DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGG.
NEWS LETTER -2022-23

Vision

The department of Electronics and Communication engineering shall stand as an excellent department, offering quality education in electronics and communication with a research focus, catering to the need of the public and being in tune with the advancing technological revolution.

Mission

M1: To train the students of Department of Electronics and Communication Engineering in technological areas.
M2: To establish centers of excellence pertaining to develop skills among the students.
M3: To facilitate the spirit of innovation & creativity in technological areas.

Message from Chairman

At VPP our quest for excellence continues through various initiatives that will help our students place themselves on a career path, that does justice to their capacities and motivation. I look forward for your suggestions and ideas for raising the bar.

-**Shri. U.N.Kalkundrikar**

Message from Principal

To impart quality education and bridge the industry-institution gap, VPP has established a Centre of Excellence which runs programmes to cater the needs of the students. Memorandum of understanding with the industries is established which helps the students in persuading internship programmes.To help students get admitted in reputed Engineering colleges, VPP conducts NATA and DCET classes for the students of final year. Your suggestions are most welcome.

 -**Ms. Shridevi S. Malaj**

<u>EVENTS</u>

- Organized SIP for first year students from 23.6.22 to 8.7.22.

- "Mobile Phone Trainer Kit" & "Set Top Box Trainer Kit" has been build for conducting the Wireless Communication experiments in laboratory for 4th semester on 13/8/2022.

- Students of V Sem E&C shared the knowledge of basic electronics and helped the students of Smt. Ushatai Gogte Girls' high school Patil Galli, Belagavi, to build project under ATAL TINKERING LAB for the need of society. 13th September to 17th September 2022.

- 5th sem students along with Mrs. Neelam Somannavar Lecturer (E&C).visited Softmusk Solutions, Belagavi in 22nd of October 2022 under industrial visit.

- 5th sem students along with Mrs. Neelam Somannavar Lecturer (E&C) visited Nandini Milk (KMF) Belagavi in 28th of October 2022 under industrial visit.

- Online Industry talk on Applications of Cryptography held on 5th November 2022, by Prof. Sagargouda Patil, Assoc.Prof. and Dean (R&D), Dept.of E&C , Dr.D.Y.Patil College of Engineering , Kolhapur.
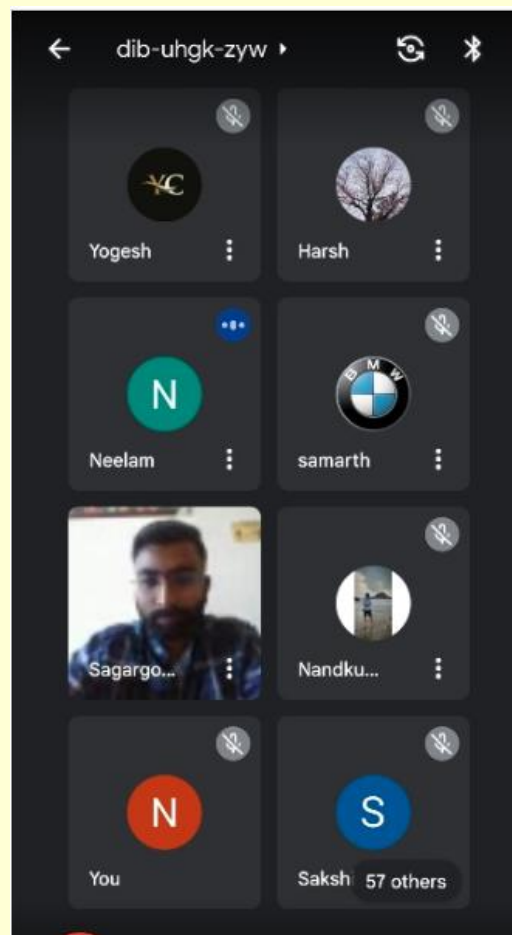
- Expert talk held on "How penetration testing is used in companies to improve their security posture "on 12th December 2022, by Mr. Sagargouda Patil , CyberSena R&D Pvt., LTD,

- Industry talk held on 16th December 2022 at 12:00 pm in seminar hall on "Handling Internal and External Incident complexity of incident management demo of real world SOC" by Mr. Chetankumar Savalgimath, Division Manager, World Informatix Cyber Security, Bangalore.

- Students build kits of "Measurement of voltage, Current, Power and Energy "under the guidance of Mr. Pramod Terdalkar Mrs. Snehal Kadam and Mr. Vilas Hiroji, Instructor, for conducting the Fundamental of Electrical and Electronics Engg experiments in laboratory for 1st and 2nd semester on 23rd December 2022.

- MOU signed with SWARAJ AUTOMATION, Belagavi, CUBICODE., Belagavi , 5th February 2023.

- Students build electronic kits under the guidance of Mr. Pramod Terdalkar and Mr. Vilas Hiroji, Instructor, for EIA lab, 4th Semester Mechanical Engg. on 28th March 2023.

- Department organized "Technical Talk" for all the students of E&C, KLS VPP on Saturday, 27th May 2023 on topic "Software & System's Engineering in Automotive Industries" Resource person Mr. Ghansham Kalpavriksha, Senior System engineer, Sensata Technologies.

- Department organized the "Technical Talk" for all the students of E&C, KLS VPP on Saturday, 31st May 2023 on topic "Importance & Benefits of IEEE and ISTE" Resource person Prof. Abhishek Deshmukh,, Dept. of E&C, KLS GIT, Belagavi

- Department. organized the "Technical Talk" for all the students of E&C, KLS VPP on Saturday, 31st May 2023 on topic "Raspberry Pi" Resource person Prof. Praveen Kalkundri,Alumni of VPP and Staff member of Dept. of E&C, KLS GIT, Belagavi

- IIOT Models are designed by V Sem students under guidance of Staff Mrs. Neelam Sommanavar, Mr. Abhiman Deshpande, on 10th June 2023.

Staff Achievements and Activities

- Mrs. Neelam Somannavar, Lecturer, attended 1 day FDP on topic "New age Education Technologies" at VDIT, Haliyal, on 18th September 2022.

- Mr. Abhiman Deshpande, Lecturer attended National Level "Introductory UHV FDP (English)" from 31/01/2023 to 6/02/2023 (5 days)

- Mrs. Neelam Somannavar, Lecturer attended National Level "Introductory UHV FDP (Hindi)" from 06/02/2023 to 10/02/2023 (5 days)

- Mrs. Neelam Sommanavar, Lecturer has completed NPTEL Exams on the topic "Digital Electronics".

- Mr. Abhiman Deshpande, Lectrurer and Mr. Vilas Hiroji, Instructor were felicitated by GC KLSVPP for conducting electronics project workshop under ATAL TINKERING LAB in Smt. Ushatai Gogte Girls' High School, Patil Galli, Belgaum-590001.

- K.S.Bharathi & AMRUTA Devangavi attended the interaction programme with Dr.S.Sadagopan at KLS,GIT on 20th April 2023.

- AMRUTA Devangavi and Neelam Devangavi attended 25th ISTE Karnataka state level; faculty convention & Faculty development programme on NEP,NAAC and NBA at KLS,GIT on 26th April 2023.

Students Achievements

- VI semester students of Electronics and comm. Engg Dept. Mr. Sujal Ambewadi ,Mr. Ranjeet Pawar,Ms. Riddhi Jadhav and Mr.Adarsh Kadalikar won the first prize in treasure hunt event organized by Angadi College of Engineering.

Final year toppers 2022-2023

Sl.No.	Name of the student	3rd year		Photo	
		Total	%age		
1	Miss.GAYATRI MACHENDRA SHINDE	1251/1375	90.98%		1st Rank
2	SMRITI SANJEEV MUTALIK	1223/1375	88.95%		2nd Rank
3	VADIRAJ NARAYAN BETAGERI	1188/1375	86.40%		3rd Rank

Second year toppers 2022-2023

Sl.No.	Name of the student	2nd year		Photo	
		Total	%age		
1	Mr.SUJAL RAHUL AMBEWADI	839/850	98.70%		1st Rank
2	SEJAL SANJAY KOKITKAR	834/850	98.12%		2nd Rank
3	SHREYASH ANANT MITHARE	819/850	96.35%		3rd Rank

First year toppers 2022-2023

Sl.No.	Name of the student	1st year		Photo	
		Total	%age		
1	Mr.VINYAS VITHAL KULKARNI	872/950	91.78%		1st Rank
2	ARCHANA NARASIMHA BASUTKAR	830/950	87.36%		2nd Rank
3	S R NEHA SHREE	805/950	84.73%		3rd Rank

- Potdar scholarship is the scholarship awarded to the top scorer of the department of E&C. It is a scholarship of Rs. 2000/- by Shri. Ajit Potdar in the name of his father Late Shri. Anantrao Potdar and father in law Late Shri. Ganesh Rajadnya.
  The recipient for this scholarship is
  1. Miss. Bhagyashri Moharire (Top scorer).

ARTICLES

Report on Cyber-Physical Systems Application using IoT Simulation Software and Hardware-Based Demonstration

Article by Lecturer Abhiman S Deshpande

Executive Summary:

This report outlines the design, implementation, and demonstration of a Cyber-Physical System (CPS) application using IoT simulation software and hardware-based activities. The application chosen for this project is a Smart Home Automation System. The integration of IoT simulation tools and hardware-based components allows for a comprehensive understanding and showcase of how CPS operates in a real-world context.

1. Introduction:

1.1 Background:

The Smart Home Automation System is a representative example of a Cyber-Physical System that incorporates various IoT devices to enhance home efficiency, security, and convenience.

1.2 Objectives:

- Develop a simulated environment using IoT simulation software.
- Integrate hardware components to demonstrate real-world interactions.
- Showcase the seamless interaction between the virtual and physical elements of the CPS.

2. System Architecture:

2.1 IoT Simulation Software:

Utilized a popular IoT simulation tool to create a virtual representation of the Smart Home Automation System. This software allows for the modeling of sensors, actuators, and communication protocols within the system.

2.2 Hardware Components:

Integrated physical devices such as smart sensors, actuators, and a microcontroller (e.g., Raspberry Pi) to emulate the physical layer of the CPS.

2.3 Communication Protocols:

Established communication protocols (e.g., MQTT or CoAP) to enable seamless interaction betweenthe simulated environment and the hardware components.

3. Simulation Scenarios:

3.1 Home Security: Simulated scenarios where smart door/window sensors detect unauthorized access, triggering alarms

and notifying the homeowner through the simulated environment.

3.2 Energy Management:

Modeled the interaction between smart thermostats and lighting systems to demonstrate energy-efficient practices, adjusting settings based on occupancy and ambient light levels.

3.3 Remote Monitoring:

Showcased the capability to remotely monitor the status of the Smart Home System through a simulated dashboard, accessing real-time data from the hardware components.

4. Hardware Demonstration:

4.1 Sensor Integration:

Connected physical sensors to the simulation environment, illustrating how changes in the physical

environment (e.g., motion detection) are reflected in the virtual representation.

4.2 Actuator Response:

Demonstrated how actuators respond to commands from the simulated environment, emphasizing the

bidirectional communication between the virtual and physical layers.

4.3 User Interaction:

Enabled user interaction with the system through physical interfaces (e.g., buttons or touchscreens),

providing a hands-on experience of controlling and monitoring the CPS.

5. Challenges and Solutions:

5.1 Synchronization:

Addressed challenges related to the synchronization of simulated and physical components to ensure

accurate representation.

5.2 Scalability:

Explored options for scaling the system to accommodate additional devices and functionalities, considering the potential expansion of a real-world implementation.

6. Conclusion:

The integration of IoT simulation software with hardware-based demonstrations for the Smart Home Automation System successfully showcased the capabilities of Cyber-Physical Systems. This approach provides a practical and educational platform for understanding the complexities of CPS applications, laying the foundation for future advancements in the field of IoT and CPS. Continuous refinement and adaptation of simulation scenarios will contribute to a more robust and versatile Smart Home Automation System.

Report on Cybersecurity Concerns, CPS Protection, and Hacking Threats: Demonstration and Solutions

Executive Summary:

This report addresses cybersecurity concerns, specifically focusing on Cyber-Physical Systems (CPS).The document explores various security threats, with a particular emphasis on hacking as a significant threat. A practical demonstration and simulation of a hacking scenario in the healthcare sector is presented, along with solutions to mitigate such threats.

1. Introduction:

1.1 Background:As Cyber-Physical Systems become integral to various sectors, ensuring their security is paramount.

Cyber threats, especially hacking, pose a significant risk to the operation and integrity of these systems.

1.2 Objectives:

- Identify and analyze cybersecurity concerns.
- Examine the specific threats to CPS, focusing on hacking.
- Conduct a simulated demonstration of a hacking scenario in the healthcare sector.
- Propose solutions to mitigate and prevent such threats.

2. Cyber security Concerns:

2.1 Data Breaches:

Unauthorized access to sensitive data, leading to potential leaks or misuse.

2.2 Malware and Ransom ware:

Deployment of malicious software to disrupt operations or demand ransom.

2.3 Insider Threats:Malicious activities initiated by individuals within an organization.

2.4 Lack of Encryption:Unprotected communication channels leading to data interception.

3. CPS Protection from Cyber Threats:

3.1 Network Segmentation:Isolation of critical components to minimize the impact of a cyber-attack.

3.2 Encryption:Securing communication channels to protect data integrity and confidentiality.

3.3 Intrusion Detection and Prevention Systems (IDPS):Implementing systems to detect and prevent unauthorized access and malicious activities.

4. Hacking as the Biggest Threat:

4.1 Types of Hacking:

4.1.1. Social Engineering:Manipulating individuals to divulge confidential information.

4.1.2. Denial-of-Service (DoS) Attacks: Overwhelming a system to render it unavailable.

4.1.3. Man-in-the-Middle (MitM) Attacks: Intercepting and altering communication between two parties.

4.2 Examples:

4.2.1. Healthcare Sector: Unauthorized access to patient records, leading to potential harm.

4.2.2. Industrial Control Systems: Disruption of critical infrastructure, such as energy or water supply.

5. Demonstration/Simulation:

5.1 Scenario: Simulated a scenario where a hacker gains unauthorized access to a healthcare system, attempting to manipulate patient records and disrupt medical procedures.

5.2 Solutions:

5.2.1. Two-Factor Authentication (2FA):Implementing an additional layer of security to verify user identity.

5.2.2. Regular Security Audits: Conducting frequent audits to identify vulnerabilities and address them promptly.

5.2.3. Employee Training: Educating healthcare staff about cyber security best practices to mitigate social engineering threats.

6. Conclusion: The simulated demonstration highlighted the vulnerabilities of Cyber-Physical Systems, particularly in the healthcare sector, and the severe consequences of hacking. Implementing robust cyber security measures, such as network segmentation, encryption, and employee training, is imperative to protect CPS from evolving cyber threats. Regular updates and adaptability in security protocols are crucial for staying ahead of potential risks in the dynamic landscape of cyber security.

MOXIE: NASA's Oxygen-Generating Experiment on Mars

Article by student **Shivam Punekar**
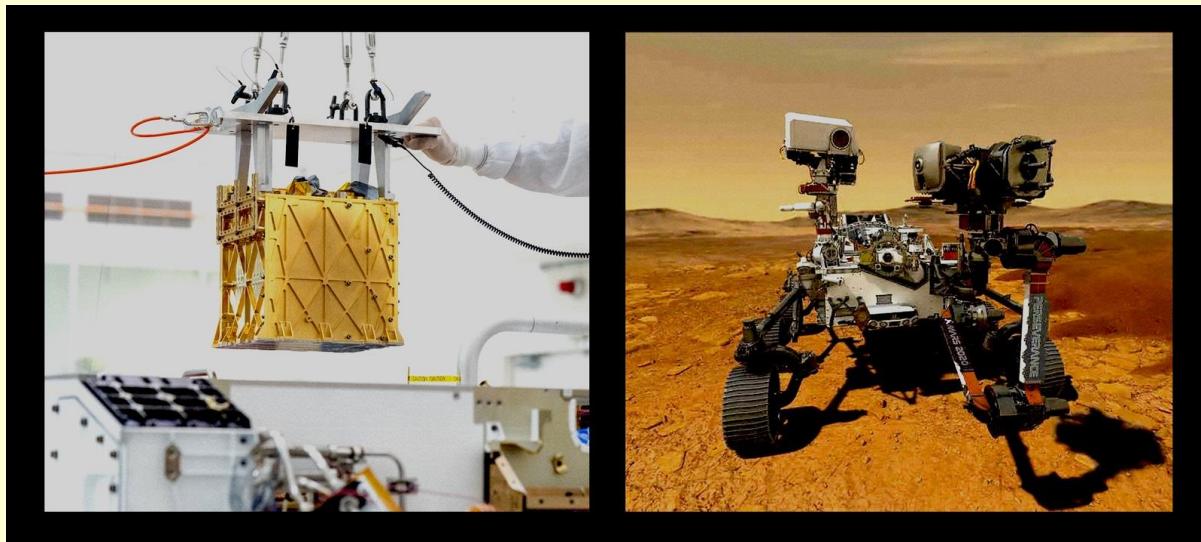
MOXIE, or the **Mars Oxygen ISRU Experiment**, is a technology demonstration on NASA's Perseverance rover that is producing oxygen from the Martian atmosphere. ISRU, or In-Situ Resource Utilization, is the process of using resources found on other planets or moons to produce materials or support human life.

MOXIE works by using a solid oxide electrolyze (SOXE) to split carbon dioxide (CO2), the main component of the Martian atmosphere, into oxygen (O2) and carbon monoxide (CO). The SOXE is heated to a high temperature, which allows the oxygen atoms to be separated from the carbon dioxide molecules. The oxygen is then collected and stored, while the carbon monoxide is released back into the atmosphere.

Purpose:

MOXIE's main purpose is to produce oxygen for use in life support systems and as propellant in the return journey of human missions to Mars. This technology is a critical component in the broader strategy of in-situ resource utilization (ISRU) which aims to reduce the need to transport resources from Earth to Mars, making long-term human exploration of Mars more sustainable.

How MOXIE Works:

MOXIE works by utilizing a process called solid oxide electrolysis. It takes in the Martian atmosphere, which is about 95% carbon dioxide (CO2), and separates the oxygen atoms from the carbon atoms. The carbon dioxide is then released back into the Martian atmosphere, and the remaining oxygen can be used for various purposes.

First Demonstration:

MOXIE's first successful demonstration took place in April 2021. During this test, it produced approximately 5.4 grams of oxygen, which is enough to sustain an astronaut for about 10 minutes of breathing. It's important to note that this was a small-scale demonstration, and future missions will need much larger oxygen production systems.

Scaling Up: NASA envisions scaling up MOXIE technology for future missions. To support human exploration, much larger versions of this technology will be needed to produce the necessary amounts of oxygen for astronauts to breathe, as well as for the production of rocket fuel for return trips to Earth.

Importance for Human Missions:

Producing oxygen on Mars reduces the need to carry it from Earth, which is both expensive and logistically challenging. In the long term, having a sustainable source of oxygen on Mars is critical for supporting extended human missions and for reducing the overall cost and risk of exploration.

KLS INSTITUTIONS

1. Raja Lakhamgouda Law College, Belgaum [1939]

2. Gogte College of Commerce (GCC), Belgaum [1954]

3. School of Business Management, Belgaum [1977]

4. Gogte Institute of Technology (GIT), Belgaum [1979]

5. Institute of Management Education and Research (IMER), Belgaum [1991]

6. Shri. Vasantrao Potdar Polytechnic, Belgaum [1992]

7. GCC Bachelor of Business Administration, Belgaum [1996]

8. GCC Bachelor Computer Applications, Belgaum [1999]

9. KLS Pre-Primary and Primary School, Belgaum [2002]

10. Vishwanathrao Deshpande Institute of Technology (VDIT), Haliyal [2004]

11. Pre-University College, Haliyal [2007]

12. KLS College of Computer Application & Business Administration, Haliyal [2009]

13. KLS Public School, Belgaum [2011]

VISION

To Make Vasantrao Potdar Polytechnic, Belagavi Stand Out as an Institution of Excellence in Building Technical Skills and to Create Individuals of Outstanding Character, Caliber and Entrepreneurial Skills.

MISSION

To Train Students of Vasantrao Potdar Polytechnic, Belagavi to Become Creative and Innovative Engineers while Imbibing in them Engineering Ethics and Professionalism, thus Empowering them to serve Human Kind.