THE ELECOMM

A Quarterly Newsletter

Department of Electronics & Communication Engg, Echelon Institute of Technology, Faridabad

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INSTITUTE VISION AND MISSION

Vision:

The institute is committed to fulfilling its vision of- "Technical and Management leaders engaged in the evolution of life, being at the frontiers of the continuous technological and administrative breakthroughs, inspired by ongoing exploration of self, society, and nature through self-reflective consciousness by building a culture of inspiration, exploration and growth."

Mission:

- M-1 Having a culture of inspiration, exploration and invention through effective, experiential teaching-learning giving rise to ever evolving knowledge and wisdom.
- M-2 To have self-inspired students ever engaged in continually working upon and sharpening and deepening computational, creative, innovative and leadership consciousness.
- M-3 Having students established in self- reflective consciousness, committed to personal, social & human integrity, and engaged in deep inquiry and conversation, giving rise to shared, inter-subjective human values and consciousness.

DEPARTMENT VISION AND MISSION

Vision:

To create highly skilled, trained, and confident Electronics and Communication Engineers having professional ethics, strong fundamental knowledge, passion for technology and competence to adapt to the rapid changes in technology with the time.

Mission:

- M-1 To impart sufficient technical knowledge, skill, and exposure to the students to make them a tech-savvy professional in the areas of VLSI, analog signal processing, digital system, embedded system, communication system etc.
- M-2 To have well qualified and competent faculty members in the department who are in a position to impart quality technical education.
- M-3 To regularly update the labs by incorporating experiments beyond syllabus and other value-added contents in keeping with current industry requirement.
- M-4 To ensure effective counselling and career guidance facility to the students to help them achieve their goals.
- M-5 To develop overall personality of the students by encouraging them to participate in technical and non-technical club activities, sports, and personality development programs.
- M-6 To encourage and prepare the students to participate in national level examinations like GATE.
- M-7 To encourage faculty and staff members to pursue higher education, research and to update themselves with the latest trends in technology being used in the field of electronics and communication.
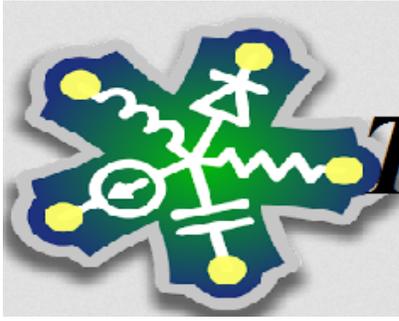
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This is the third issue of "THE ELECOMM" of the academic year 2022-2023. I would like to take this opportunity to motivate all the students to enroll in the internship programs and SWAYAM MOOCs to enhance their skills and earn the required credits.

Nitu Chauhan

Editor

Highlights

❖ **Article on Internet of Things**

❖ **Activities in department**

❖ **Lohri celebration 2024**

❖ **Vasant Panchmi celebration**

❖ **Sun Salutation**

❖ **Ran-Bhumi**

❖ **Gender Sensitization Program**

❖ **Faculty achievements**

Unraveling the Fabric of the Internet of Things: Evolution, Requirements, and Societal Advantages in the Modern Era

Figure 1. Internet of things

In the bustling landscape of technology, few concepts have garnered as much attention and promise as the Internet of Things (IoT). Often heralded as the next industrial revolution, the IoT represents a paradigm shift in the way we interact with technology, transforming everyday objects into intelligent, connected devices. From smart homes to industrial automation, the IoT has permeated virtually every aspect of

modern life, reshaping industries and revolutionizing the way we live, work, and interact with the world around us.

Evolution of the Internet of Things:

The roots of the IoT can be traced back to the early days of the internet, when researchers envisioned a world where physical objects could communicate and exchange data seamlessly. However, it wasn't until the late 20th century that advancements in microelectronics, wireless communication, and sensor technology paved the way for the realization of this vision. The convergence of these technologies gave rise to the modern IoT ecosystem, enabling the proliferation of connected devices and the exponential growth of data-driven applications.

In its nascent stages, the IoT was primarily focused on industrial applications, such as asset tracking and inventory management. However, as the technology matured and became more accessible, its scope expanded to encompass a wide range of domains, including healthcare, agriculture, transportation, and smart cities. Today, the IoT has become ubiquitous, with billions of interconnected devices spanning the globe and generating massive volumes of data.

Requirements for a Connected World:

Realizing the full potential of the IoT requires addressing several key requirements, ranging from technical challenges to regulatory and ethical considerations. One of the primary technical hurdles is interoperability – the ability of different devices and systems to communicate and work together seamlessly. Standardization efforts, such as the development of common protocols and communication standards, play a crucial role in overcoming this challenge and ensuring compatibility between diverse IoT ecosystems.

Security and privacy are also paramount concerns in the IoT landscape. As the number of connected devices continues to proliferate, so too does the attack surface for malicious actors. Securing IoT devices against cyber threats requires a multi-faceted approach, encompassing robust encryption, authentication mechanisms, and regular software updates to patch vulnerabilities. Additionally, clear regulations and guidelines are needed to safeguard user privacy and data protection in an increasingly interconnected world.

Advantages for Today's Generation and Society:

The IoT holds immense promise for today's generation, offering a myriad of benefits that span across individual, societal, and economic dimensions.

1. Enhanced Convenience and Efficiency:

At the individual level, the IoT promises to streamline daily tasks and enhance convenience through automation and intelligent decision-making. Smart home devices, such as thermostats, lights, and appliances, enable users to control and monitor their environment remotely, optimizing energy usage and

reducing utility costs. Wearable health trackers provide real-time insights into fitness levels and vital signs, empowering individuals to take proactive measures towards improving their well-being.

2. Improved Quality of Life:

In healthcare, the IoT is revolutionizing patient care by enabling remote monitoring, personalized treatment plans, and early intervention strategies. Connected medical devices, such as smart implants and wearable sensors, allow healthcare providers to gather continuous data on patients' health metrics, leading to more timely and accurate diagnoses. Telemedicine platforms leverage IoT technologies to deliver virtual consultations and remote care services, particularly valuable in underserved or remote areas.

3. Sustainable Development and Resource Management:

From agriculture to urban planning, the IoT plays a pivotal role in promoting sustainable development and efficient resource management. In agriculture, IoT-enabled sensors and actuators monitor soil moisture levels, weather conditions, and crop health, enabling farmers to optimize irrigation schedules, minimize water usage, and maximize crop yields. In smart cities, IoT infrastructure facilitates intelligent transportation systems, waste management solutions, and energy-efficient buildings, leading to reduced congestion, pollution, and energy consumption.

4. Economic Growth and Innovation:

On a broader scale, the IoT drives economic growth and fosters innovation by creating new business opportunities and revenue streams. Companies that harness IoT data can gain valuable insights into consumer behavior, market trends, and operational efficiency, leading to more informed decision-making and competitive advantage. Moreover, the proliferation of IoT ecosystems fosters collaboration and co-innovation among industry stakeholders, driving the development of novel applications and services.

Conclusion:

In conclusion, the Internet of Things represents a transformative force that is reshaping the way

we interact with technology and the world around us. From its humble beginnings as a niche concept to its current status as a ubiquitous phenomenon, the IoT has evolved rapidly, driven by advancements in technology, connectivity, and data analytics. While the road ahead is not without challenges, the potential benefits of the IoT for today's generation and society at large are undeniable. By addressing key requirements and harnessing its transformative power, we can unlock new opportunities for innovation, sustainability, and societal progress in the digital age.

Assistant Professor, ECE
Neeraj

Activities in the department

PPT Presentation on "Recent Advancement in DRONES"

At our recent PPT Presentation event held on 27th March 2024 our talented ECE students took center stage to unravel the latest strides in drone technology. With a keen focus on recent advancements, they delved into extended battery life, enhanced flight stability, and the integration of AI. Their presentations highlighted how these innovations are reshaping industries like agriculture and logistics. By showcasing miniaturization and

cutting-edge sensing technologies, they demonstrated the transformative potential of drones in diverse applications. Through their insightful discourse, our ECE 2nd and 3rd year students illuminated the path forward in this dynamic field, inspiring peers and faculty alike with their presentations and vision.

Glimpses of PPT Presentation

Lohri Celebration

Amidst the winter chill, our campus ignited with warmth and joy as we celebrated Lohri on 13 Jan 2024 with fervor and enthusiasm. Students and faculty came together, uniting in the spirit of togetherness and harmony, embracing the rich cultural heritage of Punjab. The bonfire illuminated the night sky, echoing with laughter and joyous melodies. Traditional dances, vibrant attire, and delectable treats added to the festive aura, fostering bonds and creating cherished memories. As we marked the onset of longer days and the triumph of light over darkness, Lohri served as a reminder of our shared traditions and the strength found in unity.

Vasant Panchami Celebration

The vibrant hues of Vasant Panchami adorned our campus as we celebrated the auspicious occasion with Saraswati Puja on 14th February 2024, honoring the goddess of knowledge, wisdom, and arts. Students and faculty alike gathered in reverence, seeking blessings for academic pursuits and creative endeavors. The air was filled with the mellifluous chants of hymns, and the fragrance of incense added to the sanctity of the atmosphere. Amidst the floral decorations and offerings, the presence of Goddess Saraswati infused our hearts with inspiration and guidance. As we invoked her blessings, we embarked on a journey of enlightenment and learning, embracing the spirit of Vasant Panchami with fervor and devotion.

Glimpses of Saraswati Puja 2k23

Sun Salutation – *Har Ghar Surya Namaskar 2024*

Har Ghar Surya Namaskar 2024 dawned upon our community with a special glow as a trainer graced us, illuminating the art of Surya Namaskar practice. With grace and expertise, the trainer guided participants through the rhythmic sequence of asanas, infusing each movement with intention and mindfulness. From the gentle stretch of the first salute to the final pose, every step resonated with vitality and inner peace. As the sun rose higher in the sky, so did our spirits, fortified by the ancient wisdom and vitality of Surya Namaskar. This event not only invigorated our bodies but also fostered a deeper connection to ourselves and the universe, epitomizing the essence of holistic wellness and community bonding.

Ran-Bhumi (Sports Event)

Ran-Bhumi 2024, our much-anticipated sports extravaganza, unfolded on March 22nd, igniting our campus with fervor and athleticism. The event showcased a dynamic range of competitions, from the graceful leaps of high jump and long jump to the strategic battles of volleyball, chess, and carrom. As athletes pushed their limits in the adrenaline-fueled 100m race and the rugged intensity of kabbadi, the air buzzed with excitement and anticipation. Beyond the thrill of victory, Ran-Bhumi epitomized the values of teamwork, sportsmanship, and resilience. As participants

and spectators alike came together to celebrate the power of sports, Ran-Bhumi 2024 left an indelible mark on our collective spirit.

Glimpses of Run-Bhoomi

Gender Sensitization Program

On 29th, March 2024, the institute took a significant step forward in promoting gender equality and fostering a culture of respect and understanding with the Gender Sensitization Program. Designed for both boys and girls, this initiative aimed to address prevalent stereotypes, biases, and issues surrounding gender in our society. Through interactive workshops, discussions, and activities, students were encouraged to reflect on their own beliefs and behaviors, challenging harmful norms and promoting empathy and inclusivity. By

providing a platform for open dialogue and education, the program empowered participants to become advocates for gender equity and change agents in their communities. As we strive to create a more equitable and compassionate world, the Gender Sensitization Program marked a crucial milestone in our journey towards fostering a culture of respect and equality for all.

Faculty Achievements:

Following faculty members of the department participated in several faculty development programs and workshops:

Ms. Mrinal Manjari

- Participated in the 5-day online FDP on Cutting edge technologies in wireless communication, Signal and Image Processing (CTWCSIP-2024), jointly organized by the Department of ECE of GMR Institute of Technology, Rajam and the Department of ECE , VR Siddhartha Engg. College, Vijaywada during 25th – 29th February, 2024.

Ms. Nidhi Singla

- Participated in the 5-day online FDP on Cutting edge technologies in wireless communication, Signal and Image Processing (CTWCSIP-2024), jointly

organized by the Department of ECE of GMR Institute of Technology, Rajam and the Department of ECE , VR Siddhartha Engg. College, Vijaywada during 25th – 29th February, 2024.

Mr. Neeraj

- Successfully completed SWAYAM NPTEL course on CMOS Digital VLSI Design and received FDP certificate for the same.

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For the publication of "THE ELECOMM" I would like to thank the members of faculty and students of the ECE department for their valuable contribution.

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