed learning center producing competent professionals

MISSION:-

1. Provide Quality education through interactive teaching learning practices.
2. Establish Technology-enabled environment for core competencies including robotics.
3. Arrange Industry-Interaction to hone professional skills.
4. Organize activities to foster social skills and ethical values.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) :-

Graduates of B.Tech in Electronics and Communication Programme shall be able to ..

PEO 1:
- Professional Skills: Apply Engineering concepts to solve Electronics and Communication Engineering problems of social relevance.

PEO 2:
- Software Knowledge: Design and develop Electronic devices and Systems for Industry or pursue research

POE 3:
Lifelong Learning: Demonstrate competencies through continuous learning and adapt to multidisciplinary environment.

POE 4:
Engineering citizenship: Practice professional values and contribute the societal needs.

PROGRAM SPECIFIC OUTCOMES (PSOs):-

At the time of graduation, the student of B.Tech in Electronics and Communication Engineering Programme shall be able to

PSO1:

Professional skills: Apply principles of Analog and Digital Electronics, Communication Systems, Image processing, VLSI and Embedded Systems to solve diverse problems.

PSO2:

Software Knowledge: Develop solutions for complex engineering problems of social relevance by employing Xilinx, CC Studio, Micro Wind, Keil, NG Spice, Scilab tools.

ABOUT THE DEPARTMENT:-

Department of Electronics and Communication Engineering (ECE) was established in the year 2008 and offers an under graduate program in ECE, with an initial intake of 60, and progressively increased to 180 by the year 2012. To accomplish the mission and vision of the Department, it has adequate infrastructural support with well equipped laboratories.

The Department aims at imparting the students with the latest technologies through NPTEL, Webinars, Spoken tutorials, Workshops and internships The Department also employs training programs such as ‘College to Corporate’ (C2C), International Institute of Entrepreneurship (i2E) .

The Department of ECE has membership in professional societies like IEEE and IETE. Adequate encouragement and technical scaffolding are extended to the students to participate and excel in the national Level challenges.

Program Outcomes

On successful completion of the Program, the graduates of B.Tech. (ECE) Program will be

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, andsynthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, andmodern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge toassess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, andneed for sustainable development
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities andnorms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member orleader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with theengineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and giveand receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engagein independent and life-long learning in the broadest context of technological change.

Head of the department

The Department of Electronics and Communication Engineering is committed to render-quality and professional pedagogy to pioneering engineers. The Department magazine exemplifies the voyage transverse and exhibits the technical skills of our students. Congratulations to the editorial team for their determined efforts in bringing out this edition of technical magazine. I am proud to see that the students of our department have put in appreciable effort into creating the magazine. It is good to see that today's generation has not lost its literary roots, despite the perpetual efforts of e-Technology to extinguish the flames of the written word. This e-magazine is an exceptional proof that the literary flame is burning bright. I look forward to seeing the juniors taking up the reigns of this e- magazine in future, so that this tradition remains eternal.

Dr. Mahaboob Basha

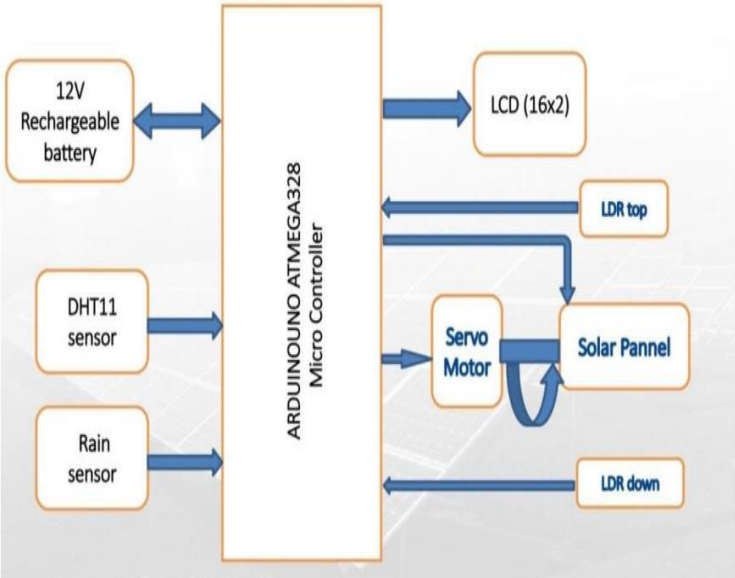
Professor, HOD of ECE

Telecommunication

Weather Tracking System

Solar power is the fastest growing means of renewable energy. The project is designed and implemented using simple dual axis solar tracker system. In order to maximize energy generation from sun, it is necessary to introduce solar tracking systems into solar power systems. A dual-axis tracker can increase energy by tracking sun rays from switching solar panel in various directions. This solar panel can rotate in all directions by using the combination of horizontal and vertical rotation. This dual axis solar tracker project can also be used to sense weather, and it will be displayed on LCD. It also shows the data and store it in a Smartphone by using Blynk app for monitoring weather. This system is powered by Arduino, consists of two servo motors, rain drop sensor, temperature sensor, humidity sensor, LCD and software used are Arduino IDE and Blynk app. Solar energy is one of the most effective resources of the renewable energy which could play a significant role to solve this crisis.

This research presents a performance analysis of dual axis solar tracking system using Arduino. The use of solar energy is increasing rapidly in the present scenario due to its environmental friendliness and abundance.



KALIKI SAI KRISHNA
(192U1A0459)
IV ECE- B

Touchless Touch Screen Technology

Touchless Touchscreen is technology that uses gesturing as form of input. It has no need of touching screen. This technology is high-end technology, that uses hand waves and hand flicks. Objective behind building such technology is making it even more comfortable and convenient for users to use their devices. It does not need touching of screen rather system detects hand movements in front of it by making use of various sensors.

This technology looks visually fascinating and is depicted in various Sci-fi movies such as Minority Report and Matrix Revolutions. The touchless touchscreen technology is divided into following parts for its working.

1.Movement detection

2. Optical pattern recognition

3. Motion pattern interruption

4. Screen pointing

Touchless touch screen technology

POKURU ARUN KUMAR
(202U1A04C1)
II ECE- B

Latest Technologies In Embedded Systems And Applications

Embedded Systems

Explosive growth of wireless connections: Unlocking the ubiquitous IoT era

The advent of 5G technology, with transmission speeds reaching up to 20 Gbps, and the future promise of 6G technology, even faster, further propel the expansion of wireless connectivity.

Furthermore, the availability of low-power wide-area networks (LPWANs) and a plethora of chips and devices from renowned suppliers like Digi, MultiTech, NimbeLink, Sequans, Elektronik, and Telit, fuels the accelerating growth of wireless connections. With such advancements, the IoT is poised to permeate every facet of our lives.

Paving the way for unprecedented computing speed: The rise of multicore processors and quantum computing

Multicore processors have revolutionized computing performance by allocating dedicated cores to handle specific computational tasks, such as graphics processing. While 8- or 16-core processors are widely recognized, industry giants like Intel and AMD have recently pushed the boundaries with 128-core processors.

Escalating cybersecurity landscape: The battle between cyber attacks and countermeasures intensifies

The race between cyberattacks and countermeasures is heating up, and the stakes have never been higher. The projected growth in cybersecurity revenues indicates the increasing emphasis on safeguarding digital environments. As organizations invest in fortified cybersecurity measures, extending these advancements to women security system using embedded systems is essential. By integrating embedded systems, these systems can adapt to evolving threats, empower women with comprehensive security solutions, and provide a greater sense of safety in an increasingly connected world.

•Unleashing the potential: Artificial intelligence integration in embedded systems

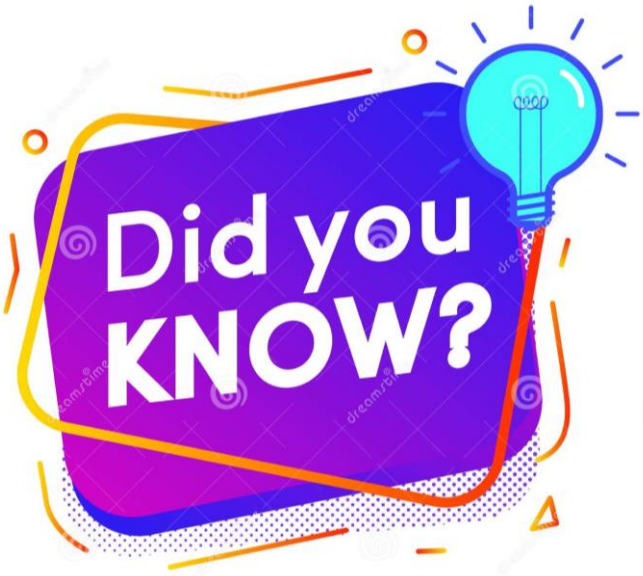
When exploring the latest technology in embedded systems, it is impossible to overlook the remarkable significance of artificial intelligence (AI). Embedded systems now boast microcontrollers equipped with powerful peripherals that accelerate calculations and facilitate the implementation of neural networks. As a result, AI has become an integral part of the product portfolio for numerous embedded systems.

A wide array of libraries and tools have emerged to support and expedite the development of AI solutions. These resources aid in implementing, learning, and testing AI-based solutions, enabling developers to harness the full potential of artificial intelligence. With these comprehensive tools, professionals can seamlessly work on AI projects, pushing the boundaries of innovation in embedded systems.

Conclusion

In an ever-evolving global economy, investments in the embedded systems domain persist, driving the development of innovative and efficient solutions to cater to emerging trends. To thrive in the competitive embedded systems market, companies and individuals must foster a culture of constant development and innovation, exploring new ideas and approaches to deliver fast, efficient, low-power, and cost-efficient solutions to consumers. Meeting the demands of cybersecurity, AI integration, and complex processors requires heightened expertise in providing these cutting-edge solutions. Consequently, the need for experts is on the rise.

SHAIK ANWAR BABU
(192U1A04D7)
III ECE- C



1. There is no letter ‘J’ in the periodic table. Why this is, no one’s sure.

2. The entire population of planet Earth could fit inside the boundaries of Los Angeles!

3. Experts at NASA believe there are between 100 and 400 billion stars in our Milky Way, which is a far smaller number than that of the estimated number of trees on earth! That figure is calculated to be around 3.04 trillion!

4. Placed in contact with water, some metals are known to explode!

5. Blushing is an automatic sensory reaction only experienced by humans.

6. Believe it or not, Hawaii is gradually moving closer and closer towards Alaska. This is thanks to tectonic plates! It technically moves approximately 7.5cm every year.

Who invented electricity, and in which year?

Electricity, being a natural phenomenon, was discovered rather than invented by the work of many great minds throughout history. Philosophers like Pliny the Elder conducted Early work on electric fish in ancient Greece and Rome.

But it wouldn't be until the 1600s and 1700s that it was studied scientifically. The first person to coin the term "electricity" was a British scientist, William Gilbert, who studied the effects of electricity and magnetism on amber.

The word electricity is derived from Gilbert's new Latin, *electricus*, meaning "of amber" or "like amber." But some of the most important work was conducted by Benjamin Franklin in the 18th Century. Further work by Volta, Faraday, Ohm, and many more great scientists furthered our understanding of the phenomena and enabled us to harness and use it today.

Here are 9 of the most important and exciting electrical inventions ever. This list is clearly in no particular order and is far from exhaustive.

1. The humble lightbulb was revolutionary

The invention of the lightbulb was one of the most significant developments in human history. Almost overnight, it enabled societies worldwide to extend the length of a working day and practically "banished the night."

2. The Internet has changed the world forever

The origins of the internet date back to the 1960s. Over the following decades, slow but essential advancements were made, culminating in the groundbreaking work of Tim Berners-Lee in the late 1980s.

Today it has grown to be practically all-encompassing, creating new industries and allowing people to connect and work anywhere in the world with an internet connection.

3. The alternating current changed everything

Alternating current, or AC, was another of the most important **electrical inventions** ever. Discovered by Nikola Tesla, AC was to prove revolutionary for generating and using electricity.

4. MP3 players changed how we all listen to music

MP3 players changed how millions of people would listen to music and other audio forever. Their development would, practically overnight, spell the end of older media forms like cassette tapes and CDs.

5. Transistors are vital for modern life

"Transistors changed the face of technology across the planet – without them, we'd have no computers, no smartphones, and only very basic communications

6. Global Positioning Systems were revolutionary

Today GPS is a common feature of modern car dashboards and smartphones, so much so that many people worldwide have long since ditched their trusted paper maps of yesteryear.

7. Digital cameras are another important invention

The concept of "filmless cameras" is nothing new, with early developments being made in the 1960s. But by 1975, one of the first electronic "digital" cameras was developed by Eastman Kodak's Steven Sasson.

Today most new cameras are digital, and almost every smartphone has at least one as standard.

8. Electric Cars were groundbreaking

you might be surprised to hear that electric cars have a reasonably long history. Some of the earliest models were developed in the late 1880s, but the development of internal combustion-engined alternatives soon foreshadowed them.

9. The electric motor changed many industries forever

By converting electrical energy into mechanical energy, electric motors have changed the face of many industries forever.

The electric motor proved so effective that it almost single-handedly replaced steam engines from factories and other major industries.

CHEDELLA MAHITHA
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IV ECE- A

ULTRACAPACITORS

An ultracapacitor, also called a supercapacitor, is a high-capacity capacitor that can store and release energy very quickly and effectively123. It has a much higher capacitance value than other capacitors, but with lower voltage limits1. It uses a liquid or wet electrolyte between two porous electrodes made of activated carbon45. It can accept and deliver charge much faster than batteries, and tolerates many more charge and discharge cycles12. It can be used in parallel or series with batteries or other energy sources to extend their life or provide high power bursts

Where Ultracapacitors Work

Harvest power from regenerative braking systems and release power to help hybrid buses accelerate.

Reliably crank semi-trucks in cold weather or when batteries are drained from repetitive starting or in-cab electric loads.

Provide cranking power and voltage stabilization in start/stop systems, backup and peak power for key automotive applications – and serve as energy storage in regenerative braking systems.

Used in blade pitch systems and to help increase reliability and stability to the energy grid.

Capture energy and provide burst power to assist in lifting operations.

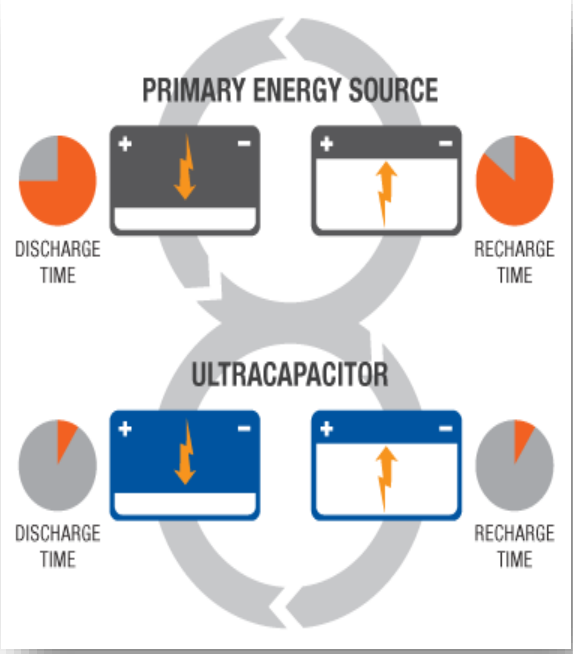
Provide energy to data centers between power failures and initiation of backup power systems, such as diesel

Provide energy storage for firming the output of renewable installations and increasing grid stability.

How Ultracapacitors Work

PRIMARY ENERGY SOURCES like internal combustion engines, fuel cells and batteries work well as a continuous source of low power. However, they cannot efficiently handle peak power demands or recapture energy in today's applications because they discharge and recharge slowly.

ULTRACAPACITORS deliver quick bursts of energy during peak power demands, then quickly store energy and capture excess power that is otherwise lost. They efficiently complement a primary energy source in today's applications because they discharge and recharge quickly.



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II ECE- A

Vehicle-to-grid(V2G)

The concept of Grid to Vehicle (G2V) includes the smart charging schedule which controls the charging rate of battery for EVs (increased or decreased) when needed. It is the unidirectional power flow between the grid and EV. The realization of Grid to Vehicle is inexpensive as it includes the simple controller to manage the charge rate. The average personal vehicles on the road are only about 4-5% of the day, which means most of the day the vehicles are parked. In order to plan a scheme for a proper dispatch of power, the grid operator needs to rely that sufficient vehicles are parked and can be connected at any time during the day. G2V can provide auxiliary services to the grid such as spinning reserve and power grid control. This improves the flexibility of the power grid operations. The flexibility of the power grid operation is significantly improved due to these auxiliary services. One of the prime requirements of the implementation of grid to vehicle is having an energy trading polices set up between the EV lenders and the power utility. In order to encourage the participation of the customers, this trading process should ensure the income for EV owners when they charge their EV during off peak hours and reduces the charges during peak hours. Additionally, overloading of the power utility can be avoided during the peak hours. Therefore, G2V implementation achieves maximization of profits by optimizing the operation of the system. However, these services are limited by the ability to provide ancillary services to power the grid. Functions such as peak load shaving, reactive power support, voltage and frequency control are the services which can only be possible to achieve with V2G. The diagram of Grid to vehicle is shown in the Fig.1

The brain can power a light bulb.

Vehicle-to-grid (V2G) is a technology that enables energy to be pushed back to the power grid from the battery of an electric vehicle (EV) 12. With V2G technology, an EV battery can be discharged based on different signals — such as energy production or consumption nearby. V2G technology powers bi-directional charging, which makes it possible to charge the EV battery and take the energy stored in the car's battery and push it back to the power grid 1. While bi-directional charging and V2G are often used synonymously, there is a slight difference between the two. While bi-directional charging means two-way charging (charging and discharging), V2G technology only enables the flow of the energy from the car's battery back to the grid

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Geethanjali Institute of Science and Technology

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