

Department Of
Electrical and Electronics Engineering

CURRENTS NEWSLETTER

JANUARY – JUNE 2024



Volume 12 – Issue 2

INDEX

Sl.No	CONTENTS	Page No.
1	Editorial team	2
2	NHCE: Vision, Mission, Quality Policy, Values	3
3	About Department	4
4	Vision, Mission, POs, PEOs, PSOs	5, 6
5	Club Activities	7, 8
6	Workshops	9-12
7	Expert Talks/Guest lectures	13-19
8	Industrial Visits	20-22
9	TEDx Talks	23-25
10	Achievements	26-28
11	Placements Details	29, 30
12	Alumni Feedback	31-33
13	MoUs	34
14	Publications	35, 36
15	Book Chapter Publications	37
16	Patents	37
17	Conference publications	38, 39
18	Research Areas in Electric Vehicles and Photovoltaics	40-43



Message from Principal

Dr. Manjunatha
Principal, NHCE

At New Horizon College of Engineering, both the faculty and I strongly believe in the need to go beyond the standard curriculum to prepare our students to be truly "Industry Ready." Numerous industry experts have pointed out a concerning trend – many engineering graduates struggle with employability due to a lack of practical skills. NHCE has consistently taken the lead in bridging this gap, ensuring that our students are equipped with the necessary skills to excel in the workforce. It is with great pleasure that I pen a few words as the prologue to the 2024 edition of the EEE Department's in-house newsletter. This issue is carefully curated to reflect the significant events, accomplishments, and initiatives within the department, making it both an informative and valuable resource. I extend my heartfelt congratulations to all the contributors and the editorial team for their hard work in bringing this excellent edition to life. Happy reading!

Message from HoD-EEE

Dr. Sakthivel Aruchamy
Prof. & HOD EEE, NHCE



I am delighted to present the 2024 edition of our newsletter, "Currents." Our editorial team has done an exceptional job in capturing and reporting the events that have taken place in the Department over the past six months. This newsletter serves as a reflection of the major successes witnessed by our students, faculty, and external participants in the field of Electrical Engineering. The primary objective of this technical newsletter is to showcase the involvement, inspiration, and dedication demonstrated across diverse areas of Electrical Engineering. It highlights the collaborative efforts of students, faculty, parents, and alumni, offering a timely and genuine portrayal of our department's activities. This endeavor has been an earnest attempt to bring forward the achievements and progress made, and the credit for its success goes to the faculty and students who have worked with unwavering dedication and enthusiasm. I extend my warm regards to all the readers and hope you enjoy this edition!

Editorial Team



Satishkumar D (NH-0200)
Senior Assistant Professor
EEE Department, NHCE

Student Coordinators



AISHWARYA C S
1NH22EE009



SHUBHASHREE M M
USN: 1NH22EE105



K JAGAN
1NH22EE055



KALPANA CHAWLA S
1NH22EE056



SAKSHI S M
1NH22EE097



KRUTHIKA M
1NH22EE062



GR YASHWANTH
1NH22EE045



S BINDUSHREE
1NH22EE094



BHUVAN R
1NH22EE024



LALITH NARAYAN
1NH22EE063



PURVIK J H
1NH22EE083



**MEENAKSHI J
CHODAVARAPU**
1NH22EE065

NEW HORIZON COLLEGE OF ENGINEERING

VISION

To emerge as an institute of eminence in the fields of engineering, technology and management in serving the industry and the nation by empowering students with a high degree of technical, managerial and practical competence.

MISSION

To strengthen the theoretical, practical and ethical dimensions of the learning process by fostering a culture of research and innovation among faculty members and students.

To encourage long-term interaction between the academia and industry through their involvement in the design of curriculum and its hands-on implementation.

To strengthen and mould students in professional, ethical, social and environmental dimensions by encouraging participation in co-curricular and extracurricular activities.

QUALITY POLICY

To provide educational services of the highest quality both curricular and co-curricular to enable students integrate skills and serve the industry and society equally well at global level.

VALUES:

- Academic Freedom • Integrity • Inclusiveness • Innovation • Professionalism
- Social Responsibility

ABOUT DEPARTMENT

Welcome to the Department of Electrical & Electronics Engineering (EEE) at New Horizon College of Engineering (NHCE), Bangalore. EEE is one of the prestigious branches of Engineering and one among the oldest departments of NHCE-Bangalore started in 2001. The EEE Department has been playing a vital role in producing engineers and technologists of high caliber ever since it was established in the year 2001. The Department is accredited by NAAC with 'A' Grade and accredited by NBA. The vision of EEE Department is to create contemporary Engineers, innovators and entrepreneurs to make a better nation and in turn, a better world. A critical investigation and innovation into the modern state-of-art and cutting edge technology lead to the fact that an electrical graduate fits better in today's competitive world.

The strength of the department is highly qualified faculty members with expertise in various fields of electrical engineering, state of art laboratory facilities. The department is inclined towards bridging the gap between Industry and academia by collaborating with Multinational Companies in the field of Electrical Engineering.

Indo-French Center of Excellence in Electricity, Automation and Energy (IFCEEAE) is one such initiative evolved through "MoU" with French Ministry of National Education and Schneider Electric India Pvt. Ltd., The main objectives of IFCEEAE are

- To train the students of all streams of engineering in automation field
- To facilitate interdisciplinary and applied research with a focus on innovative product development
- To provide excellent career opportunities to students through exchange programs with French Universities, industrial training, innovative learning and R & D activities especially in the areas like Smart Grid, Internet of things (IoT), Energy Management Systems, Embedded systems, Supervisory Control and Data Acquisition (SCADA) and industrial automation.

The Department nurtures the young minds beyond the curriculum by facilitating technical clubs in promoting technical events, community development/society impact and universal value/ethics programs. In supporting to this, Department of Electrical and Electronics Engineering has established Institute of Electrical and Electronics Engineers (IEEE) – Power Electronics Society (PELS) Student Branch Chapter (Geo-Code: SBC66131). Industrial Electronics Society (IES) Student Branch Chapter (Geo-Code: SBC66131B) which is the non- profitable, world largest technical professional organization for the advancement of technology. The students have a greater exposure and flexibility in campus placements in core industries, IT sectors and Public Sector Units (PSU).

VISION

To evolve into a centre of excellence in Electrical and Electronics Engineering for bringing out contemporary engineers, innovators, researchers and entrepreneurs for serving nation and society.

MISSION

To provide suitable forums to enhance the teaching-learning, research and development activities.

Framing and continuously updating the curriculum to bridge the gap between industry and academia in the contemporary world and serve society.

To inculcate awareness and responsibility towards the environment and ethical values.

Program Outcomes (POs)

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems in Electrical and Electronics Engineering.

PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems in Electrical and Electronics Engineering 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 of Electrical and Electronics Engineering 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 in Electrical and Electronics Engineering, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities in Electrical and Electronics Engineering with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice in Electrical and Electronics Engineering.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions of Electrical and Electronics Engineering in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication Skills: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and 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 engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To provide good learning environment to develop entrepreneurship capabilities in various areas of Electrical and Electronics Engineering with enhanced efficiency, productivity, cost effectiveness and technological empowerment of human resource.

PEO2: To inculcate research capabilities in the areas of Electrical and Electronics Engineering to identify, comprehend and solve problems and adopt themselves to rapidly evolving technology.

PEO3: To create high standards of moral and ethical values among the graduates to transform them as responsible citizens of the nation.

PROGRAM SPECIFIC OUTCOME (PSOs)

PSO1: Graduates will be able to solve real life problems of Power system and Power Electronics using MiPower, PSpice and MATLAB software tools and hardware.

PSO2: Graduates will be able to develop and support systems based on renewable and sustainable Energy sources.

CLUB ACTIVITIES

Empowering Control: Navigating the Future with HMI and SCADA Excellence
08.02.2024



MekalaRohith Kumar Reddy, an Electrical Design Engineer based in Anantapur, Andhra Pradesh. He has completed his graduation from New Horizon College of Engineering in 2023. A technical workshop based on HMI and SCADA is a training session that aims to teach the participants the fundamentals and applications of human-machine interface (HMI) and supervisory control and data acquisition (SCADA) systems in industrial automation. HMI and SCADA are two related but distinct concepts that enable human operators to interact with, monitor, and control machines and processes remotely.

Green Energy Club Presents "A Technical Workshop IDEA TO IMPACT" 14.05.2024



The primary objective of the workshop was to provide an in-depth understanding of the process, challenges, and rewards of creating a successful sustainability startup. The presenter, Meenakshi B, Co-founder & Marketing Lead of EETA, shared the story of her startup, which focuses on solving the food waste problem, making the poultry and aquaculture industry; greener and promoting sustainability.

Some of the key takeaways of this workshop were:

- Introduction to EETA
- Measuring Sustainability: The speaker provided a framework for quantifying the environmental impact of a product service including energy savings, reduction of natural resource usage, pollution removal, and extended shelf life.
- Electrical Engineering for Sustainability: The critical role of electrical engineering in sustainability was also highlighted, covering topics such as renewable energy, energy efficiency, and waste-to-energy solutions.

The workshop concluded by listing valuable books and resources for those interested in learning more about startups, sustainability, and entrepreneurship.

WORKSHOPS


Intellectual Property Rights (IPRs) and IP Management for start up

06.05.2024






Institution Innovation Council in Association with Department of Electrical and Electronics Engineering had organized one day workshop on “Intellectual Property Rights (IPRs) and IP Management for start up” on 06.05.2024 at Tejas Seminar, Hall, New Horizon College of Engineering, Bengaluru. The speaker Dr N Nagarajan, Technical Director, Lead Patent Analyst, NSKD Tecnoresearch and Innovation, Dhramapuri emphasized on Intellectual Property (IP) as a critical asset for startups, often forming the foundation of their competitive advantage, to protect their innovations, attract investors and avoid legal pitfalls.

15.06.2024



**NEW HORIZON
COLLEGE OF ENGINEERING**


Department of Electrical and Electronics Engineering

Organizes

National Level Workshop on Modeling and Simulation of Electrical Networks using Scilab

📅 Online (Microsoft Teams)
📍 15 June 2024, Saturday | IST 10:00 AM – 11:30 AM



Resource Person
Mr. Sumukh Surya
Senior Engineer
Bosch Global Software Technologies Pvt. Limited,
Bengaluru

Registration Link
<https://tinyurl.com/Scilab-workshop>
Last Date of Registration: 14 June 2024
Free Registration, E – Certificates will be provided

Organizing Committee

Mr. D. Satish Kumar
Sr. Assistant Professor, EEE
Coordinator

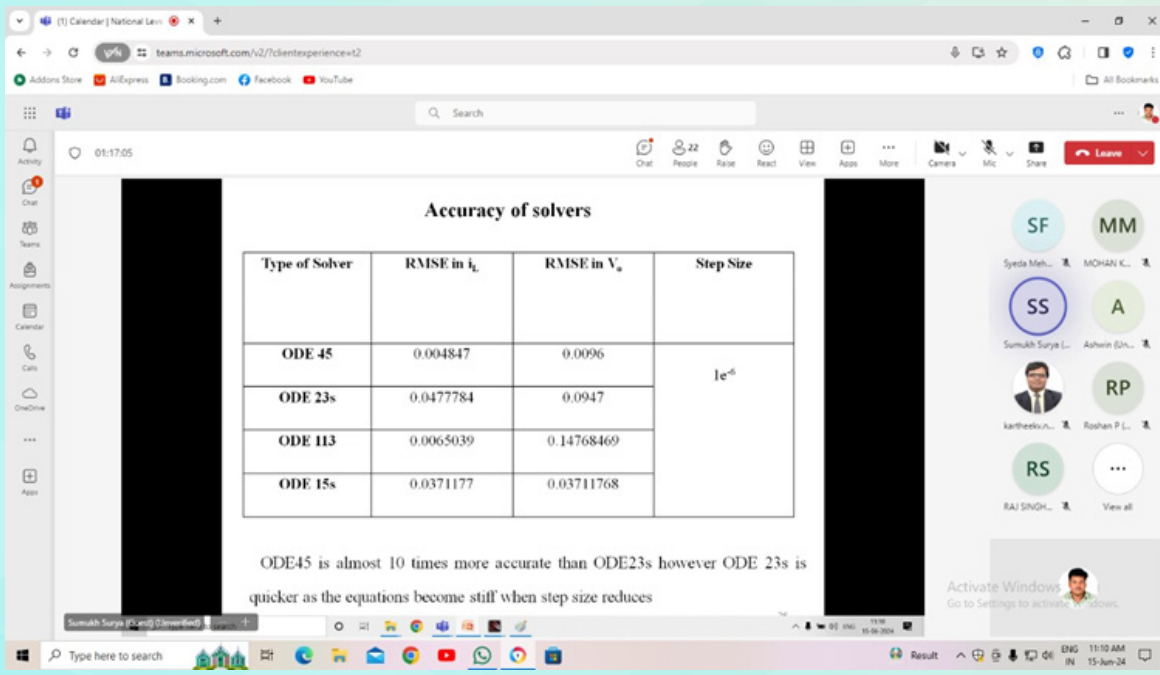
Dr. Vinoth Kumar K
Professor, EEE
Advisor – IEEE IES NHCE SBC

Dr. Saktivel Aruchamy
HoD - EEE

Contact

Mr. Jeevan M
IEEE IES NHCE SBC Chair +91 9108299438

Mr. Adiyti Suman
IEEE IES NHCE SBC Vice-Chair +91 9845156053



Accuracy of solvers

Type of Solver	RMSE in i_L	RMSE in V_o	Step Size
ODE 45	0.004847	0.0096	$1e^{-6}$
ODE 23s	0.0477784	0.0947	
ODE 113	0.0065039	0.14768469	
ODE 15s	0.0371177	0.03711768	

ODE45 is almost 10 times more accurate than ODE23s however ODE 23s is quicker as the equations become stiff when step size reduces

The IEEE IES NHCE Student Branch Chapter from Department of Electrical and Electronics Engineering, New Horizon College of Engineering, Bengaluru had organized the National level workshop on “Modeling and Simulation of Electrical Networks using Scilab” on 15th June 2024, Saturday, between 10:00 AM to 11:30 AM in association with IEEE Industrial Electronics Society Bangalore Chapter at NHCE Bengaluru. The resource person for the workshop was Mr Sumukh Surya, Senior Engineer, Bosch Global Software Technologies, Bengaluru. This workshop attracted participants from various institutions and industries, emphasizing the growing importance of simulation tools in engineering. The workshop was an enlightening experience, offering deep insights into the practical applications of Scilab in industrial settings.

Workshop on Strategies of Servomotor Design and Control

07.06.2024 & 08.06.2024





The National Level Skill Development Programme on Strategies of Servomotor Design and Control, under the auspices of the MHI-PSG Industry Accelerator Project, was a dynamic and intensive two-day workshop hosted at New Horizon College of Engineering. The workshop delved deeply into the intricacies of servomotor design and control, a pivotal area in the field of automation and robotics. Topics covered included the fundamentals of servomotor technology, advanced design strategies, control mechanisms, and real-world applications. Participants engaged in hands-on sessions that allowed them to apply learned concepts in a controlled environment, enhancing their practical skills and understanding. These interactive sessions were designed to simulate real-world challenges, encouraging innovative problem-solving and critical thinking. In addition to technical knowledge, the workshop facilitated networking opportunities, fostering collaboration between academia and industry. This interaction aimed to drive forward-looking initiatives and innovations in servomotor technology.

EXPERT TALKS/GUEST LECTURES

Expert Talk on Design Thinking: Human-Centred Approach to innovation

11.01.2024



Faculty Co-ordinator: Dr Sujitha S, Professor, EEE Department, NHCE

On January 11, 2024, the IEEE PELS NHCE SBC organized a special talk at Tejas Seminar Hall on Workshop titled " Human-Centred Approach to innovation" in association with IEEE PELS Bangalore Section Chapter. The speaker is Dr.Chinnu Nallathambi, Founder of Brain Alchemy Technology Co-Founder of Brain Magic Academy and a WHO-endorsed Life Skill Trainer. Mr. Nallathambi passionately discussed how understanding and harnessing the power of the subconscious mind can be directly linked to fostering innovation. He explained how our subconscious mind, often operating beneath our conscious awareness, plays a crucial role in shaping our thoughts, ideas, and problem-solving abilities. The eminent expert from the industry delivered the lecture and his talk has been very well received by the 82 participants

Modern Trends in Electrical Protection and Transmission and Distribution

17.01.2024





The Department of Electrical and Electronics Engineering of IEEE PES NHCE SBC, New Horizon College of Engineering had organized a Guest Lecture on “Modern Trends in Electrical Protection and Transmission and Distribution” in association with IEEE PES Bangalore Chapter on 19.01.2024, Friday from IST 9:00 AM to 11:00 AM. The session was handled by Mr. Vinoth Kumar S Senior Lead, Electrical P and C Design Engineer WPS Consultant India Private Limited. The outcome of the programme was to facilitate exchanging and sharing the knowledge about the various methodologies in transmission, the importance of high voltage transmission and the various protection devices such as relays, circuit breakers used across the transmission lines and the software used for managing the panels through SCADA. The expert shared experimental videos with the students which were very informative and students of 5th semester got benefited.

Comprehensive Approach to Object-Oriented Programming using Java

07.02.2024



The IEEE NHCE Student Branch Chapter of Department of Electrical and Electronics Engineering, New Horizon College of Engineering, Bengaluru had organized a Lecture on “Comprehensive Approach to Object-Oriented Programming using Java” on 7/02/2024 for 5th semester students. Dr.Beenu Mago, Assistant Professor in the School of Computing, Skyline University, Sharjah, and UAE conducted the live session on topics like methods, objects, classes, constructors, static variables, access modifiers, data field, and encapsulation.

Art of Writing Innovative Research Proposal for Funding– An Overview

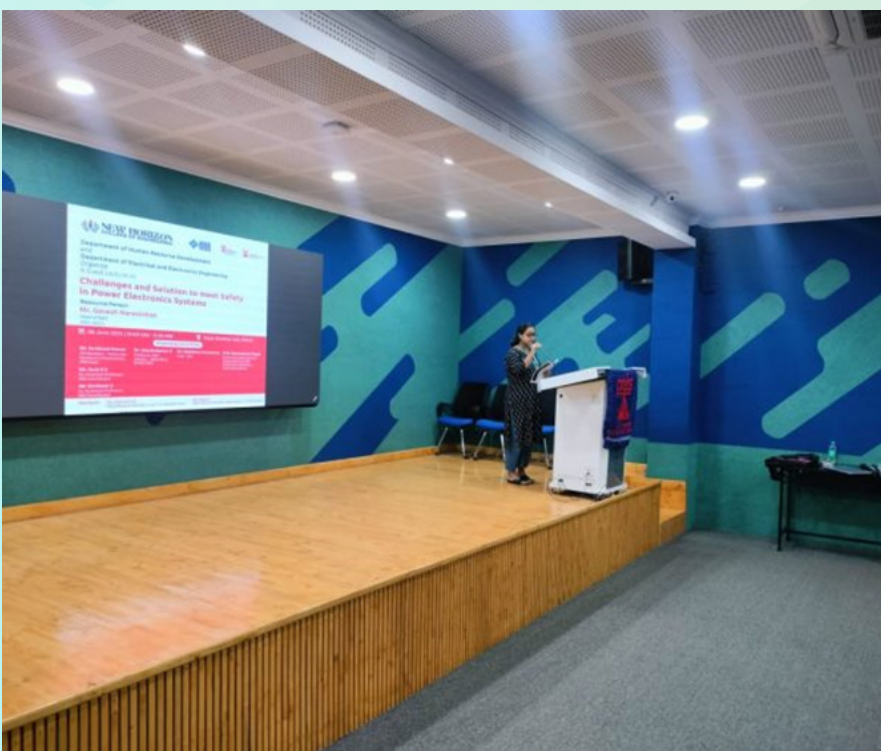
10.02.2024



The department of Research & Development In association with Department of Electrical and Electronics Engineering had organized Lecture #4(of R&D Lecture Series)on Innovative Research titled Art of Writing Innovative Research Proposal for Funding– An Overview on 10/02/2024 at Falconry Seminar Hall. The objective of the lecture series was to provide insights on research proposal writing to get funding in different research areas .Dr. C. Bharatiraja, Head- Centre of Electric Mobility (EMC), DSTPURSE Coordinator SRM Institute of Science and Technology, Chennai was the resource person.

Challenges and Solution to Meet Safety in Power Electronics Systems

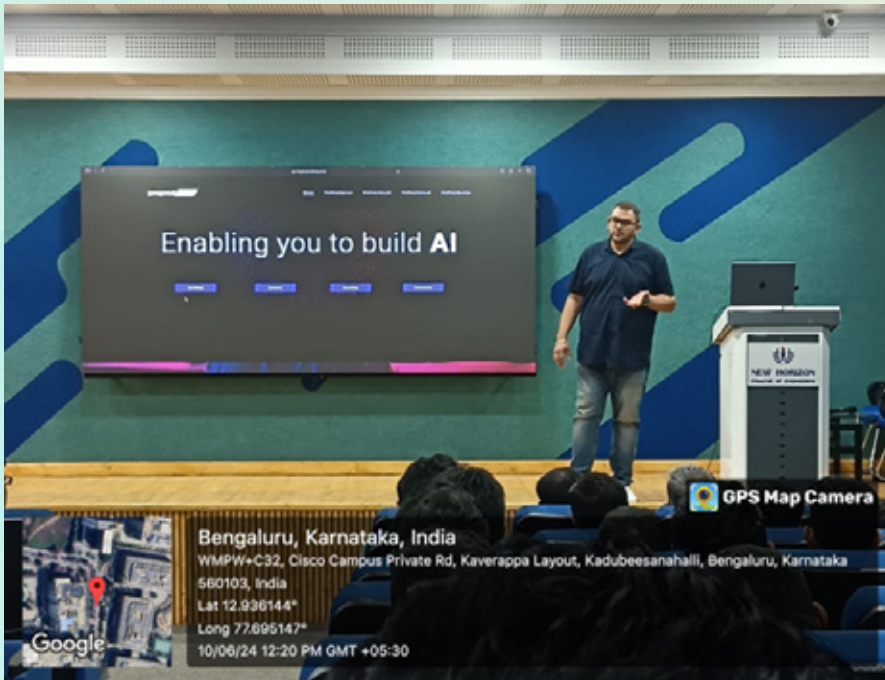
08.05.2024



IEEE PELS NHCE Student Branch Chapter from Department of Electrical and Electronics Engineering, New Horizon College of Engineering, Bengaluru had organized the Guest Lecture on Challenges and Solution to meet Safety in Power Electronics Systems on 08/05/2024 in association with IEEE PELS Bangalore Section Chapter. Mr. Ganesh Narasimhan, Head of R&D, IPEC INDIA was the resource person. He outlined the information about opportunities, challenges and solution to meet Safety in Power Electronics Systems.

“AI” as a wrapper around your domain

10.06.2024



Department of Electrical and Electronics Engineering had organized an expert talk on “AI as a wrapper around your domain” on 10/062024. The speaker of this event was Mr. Krishnav Dave, Founder &CEO, @Preprod Crop, Bangalore. The speaker embarked on AI and the importance of observation and prediction which forms the core of predictive analytics.

INDUSTRIAL VISITS

Industrial Visit on “Electrical Machines”

11.01.2024



IEEE Power Electronics Society NHCE Student Branch Chapter of Electrical & Electronics Engineering Department, NHCE in association with IEEE PELS Bangalore Chapter Organized Industrial Visit on “Electrical Machines: Synchronous and Induction Machines” on 11.01.2024 at Rajamane & Hedge Services Pvt Ltd, Tumkur. This Industry was established in the year 1975 by its founder Chairman Mr. S.K.Rajamane, an ex-design engineer of rotating machines from Kirloskar Electric. The outcome of the programme is to bring the students to industry platform to a collective gathering for exchanging and sharing the knowledge about the recent developments in electrical machines. The entire session is very informative and enthusiastic manner in the area of electrical machines industry.

Industrial Visit on “Electrical Machines”

18.01.2024



IEEE Power Electronics Society NHCE Student Branch Chapter of Electrical & Electronics Engineering Department, NHCE in association with IEEE PELS Bangalore Chapter had organized an Industrial visit on 18.01.2024 to Rajamane& Hedge Services Pvt Ltd, Tumkur. The outcome of the program was to bring the students to industry platform to a collective gathering for exchanging and sharing the knowledge about the recent developments in electrical machines.

Industrial Visit to ISRO-U R Rao Satellite Center (URSC), Bengaluru

29.05.2024



The department of EEE had organized an Industrial visit to Indian Space Research Organisation (ISRO) on 29/05/2024 and 30/05/2024. The visit provided the students with valuable insights into the operations, research, and development activities of one of the world's leading space agencies. The Industrial visit to ISRO was an incredibly enriching experience that broadened the understanding of space science and technology. It provided a firsthand look at the operations of a leading space research organization and highlighted the importance of innovation, teamwork, and dedication in achieving scientific milestones. The visit has ignited the passion for space exploration and motivated students to excel in their respective fields.

TEDxTALKS

Hacking the future excelling in tomorrow's playground

29.04.2024

TEDxTALK
(RECORDED)

NEW HORIZON
COLLEGE OF ENGINEERING

Department of Electrical and Electronic Engineering

VI SEMESTER SECTION A
HACKING THE FUTURE
EXCELLING IN TOMORROW'S PLAYGROUND

Speaker: **R K Shenoy** Room No./Faculty Coordinator: **B-203/Prof. Kavitha C H**

📅 29 April, 2024 🕒 11:00 AM to 12:00 PM

VI SEMESTER SECTION B
TRANSFORMING GRIEF
INTO POSITIVITY

Speaker: **Manya Ganapathy** Room No./Faculty Coordinator: **B-204/Prof. Kavitha C H**

Convener: **Dr.A.Sakthivel**

📅 29 April, 2024 🕒 12:00 PM to 1:00 PM



The Department of Electrical and Electronics Engineering had organized TEDx Talk(recorded) for VI Semester Sec A and B students on 29/04/2024. In his TED Talk, the speaker Mr. RK Shenoy, CTO – Executive Board and Senior VP – Mobility Engineering at BGSW (Bosch Global Software Technologies) briefed his personal and professional journey as an electronics engineer, highlighting significant transformations in the mobility and IoT sectors. In another Talk the speaker Ms Manya Ganapathy embarked on the Anugraha Project which focuses on providing free, nutritious meals to low-income residents in Bangalore.

TEDx TALKS

04.05.2024



The Department of EEE had organized TEDx Talk(recorded) for VIII Semester Sec A and B students on 04/05/2024. The speaker NamanVankadari is a prominent Advocate and Assistant Professor known for his innovative approach at the intersection of law, education, and entrepreneurship. Through his TEDx talk, he advocates for experiential learning and critical thinking. The other speaker Mansi Prasad explores the concept of aligning one's professional career with personal passions to achieve a fulfilling and purposeful life. Being a Carnatic vocalist and museum director, she emphasizes the importance of self-discovery and introspection in identifying one's true calling.

Unveiling Bliss- Navigating Contentment while Pursuing your Dreams

06.06.2024



The Department of Electrical and Electronics Engineering had organized TEDx Talk(recorded) for IV Semester Sec A and B students on 06/06/2024. The speaker Dushyant Dubey narrated his empowering journey in Bengaluru where he emphasizes the transformative power of community support and Dubey's involvement in social causes spans a broad spectrum, from civic awareness and animal welfare to women's empowerment and mental health. The other speaker Krishnan Mahadevan, popularly known as the "Idly King of Bangalore," Mahadevan emphasized that success is not solely measured by financial gains but by the fulfillment and joy that comes from pursuing one's passion. One of the key themes of Mahadevan's talk is innovation. When he took over the family business, he didn't just continue the legacy; he transformed it. He implemented stringent quality controls, modernized business practices, and developed innovative marketing strategies to build a brand that stood out in the competitive food industry.

Achievements

47th series of Student Project Programme (SPP): 2023-24

The following list of E.E.E Student Project proposals have been approved for Sponsorship under Karnataka State Council for Science and Technology, 47th series of Student Project Programme (SPP): 2023-24

Project Title: A Portable Improvised Solar Home Lighting System with LiFePO₄ Battery.

Team Members: Mr. Advait Madhavan, Mr. Khadim Hussain, Mr. Kovvuri Javed, Mr. Ajmal Baba, & Mr. Jawahar. M. P

Amount for Sponsorship: 5000 INR; Project Guides: Dr. Vinoth Kumar. K, Ms. Anitha. A

Project Title: Farm Guard: Automated Animal Detection and Monitoring System.

Team Members: Ms. Disha. M, Ms. Harshika, Ms. Hemavathi. V, & Ms. Aamna Nafiza

Amount for Sponsorship: 5500 INR; Project Guide: Dr. Sujitha. S

Project Title: EMPOWERING MOBILITY FOR DISABLED: DESIGN AND FABRICATION OF E-TRICYCLE.

Team Members: Mr. SANJAN R, Mr. MOHAMMED IMAD, Mr. SHASHANK JOSHI, & Ms. SNEHA S. A.

Amount for Sponsorship: 7000 INR; Project Guide: Dr. Sujitha. S

Project Title: EV TOUCH START FINGERPRINT – POWERED IGNITION.

Team Members: Mr. Gagan M, Mr. Arunesh Kumar Singh, & Mr. Varun. P. C

Amount for Sponsorship: 6500 INR; Project Guide: Dr. Sujitha. S

Project Title: SOLAR POWERED INDUCTION MOTOR SPEED CONTROL USING IOT FOR AGRICULTURE.

Team Members: Mr. Kamalesh Badola, Mr. Kushal Naik. K, Mr. Lava Kumar. M.N, & Mr. Mohammad Aman

Amount for Sponsorship: 6500 INR; Project Guide: Dr. Vinoth Kumar. K

Project Title: LOAD FREQUENCY CONTROL OF ISOLATED HYBRID MICROGRID.

Team Members: Mr. ANSHU KUMAR U, Mr. ADITYA NARAYAN, & Mr. AKSHAT SHAJI

Amount for Sponsorship: 6500 INR; Project Guide: Dr. Mausri Bhuyan

Project Title: Enhanced Electric Propulsion and Stability Control in two-wheeled vehicles.

Team Members: Mr. Dayas A. Dixen, Mr. Dheeresh Vijay Devadiga, Mr. Dony Snehit. P & Ms. Harshitha. K

Amount for Sponsorship: 7000 INR; Project Guide: Dr. Sujitha. S

Young Upstart Entrepreneurial Design Thinking



Vikash Rawat (1NH20EE120) & Tantapureddi Harita (1NH20EE117) of EEE department, NHCE for securing 3rd place in the 'Young Upstart Entrepreneurial Design Thinking' Competition held at SAP Labs India, Whitefield, Bangalore on 01/03/2024 and 07/03/2024. Their dedication, hard work, and passion have not only brought recognition to themselves but also added pride to our institution.

**Handball tournament at the VTU Central Zone level,
held at BMS College of Engineering**



Students from New Horizon College of Engineering, Bangalore, participated in the Handball tournament at the VTU Central Zone level, held at BMS College of Engineering, Bangalore, on 03.02.2024. Our team achieved the runner-up position. Two students, Baru Tejesh (1NH22EE017) and Pavan Kumar. M (1NH23EE404), represented the E.E.E department. We extend our heartfelt congratulations to them.

EEE STUDENTS PLACEMENT DETAILS

USN	Name	Company Placed	CTC
1NH20EE101	SHASHANK JOSHI	Eurofins IT Solutions/KPIT	1075000/4,50,000
1NH20EE066	MOHAMMED IMAD	KPIT	450,000
1NH20EE120	VIKASH RAWAT	KPIT	450,000
1NH20EE037	HARSHIKA HARSHIKA	KPIT	450,000
1NH20EE029	DAYAS A DIXEN	KPIT	450,000
1NH20EE085	RAGHAVENDRA NAGAYYA SWAMI	KPIT	450,000
1NH20EE107	SHREYA D REVANKAR	Computacenter	500,000
1NH20EE035	DONY SNEHIT	Societe Generale	543,724
1NH21EE402	DHEERESH DEVADIGA	Surya Software	700,000
1NH20EE049	KEERTHI M	Netradyne Technology Pvt Ltd	600,000
1NH20EE098	SAPNA S	ITC Infotech Ltd/SIEMENS	425000/4,50,000
1NH20EE037	HARSHIKA HARSHIKA	ITC Infotech Ltd	425,000
1NH20EE075	PM KEERTHANA	ITC Infotech Ltd	425,000
1NH20EE030	DEEPIKA K SHETTY	ITC Infotech Ltd	425,000
1NH20EE063	MANU K	Musigma	500,000
1NH20EE042	INFANCIA PRAGNA	Musigma	500,000
1NH20EE005	ADITI J	Musigma	500,000
1NH20EE078	PONDE SUMANTH	Microland	400,000
1NH20EE128	YESHWANTH M	Microland	400,000
1NH20EE064	MEGHANA I K	Microland	400,000
1NH20EE117	TANTAPUREDDI HARITHA	Microland	400,000
1NH20EE090	ROCHIL BISEN	Microland	400,000
1NH20EE077	PAVAN KUMAR BP	Microland	400,000
1NH20EE078	PONDE SUMANTH	PhonePe	480,000
1NH20EE122	VINAYKUMAR KAWTAGI	PhonePe	480,000
1NH20EE097	SANJANA	PhonePe	480,000
1NH20EE123	VISHAL	PhonePe	480,000
1NH20EE077	PAVAN KUMAR BP	PhonePe	480,000
1NH20EE013	ANUJ PRATHAP SINGH	Yokogawa	460,000
1NH20EE096	SANJAN R	Yokogawa	460,000
1NH20EE007	Advaith Madhavan	DYNALEKTRIC	300,000
1NH20EE024	C K KISHORE	DYNALEKTRIC	300,000
1NH20EE081	Pramod G	DYNALEKTRIC	300,000
1NH21EE404	JAYANTH C K	DYNALEKTRIC	300,000
1NH20EE039	HARSHITHA K	CAPGEMINI	425,000

1NH20EE048	Kamalesh Badola	CAPGEMINI	425,000
1NH20EE054	KOVVURI JAVED AJMAL BABA	CAPGEMINI	425,000
1NH20EE063	Manu K	CAPGEMINI	425,000
1NH20EE073	Neha	CAPGEMINI	425,000
1NH20EE111	Sneha S A	CAPGEMINI	425,000
1NH20EE066	Mohammed Imad	NAKANICHI METAL (International)	2,500,000
1NH20EE028	Darshan	Intrainz	400,000
1NH20EE051	Kiran R	Intrainz	400,000
1NH20EE001	Aamna Nafiza	Merck	
1NH20EE112	Sreeram G	Fleurdelis Technologies Pvt Ltd	300,000
1NH20EE044	Jayanth D	Fleurdelis Technologies Pvt Ltd	300,000
1NH21EE409	Sharath Kumar M	Fleurdelis Technologies Pvt Ltd	300,000
1NH20EE079	Pooja R	SOLAREEDGE	500,000
1NH20EE086	Rahul B	SOLAREEDGE	500,000
1NH20EE020	Beula Jasmine A	SOLAREEDGE	500,000
1NH20EE010	Amisha Athrey	SOLAREEDGE	500,000
1NH20EE093	S Sonu	SOLAREEDGE	500,000
1NH20EE059	M.Gagan	SOLAREEDGE	500,000
1NH20EE088	Rakshitha Hr	IPEC MOBILITY	314,000
1NH20EE022	BHARATH T	IPEC MOBILITY	314,000
1NH20EE110	Simran Kanwar	Hitachi India	500,000
1NH20EE039	Harshitha K	Hitachi India	500,000
1NH20EE129	Yoga Pratesh R	HEALTHASYST	500,000
1NH20EE108	SIDDANTH REDDY K S	FINTELLIX - Phase 2	280,000
1NH20EE027	DAIVIK K	FINTELLIX - Phase 2	280,000
1NH20EE002	Abhay Shetty KN	Formoplastic	300,000
1NH21EE40	Ramakanth H Dolli	Formoplastic	300,000
1NH20EE124	Vishwas D.P	Oneadvanced	642,000
1NH20EE061	Manasa Reddy	Oneadvanced	642,000
1NH21EE400	Anilakumar U	Avalon Technologies private limited	600,000
1NH20EE127	YASWANTH S	Candor	350,000
1NH20EE058	LAVANYA N	FINTELLIX - Phase 2	280,000

Alumni Feedback



Tantapureddi Haritha
(1NH20EE117)

I am incredibly grateful to the Human Resource Development (HRD) department at New Horizon College of Engineering for their significant role in my successful placement at Microland. The HRD team's comprehensive training program not only strengthened my technical capabilities but also honed critical soft skills such as effective communication, collaborative teamwork, and strategic problem-solving. Through hands-on training sessions, realistic mock interviews, and team-based exercises, I gained the confidence and skills necessary to excel in the corporate environment. Moreover, the HRD department organized visits to prominent IT firms, providing us with invaluable exposure to real-world corporate environments. These experiences not only gave us insights into industry trends but also prepared us to navigate the transition from academia to the professional arena with greater ease. I am also thankful to the Electrical and Electronics Engineering (EEE) department, where I received invaluable support throughout my academic journey. I would like to express my gratitude to our Head of Department for his inspirational leadership and steady encouragement. My mentor deserves special thanks for his guidance and advice, helping me overcome academic and personal challenges. I am equally grateful to my class teacher for her kindness and patience, creating a positive learning environment. The combined support from the EEE department has been crucial in building my confidence and skills, setting the stage for a successful career. I would like to extend my heartfelt gratitude to New Horizon College of Engineering as a whole. The college has provided me with an excellent education and a nurturing environment to grow both academically and personally. The commitment of the faculty and staff, the state-of-the-art infrastructure, and the culture of innovation have all contributed to my success. I am proud to be a part of this esteemed institution, and I will carry the values and lessons I learned here into my future endeavours.



Shashank Joshi
(1NH20EE101)

I, Shashank Joshi, want to express my sincere gratitude to the Human Resource Development (HRD) department at New Horizon College of Engineering for their instrumental role in securing my placement at Eurofins IT Solutions. The HRD team's exceptional training program significantly enhanced my technical skills and honed essential soft skills like communication, teamwork, and problem-solving. Through engaging training sessions and collaborative exercises, I gained the confidence and abilities needed to thrive in the corporate world. I would also like to acknowledge the Electrical and Electronics Engineering (EEE) department for their unwavering support throughout my academic journey. My deepest gratitude goes to the Head of the Department for his inspiring leadership and constant encouragement. My mentor deserves special recognition for his guidance and advice, which proved invaluable in overcoming academic and personal challenges. I am equally thankful to my class teacher for her kindness and patience, which fostered a positive learning environment. The collective support from the EEE department has been paramount in building my confidence and skills, paving the way for a successful career. Finally, I extend my heartfelt gratitude to New Horizon College of Engineering as a whole. The college provided me with an exceptional education and a nurturing environment that fostered both academic and personal growth. The dedication of the faculty and staff, the infrastructure, and the emphasis on innovation all significantly contributed to my success. I am honoured to be an alumnus of this esteemed institution, and I will carry the values and lessons learned here throughout my future endeavours.



Infancia Pragna
(INH20EE042)

NHCE is more than just a campus; it's a hub of growth, where learning, camaraderie, and cultural enrichment blend seamlessly. Here, every voice is valued, every opinion respected. My journey here has been transformative, elevating my knowledge and bolstering my confidence. The faculty's unwavering support extends beyond academics, nurturing holistic development through various activities. Thanks to NHCE, I've not only honed my engineering skills but also cultivated qualities essential for personal growth. The comprehensive placement training paved the way for a promising career start. My heartfelt gratitude to all who have made this remarkable journey possible.



Mohammed Imaad
(INH20EE066)

I owe a debt of gratitude to the HR department at New Horizon College of Engineering for their invaluable assistance in securing a position at a prestigious Japanese company. Their dedication to providing comprehensive career guidance, organizing impactful workshops, and facilitating networking opportunities played a pivotal role in my professional journey. Thanks to their unwavering support and commitment, I am now embarking on an exciting chapter in my career, and I am incredibly grateful for their guidance and encouragement every step of the way.

MoUs



New Horizon College of Engineering signed an MoU with Chaarvedha Solutions, Bengaluru to strengthen industry-institute collaboration on 10th February 2024. This partnership will augment research and consultancy and also provide skilling opportunities for the students and Faculty of New Horizon College of Engineering, Bangalore. NHCE is a leader in Industry Collaboration across domains and this day marks another important milestone for both NHCE and Chaarvedha in the area of Industrial Automation and EV technologies.

Key takeaways

- Industry-academia collaboration to bridge the skills gap and to exchange information on research and educational programs.
- Training and development opportunities for students, freshers, NHCE faculty members, and Industry Trainees.
- A hub for cutting-edge research and Consultancy projects in Industrial Automation and EV technologies.

Publications

Sl.No	Faculty Name	Paper Title	Month Year	Journal / Conference Title	Volume	Issue	Page start	Page end	Source (Scopus / WOS)	Publication Type	DOI
1	Dr. Sanjeev Sharma Dr. Mohan Das R	Peak-to-Average Power Ratio Reduction of OFDM Systems Towards 6G Communications Using Osprey Optimization Algorithm	May 2024	Wireless Personal Communications	-	-	1	22	Scopus & WOS	Journal	https://doi.org/10.1007/s11277-024-11045-y
2	Dr. Sakthivel Aruchamy	Multi-Port Non-isolated DC-DC Converters and their Control Techniques for the Applications of Renewable Energy	June 2024	IEEE Access	12	-	88458	88491	Scopus & WOS	Journal	https://doi.org/10.1109/ACCESS.2024.3413354
3	Dr. Sakthivel Aruchamy Dr. Mohan Das R	Enhancing electric vehicle performance through buck-boost converters with renewable energy integration using hybrid approach	June 2024	Optimal Control Applications and Methods	-	-	1		Scopus & WOS	Journal	https://doi.org/10.1002/oca.3153
4	Dr. Vinoth Kumar K	An Analysis of Positive Switching Impulse Voltage and negative streamer growth in point-sphere gap towards Valve Hall	May 2024	Przeglad Elektrotechniczny	5	-	190	193	Scopus & WOS	Journal	https://doi.org/10.15199/48.2024.05.35/
5	Dr. Baswaraju Swathi Dr. Gunapriya B	Securing the patient healthcare data using Deep Inception-ResNet based CPABPP model in Internet of Things	January 2024	Journal of Integrated Science and Technology	12	5	1	13	Scopus & WOS	Journal	10.62110/sciencen-jst.2024.v12.805
6	Dr. Agalya V	Multi-objective optimization for optimal energy transporting path and energy distribution in electric vehicles energy internet	January 2024	International Journal of Communication Systems	37	6	1	21	Scopus & WOS	Journal	https://doi.org/10.1002/dac.5700
7	Dr. Gunapriya B Dr. Manjunatha B	LW-CNN-based extraction with optimized encoder-decoder model for detection of diabetic retinopathy	January 2024	Journal of Autonomous Intelligence	7	3	1	16	Scopus & WOS	Journal	https://doi.org/10.32629/jai.v7i3.1095
8	Dr. Mohan Das R	Bi-directional DC-AC using BLDC motor for electric and hybrid electric vehicles applications with reduced number of switches	June 2024	International Journal of Power Electronics and Drive Systems	15	2	1081	1090	Scopus	Journal	http://doi.org/10.11591/jipeds.v15.i2.pp1081-1090
9	Dr. Gunapriya B	Designing Compensators for Reduced Order Systems Using Genetic Algorithms	January 2024	Lecture Notes in Electrical Engineering	1098	-	379	389	Scopus	Conference	https://doi.org/10.1007/978-981-99-7383-5_28
10	Dr. Mausri Bhuyan	Impact of Communication Delay in a Coordinated Control VPP Model with Demand Side Flexibility: A Case Study	February 2024	Smart Innovation, Systems and Technologies	373	-	431	443	Scopus	Conference	https://doi.org/10.1007/978-981-99-6866-4_33
11	Dr. Gunapriya B	Microwave-Assisted Cladding of Ni-BaTiO3 Mixture onto SS-304 for Enhancing the Wear Resistance and Surface Hardness	March 2024	E3S Web of Conferences, International Conference on Futuristic Trends in Engineering, Science & Technology (ICFEST-2024)	507	1014	1	11	Scopus	Conference	https://doi.org/10.1051/e3sconf/202450701014
12	Dr. Revathi V Dr. Gunapriya B	Despise Detection through LOA Using F _s with 1D-CNN in Public Forum	February 2024	2024 IEEE International Conference on Computing, Power and Communication Technologies (IC2PCT)	-	-	1445	1451	Scopus	Conference	https://doi.org/10.1109/IC2PCT60090.2024.10488644
13	Dr. Vinoth Kumar K	Hardware Setup Investigation of Transferrable Solar Home-based Lighting System using IoT	June 2024	2024 IEEE International Conference on Inventive Computation Technologies (ICICT)	-	-	1655	1659	Scopus	Conference	https://doi.org/10.1109/ICICT60155.2024.10545009
14	Ms. Kavitha Chenna Reddy	Algorithmic Optimization for Partially Shaded PV Solar Systems	March 2024	2024 11th International Conference on Computing for Sustainable Global Development (INDIACom)	-	-	1388	1392	Scopus	Conference	https://doi.org/10.23919/INDIACom61295.2024.10498385
15	Ms. Anitha Nais A S	Ant Colony Optimization- Tuned Fractional Order PID Controller for Speed Regulation in Hybrid Electric Vehicle	June 2024	2024 International Conference on Recent Advances in Electrical, Electronics, Ubiquitous Communication, and Computational Intelligence (RAEUECCI)	-	-	1	5	Scopus	Conference	https://doi.org/10.1109/RAEUECCI61380.2024.10547797
16	Dr. Sujitha S Dr. Vinoth Kumar K	Implementation of Farmguard with Automated Animal Detection and Monitoring System using IoT	June 2024	2024 Ninth International Conference on Science Technology Engineering and Mathematics (ICONSTEM)	-	-	1	4	Scopus	Conference	https://doi.org/10.1109/ICONSTEM60960.2024.10568785
17	Mr. Vinod Kumar S Dr. Vinoth Kumar K	Wearable electrocardiogram monitoring device for remote cardiac health management	June 2024	2024 Ninth International Conference on Science Technology Engineering and Mathematics (ICONSTEM)	-	-	1	5	Scopus	Conference	https://doi.org/10.1109/ICONSTEM60960.2024.10568796
18	Mr. Vinod Kumar S Dr. Vinoth Kumar K	Indoor Air Quality Monitoring System for Healthcare	June 2024	2024 Ninth International Conference on Science Technology Engineering and Mathematics (ICONSTEM)	-	-	1	5	Scopus	Conference	https://doi.org/10.1109/ICONSTEM60960.2024.10568669
19	Dr. Sakthivel Aruchamy	Smart Energy Meter Under Gruha Jyothi Scheme in Karnataka	June 2024	2024 Ninth International Conference on Science Technology Engineering and Mathematics (ICONSTEM)	-	-	1	3	Scopus	Conference	https://doi.org/10.1109/ICONSTEM60960.2024.10568606
20	Dr. Anusuya V S Dr. Gunapriya B	A smart innovative pre-trained model-based QDM for weed detection in soybean fields	May 2024	Advanced Intelligence Systems and Innovation in Entrepreneurship	-	-	262	285	Scopus	Book Chapter	10.4018/979-8-3693-0790-8.ch015

Sl No	Faculty Name	Paper Title	Month Year	Journal / Conference Title	Volume	Issue	Page start	Page end	Source (Scopus/WoS)	Publication Type	DOI
21	Dr. Gunapriya B	Operation and Control of EV Infrastructure for Microgrid	January 2024	Microgrids for Commercial Systems	-	-	345	379	Scopus	Book Chapter	https://www.wiley.com/doi/10.1002/97811194166305.ch379
22	Dr. Rakesh C Dr. Gunapriya B	NMRA-facilitated optimized deep learning framework: A case study on IoT-enabled waste management in smart cities	April 2024	Developments Towards Next Generation Intelligent Systems for Sustainable Development	-	-	247	268	Scopus	Book Chapter	https://doi.org/10.4018/979-8-3693-5643-2.ch010
23	Dr. Rakesh C Dr. Gunapriya B	Detection of pepper plant leaf disease detection using Tom and Jerry algorithm with MSTNET	April 2024	Machine Learning Techniques and Industry Applications	-	-	143	168	Scopus	Book Chapter	https://doi.org/10.4018/979-8-3693-5271-7.ch008

Book Chapter Publications

Sl. No.	Name of the faculty	Title of the book	Title of the chapters published	Year of publication	ISBN/ISSN number of the proceeding	Name of the publisher
1	Dr. Gunapriya B	Developments Towards Next Generation Intelligent Systems for Sustainable Development	NMRA-facilitated optimized deep learning framework: A case study on IoT-enabled waste management in smart cities	2024	979-836935645-6, 979-836935643-2	IGI Global
2	Dr. Anusuya V S Dr. Gunapriya B	Advanced Intelligence Systems and Innovation in Entrepreneurship	A smart innovative pre-trained model-based QDM for weed detection in soybean fields	2024	9798369307908, 9798369371596, 9798369307915	IGI Global
3	Dr. Gunapriya B	Machine Learning Techniques and Industry Applications	Detection of Pepper Plant Leaf Disease Detection Using Tom and Jerry Algorithm With MSTNet	2024	979-836935273-1, 979-836935271-7	IGI Global
4	Dr. Gunapriya B	Microgrids for Commercial Systems	Operation and Control of EV Infrastructure for Microgrid	2024	978-139416731-9, 978-139416630-5	Wiley

Patents

Title of Patent	Jurisdiction/ Published in Indian Patent Journal/ Published Date	Inventors' Name (Faculty / Students)
Intelligent Horticulture Crop Design for Agricultural Fields Application Number: 202441006321 A dated 31.01.2024	India 08/2024 Dated 23/02/2024	Vinoth Kumar K
Utilising optimisation, design and validate the battery performance of an electric vehicle Application Number: 202441006272 A dated 31.01.2024	India 08/2024 Dated 23/02/2024	Vinoth Kumar K
Utilising optimisation, design and validate the battery performance of an electric vehicle Application Number: 202441006273 A dated 31.01.2024	India 08/2024 Dated 23/02/2024	Vinoth Kumar K

Faculty competencies in correlation to the Research Papers Presentation in Conference

Sl. No	Academic Year	Name of the Faculty	Title of the paper	Name of the Conference	Dates	Venue
1.	2023-24	Dr. Sujitha S	Traffic Disciplinary Control using IoT for urban areas and expressways	International Conference on Nanotechnology, Renewable Materials Engineering & Environmental Engineering (ICNRMEEE 2024)	23.05.2024	ICNRMEEE, Mysore
2.	2023-24	Ms. Surat Pyari Atti	Traffic Disciplinary Control using IoT for urban areas and expressways	International Conference on Nanotechnology, Renewable Materials Engineering & Environmental Engineering (ICNRMEEE 2024)	23.05.2024	ICNRMEEE, Mysore
3.	2023-24	Dr. Mausri Bhuyan	Frequency analysis in a combined hybrid microgrid tuned by DBOA Algorithm	3 rd IEEE International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES 2024)	26.04.2024 to 28.04.2024	Delhi Technological University, Delhi
4.	2023-24	Ms. Anitha Nair A S	Ant Colony Optimization tuned fractional order PID controller for speed regulation in hybrid electric vehicle	3 rd IEEE International Conference on Recent Advances in Electrical, Electronics, Ubiquitous Communication and Computational Intelligence (RAEEUCCI 2024)	17.04.2024 to 18.04.2024	SRM Institute o Science and Technology, Kattankulathur
5.	2023-24	Dr. Mausri Bhuyan	Economic load dispatch for dealing with solar power uncertainty using pelican optimization algorithm	3 rd IEEE International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES 2024)	26.04.2024 to 28.04.2024	Delhi Technological University, Delhi
6.	2023-24	Dr. Gunapriya B	Renewable – Powered Smart Grids Seamless Integration of electric vehicles	International Conference on Design, Materials Metaheuristic Algorithm for Engineering (ICDMMME 2024)	24.04.2024	Jai Shriram Engineering College, Tirupur
7.	2023-24	Mr. Kartheek Vankadara	Simulation based exploration of AI & IoT integration in autonomous vehicle systems	International Conference on Design, Materials Metaheuristic Algorithm for Engineering (ICDMMME 2024)	24.04.2024	Jai Shriram Engineering College, Tirupur
8.	2023-24	Dr. Sujitha S	Simulation based exploration of AI & IoT integration in autonomous vehicle systems	International Conference on Design, Materials Metaheuristic Algorithm for Engineering (ICDMMME 2024)	24.04.2024	Jai Shriram Engineering College, Tirupur
9.	2023-24	Dr. Vinoth Kumar K	Hardware setup investigation of transferrable solar home-based lighting system using IoT	7 th IEEE International Conference on Inventive Computation Technologies (ICICT 2024)	24.04.2024 to 26.04.2024	Tribhuvan University, Nepal

Sl. No	Academic Year	Name of the Faculty	Title of the paper	Name of the Conference	Dates	Venue
10.	2023-24	Dr. Sakthivel Aruchamy	Smart Energy Meter Under Gruha Jyothi Scheme in Karnataka	9 th IEEE International Conference on Science, Technology, Engineering and Mathematics (ICONSTEM 2024)	04.04.2024 to 05.04.2024	Jeppiaar Engineering College, Chennai
11.	2023-24	Mr. Vinod Kumar S	Indoor air quality monitoring system for healthcare	9 th IEEE International Conference on Science, Technology, Engineering and Mathematics (ICONSTEM 2024)	04.04.2024 to 05.04.2024	Jeppiaar Engineering College, Chennai
12.	2023-24	Mr. Vinod Kumar S	Wearable electrocardiogram monitoring device for remote cardiac health management	9 th IEEE International Conference on Science, Technology, Engineering and Mathematics (ICONSTEM 2024)	04.04.2024 to 05.04.2024	Jeppiaar Engineering College, Chennai
13.	2023-24	Dr. Sujitha S	Implementation of automated forest fire detection system using IoT	6 th IEEE International Conference on Inventive Computation and Information Technologies (ICICIT 2024)	16.04.2024 to 17.04.2024	Stamford International University, Bangkok, Thailand
14.	2023-24	Dr. Vinoth Kumar K	Implementation of Farmguard with automated animal detection and monitoring system using IoT	9 th IEEE International Conference on Science, Technology, Engineering and Mathematics (ICONSTEM 2024)	04.04.2024 to 05.04.2024	Jeppiaar Engineering College, Chennai
15.	2023-24	Dr. Sujitha S	Implementation of Farmguard with automated animal detection and monitoring system using IoT	9 th IEEE International Conference on Science, Technology, Engineering and Mathematics (ICONSTEM 2024)	04.04.2024 to 05.04.2024	Jeppiaar Engineering College, Chennai
16.	2023-24	Dr. Vinoth Kumar K	A certain analysis of solar home based lighting system for smart city designed for sustainable development	2024 IEEE International Conference on Recent Innovation in Smart and Sustainable Technology (ICRISST 2024)	15.03.2024 to 16.03.2024	Presidency University, Bengaluru
17.	2023-24	Mr. Satish Kumar D	Speed Control of PMSM using Fuzzy Logic Control with PSO Optimization Technique	2024 IEEE International Conference on Recent Innovation in Smart and Sustainable Technology (ICRISST 2024)	15.03.2024 to 16.03.2024	Presidency University, Bengaluru
18.	2023-24	Ms. Sangeetha C N	Object – Oriented RFID with machine learning and IoT	2024 IEEE International Conference on Recent Innovation in Smart and Sustainable Technology (ICRISST 2024)	15.03.2024 to 16.03.2024	Presidency University, Bengaluru
19.	2023-24	Dr. Vinoth Kumar K	Object – Oriented RFID with machine learning and IoT	2024 IEEE International Conference on Recent Innovation in Smart and Sustainable Technology (ICRISST 2024)	15.03.2024 to 16.03.2024	Presidency University, Bengaluru
20.	2023-24	Dr. Mausri Bhuyan	Object – Oriented RFID with machine learning and IoT	2024 IEEE International Conference on Recent Innovation in Smart and Sustainable Technology (ICRISST 2024)	15.03.2024 to 16.03.2024	Presidency University, Bengaluru

1. Introduction

The transition to sustainable energy sources and clean transportation is critical in combating climate change. Electric Vehicles (EVs) and Photovoltaics (PV) are two significant technologies leading the charge toward reducing greenhouse gas emissions. While EVs contribute to lowering emissions in the transportation sector, PV systems offer renewable and clean energy. This document explores key research areas in both domains, highlighting the technologies that can drive innovation.

2. Electric Vehicles Research Areas

Electric vehicles (EVs) represent a transformative shift in the automotive industry, offering a cleaner alternative to fossil fuel-based transportation. As EV adoption grows, various research areas focus on enhancing their performance, cost-efficiency, and integration with renewable energy systems.

2.1. Battery Technology

One of the core areas of EV research is improving battery technology. The battery is the heart of an EV, determining the range, charging time, and overall performance. The main challenges are related to:

Energy Density: Researchers are working on increasing the energy storage capacity of batteries without increasing their size or weight.

Cycle Life: Enhancing the longevity of batteries to ensure they can last through thousands of charging cycles.

Safety: Improving battery safety by reducing the risk of overheating or explosion, especially with large-scale use.

Key Technologies:

Lithium-Ion Batteries: Currently the most widely used, offering good energy density and reasonable cost.

Solid-State Batteries: These promise higher energy density and improved safety by replacing liquid electrolytes with solid materials.

Alternative Chemistries: Sodium-ion, lithium-sulfur, and hydrogen fuel cells are being researched to find cheaper and more sustainable alternatives.

Research Areas:

Battery Management Systems (BMS): Developing intelligent BMS that can monitor and optimize battery health and performance.

Thermal Management: Ensuring the battery operates within an optimal temperature range for both performance and safety.

Recycling and Sustainability: Developing recycling processes for used batteries and finding eco-friendly materials for future batteries.

Illustration: Diagram showing the internal structure of a lithium-ion battery with its key components such as cathode, anode, separator, and electrolyte.

2.2. Electric Drive Systems

The electric drive system in an EV converts electrical energy from the battery into mechanical energy that powers the vehicle. Improving the efficiency of this process is critical to extending the range of EVs and reducing energy consumption.

Research Areas:

Battery Management Systems (BMS): Developing intelligent BMS that can monitor and optimize battery health and performance.

Thermal Management: Ensuring the battery operates within an optimal temperature range for both performance and safety.

Recycling and Sustainability: Developing recycling processes for used batteries and finding eco-friendly materials for future batteries.

Illustration: Diagram showing the internal structure of a lithium-ion battery with its key components such as cathode, anode, separator, and electrolyte.

2.2. Electric Drive Systems

The electric drive system in an EV converts electrical energy from the battery into mechanical energy that powers the vehicle. Improving the efficiency of this process is critical to extending the range of EVs and reducing energy consumption.

Key Challenges:

Minimizing Energy Losses: Maximizing the efficiency of power conversion from the battery to the motor.

Enhancing Motor Performance: Improving the power-to-weight ratio and the overall performance of electric motors.

Key Technologies:

Permanent Magnet Synchronous Motors (PMSM): These motors offer high efficiency and power density, making them popular in modern EVs.

Power Electronics: Innovations in power electronics for motor control are essential for improving drive system efficiency and reliability.

Research Areas:

Control Algorithms: Field-oriented control (FOC) and direct torque control (DTC) algorithms are being optimized for better motor performance.

Regenerative Braking: Enhancing the efficiency of regenerative braking to recover more energy during braking. **Illustration:** Motor drive system diagram showcasing the power flow from the battery through the inverter to the electric motor.

2.3. Charging Infrastructure The expansion of charging infrastructure is vital for widespread EV adoption. Research focuses on increasing the availability and speed of charging stations, while also integrating renewable energy to make charging more sustainable.

Key Challenges:

Fast Charging: Reducing the time it takes to charge an EV to make it comparable with refueling a gasoline vehicle.

Load Management: Managing the increased load on the grid as more EVs require charging simultaneously.

Key Technologies:

Inductive Charging: Wireless (inductive) charging is an area of active research, with the aim of making charging more convenient.

Bidirectional Chargers: These chargers enable vehicle-to-grid (V2G) systems, where EVs can discharge energy back into the grid when needed.

Research Areas:

Dynamic Wireless Charging: Developing systems that allow EVs to charge while in motion on specially equipped roads.

Smart Charging with Renewable Energy: Integrating solar and wind energy into charging stations, and optimizing energy flows using AI-based load management systems.

3. Photovoltaics (PV) Research Areas

Photovoltaic technology is crucial for generating renewable energy from sunlight. It is one of the fastest-growing sectors in renewable energy, and ongoing research aims to improve efficiency, reduce costs, and enhance the integration of solar energy into the grid.

3.1. Next-Generation Solar Cells

Research in photovoltaics is focused on developing solar cells with higher efficiency and lower costs. Silicon-based solar cells dominate the market, but researchers are exploring new materials and technologies to improve performance.

Key Technologies: Perovskite Solar Cells: These cells have gained attention due to their high efficiency and low production costs. However, stability and durability remain challenges.

Multi-Junction Solar Cells: These cells use multiple layers of materials to absorb different wavelengths of light, significantly boosting efficiency.

Organic Photovoltaics (OPVs): OPVs are flexible, lightweight, and have the potential for low-cost production.

Research Areas:

Stability Improvements: Enhancing the stability of perovskite solar cells to ensure they can last for 20+ years, like silicon cells.

Material Innovations: Exploring new materials such as quantum dots and tandem structures to further increase efficiency.

3.2. PV System Integration with Energy Storage Integrating PV systems with energy storage is key to ensuring a stable and reliable supply of renewable energy, even when the sun isn't shining. Research is focused on improving energy storage solutions and integrating them with the grid.

Key Technologies:

Solar Inverters: Converting the direct current (DC) from PV panels into alternating current (AC) for use in homes and businesses.

Hybrid Systems: PV systems combined with battery storage, allowing energy generated during the day to be used at night or during cloudy periods.

Research Areas:

Smart Inverters: Developing inverters that can communicate with the grid, offering better control over energy flows and improving grid stability.

Microgrid Integration: Research on how PV and storage systems can form microgrids, providing energy to isolated communities or as backup systems during outages.

3.3. Building-Integrated Photovoltaics (BIPV)

BIPV technology integrates solar cells directly into building materials, allowing buildings to generate their own electricity without the need for additional space for solar panels.

Key Technologies:

Semi-Transparent Solar Panels: These panels can replace windows or skylights, allowing light to pass through while also generating electricity.

Flexible Thin-Film Solar Cells: Thin-film cells can be used on curved surfaces and are lightweight, making them ideal for integration into building materials.

Research Areas:

Durability and Performance: Developing materials that can withstand harsh weather conditions while maintaining high energy efficiency.

Aesthetics: Ensuring that BIPV systems can be integrated into buildings without compromising their visual appeal.

4. Convergence of EVs and Photovoltaics

One of the most promising research areas is the convergence of EV and PV technologies.

Solar-powered EVs or PV-assisted charging stations offer an opportunity for a fully renewable-powered transportation ecosystem.

4.1. Solar-Powered EVs

Research is being conducted into integrating PV panels directly into EVs, enabling them to generate power from sunlight. While full solar-powered EVs are still in development, this technology could extend the range of EVs and reduce reliance on charging infrastructure. Research Areas:

Lightweight PV Materials: Developing flexible and lightweight PV materials that can be installed on the surfaces of vehicles.

Hybrid Systems: Combining solar energy with traditional battery storage to maximize vehicle range.

4.2 PV-Assisted Charging Stations

Solar-assisted charging stations combine PV systems with energy storage to provide a green solution for EV charging. These stations could be standalone or integrated with the grid. Research Areas:

Energy Management: Optimizing the flow of energy between the PV system, storage, and the grid.

Vehicle-to-Grid (V2G): Exploring how EVs can act as storage devices, providing power to the grid during peak demand.

5. Conclusion

The research areas in electric vehicles and photovoltaics hold great promise for creating a sustainable energy future. Innovations in battery technology, motor systems, and charging infrastructure



Ring Road, Bellandur Post, Near Marathahalli
Bengaluru, India pin-560103

www.newhorizonindia.edu

