Kalpataru Vidya Samste®

Kalpataru Institute of Technology

The Byte

Dream. Design. Deliver: The ECE Way

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

2023-24

Table of contents

ABOUT THE INSTITUTION

Kalpataru Institute of Technology was established in 1986 with a view to provide quality technical education. The college is affiliated to Visvesvaraya Technological University, Belagavi, approved by All India Council for Technical Education (AICTE), New Delhi.

INSTITUTE VISION

To bring forth Technical Graduate of high caliber with a strong character and to uphold the spiritual and cultural values of our country

INSTITUTE MISSION

To impart quality technical and managerial education at Graduate and Post Graduate levels through our dedicated and well qualified faculty members.

GUIDING VISIONARIES

President

Sri. P.K.Thipperudrappa

Treasurer

Sri. T S Shivaprasad

Vice Presidents

Sri. T.S Basavaraju

Sri.Bagepalli Nataraj

Sri. G.P.Deepak

Sri. B.S.Umesh

Secretaries

Sri. M.R.Sangamesh

Sri. Sudhakar.H.G

Sri. G.S.Umashankar

Sri. T.U.Jagadeeshmurthy

GUARDIAN OF ACADEMIC INTEGRITY

Principal

Dr. G.D. Gurumurthy

PIONEER OF DISCIPLINE EXCELLENCE

Head of the Department

Prof. G.S.Yogananda

THE VOICE BEHIND THE PAGES

Editorial Curator

Prof. PradeepKumar S K

ABOUT THE DEPARTMENT

Department of Electronics and Communication Engineering was established in the year 1986 with an intake of 60 students for Bachelor of Engineering (BE) programme and affiliated to Bangalore University. Subsequently the department of Electronics and Communication Engineering of Kalpataru Institute of Technology was affiliated to Visvesvaraya Technological University during the year 1998.

Currently the department is offering Bachelor of Engineering with an intake of 120 students in Under Graduate (UG) programme. The Department also has a Research Center where the Research Scholars can do Research & pursue Ph.D Degree.

VISION

To contribute towards the development of technology in the field of Electronics and Communication so that mankind can have more benefits from our works and thoughts.

MISSION

M1: To provide excellent education in the field of Electronics and communication technologies

M2: To promote scientific and research attitudes to bring out the best from our students to make them excellent engineers.

MESSAGE FROM THE HOD

On behalf of the Electronics and Communication Department, Kalpataru Institute of Technology, I am pleased to announce the launching of the 2023-24 edition of the **"The Byte"** Magazine of the Electronics and Communication Department and to make it available to everyone. This Technical Magazine aims to disseminate achievements from our students and faculties in research and developments.

As HOD, I am open to exploring the opportunities for making this Technical Magazine an exciting and definitive forum for attracting and publishing high-impact research contributions that are innovative and transformative, and for making this technical magazine serve as a forum for disseminating timely and exciting ongoing research that can stimulate innovation.

The entire Editorial team has worked diligently to create a platform for esteemed faculty members, researchers and students to disseminate their latest achievements. Through this, we aim to share the knowledge gained from their technical pursuits with fellow researchers, faculty, industry experts, and students.

OUR DEDICATED EDUCATORS

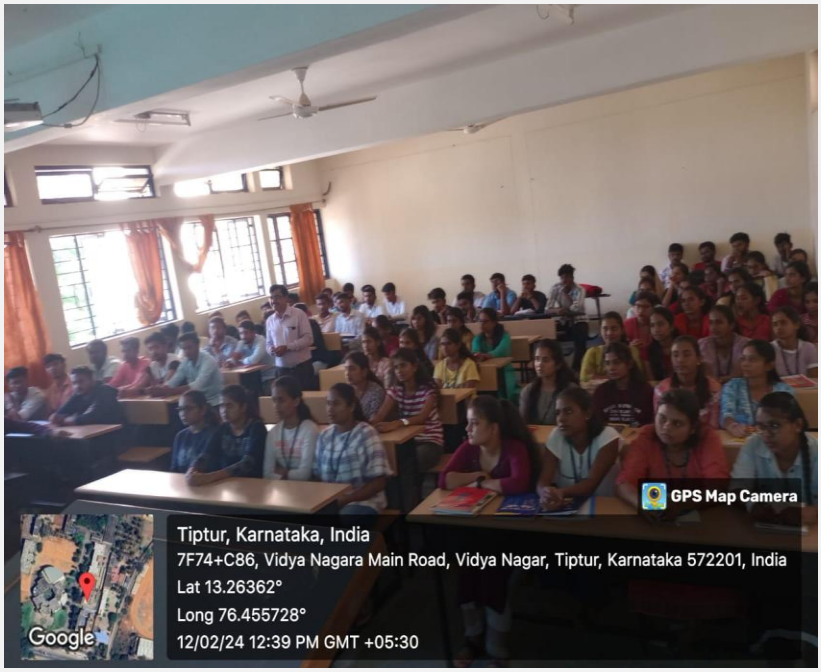
FACULTY PROFILES

Sl.No	Name	Designation	Area of Specialization
1	Dr. S V Rajashekarardhya	Professor	Image Processing
2	Dr. G S Yogananda	Professor	Image Processing
3	Dr. Gurumurthy G D	Professor	Wireless Communication
4	Mr. Channabasayya Mathad	Associate Professor	Wireless Communication
5	Mr. Prashanth N R	Associate Professor	VLSI Design & Embedded System
6	Dr. Hadimani Shivakumar	Professor	Nano Dielectrics
7	Mr. Rudresh M D	Associate Professor	Signal Processing
8	Mr. Niranjana Swamy G S	Associate Professor	Power Electronics
9	Mrs. Prathibha C	Assistant Professor	Computer Science
10	Mr. Anand U Hiremath	Assistant Professor	DE&CS
11	Mr. Pradeepkumar S K	Assistant Professor	VLSI Design & Embedded System
12	Dr. Lohith M S	Associate Professor	Signal processing
13	Mr. Sunil Kumar K M	Assistant Professor	DE&CS
14	Mrs. Smitha M M	Assistant Professor	Electronics
15	Dr. Nandeesh G S	Associate Professor	DE&CS
16	Mrs. Chethana H S	Assistant Professor	VLSI Design & Embedded System
17	Mr. Sundaresh M P	Assistant Professor	Image Processing
18	Mrs. Nandini S	Assistant Professor	DE&CS
19	Mrs. Shilpa C N	Assistant Professor	Digital Electronics
20	Mrs. Amruthavarshini S Hadimani	Assistant Professor	VLSI Design & Embedded System

A technical talk on “Introduction to Computer networking and security” on 12th February 2024 by Dr. Ravishankar K C

Professor Dr. Ravishankar K C presented an insightful and engaging technical talk on "Introduction to Computer Networking and Security" tailored specifically for 5th-semester students. The session offered a comprehensive overview of the foundational concepts and their practical applications in the rapidly advancing world of technology.

The talk began with an introduction to the fundamentals of computer networking, exploring the structure and function of networks, including IP addresses, protocols, routers, and switches. Dr. Ravishankar highlighted the importance of data exchange and connectivity in both local and global contexts, emphasizing how networking drives modern communication and collaboration.



The second half of the session focused on computer security, shedding light on critical issues like malware, phishing, and Distributed Denial-of-Service (DDoS) attacks. Dr. Ravishankar explained essential security measures such as encryption, firewalls, and intrusion prevention systems while touching on ethical hacking and the role of cybersecurity policies in protecting digital assets.

Through real-world examples and relatable analogies, the talk not only clarified complex concepts but also inspired students to explore networking and security as potential career paths. The session concluded with practical advice and encouragement for students to embrace lifelong learning in this ever-evolving field.

This talk served as an invaluable resource for building foundational knowledge and igniting curiosity among aspiring technologists.

DRIVING INNOVATION: INSIGHTS FROM AN INDUSTRY EXPERT

Workshop on Network Design Using CISCO Packet Tracer 29th & 30th December 2023 | Conducted by Mr. Veerabhadra, Senior Cloud Security Engineer, Accenture

The two-day workshop on "Network Design Using CISCO Packet Tracer," led by Mr. Veerabhadra, a seasoned Senior Cloud Security Engineer at Accenture, was an enriching experience for participants aiming to develop their networking skills. This hands-on training provided an in-depth understanding of designing, configuring, and troubleshooting networks using the powerful CISCO Packet Tracer simulation tool.

On the first day, the workshop focused on the fundamentals of computer networks, including concepts like IP addressing, routing, and switching. Participants were introduced to the CISCO Packet Tracer interface and learned how to simulate basic network setups. Practical exercises allowed attendees to gain confidence in creating and managing simple network topologies.

The second day delved into advanced topics such as dynamic routing protocols, VLAN configurations, and network security measures. Mr. Veerabhadra shared valuable industry insights, highlighting real-world challenges and solutions in network design and security.

Interactive sessions and Q&A discussions enabled participants to deepen their understanding and ask questions tailored to their learning needs.

The workshop provided with an insight, equipping attendees with practical skills and knowledge to excel in the field of networking. It was a productive and insightful event for students and professionals eager to master network design concepts.

LATEX UNLOCKED

LaTeX Made Easy: A Hands-on Workshop by Dr. Lohith MS

The event *"LaTeX Made Easy: A Hands-on Workshop,"* held on 4th April 2024 and led by Dr. Lohith M S, was a comprehensive introduction to LaTeX, a powerful tool for professional document preparation. Designed for students and professionals, the workshop aimed to equip participants with the skills needed to create well-structured, high-quality documents with ease.

He started the session by introducing the basics of LaTeX, including its syntax, structure, and unique capabilities compared to traditional word processors. Participants explored practical applications, such as creating academic papers, reports, presentations, and resumes. Through hands-on exercises, attendees learned to format text, manage references, design tables, and incorporate mathematical equations and graphics.

The interactive nature of the workshop ensured that participants actively engaged with the tool, gaining confidence in navigating its features. He also shared valuable tips and tricks to enhance productivity and efficiency when using LaTeX.

The event concluded with participants expressing enthusiasm for the practical knowledge gained and the new skills they could apply in their academic and professional pursuits. It was a productive and insightful experience for everyone involved.

Guest Lecture: "Time Response of First Order and Second Order Systems" by Dr. G. D. Gurumurthy

On the 7th of September 2023, a highly insightful and engaging guest lecture on **"Time Response of First Order and Second Order Systems"** was organized for the 4th semester Electronics and Communication Engineering (ECE) students. The lecture was delivered by the distinguished scholar and expert, Dr. G. D. Gurumurthy, Principal, K I T whose wealth of knowledge in the field provided immense value to the participants.

The session delved deep into the dynamic behavior and time-domain analysis of first and second-order systems, emphasizing concepts such as time constants, step responses, settling time, peak time, and overshoot.

Dr. Gurumurthy explained the intricacies of these systems with remarkable clarity, making complex mathematical models and theories accessible to students. By bridging theoretical concepts with practical applications, the lecture illustrated how these systems form the foundation for analyzing and designing control systems in various engineering domains.

Students gained valuable insights into system behavior and its practical applications, making the session both informative and engaging. The lecture was highly appreciated for its clarity and relevance to their academic curriculum.

EDUCATORS EVOLVING: A SUMMARY OF THE FDP JOURNEY

One-Week National-Level Online FDP on "Cyber Security & Ethical Hacking" February 12th – February 17th, 2024

The one-week National-Level Online Faculty Development Program (FDP) on "Cyber Security & Ethical Hacking" was successfully conducted from February 12th to February 17th, 2024. Organized with the goal of enhancing knowledge and fostering innovation in the vital areas of cybersecurity and ethical hacking, the FDP saw enthusiastic participation from educators and professionals across the country.

The program featured sessions by a panel of esteemed resource persons, bringing together a blend of academic depth and industry expertise:

1. **Dr. Ravishankar K C** – Professor & Head of CSE, GEC, Hassan Topic: Advanced cybersecurity concepts and their practical applications. Dr. Ravishankar provided insights into evolving cybersecurity threats and the corresponding academic challenges.
2. **Dr. Anand Babu J** – Associate Dean, MCE, Hassan Topic: Ethical hacking frameworks and tools. His sessions emphasized ethical perspectives and the use of hacking methodologies for security reinforcement.
3. **S M Krishna Reddy Padala** – Certified Offensive Security Professional, Hyderabad Topic: Offensive security strategies and penetration testing. Mr. Krishna Reddy shared his expertise on handling offensive security operations and practical case studies.
4. **Mr. Veera Bhadra Swamy** – Lead Security Specialist, Carl Zeiss, Bangalore Topic: Corporate security protocols and their implementation. He offered valuable insights into securing organizational digital assets.

5. **Mr. Vinay H C** – Cyber Security Analyst, EVRY India Pvt. Ltd., Bangalore Topic: Incident response strategies in the field of cybersecurity. Mr. Vinay's sessions provided a hands-on approach to understanding cyber incidents and their resolution.

6. **Mrs. Vani K G** – Senior Penetration Test Engineer, Bank Bazaar, Bangalore Topic: Real-world penetration testing techniques and practices. Mrs. Vani enriched the program with practical examples and industry-leading practices.
7. **Mr. Akash H C** – Senior Security Engineer, Noodle.ai, Bangalore Topic: Artificial intelligence in cybersecurity. Mr. Akash's discussions highlighted the role of AI in predicting and mitigating security threats.

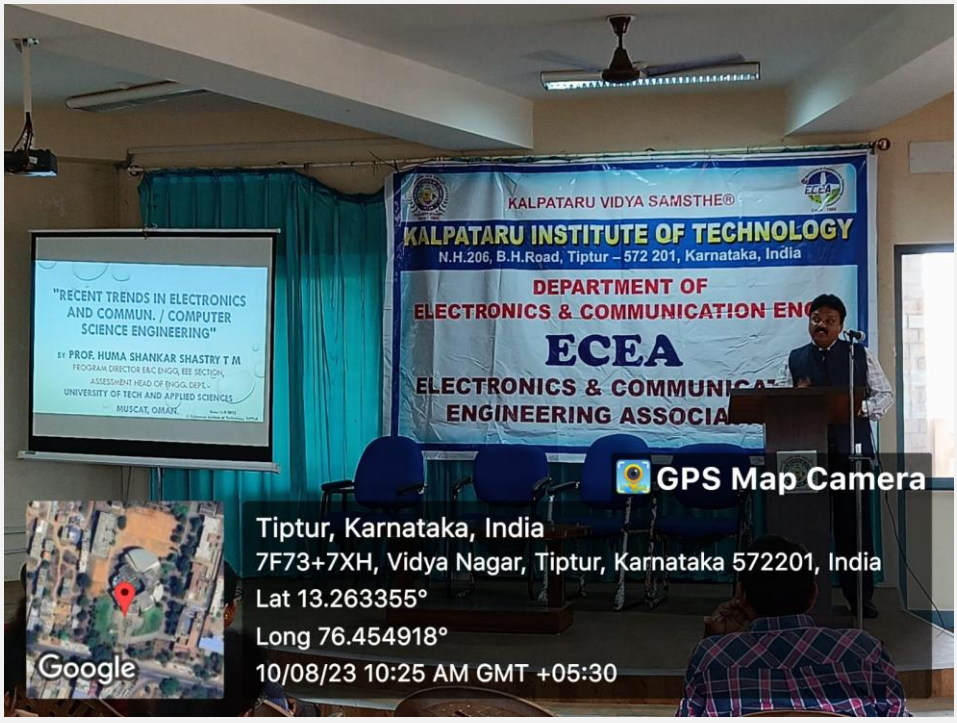
The FDP covered a wide array of topics, ranging from foundational concepts in cybersecurity to cutting-edge advancements like AI integration. The sessions were interactive, with participants engaging in Q&A, live demonstrations, and discussions on emerging challenges and opportunities in the field.

The program concluded with a feedback session, where participants praised the quality of the sessions and the expertise of the resource persons. This FDP not only equipped attendees with up-to-date knowledge and practical skills but also inspired a collaborative spirit for tackling future cybersecurity challenges.

Guest Lecture: "Recent Trends in Electronics and Communication/Computer Science Engineering" by Prof. Huma Shankar Shastry T M

On 10th August 2023, the Department of Electronics & Communication Engineeering hosted an illuminating guest lecture on **"Recent Trends in Electronics and Communication/Computer Science Engineering"**, delivered by the distinguished **Prof. Huma Shankar Shastry T M**, Program Director of E&C, EEE Section at the University of Technology and Applied Sciences, Muscat, Oman.

The session brought together students and faculty to explore the rapidly evolving landscape of electronics and communication, as well as computer science engineering. Prof. Huma Shankar Shastry, with her vast experience and international perspective, shed light on the technological advancements shaping these fields and the opportunities they present for aspiring engineers.



The lecture encompassed a variety of topics, including the integration of Artificial Intelligence (AI) and Machine Learning (ML) in engineering systems, the rise of 5G communication and its transformative impact on global connectivity, and the expanding role of the Internet of Things (IoT) in automating industries and enhancing everyday life.

A significant highlight of the session was the emphasis on interdisciplinary approaches and the need for engineers to adapt and innovate in response to rapidly changing industry demands. Prof. Shastry encouraged students to focus on continuous learning, collaborative problem-solving, and embracing global trends to remain competitive in the field.

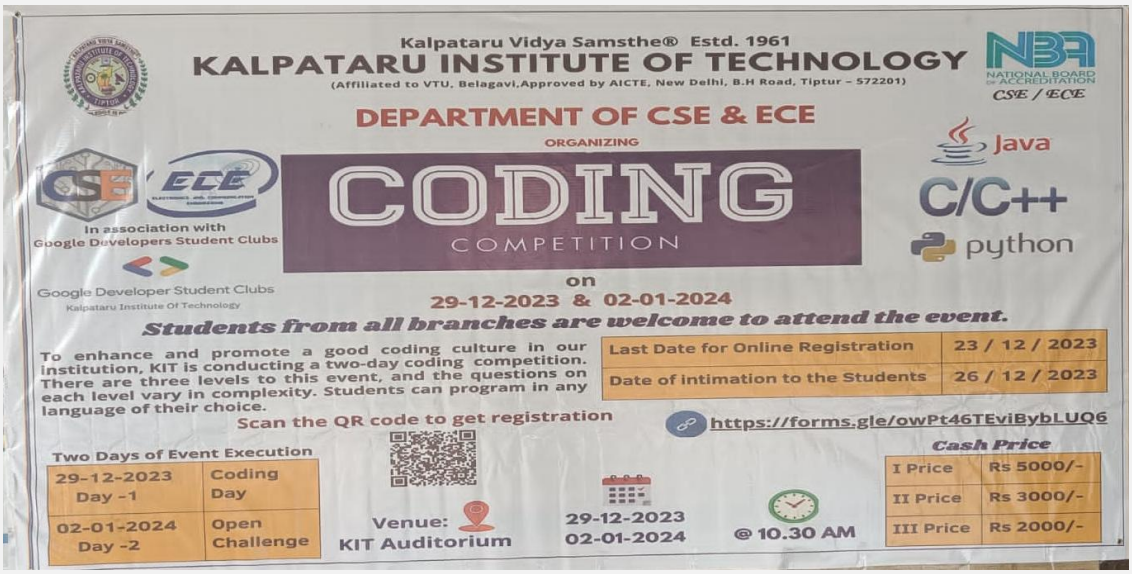
The lecture was interactive and engaging, with students actively participating in thought-provoking discussions. Prof. Shastry's ability to simplify complex concepts, share real-world examples, and provide career insights inspired the audience and sparked a sense of curiosity and ambition.

In addition to its academic impact, the session reinforced the importance of aligning education with industry trends, preparing students to become future-ready professionals. The event was widely appreciated for its relevance and practical significance, making it a memorable and enriching experience for all attendees.

This guest lecture served as a reminder of the rapid pace of technological innovation and highlighted the endless possibilities awaiting those who embrace the challenges and opportunities in electronics and communication and computer science engineering.

CIRCUIT & CODE CARNIVAL: A DUEL OF MINDS

Coding Competition Organized by Departments of CSE and ECE



The Departments of Computer Science and Engineering (CSE) and Electronics and Communication Engineering (ECE), in collaboration with the Google Developer Students Club, hosted a thrilling Coding Competition on December 29th, 2023, and January 2nd, 2024. The event attracted an impressive participation of 183 students from various branches.

The competition spanned three rounds of increasing complexity:

- Level 1: 80 marks
- Level 2: 80 marks
- Level 3: 40 marks

Cumulatively, the competition was scored out of 200 marks.

The event was graced by Mr. Neeraj Kumar Singh, Senior Principal Engineer at Arm System Architecture, Bengaluru, as the Chief Guest. Renowned for his vast expertise in ARM Architecture, System Software, System Architecture, and System-on-a-Chip (SoC) design, he inspired participants with his insightful presence.

The competition showcased remarkable talent, and the winners were as follows:

- First Prize: Varsha T S
- Second Prize: Nandeesh Aradhya
- Third Prize: Hemanth P

Cash prizes were awarded to the top three performers, along with certificates for the highest-achieving participants. The event proved to be an enriching experience, fostering technical excellence and innovation among students.

STUDENTS ENGAGEMENT

STUDENT INVOLVEMENT IN INTER-INSTITUTE COMPETITIONS AND ACTIVITIES

Sl.No	Student Name	USN	Date	Paper title/Conference Name/workshop/Hackathon	Place
1	SUCHITHRA C	1KI20EC038	8th to 29th August 2023	Certificate of Achievement in completing 3 weeks Internship program as HR Intern	Salesine
2	SUPREETH A L	1KI20EC040	9th December 2023	Completed Course on CMOS VLSI	FastBit Embedded Brain Academy, Udmey
3	SUPREETH A L	1KI20EC040	13th December 2023	Completed Course on Embedded Systems Programming on ARM Cortex-M3/M4 Processor	FastBit Embedded Brain Academy, Udmey
4	SUPREETH A L	1KI20EC040	29th December & 2nd January 2024	Participated in Code-KIT coding competition Jointly organized by Department of CSE & ECE	Kalpataru Institute of Technology, Tiptur
5	SUPREETH A L	1KI20EC040	11th March 2024	Completed 6 week Online training on Machine Learning	INTERSHALA TRAINING
6	SANTHOSH S V	1KI21EC404	11th to 15th September 2023	Completed online course on JavaScript Zero to Hero(5 Days)	provided by NSDC,GDG Mad
7	AMRUTHA G R	1KI21EC006	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "PLASMA 2K23"	JNN College of Engg, Shivamogga
8	HARSHINI J M	1KI21EC035	19th July 2024	Certificate of Participation in SPARK 2K24 Mini-Project Competition conducted by EC Dept	Dayananda Sagar Academy of Technology & Management, Bangalore
9	KRUTHIKA M R	1KI21EC046	9th Sep to 21st Dec 2024	Certificate of Completion on Internship in Data Science and Machine Learning"	Take It Smart, Bengaluru
10	KRUTHIKA M R	1KI21EC046	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "Plasma 2K23"	JNN College of Engg, Shivamogga
11	LOHITH G P	1KI21EC051	23rd & 24th Nov 2023	Certificate of Participation in " National Level Hackathon 5.0 INVADERS on Cyber Security & Ethical Hacking"	Maharaja Institute of Technology, Mysore

STUDENT INVOLVEMENT IN INTER-INSTITUTE COMPETITIONS AND ACTIVITIES

Sl.No	Student Name	USN	Date	Paper title/Conference Name/workshop/Hackathon	Place
12	PALLAVI U	1KI21EC065	9th May 2024	Certificate of Participation in " ROBOCOR"24	Siddaganga Institute of Technology, Tumakuru
13	PRAKRUTHI A M	1KI21EC069	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "PLASMA 2K23"	JNN College of Engg, Shivamogga
14	RAKSHITHA B R	1KI21EC072	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "PLASMA 2K23"	JNN College of Engg, Shivamogga
15	SAHANA T N	1KI21EC082	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "PLASMA 2K23"	JNN College of Engg, Shivamogga
16	YASHASWINI G K	1KI21EC113	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "PLASMA 2K23"	JNN College of Engg, Shivamogga
17	SUMAN S A	1KI22EC415	23rd Dec 2023	Certificate of Participation in State Level Technical Symposium "PLASMA 2K23"	JNN College of Engg, Shivamogga
18	SUMAN S A	1KI22EC415	29th Dec 2023 & 2nd Jan 2024	Certificate of Participation in " Code-KIT Coding Competition"	Kalpataru Institute of Technology, Tiptur
19	SUMAN S A	1KI22EC415	29th Feb 2024	Certificate of Participation in "Line Follower Event held in Tech Utsav"	GM Institute Technology, Davsnsgere
20	SUMAN S A	1KI22EC415	3rd & 4th May 2024	Certificate of Participation in "Line Follower Event"	Siddaganga Institute of Technology, Tumakuru
21	SUMAN S A	1KI22EC415	9th May 2024	Certificate of Participation in " ROBOCOR"24	Siddaganga Institute of Technology, Tumakuru
22	YASHWANTH T D	1KI22EC418	9th May 2024	Certificate of Participation in " ROBOCOR"24	Siddaganga Institute of Technology, Tumakuru

TOP OF THE CLASS

TOPPER LIST OF ODD SEM 2023

SEM	USN	NAME	CGPA
1	1KI23EC068	RAKSHITHA R	8.90
3	1KI22EC097	SHREEGANGA H R	9.20
5	1KI21EC019	CHANDANA D	9.47
7	1KI20EC002	AKARSH A S	8.81

TOPPER LIST OF EVEN SEM 2024

SEM	USN	NAME	CGPA
2	1KI23EC068	RAKSHITHA R	9.00
4	1KI22EC097	SHREEGANGA H R	9.14
6	1KI21EC019	CHANDANA D	9.43
8	1KI20EC002	AKARSH A S	8.88

PLACEMENT ACHIEVEMENTS AT A GLANCE

Sl.No.	Student Name	USN	On/Off Campus	Company
1	Santosh S V	1KI21EC404	On Campus	Codegnan Destination
2	Supreeth A L	1KI20EC040	On Campus	Codegnan Destination
3	Ashwini K S	1KI20EC006	On Campus	CelStream
4	Bhavana R	1KI20EC008	On Campus	Palle Technologies
5	Dhanya M P	1KI20EC015	On Campus	Palle Technologies
6	Komala B J	1KI20EC021	On Campus	Palle Technologies 24/7.ai
7	Madhushree A S	1KI20EC023	On Campus On Campus Pool Campus	Excel-IR Palle Technologies ZScaler
8	Mamata Magod	1KI20EC024	On Campus	Palle Technologies
9	Poorvika M Raj	1KI20EC029	On Campus	Excel-IR
10	Sabahath Naz	1KI20EC034	On Campus	Global Quest
11	Suchithra C	1KI20EC038	On Campus	JLC Technologies
12	Lahari Bharadwaj N	1KI21EC402	Off Campus	Ananya Cable Technology
13	CS Arpitha Subramanya	1KI20EC009	Off Campus	Samsung
14	Rohan Y	1KI20EC033	Off Campus	Apex Enterprises

NURTURING EXCELLENCE:
FACULTY'S ROLE IN PROFESSIONAL DEVELOPMENT

Sl. No	Name Of the Faculty	Details Of the Participation	Number Of Days	July 22 To June 23
1	Dr. S V Rajashekararadhya	"Generative AI – Novice to Master"	15	10 To 24 June 2024
2	Prof. Channabasayya Mathad	"Cyber Security and Ethical Hacking"	05	12 To 17 Feb 2024
		"Emerging Technologies "	05	11 To 15 Dec 2023
3	Prof. Prashanth N R	" Emerging Trends in Electronic Circuit Design Signal Processing and Communication ".	05	1 To 6 July 2024
		"Opportunities and Challenges in Entrepreneurship".	15	3 To 19 Jan 2024
4	Prof. Prathibha C	"Artificial Intelligence & Machine Learning for Medical Image Analysis using Python".	05	21 To 25 Aug 2023
		"Emerging Technologies".	05	11 To 15 Dec 2023
		"Research Methodology and Developing Research Skills"	05	26 Feb To 1 Mar-24
5	Prof. Pradeepkumar S K	"Emerging Trends in Signal and Image Processing and AI".	05	12 To 16 Sep 2023
		"Recent Advances and Challenges in Electric Vehicles".	05	23 To 28 Oct 2023
		"Emerging Trends in Electronic Circuit Design Signal Processing and Communication"	07	1 To 6 July 2024
6	Prof. Sunil Kumar K M	"Opportunities and Challenges in Entrepreneurship".	15	3 To 19 Jan 2024
		"Sustainable and Eco-friendly products, Digital and E – commerce Businesses".	21	7 To 24 Feb 2024

ACADEMIC EXCELLENCE: FACULTY RESEARCH AND PUBLICATIONS HIGHLIGHTS

JOURNAL PUBLICATIONS FOR THE YEAR 2023–24 (JULY 2023 – JUNE 2024)			
FACULTY NAME	**TITLE**	**PUBLICATION DETAILS**	**REMARKS**
Dr. SVR	HDLNet: design and development of hybrid deep learning network for optimally ecognizing the handwritten Kannada characters	Australian Journal of Electrical and Electronics Engineering	ISSN: (Print) (Online) Journal homepage: Page no1-21 www.tandfonline.com/journals/tele20 **DOI: 10.1080/1448837X.2024.2316497** https://doi.org/10.1080/1448837X.2024.2316497
Dr. SVR	Handwritten Character Recognition of Kannada Scripts using Novel Feature Extraction Techniques and BMCNN Classifier	SSRG International Journal of Electrical and Electronics Engineering	Volume 10 Issue 7, Page no 125-139, July 2023 ISSN:2348-8379/ **https://doi.org/10.14445/23488379/IJEE**-V10I7P112 © 2023 Seventh Sense Research Group®
Dr. SVR	An Adaptive Ensemble Learning-Based Smart Face Recognition and Verification Framework with Improved Heuristic Approach	International Journal of Electrical and Electronics Engineering	Volume 10 Issue 7, Page no 148-169, July 2023 ISSN:2348-8379/ https:**//doi.org/10.14445/23488379/IJEE**-V10I7P114 © 2023 Seventh Sense Research Group®
Dr. SVR	Effective Face Recognition using Adaptive Multi-scale Transformer-based Resnet with Optimal Pattern Extraction	International Journal of Advanced Computer Science and Applications, (IJACSA)	Vol. 14, No. 7, 2023 Page no 812-827 www.ijacsa.thesai.org
Dr. SVR	A Smart Face Recognition and Verification using Optimal Spatial and Spectral Feature Selection with Adaptive Multiscale Mobilenet	Advances in Artificial Intelligence and Machine Learning; Research	Published 09-09-2023 Vol 3 Page no 1407-1443 https://www.oajaiml.com/
Dr. SVR	A Novel Framework of Face Recognition using Heuristic Development of Ensemble Classifier Model	Advances in Artificial Intelligence and Machine Learning; Research	09-09-2023 Page no 1389-1406 https://www.oajaiml.com/
Dr GSN	Color image restoration using DSS-NL-mapping- basedmulti-noiseNet CNN model	SPRINGER The Optical Society of India (J Opt)	Vol.:(0123456789)1 3 29 AUG 2023 https://doi.org/10.1007/s12596-023-01375-8

ACADEMIC EXCELLENCE: FACULTY RESEARCH AND PUBLICATIONS HIGHLIGHTS

JOURNAL PUBLICATIONS FOR THE YEAR 2023–24 (JULY 2023 – JUNE 2024)			
FACULTY NAME	**TITLE**	**PUBLICATION DETAILS**	**REMARKS**
Dr GDG	Dynamic Mechanical Properties of Graphene and Carbon Fabric-Reinforced Epoxy Nano Composites	Polymer Composites Wiley	2 January 2024 Page No -5281-5289 Wileyonlinelibrary.com/journal/pc **DOI: 10.1002/pc.28126**
Dr GSY	Graph laplacian regularization with sparse coding in secure image restoration and representation for Internet of Things	International Journal of Modeling, Simulation, and Scientific Computing WorldScientific Publishing Company	Published 5 September 2023 Page no 1-19 **DOI: 10.1142/S1793962324410149**
Dr GSY	Dynamic Mechanical Properties of Graphene and Carbon Fabric-Reinforced Epoxy Nano Composites	Polymer Composites Wiley	2 January 2024 Page No -5281-5289 wileyonlinelibrary.com/journal/pc **DOI: 10.1002/pc.28126**
Dr.HSK	Thermal properties of epoxy – GNP Base Nano- Dielectrics	Journal of mimes, metals and fuels	Vol 71 (12A) DEC 2023 Page No 86-90 **Print ISSN;022-2755** **http//www.informaticsjournal.com/index/jmmf**
Dr.HSK	Dynamic Mechanical Properties of Graphene and Carbon Fabric-Reinforced Epoxy Nano Composites	Polymer Composites Wiley	2 January 2024 Page No -5281-5289 wileyonlinelibrary.com/journal/pc **DOI: 10.1002/pc.28126**
Dr GDG	Thermal properties of epoxy – GNP Base Nano- Dielectrics	Journal of mimes, metals and fuels	Vol 71 (12A) DEC 2023 **Print ISSN;022-2755** Page No 86-90 **http//www.informaticsjournal.com/index/jmmf**
Dr MPS	Color image restoration using DSS-NL-mapping-based multi-noiseNet CNN model	SPRINGER The Optical Society of India (J Opt)	Vol.:(0123456789)13 29 AUG 2023 **https://doi.org/10.1007/s12596-023-01375-8**
CONFERENCE 2023-24 (JULY 2023 – JUNE 2024)			
Dr SVR	Heuristic Optimization on Deep Neural Network with Horse Herd Optimization for Efficient Face Recognition Framework	II WORLD CONFERENCE ON INFORMATION SYSTEM FOR BUSINESS MANAGEMENT	ISBN BANKOK 2023 7-8 SEPT 2023 Published in Springer Page no 1-10

Brain-Computer Interface: Decoding the Future of Human Interaction

Imagine a world where a simple thought lets someone control a computer or a robotic arm. For many, this is a dream come true, allowing them to regain movement or share their thoughts when they cannot speak. This is the promise of a Brain-Computer Interface, or BCI.

A BCI is a tech tool that bridges the gap between our brains and the outside world. They open new possibilities in medicine, communication, and even how we understand our minds. This article will explore how they work, what they do now, and what their future might hold.

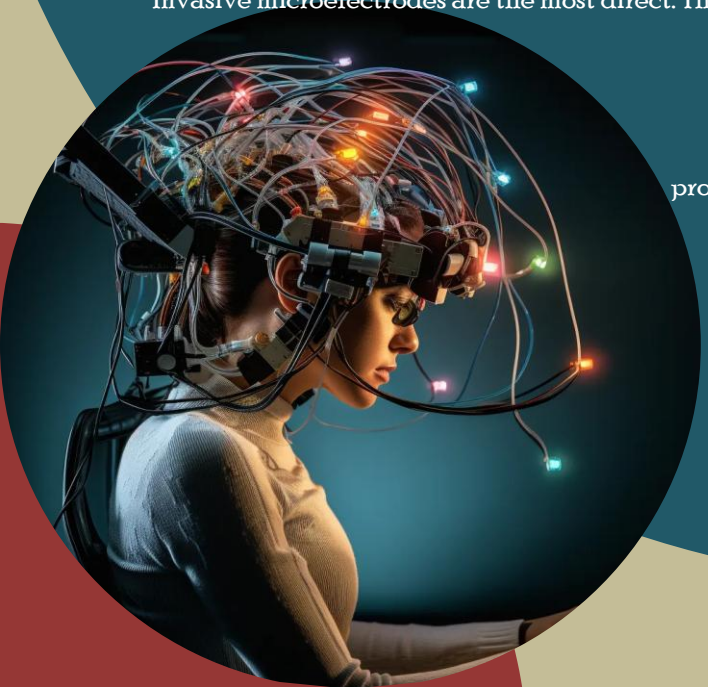
Understanding the Science of Brain-Computer Interfaces

Let's get into the science behind BCIs. It's a mix of brain science, computer engineering, and a bit of magic. The end goal is to translate thoughts into actions.

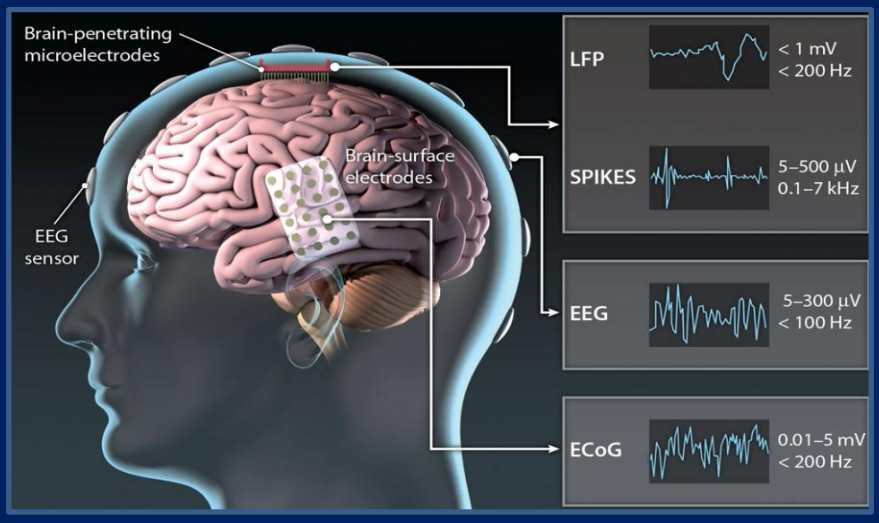
How BCIs Work: A Technical Overview

How do these things even function? BCIs read brain activity, translate it, and then create actions based on those signals.

First, we need to record brain activity. Electroencephalography (EEG) is a common way. It uses sensors on the scalp. Electrocorticography (ECoG) is a little more involved. It requires placing electrodes directly on the brain's surface. Functional magnetic resonance imaging (fMRI) watches brain activity through blood flow. Invasive microelectrodes are the most direct. They are implanted in the brain.



These methods use electrodes, amplifiers, and smart computer programs. Electrodes grab the brain's signals. Amplifiers make those signals stronger. Algorithms translate the data into commands a computer can understand.



Types of BCIs: Invasive vs Non-Invasive Approaches

BCIs come in two main types: invasive and non-invasive. Each has its pros and cons. Non-invasive BCIs are like EEG caps. They are safer but pick up weaker signals. Invasive BCIs, such as implanted electrodes, offer clearer, stronger signals. However, they carry more risk, since surgery is needed. A non-invasive example is an EEG headset used for gaming. An invasive example is a brain implant that helps a paralyzed person move a robotic arm. Each type is used for different purposes, based on what is needed and the level of risk that is acceptable.

Decoding Brain Signals: Challenges and Advancements

Decoding brain signals is no simple task. Our brains are complex! Making sense of its activity is difficult. But, we're learning more every day. Machine learning and AI are helping. These tools find patterns in brain data. This helps BCIs get better at understanding what someone wants to do. Personalizing BCIs is also key. Everyone's brain is different. BCIs that learn and adapt to a specific individual's brain patterns tend to work much better.

Current Applications of Brain-Computer Interfaces

Today, BCIs are used in many different ways. They're changing lives and opening new doors. Who could have imagined?

Restoring Motor Function: Assisting Individuals with Paralysis

One of the most amazing uses of BCIs is helping people with paralysis. These devices can give the gift of movement back to those who have lost it. BCIs can control prosthetic limbs, exoskeletons, and other tools. People can now move robotic arms with their thoughts. They can walk using exoskeletons guided by a BCI. Many companies and research groups focus on these motor-restoring technologies. It's a hopeful area with real, life-changing results.

Enhancing Communication : Enabling Speech for the Speechless

BCIs can also help people who can't speak. For those with conditions like ALS, this tech can be a game-changer.

Brain-controlled typing lets a person type messages on a screen using only their thoughts. "Thought-to-speech" systems are also being created. This turns brain activity directly into spoken words. This tech gives a voice to those who might not have one otherwise, which greatly enhances their life quality.

Ethical Considerations: Privacy, Security, and Accessibility

As BCIs become more powerful, we must consider ethical issues. How do we protect a person's brain data? Can hackers access these systems? Will everyone have access to this tech, or just the wealthy?

We must think about data privacy and security. Guidelines and rules are needed to ensure BCIs are used responsibly. It is very important that this tech benefits everyone.

Overcoming Challenges and Realizing the Full Potential of BCIs

BCI research still has hurdles to clear. We need more money to fund this area of research. Experts from different fields must work together. More people should also learn about the potential benefits of BCIs.

Researchers, developers, and politicians all have a role. They can work to push BCI innovation forward. The goal is to make these tools work better, be safer, and reach more people.

Conclusion

Brain-Computer Interfaces are more than just tech. They represent hope. They offer the chance to restore lost abilities and expand human potential.

We must keep ethics in mind as we move forward. Privacy, security, and equal access are critical. With care and attention, BCIs can truly change the world for the better. Learn more, support BCI research, and be part of this amazing journey.

Quantum Computing: The Future is Now?

What if computers could solve problems that are impossible today? Quantum computing holds that promise. It is a new approach. This tech could change everything. It goes beyond what our current computers can do. Classical computers use bits. These bits are either 0 or 1. Quantum computers use qubits.

Qubits can be 0, 1, or both at the same time. This difference is key. Quantum computing has the potential to change many fields. Medicine, finance, and security could all see big improvements. However, the tech faces a few challenges. Building and using these computers is hard. The journey is underway.

Understanding the Quantum Realm

Quantum computing works because of quantum mechanics. This area of science studies the world at its smallest. It governs atoms and the particles within them. Several laws govern how they behave. Quantum mechanics provides the rules for quantum computers.

Qubits vs. Bits: The Quantum Leap

Classical computers store information as bits. Think of a light switch. It is either on (1) or off (0). Qubits are different. They use quantum mechanics to do more. They can be both 0 and 1 at the same time. This is superposition. They can also be linked together. This is entanglement. These two things give quantum computers their power.

Superposition: Being Everywhere at Once

Imagine a coin spinning in the air. It is not heads or tails until it lands. Superposition is like that. A qubit can represent 0, 1, or any combination of both. It is only one or the other when measured. This "both-at-once" ability lets quantum computers explore many possibilities at the same time. It massively increases the computational speed.

Entanglement: Spooky Action at a Distance

Entanglement links two qubits together. When you measure one, you instantly know the state of the other. It does not matter how far apart they are. Einstein called it "spooky action at a distance." Entanglement is important for quantum communication. It can help make unbreakable codes. It also makes quantum computers more powerful.

The Power and Potential of Quantum Computing

Quantum computing has the power to change many parts of our world. Problems that take regular computers years to solve could be cracked in minutes. This opens up new possibilities. Several industries may benefit greatly.

Revolutionizing Medicine and Drug Discovery

Finding new medicines is usually long and expensive. Quantum computers can speed this up. They can simulate how drugs interact with molecules in the body. This helps scientists find the best drug candidates faster. It can also help create personalized medicine. Treatment is then tailored to a person's specific genes.

Breaking Encryption and Securing the Future

Quantum computers could break current encryption methods. These methods protect our data online. This includes bank accounts and emails. Quantum computers could crack these codes. Scientists are now creating quantum-resistant cryptography. This will help protect our data in the future.

The Challenges and Limitations of Quantum Computing

Quantum computing is not perfect yet. Many obstacles stand in the way of its widespread use. Solving these problems is key to unlocking its true potential.

Quantum Decoherence: Maintaining Stability

Qubits are sensitive. They can easily lose their quantum state. This is called decoherence. Outside noise, like vibrations and temperature changes, can cause it. Keeping qubits stable is a big challenge. Scientists are exploring new ways to protect qubits from decoherence.

Scalability: Building Larger Quantum Computers

Today's quantum computers are small. They have only a few qubits. To solve real-world problems, we need many more. Building larger quantum computers is hard. It requires precise engineering. It also requires new ways to control qubits.

Conclusion

Quantum computing holds amazing promise. It could transform medicine, finance, and security. Yet, the technology faces big challenges. Decoherence, scalability, and error correction are major hurdles. Despite these obstacles, progress continues.

Hybrid computing and QCaaS are making quantum computers more accessible. We must keep researching and developing quantum tech. This is needed to unlock its full potential.

The Heart of Modern Technology Beats in the Hands of ECE Engineers

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