VIT®

Vellore Institute of Technology

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ELECTRICA 2021

TECHNICAL MAGAZINE FROM THE SCHOOL OF ELECTRICAL ENGINEERING

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Vision

To offer an education in electrical engineering that provides strong fundamental knowledge, skills for employability, cross-disciplinary research and creates leaders who provide technological solutions to societal and industry problems.

Mission

- Provide personalized experiential learning in industry sponsored labs to prepare students in electrical engineering with strong critical thinking and employability skills.
- Foster design thinking, creativity and cross-disciplinary research with highly qualified faculty to create innovators and entrepreneurs in the broad area of electrical engineering.
- Collaborate with national and international partners to provide innovative solutions to societal and industry challenges.

Magazine Credits:

Chief Editors:(UG final Year Students)

- Prateek Singh
- AdhyanVijeta Mittal
- AadharshParameshwar V
- Mylaram Bunny Sharan

Associate Editors:(UG Third year)

- Keshav Gupta
- Sarah Julia Dsouza
- Vashraj Singh
- Sharan J

From the Magazine Team

"We are delighted to present to you all yet another fascinating issue of this magazine, which has been painstakingly, creatively, and inventively made. This year's issue, a result of perseverance and teamwork, captures the spirit of our department's advancements in a variety of areas this academic year. This edition, which was thoughtfully drafted and properly indexed, is adorned with teacher messages, creative corners, academic accomplishments, and much more. We genuinely hope that these observations will pique your interest, encourage you, and highlight the seemingly endless possibilities of electrical engineering. Explore and celebrate our dynamic community's outstanding accomplishments

HAPPY READING!"

Assistant Designers:(UG Second year)

- Lakshmi K Sathyan
- Meenakshi P
- SatyajitMondal
- AkashDey

Advisory Team: (PG Students)

- Sarthak Mishra
- S Sahitya
- PatilGauravNatujirao
- VibhavKulkarniSurendra

Faculty Coordinator:

- Dr. Indragandhi V
  (Professor)

Data Support:

- Mrs. S. Padma
  (Sr. Assistant, SELECT)

Edition 2021:

"ELECTRICA"

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

SELECT– VIT

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1.1 DEAN'S REFLECTION

Respected readers, It gives me immense pleasure to welcome you all to drift through the pages of a yet another edition of our department's annual magazine, a testament to the achievements, ideas and aspirations that define our department of electrical engineering, SELECT.

Electrical engineering is not merely about circuit analogies and systems. It is rather, the art of innovation that breathes life into technology. From renewable energy systems and intelligent networks to cutting edge advancements in automation and artificial intelligence, this domain has been a driving force behind societal progress. As engineers, we are tasked with not just solving present-day challenges but envisioning a future that aligns with sustainable and inclusive growth.

Innovation is also about adaptability and resilience. In an era of rapid technological evolution, electrical engineers hold the responsibility of leveraging emerging trends like green technologies, energy-efficient systems, and the Internet of Things to redefine how we live and work. The solutions we create today will shape the world for generations to come.

As you traverse through the columns of this magazine, I would encourage you to reflect on the transformative potential of this domain. Let this publication ignite your passion and inspire you to contribute in this ever evolving field. Together let us continue to shape young hearts, and lead with vision, creativity and purpose.

Dr. Sivabalan. S
Professor and DEAN
School of Electrical Engineering (SELECT)

1.2 HoD's FORESIGHT

As A P J Abdul Kalam once stated, "Dream is not that which you see while sleeping, it is something that does not let you sleep." Learning is always a journey filled with obstacles. As a teacher, I get to witness a variety of students and faculty members working hard to fulfil their goals.

We commemorate the achievements that make our department the centre of creativity and innovation as we continue to navigate the always shifting terrain of our branch. This article demonstrates our department's ground-breaking research, innovative efforts, and exceptional accomplishments. Since we all think that the possibilities are endless, it demonstrates the ingenuity and the incredible accomplishments made by the teachers, students, and researchers in our department.

I want to express my appreciation to the magazine team in our department for bringing the vibrant atmosphere of our department to life. We use this publication as a forum to strengthen our sense of belonging. Undoubtedly, this edition will serve as a memory of the fantastic year we've had.

I hope our department's accomplishments make you proud and inspire you to keep going and realize your goals.

Dr. Jacob Raglend Isaac
Professor and HOD/EEE
School of Electrical Engineering (SELECT)

1.3 FACULTY COORDINATOR'S MESSAGE

Greetings, Readers

Speaking to you on behalf of the department of Electrical and Electronics Engineering has always been a privilege and a joy. Students are continuously supported by the department, which also helps them develop their innovative skills and abilities. Our department's several priority areas, such as renewable energy and e-vehicles, are aimed at improving people's everyday life. The department empowers students to carry out financed research in well-equipped research laboratories by fostering an innovative and inquisitive environment. To keep them on the cutting edge, we give them a well-planned, up-to-date academic education. We also give them the connections they need to pursue higher education and an entrepreneurial path.

Students that receive holistic development become more responsible, creative, and inventive. As a result, we encourage our students to participate in extracurricular and co-curricular activities in addition to their coursework. They can become future leaders since this method boosts their self-esteem, cultivates a positive outlook, and increases their social and ethical awareness. Their constant development and accomplishments are made possible by their efforts as well as the steadfast support of their parents, instructors, and well-wishers. Little actions taken repeatedly over time add up to success. Never give up because the work you do now will determine the engineer, inventor, and leader you become in the future. I would want to express my sincere gratitude to everyone who helped the EEE department succeed.

Dr. Indragandhi V
Professor
School of Electrical Engineering (SELECT)

2.1 HISTORY OF EEE

The B.Tech Electrical and Electronics Engineering programme had its inception in 1994. The programme lays emphasis on strong theoretical background on electrical engineering concepts in addition to providing avenues for divergent applications related to electromagnetism, power engineering, electronics and renewable resources.

The programme is handled by a team of experienced faculty equipped with wide research expertise in domains such as Smart Grid, Energy Management, E-Vehicle, Renewable and Sustainable Energy, Energy Monitoring, Insulation Diagnosis etc.

The department has excellently furnished laboratories to cater to the needs of both curriculum and research requirements. In addition, industry sponsored Centre of Excellence Schneider Electric Laboratory, Power System Research Lab, Switchgear & Protection Lab with high voltage testing facility for insulation diagnosis etc., provide the students with the essential hands-on experience to tackle real-time industry related challenges.

The department has signed several MoUs with various reputed Industries and Universities across the globe. The curriculum of the programme is conceived and formulated in close collaboration with leading experts from industries to ensure effective bridging of the gap between industry and academia.

2.2 INNOVATIONS

Power & Energy Systems

- **Solid-State Transformers (SSTs)**: Improved SST designs enabled higher efficiency and reliability in power distribution, replacing bulky traditional transformers.
- **Wide Bandgap Semiconductors (SiC & GaN)**: Silicon carbide (SiC) and gallium nitride (GaN) gained more adoption in power electronics, boosting efficiency in inverters and chargers.
- **Advanced DC Microgrids**: Progress in DC-based power systems improved energy efficiency in data centers, electric vehicles (EVs), and renewable energy integration.
- **Wireless Power Transfer (WPT) for EVs**: High-power wireless charging for electric vehicles became more efficient, with companies developing 100kW+ systems for faster charging.

Renewable Energy & Fuel Cells

- **Hydrogen Fuel Cell Efficiency Gains**: Advances in proton exchange membrane (PEM) fuel cells increased power density, improving applications in EVs and stationary power.
- **Perovskite Solar Cells**: These new-generation solar cells achieved record efficiencies of over 25%, making them a strong alternative to silicon-based photovoltaics.
- **Hybrid Energy Systems**: Integration of solar, wind, and fuel cells into hybrid microgrids improved reliability and sustainability.

Electric Vehicles (EVs) & Transportation

- **800V EV Architecture**: Carmakers like Porsche and Tesla introduced 800V battery systems, reducing charging times and improving efficiency.
- **Silicon Carbide (SiC) Inverters**: These high-performance inverters improved power conversion efficiency in EV drivetrains.
- **Fast Charging & Solid-State Batteries**: Advances in lithium-ion and solid-state batteries significantly improved charging speeds and energy densities.

- **Fuel Cell-Powered Two-Wheelers**: Emerging applications of hydrogen fuel cells in motorcycles and scooters showed promising results.

Smart Grids & Energy Storage

- **AI-Based Grid Management**: AI and machine learning optimized energy distribution, reducing power losses and improving demand forecasting.
- **Advanced Energy Storage**: Innovations in sodium-ion and flow batteries provided alternatives to lithium-ion for grid-scale storage.
- **Vehicle-to-Grid (V2G) Integration**: EVs were increasingly used as mobile energy storage, feeding power back to the grid when needed.

IoT& Embedded Systems

- **Edge AI in Embedded Systems**: AI-powered microcontrollers enabled smarter, more efficient real-time decision-making for industrial automation and energy applications.
- **Ultra-Low-Power IoT Sensors**: Advances in energy harvesting allowed IoT devices to operate with minimal external power sources.
- **5G-Enabled Smart Grids**: Faster and more reliable communication networks improved power grid monitoring and automation.

Power Electronics & Control Systems

- **Multilevel Converters**: Improved topologies like modular multilevel converters (MMC) enhanced efficiency in HVDC transmission and electric drives.
- **Resonant Power Converters**: These converters reduced switching losses in power supplies and inverters, improving overall efficiency.
- **AI-Based Motor Control**: Machine learning algorithms optimized motor efficiency and predictive maintenance in industrial applications.

2.3 FACILITIES

The B.Tech Electrical and Electronics Engineering program conceived with industry partners and ensure world-class facilities which provide students with the knowledge and technical expertise in a wide range of Electrical and Electronics domains which include latest research areas like Smart Grid, Power Electronics, and Electric Vehicle etc. The electrical and electronics engineers are required in various core industries, IT companies and PSUs. Besides, the program enhances the creativity of the students to develop innovative projects and eventually results in novel products which help to starts their own company.

Laboratories:

- **Schneider Centre for Excellence Laboratory**
- **Electrical Machines Laboratory**
- **Power Systems Research Laboratory**
- **Protection and Switchgear Laboratory**
- **Digital Simulation Laboratory**

Major Equipment:

- **High Voltage Test & Measuring Equipment – Impulse Test Set (100 kV, 10 kVA AC, 140 kV, 25 mA DC / 140 kV, 980 Joules)**
- **Fault Analyzer (LL-LG)**
- **Dielectric Testing and Measurement System for Insulation Diagnosis- Partial Discharge Testing and Measurement System**
- **3-Phase Transformer/ differential relay (Transformer Protection Simulator)**
- **Generator Protection Simulator**

- SCADA Based Setup for Generator Protection Simulator
- CYME T & D Power Engineering
- Air Circuit Breaker
- Typhoon - Real-Time emulator
- PMSG Machine coupled with DC motor
- ElecNet VT Perpetual
- Programmable AC/DC Electronic Load
- High Performance GPU Hardware System with Accessories
- Driver Control System for Electrical Machines and Driver Test Bench
- APLAB make custom built DC power supply. O/P 20-200V/200A
- Computerization of testing and controlling Induction Motor bundle (8 slot integrated dual controller Artix-7FPGA, 512 MB RAM and 1GB ROM memory with ethernet cable)

PV integrated shunt active filter

2.4 EVENTS

According to the statistical data, students have orchestrated a wide range of events ranging from thons to work shops. These events serve as a platform for creativity, networking, and knowledge exchange, contributing significantly to personal and academic development. These initiatives not only enhance students' organizational and leadership skills but also promote collaboration and innovation across various disciplines.

Sl. No	Event Title	From Date	To Date	Participants	Level
1.	3rd IEEE International Conference on Innovations in Power and Advanced Computing Technologies (IPACT-2021)	27-11-2021	29-11-2021	556	International
2.	Virtual International Conference on Smart Grid and Green Energy Systems	30-07-2021	31-07-2021	160	International
3.	Application of Signal Processing, Machine Learning and IoT in Sustainable Development of the Society	17-12-2021	19-12-2021	15	National
4.	Project-Based Learning Using MATLAB and Simulink	01-09-2021	01-09-2021	104	National

3.1 STUDENT ACHIEVEMENTS

DETAILS OF EVENTS OUTSIDE THE STATE AY 2020-21

International (AY 2020-21)

S. No	NAME	Reg. No.	Event Name & Place	Position	Award Detail
1.	Dhruv Shah	18BEE0189	SEDS INDIA VIT Vellore	Finals Qualifier	URC2021 finals qualifier - SEDS VIT
2.	Manav Mantri	18BEE0235	SEDS INDIA VIT Vellore	Finals Qualifier	URC2021 finals qualifier - SEDS VIT
3.	Aditya Raj	20BEE0209	SEDS INDIA VIT Vellore	Finals Qualifier	URC2021 finals qualifier - SEDS VIT
4.	Sweta Shah	17BEE0033	EPREC2021, NIT Jamshedpur	Best Paper Award	Recent Advances in Power Systems-4 (PS-4) category
5.	Dhruv Mahajan	17BEE0352	EPREC2021, NIT Jamshedpur	Best Paper Award	Recent Advances in Power Systems-4(PS-4) category
6.	Vaidik Jain	17BEE0018	EPREC2021, NIT Jamshedpur	Best Paper Award	Recent Advances in Power Systems-4(PS-4) category
7.	Pulkit Mahajan	18BEE0127	Winhacks 2021 & Windsor Essex	Second	Major League hacking Winhacks 2021

8.	Shivika Bisaria	18BEE0044	International Planetary Aerial Systems Challenge & Mars society South Asia (Team Ardra)	Participant	Participant in IPAS challenge
9.	Shwetanshu	18BEE0076	International Planetary Aerial Systems Challenge & Mars society South Asia (Team Ardra)	Participant	Participant in IPAS challenge
10.	Asutosh Dalei	18BEE0289	International Planetary Aerial Systems Challenge & Mars society South Asia (Team Ardra)	Participant	Participant in IPAS challenge
11.	Shivika Bisaria	18BEE0044	International Planetary Aerial Systems Challenge & Mars society South Asia (Team Ardra)	Paper Presented	Participant in IPAS challenge

DETAILS OF EVENTS OUTSIDE THE STATE AY 2020-21

National (AY 2020-21)

S. No	Name of the student	Reg.No.	Event Name &Place	Position	Award Detail
1.	Shivani Sanjay Mishal	18BEE0075	SheHacks 21 IIT Allahabad	First	Hackathon
2.	Deyvant Rakesh Kumar Bhardwaj	18BEE0103	Techkriti'21 IIT Kanpur	Seventh	IDRL ESPRTS Drone Racing Championship
3.	Shivani Sanjay Mishal	18BEE0075	UT Austin Women in Computer Science Hackathon	Second	First position in SHEHACKS with cash prize of Rs. 20000
4.	Vishal Vinod Hingorani	18BEE0331	Hackowasp 3.0, Thapar Institute of Technology	First	Self-Stabilizing Spoon with Remote Monitoring and won Rs.10000 cash prize

DETAILS OF EVENTS WITHIN THE STATE AY2020-21

S. No	NAME	Regn. No.	Event Name &Place	Position	Award Detail
1.	Sweta Shah	17BEE0033	EPREC2021 NIT Jamshedpur	Best Paper Award	Category of Recent Advances in Power Systems-4 (PS-4)
2.	Dhruv Mahajan	17BEE0352	EPREC2021 NIT Jamshedpur	Best Paper Award	Category of Recent Advances in Power Systems-4 (PS-4)
3.	Vaidik Jain	17BEE0018	EPREC2021 NIT Jamshedpur	Best Paper Award	Category of Recent Advances in Power Systems-4 (PS-4)

3.2 FACULTY ACHIEVEMENTS

No. of Books published/Edited/Authored/Chapter

Sl. No.	Year	Content Title	ISBN	Content Type
1	2021	Design and Planning of Indoor and Outdoor Substation - Bibhu Prasad Ganthia, Monalisha Mohanty, SubhashreeChoudhury, Satyajit Mohanty, Pritam Bhowmik	978-93-5506-071-6	Book Authored
2	2021	Essential tool kit for PhD research scholars - P. Uma Sathyakam	978-93-5437-398-5	Book Authored
3	2021	Energy Conservation Strategies for Asynchronous Machine Drives - R. Raja Singh	6203854441	Book Authored
4	2021	Design and Crosstalk Analysis in Carbon Nanotube Interconnects - P. Uma Sathyakam and Partha Sharathi Mallick	978-981-15-8888-4	Book Authored
5	2021	Fundamentals of MATLAB Programming – Upendra Raju, N. Amutha Prabha, D. Srinivasulu Reddy	9781956102062	Book Authored
6	2021	Introduction to Engineering - Darius Gnanaraj Solomon, Edison Gundabattini, R. Raja Singh, Preethi S. H. Darius	9781632789594	Book Authored
7	2021	Multilevel Converters: Control Techniques for Renewable Energy resources – Sudhakar Babu Thanikanti, Sudhakar Natarajan, Umashankar Subramaniam, Sam Sichilalu	9782889740574	Book Edited
8	2021	Advances in Automation Signal Processing Instrumentation and Control – Komanapalli Venkata Lakshmi Narayana, Sivakumaran N, Hampannavar Santoshkumar	978-981-15-8220-2	Book Edited

Sponsored Research:

Project Title	Funding Agency	Amount In INR	Duration/Sanctioned Date	PI/Co-PIs	Outcome
Capacity Building in Collaborative Research, Academic Curriculum Development and Outreach towards Additively-Manufactured Electric Scooter for Addressing Sustainability Challenges in India and UK	RYEUK	8100000	2yrs (March 2021 - Feb 2023) / 08-03-2021	Prof. Jeevananthama .K, Prof. Ashok B, Prof. Kannan C, Prof.Rani C, Prof. Thirumalaivasan R, Prof. Rajesh Kumar M	No. of Papers published - 03
Design and Development of fiber optic narrow band pass filter at infrared wavelength	ISRO	2823000	3yrs (Jan 2021 – Jan 2024) / 08-01-2021	Prof. Sivabalan S ,Prof. Thirumalaivasan R	No. of Papers published - 01
Computer aided diagnosis system for detecting the impact of COVID-19 on human using deep learning techniques	PSUSA	1000000	6 months (Nov 2020 – June 2021) / 30-11-2020	Prof. Monica Subashini M	No. of Papers published - 01

4.1 STUDENT PROJECTS

S. No	REG.NO	Name	Guide Name	Title	Capstone Project at Inhouse/ Industry/ SAP
1	17BEE0311	SYED ABDUL WASEY	Dr. VIJAYA PRIYA P	Implementation Of Fuzzy Based Frequency Stabilization Control Strategy In Raspberry Pi For A Wind-Powered Microgrid	Inhouse
2	17BEE0340	SOUNDARYA S	Dr. RANI C	Design And Modelling Of Hybrid Power Generator Using Solar And Piezoelectric Transducer	Inhouse
3	17BEE0096	HARSHIT SHARMA	Dr. BALAJI S	Smart Symptom Detector And Data Analysis For Covid-19	Inhouse
4	17BEE0018	VAIDIK JAIN	Dr. SATHISHKUMAR K	Harmonic Reduction In A Three- Phase Network Using Shunt Active Filters By Implementing P-Q &D-Q Control Schemes	Inhouse

5	17BEE0234	K PREETHI	Dr. PRABHAKAR KARTHIKEYAN S	Optimization Of Sizing And Constructional Cost Of Electric Vehicle Charging Stations Using Beetle Antennae Search (BAS) Algorithm	Inhouse
6	17BEE0026	J.P.SANJAY	Dr. MANIMOZHI M	Prediction Of Health Problems And Recommendation System Using Machine Learning And IOT	Inhouse
7	17BEE0028	ASHVATH	Dr. ARULMOZHI VARMAN P	Drone Pass Device For DGCA Drone Verification	Industry
8	17BEE0038	OMKAR JAISWAL	Dr. MAGESHVARAN R	Solar Power Conditioning System For Residential Loads	Inhouse
9	17BEE0222	ANIKET ANAND	Dr. PALANISAMY K	Smart Energy Monitoring	Inhouse
10	17BEE0062	VEDANT SINGH	Dr. ARUN N	IoT Enabled Remote Access And Control Of Monitoring Systems During COVID-19	Industry
11	17BEE0260	JETTI MUKESH	Dr. AMUTHA PRABHA N	Deep Learning Based Channel Estimation And Tracking For Millimeter-Wave	Inhouse

				Vehicular Communications	
12	17BEE0124	PATHAK JIGNASU YAGNESH	Dr. BALAMURUGAN S	Design Of Low-Power And High-Speed 4:2 Compressor Based Multiplier	Inhouse
13	17BEE0290	NARALA ANUDEEP REDDY	Dr. MARIMUTHU R	Design Of Low Power &High-Speed Approximate Compressor Based Multiplier	Inhouse
14	17BEE0314	JOEL ABRAHAM CHERIAN	Dr. MARIMUTHU R	Stress Level Monitoring Device	Inhouse
15	17BEE0150	SHANTANU GHOSH	Dr. MARIMUTHU R	Smart Fleet Management For Commercial Electric Vehicles And Their Prognostic Maintenance	Inhouse
16	17BEE0163	UTKARSH SHARMA	Dr. BELWIN EDWARD J	Futuristic Home Automation	Industry
17	17BEE0079	HARSH UTTARWAR	Dr. BELWIN EDWARD J	Hybrid Battery Energy Storage System Using Bidirectional Charge Controller	Inhouse
18	17BEE0188	ABHISHEK TIWARI	Dr. BELWIN EDWARD J	Transforming Conventional Rickshaw To E-Rickshaw	Inhouse
19	17BEE0087	RAJNEESH	Dr. BELWIN EDWARD J	Animatronic Hand	Inhouse
20	17BEE0002	KARAPURKAR SHIVANI PRASHANT	Dr. RAZIA SULTANA W	Design And Analysis Of Bidirectional CLLC	Inhouse

				Converter For Battery Charging Applications	
21	17BEE0070	ATRI ACHARYA	Dr. SARAVANA N B	Wind-farm Power System Stability In A Microgrid Structure	Inhouse
22	17BEE0111	SAKSHI KUMARI	Dr. RAVI K	An Automated Method For The COVID-19 Detection Based On Streamline Data Using A Hoeffding Decision Tree	Inhouse
23	17BEE0015	SWARNIMA SINGH	Dr. RAVI K	Energy Management And Control Of Grid-Connected Solar PV And BES System	Inhouse
24	17BEE0096	MEGHNAA SUNIL JAISWAL	Dr. RAVI K	Traffic Control System Using Lasers And Lidar Sensors	Industry
25	17BEE0009	ASHISH CHHABRA	Dr. RAVI K	The Effects Of Renewable Energy Sources Integration On A 21-Bus Power System	Inhouse

4.2 PUBLICATIONS

Students are encouraged to submit articles to magazines that are pertinent to the most recent advancements in the fields of Electrical and Electronics Engineering, as well as other engineering disciplines. The received articles are reviewed by the team members and the selected articles are published in ELECTRICA magazine.

S.No.	Name of the article	Name of the contributed student	Description
1	Elevated Energy Storage System	Nisshanthan S 19BEE0068 Ravin Chandar J 19BEE0065 Mohnish S 19BEE0114	Energy storage is a crucial element in the development of modern energy systems. The integration of renewable energy sources and the improvement of grid reliability and stability are dependent on efficient energy storage systems. One promising approach to energy storage is the lifting of heavy objects against gravity, storing potential energy that can be released later to generate electricity. This process of storing energy via gravity has been studied extensively with a focus on lifting blocks or other heavy masses.
2	E-Bike Motor Speed Controller	AkashDey 20BEE0169 Sidrameshwer 20BEE0289	The system includes an STM32 controller, throttle input, tire speed sensor, switch, motor driver, e-bike motor, battery and OLED display. The focus is on e-bike throttles and speed displays. A non-contact throttle position sensor (TPS) uses Hall effect, inductive, or magneto resistive technology to control the throttle. Stable sensor and sign handling circuit board detect sensor magnetic field adjustment. Created voltage goes to the ECU. The controller processes the throttle signal and controls power and speed by altering motor voltage through the motor driver. Speed sensors use hall effect to transmit wheel RPM and monitor speed sensor information. The LCD displays the RPM value and turning off the main switch turns off motor speed and sensor monitoring. Turning on the switch resumes the procedure.

3	Solar based Electric Vehicle Charging Circuit in G2V and V2G modes of Operation	Anisha Pattanayak (20BEE0080)	This study offers a solar-powered EV charging circuit. The Incremental Conductance MPPT Algorithm maximizes solar PV panel power at STC conditions. Using a boost converter, the solar PV panel charges a 100Ah battery to 400V. Buck operation requires stepping down the voltage for 220V batteries. The system's passive parameters are calculated and used. The electric vehicle is charged from the grid using a PR controller with a corner frequency of 10rad/sec when solar PV is unavailable. A DC-DC bidirectional converter receives 400V DC from a H-bridge rectifier. Reverse power flow occurs when grid voltage and current are in phase while charging and out of phase during discharging. Solar-powered EVs reduce grid dependence and provide clean, smooth vehicle movement.
4	Implementation of a Renewable Energy-Based Power-Electronic System to Power Remote Smart Houses	Kotha Yagna Sai Teja (18BEE0023) Utkarsh Srivastava (18BEE0016)	This article proposes a step-up step-down DC-DC system for smart homes, integrating renewable energy sources like PV, fuel cell, battery and hybrid vehicles. The system uses nine power switches with independent and dependent duty cycles, maximizing electricity from PV sources and regulating bus-bar voltage. Simulations using PSCAD/EMTDC were conducted to demonstrate system capacity and its potential for remote smart home applications.
5	Comparative analysis of various MPPT Algorithms on PV and Wind Systems	Dharani Dharan K R (18BEE0027) S Akash (18BEI0109)	This article analyzes and compares MPPT algorithms on PV and wind systems, focusing on performance under standard load conditions. The main goal is to reach maximum generation output. Design approach, specifications and schedule are discussed. MATLAB Simulink is used for model implementation. The main goal is to vary duty cycle of the boost converter for maximum power output.

5.0 AWARDS & RECOGNITION

Sl. No	Faculty Name	Awarding Agency	Name of Award	Award Type
1	Dr. Elangovan D	ASC VIT	Certificate of Appreciation	Recognition
2	Dr. Mahalakshmi P	VIT-Vellore	Reviewer for an International Conference iPACT-2021	Recognition
3	Dr. Yashwant Sawle	Indian Institute of Projects Technology	Judgment in YOUTZEST 2021 for award	Recognition
4	Dr. Yashwant Sawle	NIT Jamshedpur	Best Paper Award in EPREC 2021 springer publication	Awards
5	Dr. Vijaya Priya Ramachandran	AWS	AWS Certified Cloud Practitioner	Recognition
6	Dr. Yashwant Sawle	Sustainable Cities and Society Elsevier Journal	Work as Reviewer in Sustainable Cities and Society Elsevier Journal	Recognition
7	Dr. Yashwant Sawle	MA NIT Bhopal	Chair a Technical Session in AMEEE 2021	Recognition
8	Dr. Uma Sathyakam P	Elsiever	Reviewer certificate	Recognition
9	Dr. Saravanakumar R	Samsung Research Institute Bangalore	SAMSUNG PRISM	Extension

10	Dr. Yashwant Sawle	VNIT Nagpur	Reviewer in STPEC2021	Recognition
11	Dr. Mahalakshmi P	AICTE SLAP	Expert	Recognition
12	Dr. Ruban N	Samsung	Certificate of Appreciation	Recognition
13	Dr. Suprava Chakraborty	Elsevier Applied Energy	Reviewer Reorganization	Recognition
14	Dr. Uma Sathyakam P	WILEY	Reviewer Certificate	Recognition
15	Dr. Arunkumar G	Government College of Engineering	BoS Member	Recognition
16	Dr. Uma Sathyakam P	WILEY	Reviewer certificate	Recognition
17	Dr. Tapan Prakash	UPCON 2020	Reviewer recognition	Recognition
18	Dr. Tapan Prakash	MNNIT Alahabad	Reviewer recognition	Recognition
19	Dr. Suprava Chakraborty	Elsevier Renewable Energy	Reviewer Recognization	Recognition
20	Dr. Yashwant Sawle	National Institute of Technology Raipur	Reviewer in SGESC 2021	Recognition
21	Dr. Mahalakshmi P	VIT-Vellore	Nominee-Dean-Academic Research	Recognition
22	Dr. Prabhakar Karthikeyan S	IEEE PES	TC Member ICPES 2020	Recognition

23	Dr. Prabhakar Karthikeyan S	IITR	Outstanding paper in SOCPROS 2020	Recognition
24	Dr. Vijaya Priya Ramachandran	NASSCOM	NASSCOM	Recognition
25	Dr. Rajasekar N	Stanford University	Top 2% scientists of the world from India (all fields)	Recognition
26	Dr. Mageshvaran R	VIT	Research Award	Recognition
27	Dr. Prabhakar Karthikeyan S	VITAA Institutional chapter	Secretary	Recognition
28	Dr. Tapan Prakash	IJEPES Elsevier	Certificate of reviewing	Recognition
29	Dr. Washima Tasnin	Energy Swaraj Foundation	Energy Literacy Award	Recognition
30	Dr. Prabhakar Karthikeyan S	Coursera	MOOC How to make a MOOC	Recognition
31	Dr. Satyajit Das	London Journals Press	Rosalind Membership	Awards
32	Dr. Ravi K	VIT	VIT research award	Recognition
33	Dr. Belwin Edward J	SKCET Coimbatore	BoS Member	Recognition

SL. No	Faculty Name	Innovation Title	Award Agency	Level	Type
1	Dr. Rajini G.K	Research	RESEARCH OFFICE	Institute	Research
2	Dr. Razia Sultana W	Research Award	VIT Vellore	VIT	Research

3	Dr. Rama Prabha D	Research award	VIT	VIT	Research
4	Dr. Kishore Bingi	Silver Award	International Innovation Awards The Malaysia Croatia Technology Exchange 2021 20th Malaysia Technology Expo	Internatio nal	Research
5	Dr. Chitra A	Research award	VIT	VIT	Research
6	Dr. Medarametla Praveenkumar	research award	VIT	VIT	Research
7	Dr. Indragandhi V	Research Publications	VIT	National	Research
8	Dr. Mahalakshmi P	Research Award	VIT-Vellore	VIT	Research
9	Dr. Joshua Sunder David Reddipogu	Research Award	VIT University	VIT	Research
10	Dr. Belwin Edward J	Research Award	VIT	Institute	Research
11	Dr. Balamurugan S	Research Award for the Year 2020 in recognition of contribution to research through Funded Projects	Vellore Institute of Technology	VIT	Research
12	Dr. Balamurugan S	Research Award for the Year 2020 in recognition of contribution to	Vellore Institute of Technology	VIT	Research

		research through publications			
13	Dr. Marimuthu R	Research Award	Vellore Institute of Technology	Institute	Research
14	Dr. Raja Singh R	Research Award for the Year 2020	VIT Vellore	Institute	Research
15	Dr. Sathishkumar K	Research contribution	VIT	VIT	Research
16	Dr. Balamurugan S	Research Award for the Year 2020 in recognition of contribution to research through Funded Projects	Vellore Institute of Technology	VIT	Research
17	Dr. Balamurugan S	Research Award for the Year 2020 in recognition of contribution to research through publications	Vellore Institute of Technology	VIT	Research
18	Dr. Marimuthu R	Research Award	Vellore Institute of Technology	Institute	Research
19	Dr. Raja Singh R	Research Award for the Year 2020	VIT Vellore	Institute	Research
20	Dr. Sathishkumar K	Research contribution	VIT	VIT	Research
21	Dr. Marimuthu R	Research Award	Vellore Institute of Technology	Institute	Research
22	Dr. Raja Singh R	Research Award for the Year 2020	VIT Vellore	Institute	Research

6.0 ALUMNI SPOTLIGHT

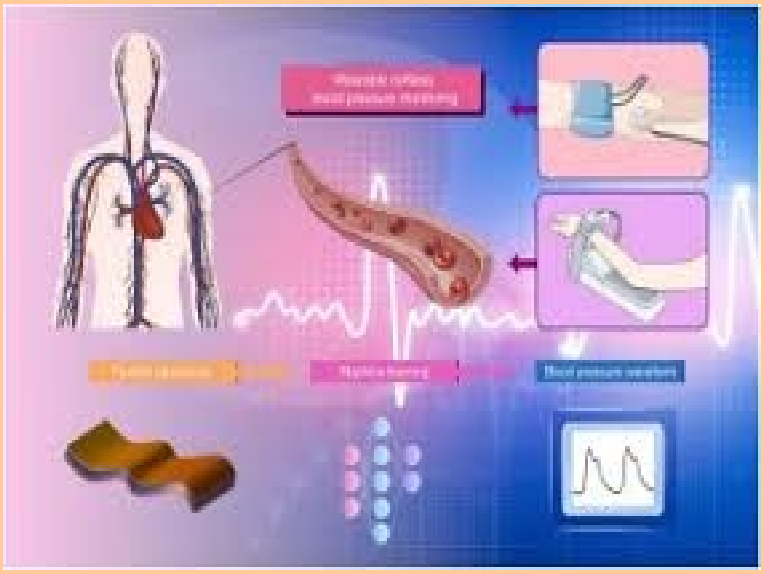
Siddharth Sinha works at Google, leading Public Policy in India for technology products and platforms linked to climate mitigation and adaptation, sustainability, and liveable cities. Before joining Google, Siddharth worked at the G20 Secretariat during 'India's Presidency as the Adviser to 'India's G20 Sherpa. Siddharth joined the Indian Government through the Young Professionals Program of the National Institution for Transforming India (NITI Aayog), the 'government's apex policy-making institution headed by the Prime Minister. He went on to become the 'CEO's Chief of Staff. During his tenure, Siddharth led two of 'India's key transport decarbonization projects, contributed to national policies on transformative mobility, climate, and circular economy, and served as 'India's representative to the OECD-ITF. Outside of work, Siddharth is a mountaineer and a passionate public speaker. He founded an NGO that works with youth from vulnerable communities to tackle challenges, including substance abuse and sexual abuse. An electrical engineer, Siddharth holds a 'Master's in Public Administration from the London School of Economics and Political Science.

7.0 CREATIVE CORNER

Development of Wearable Cuff-Less Blood Pressure Measurement Device Using Machine Learning

17BEE0041-SPARSH RAJ

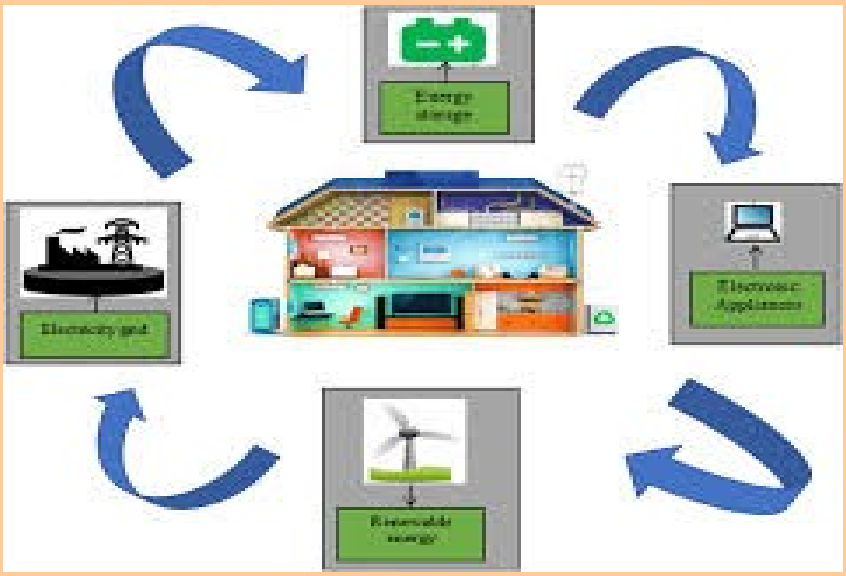
Blood pressure (BP) monitoring is crucial for detecting and managing cardiovascular diseases. Traditional cuff-based BP measurement devices can be uncomfortable and inconvenient for continuous monitoring. This report explores the development of a wearable, cuff-less BP measurement device leveraging machine learning techniques. The system integrates physiological signal acquisition, feature extraction, and predictive modeling to estimate BP values accurately.



Home Energy Management System with Renewable Energy Sources: Usage Storage & Supply to Grid

17BEI0086-GARVIT PUJARI

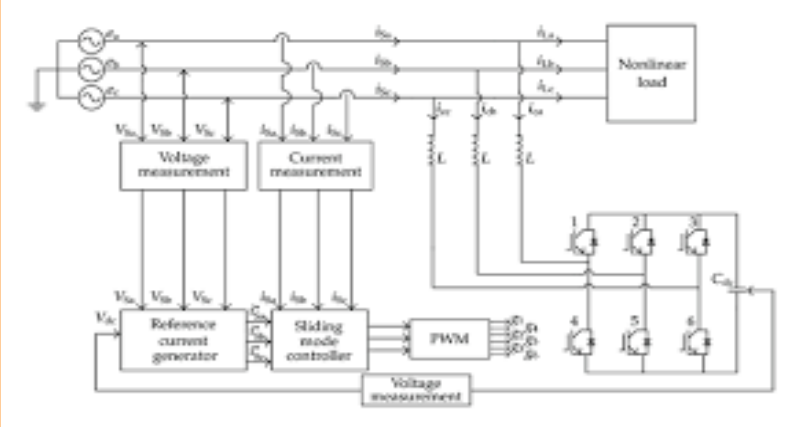
A **Home Energy Management System (HEMS) with renewable energy sources is crucial for optimizing energy usage, storage, and supply to the grid. This study presents an intelligent HEMS that integrates multiple renewable energy sources, such as solar PV and fuel cells, to enhance energy efficiency and grid interaction. The system dynamically manages power distribution between household loads, energy storage systems (ESS), and grid supply based on real-time demand and generation. A smart controller ensures optimal energy flow by prioritizing renewable sources, efficiently utilizing stored energy, and minimizing grid dependency. The proposed system enhances energy reliability, reduces electricity costs, and contributes to sustainable energy practices. Simulation and experimental validation demonstrate the effectiveness of the HEMS in ensuring an efficient, stable, and eco-friendly home power management strategy.**



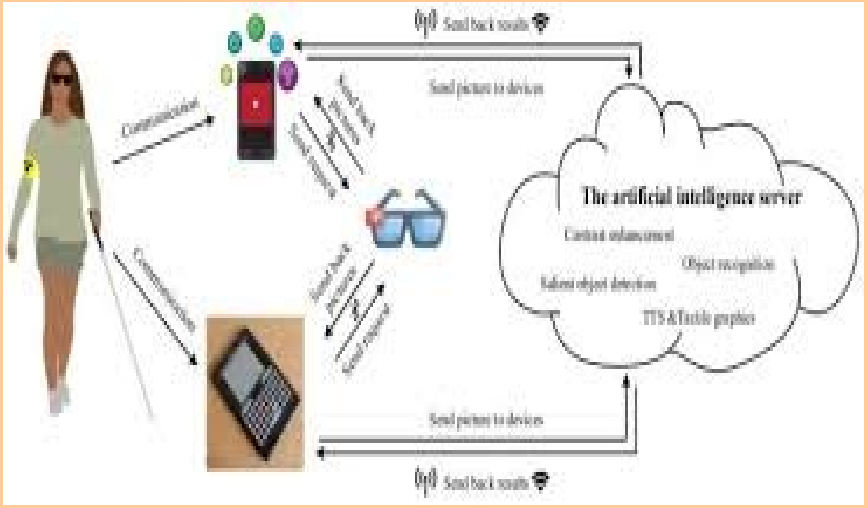
Harmonic Reduction in a Three- Phase Network Using Shunt Active Filters By Implementing P-Q & D-Q Control Schemes

17BEE0018-VAIDIK JAIN, 17BEE0351-ANANT DEVENDRA SAXENA

Harmonic distortion in three-phase power networks adversely affects power quality, leading to inefficiencies and equipment malfunctions. This paper explores the implementation of Shunt Active Power Filters (SAPF) for harmonic reduction using P-Q (Instantaneous Power) and D-Q (Synchronous Reference Frame) control schemes. The SAPF dynamically compensates for harmonics and reactive power by injecting corrective currents into the system. The P-Q control strategy is based on instantaneous power theory, while the D-Q control method employs a rotating reference frame for improved harmonic detection and compensation. A comparative analysis of both schemes is performed to evaluate their effectiveness in mitigating harmonics and enhancing power factor. Simulation and experimental results validate the proposed approach, demonstrating significant reduction in Total Harmonic Distortion (THD) and improved power quality in the three-phase network.



Development of Low-Vision aid for personalized visual correction using machine learning algorithms

17BEE0673-KUMAR VISHAKHA VINIT, 17BEE0501-VIGNESH

Low-vision impairment significantly affects the quality of life, necessitating personalized assistive solutions for enhanced visual perception. This study presents the development of a low-vision aid that utilizes machine learning algorithms for personalized visual correction. The system integrates real-time image processing and adaptive enhancement techniques to optimize visual output based on individual user preferences and visual deficiencies. A deep learning-based approach is employed to analyze user responses and dynamically adjust contrast, brightness, edge detection, and magnification levels. The proposed device, implemented using embedded vision hardware, provides a customizable interface to accommodate varying levels of vision impairment. Experimental validation and user trials demonstrate the effectiveness of the system in improving object recognition, readability, and overall visual experience. The results indicate that machine learning-driven personalized correction significantly enhances visual accessibility for individuals with low vision.