empowerEd...

Beyond the Clock Pulse and the Code Loop, We Engineer Every Possibility. The Power of Two Streams, One Vision.

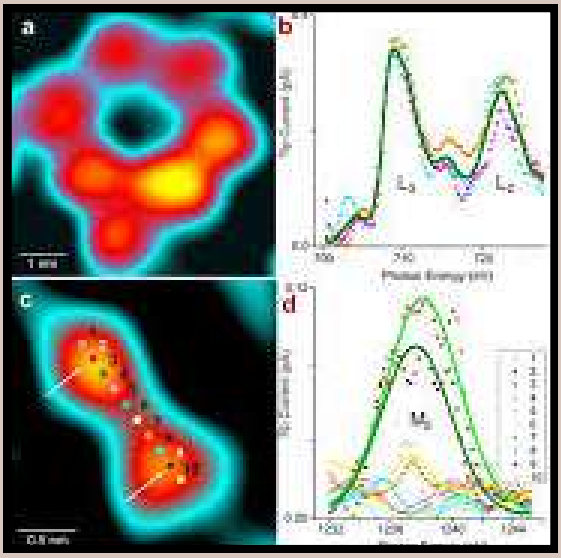
Serves as a dynamic platform to share knowledge, innovations, and updates in the rapidly evolving tech world. Its primary motive is to foster a culture of learning, collaboration, and creativity among students by showcasing projects, technical articles, and industry trends.This initiative helps bridge the gap between academic learning and real-world applications, inspiring peers to stay informed and engaged in their field.

CONTEXT

NEWS LETTER OF ERE'26
EDITION 2
MARCH 2023 - AUGUST 2023

Editors:
DRISHYA N, DEVI KRISHNA S

THE BREAKTHROUGHS



Scientists Capture First-Ever X-Ray Image of a Single Atom

A team of scientists successfully captured the first X-ray image of a single atom. This breakthrough was achieved using synchrotron X-ray scanning tunneling microscopy (SX-STM), a technique that allows researchers to run a sharp tip over a surface and generate an image from the tip. The X-ray technique was used to identify the type and chemical state of the atom, as well as its environmental effect.

DO YOU KNOW ?

IBM computer scientists report that a quantum computer produced better results for a physics problem than a conventional supercomputer

On March 14, OpenAI launched GPT-4, a LLM for ChatGPT, which can respond to images and can process up to 25,000 words

ISRO Becomes First to Land at Lunar South Pole with Chandrayaan-3

On 14 July, The Indian Space Research Organisation (ISRO) successfully launched its Chandrayaan-3 spacecraft towards the Moon, carrying a lunar lander named Vikram and a lunar rover named Pragyan, aiming to become the fourth nation to achieve a soft landing on the lunar surface. Followed by this, on 23 August, it becomes the first spacecraft to land near the south pole of the Moon, where frozen water is believed to exist.

THE BREAKTHROUGHS

From Paralysis to Motion: Brain–Spine Interface Breakthrough

A pioneering wireless brain–spine interface (BSI) enabled a man with chronic tetraplegia to regain the ability to walk naturally, even on complex terrains. This digital bridge reestablished communication between the brain and spinal cord by decoding cortical signals and translating them into targeted electrical stimulation of the spinal cord regions responsible for walking. The BSI comprises fully implanted recording and stimulation systems, allowing the patient to stand, walk, climb stairs, and navigate varied environments with enhanced control and fluidity. Remarkably, the patient experienced sustained neurological improvements, maintaining the ability to walk with crutches even when the BSI was deactivated. This suggests that the interface not only restored movement but also promoted the reorganization of residual neuronal pathways, facilitating long-term recovery.

IBM significantly advanced the field of quantum computing by unveiling the 'Heron' quantum processor and the modular Quantum System Two. IBM Quantum Heron processor, with its tunable coupler architecture, represents a major leap forward in quantum hardware performance. It significantly improved the speed and fidelity of two-qubit gate operations, leading to a dramatic reduction in error rates. Heron's design also makes it compatible with a larger, modular system, a key step towards scaling up quantum computing. Meanwhile IBM Quantum System Two is a modular system designed to be scalable and easier to use, promoting wider adoption of quantum computing. It leverages modularity, communication, and middleware to enhance computation capacity and integrate quantum and classical workflows.

DO YOU KNOW ?

The discovery of 62 new moons of Saturn is reported, taking its total confirmed number to 145 and overtaking Jupiter, that has 92.

BYTES

Embedded Systems & IoT : Powering the Smart World

What is an Embedded System?

An embedded system is a special-purpose computer designed to perform one specific task, and it is embedded inside a larger device.

Key Characteristics:

- Task-specific * Real-time performance
- Low power & small size * Cost-efficient
- Often contains a microcontroller (like Arduino) or microprocessor.

How are Embedded Systems and IoT Connected?

- Embedded systems are the brains inside IoT devices.
- IoT = Embedded System + Connectivity (Wi-Fi, Bluetooth, LoRa, etc.) + Cloud
- Example: A smart door lock uses an embedded system to control locking and communicates over the internet to be controlled by your phone.

Common Microcontrollers for IoT & Embedded Projects:

- Arduino Uno/Nano/ESP32 – Easy for beginners
- Raspberry Pi – More powerful; runs Linux
- STM32 – Used in industry
- 8051 / PIC – Traditional MCUs

Communication Protocols

- Wi-Fi, Bluetooth – Short to medium range
- Zigbee, LoRa – Low-power, long-range
- MQTT, HTTP – Protocols for sending data between device and cloud

Examples for Embedded Systems:

- Microwave oven * Smart TVs
- Elevators * Fitness bands

Examples for IOT devices :

- Smart home systems (lights, fans)
- Smart agriculture (soil moisture and weather sensors)
- Industrial automation (real-time monitoring of machines)
- Health monitoring wearables

BYTES

Embedded Systems & IoT : Powering the Smart World

What is the Internet of Things?

IoT is a network of physical devices that are connected to the internet and communicate with each other to collect, send, or receive data.

Key Characteristics:

- Internet-enabled
- Uses sensors, actuators, and communication modules
- Allows remote monitoring and control
- Devices can “talk” to each other.

Components of an IoT System

1. Sensors & Actuators – Collect data and interact with the physical world
2. Microcontroller/Microprocessor – Core brain (e.g., ESP32, STM32, Raspberry Pi)
3. Connectivity Module – Wi-Fi, Bluetooth, Zigbee, LoRa, NB-IoT
4. Cloud Server – Stores and analyzes data
5. User Interface – Web/mobile app or dashboard

Why They Matter

- Automate daily tasks
- Enable smart cities, precision farming, and industrial automation
- Improve efficiency, safety, and resource management
- Enable real-time decision-making using real-world data

Future Scope

1. Edge Computing – Processing data locally on the device before sending to the cloud
2. TinyML – Running ML models on embedded IoT devices
3. 5G & IoT – Faster, more reliable communication
4. Batteryless IoT – Using energy harvesting for long-lasting sensors
5. Security Enhancements – More focus on protecting data and devices
6. Swarm IoT – Coordinated behavior among multiple devices (e.g., drones)

YAVANIKA'23

We proudly clinched the title of 2nd Overall Champions

- Star Dance : 1st Prize
- Face Painting : 3rd Prize
- Nostalgic Son : 3rd Prize
- Adaptune : 3rd Prize
- Demo Dance : 3rd Prize

S1 Toppers

Devi Krishna S
Sgpa : 8.62

Gopika R
Sgpa : 8.35

Drishya N
Sgpa : 8.18

B R Kavya Prabhakar
Sgpa : 8.09

ABOUT US

We are the first batch of the newly introduced Electronics and Computer Engineering course at LBSITW, launched in the year 2022, with Electronics and communation Engineering as our parent department. Our class comprises 46 students, and according to the result analysis of the S1 examinations, we have achieved an overall pass percentage of 65.31%.

Class Representatives	: Drishya N, Nivedya G S
Staff Advisors	: Dr. Reena M Roy, Dr. Deepambika

CONNECTED WITHOUT LIMITS

~ DEVI KRISHNA S

From smartphones in our pockets to satellites orbiting above, the worlds of semiconductors and connectivity are undergoing a transformation that promises to reshape how we live, work, and communicate. Recent breakthroughs are not only making devices faster and more efficient, but also bringing high-speed internet to places once considered unreachable. These innovations point toward a future where performance and connectivity are truly universal. Qualcomm's Snapdragon 7+ Gen 2 mobile platform delivers flagship-level capabilities to affordable smartphones. Key highlights include:

- *CPU Performance: Up to 50% faster than its predecessor.*
- *GPU Performance: 2× improvement, enabling richer graphics for gaming, AR, and multimedia.*
- *AI Processing: Advanced on-device AI for smarter photography, natural language tasks, and system optimization.*
- *Power Efficiency: Optimized design for longer battery life without sacrificing performance.*

This leap in mobile processing power ensures that high-end features are no longer limited to premium devices, making advanced technology more accessible to a wider audience. Alongside chip innovation,

5G Non-Terrestrial Networks (NTN) are expanding connectivity through satellites, enabling communication even in areas where ground-based networks cannot reach. Notable developments include:

- *Samsung's Standardized 5G NTN Modem – enabling smartphones to communicate directly with satellites.*
- *MediaTek's MT6825 Chipset – the first commercial 5G IoT-NTN solution for global device connectivity.*
- *Motorola Defy Satellite Link – a portable device allowing messaging and location sharing without cellular coverage.*

This technology has the potential to bridge the digital divide, providing critical connectivity for remote learning, disaster relief, and industries operating in remote or isolated regions.

VISION & MISSION

- **VISION OF THE INSTITUTION**

To be a centre of academic excellence empowering women in technical domain.

- **MISSION OF THE INSTITUTION**

Imparting value based technical education for transforming young women to professionals excelling globally in academics, research & development and industry meeting societal challenges.

- **VISION OF THE DEPARTMENT**

To become a centre of excellence in Electronics, Communication, Instrumentation and Computer Engineering to facilitate professional education and research keeping higher level of value systems.

- **MISSION OF THE DEPARTMENT**

M1 : To transform young women to high quality engineers, entrepreneurs and researchers with ethical values.

M2 : To contribute creative engineering solutions to industry by keeping pace with latest technological advancements.

M3 : To provide intellectual services to the society by the application of Electronics, Communication and Computer Engineering.