VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

ELECTRICA 2024

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)

- Anshuman Barpanda
- Arham Jain
- Athul A Augustine
- Darshan Mishra

Associate Editors:(UG Third year)

- Prajan R
- Devangshi Rout
- Tejsva Pandey
- Nandini Walia

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)

- Harsh Jalan
- Rupsa Patra
- Bhavy Gupta
- Anish V S

Advisory Team: (PG Students)

- Mohammed AkhilShariff
- DipteshBarua
- ShwetaSambhavi
- Swati Pandey

Faculty Coordinator:

- Dr. Indragandhi V
  (Professor)

Data Support:

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

Edition 2024:

"ELECTRICA"

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

SELECT– VIT

CONTENTS:

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. Mathew Mithra Noel
Professor (HAG) and DEAN
School of Electrical Engineering (SELECT)

1.2 HoD’s FORESIGHT

In the words of A P J Abdul Kalam, "Dream is not that which you see while sleeping, it is something that does not let you sleep." The process of learning is constantly fraught with challenges. As a teacher, I get to see a range of students and faculty members put in a lot of effort to achieve their objectives.

As we continue to traverse the always changing landscape of our branch, we celebrate the accomplishments that have made our department the epicentre of innovation and creativity. This article highlights the groundbreaking research, creative endeavours, and outstanding achievements of our department. We all believe that the possibilities are limitless, therefore it shows how creative and amazing the teachers, students, and researchers in our department.

I would like to thank our department's magazine team for bringing our department's lively culture to life. This publication serves as a platform for us to deepen our sense of community. This edition will definitely be remembered as a tribute to the amazing year we've had.

I hope you are happy of our department's achievements and are motivated to continue working toward your objectives.

Dr. Thiruvenkadam S
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 inextracurricular 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

E-Vehicle Battery Charging Techniques:

Electric vehicle (EV) batteries can be charged using AC or DC power, and there are also wireless charging and battery swapping options.

AC charging

- **Also known as Level 2 charging, this is a faster alternative to trickle charging.**
- **AC charging is used at home with a conventional plug or wall box, and at some public stations.**
- **Normal AC charging is less energy-intensive but slower.**

DC charging

- **Also known as fast charging, this uses direct current (DC) to charge the battery directly.**
- **DC charging is typically only found at public charging stations.**
- **DC charging can be completed in under an hour.**

Wireless charging

- **One of the two charging method for battery electric vehicles.**

Battery swapping

- **Allows batteries to be charged more slowly, which could extend their lifespan.**
- **Battery swapping stations can reduce energy demand by charging during off-peak times.**

Charging speed

Charging speed depends on the power level of the charging station and the charging capacity of the vehicle. Higher-power charging stations can provide more power to the vehicle, reducing charging time.

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.

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)**

Laboratories:

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

Workstation in TT433

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.

List of events organized by the School of Electrical Engineering in AY-2023-24:

Sl. No.	Event Title	From Date	To Date	Participant	Type
1.	International Conference on Innovations in Power and Advanced Computing Technologies (IPACT 23)	08-12-2023	10-12-2023	245	Conference
2.	3-Day International Online Seminar on Sustainable Energy	17-04-2024	19-04-2024	54	Seminar
3.	3-Days International Online Workshop on Future Prospects and Challenges of Renewable Energy for Sustainability	26-06-2024	28-06-2024	30	Workshop
4.	Green Fuel and Electric Vehicle Technology	22-01-2024	26-01-2024	63	Workshop

5.	International Higher-End Workshop on Electric Vehicle Intelligent Technologies	08-07-2023	12-07-2023	63	Workshop
6.	SIGMAA2023	15-12-2023	16-12-2023	250	Conference
7.	One Day Virtual Seminar on Artificial Intelligence & Machine Learning Applications in Power Electronics and Image Processing	17-10-2023	17-10-2023	40	Seminar
8.	Power Electronics Application to Smart Grid and Integration of Renewable Energy Sources - PESGRE 2023	27-11-2023	01-12-2023	67	Short Term Course
9.	Energy Conservation Week	01-11-2023	05-11-2023	400	Workshop
10.	LabVIEW for Beginners	26-10-2023	28-10-2023	34	Workshop
11.	A Two-Days Hand - On Workshop on Python for Science and Engineering Applications	16-10-2023	17-10-2023	40	Workshop

12	3 Day Workshop On "Hands on Training on Development of Electric Vehicles"	28-09-2023	30-09-2023	77	Workshop
13	Embedded System Architecture and ARM Processor	09-09-2023	09-09-2023	20	Workshop
14	2-Day Workshop on Training on Applications of Artificial Intelligence and Machine Learning in Condition Monitoring for High Voltage Assets, AIMCOM-2023	08-09-2023	09-09-2023	30	Workshop
15	A Three-Days Hands-On Workshop on Latex for Technical Writing	01-09-2023	03-09-2023	45	Workshop

3.1 STUDENT ACHIEVEMENTS

DETAILS OF EVENTS OUTSIDE THE STATE AY 2023-24

International (AY 2023-24)

S. No	NAME	Regn. No.	Event Name &Place	Position	Award Detail
1	S Siddharth	20BEE0001	i-PACT 2023 VIT, Vellore	Paper presented	Participated in paper presentation
2	Karmarkar Siddharth Hemant	20BEE0212	i-PACT 2023 VIT, Vellore	Paper presented	Participated in paper presentation
3	Ishaan Chandra Saxena	20BEE0157	ICEMCE-2023 Madurai	Paper presented	Participated in paper presentation
4	Yash Anand Shingavi	20BEE0213	AIMLA Tiruchengode	Paper presented	Participated in paper presentation
5	Ankur Kumar	20BEE0236	AIMLA Tiruchengode	Paper presented	Participated in paper presentation
6	Krrish Bhalla	20BEE0297	IATMSI Gwalior	Paper presented	Participated in paper presentation
7	Avvaru Sai Aasrith	20BEE0343	CERA 23 IIT Roorkee	Paper presented	Participated in paper presentation
8	S Visweshwar	19BEE0123	MITACS Globalink University of British Columbia Vancouver	Paper Presented	Designing the next generation of Power Converters for Solar Power Applications
9	Shaurya Chandra	20BEE0314	MITACS Globalink Research Internship University of Quebec at Chicoutimi	Research Intern	Full funded internship + 10kCAD dollar

DETAILS OF EVENTS OUTSIDE THE STATE AY 2023-24

National (AY 2023-24)

S. No	NAME	Reg.No.	Event Name &Place	Position	Award Detail
1	S. Siddarth	20BEE0268	FSEV Concept Challenge	Participation Certificate	Participation in 6th Annual FSEV Concept Challenge
2	Swapneel Chatterjee	21BEE0266	V RendezvousX fest, IIT Delhi	Second	V RendezvousX fest
3	Apurba Ranjan	20BEE0203	PESMUN 2023 PES University Bangalore	Third	In UNHRC Committee on the topic Deliberation on Arbitrary Detentions and Extra-Judicial killings of Human Rights Defenders
4	Vishakh Garg	20BEE0012	The Times of India-Ahmedabad	Second	Won cash prize of Rs.40,000/-
5	Sagneek Sengupta	21BEE0062	RMLBPD-pre-WUDC 2023 Lucknow.	First	Winner RMLBPD
6	Shreya	22BEE0369	SAE Aero Design East, Lakeland, Florida, USA	Participated	SAE Aerodesign
7	Dushyant Mahto	21BEE0096	LLM Bootcamp	Fourth	Winner at open-source projects(Winter LLM Bootcamp)
8	Dushyant Mahto	21BEE0096	Blog-a-Thon	Third	Best UI/UX in Blog-a-Thon

9	Prakhar Mishra	21BEE0189	Formula Student Germany GmbH, Hockenheim ring	Participation	Formula Student Germany (FSG)
10	Nigesh Palani	22BEE0043	EcoStruxure VIT, Vellore	Second	EcoStruxure operator terminal expert
11	Mukund	22BEE0135	ScreencraftHackathon	First	Schneider Electric Hackathon
12	Swapneel Chatterjee	21BEE0266	Saarang 2024 IIT Madras	First	First position at SAARANG 2024
13	Kavin P	22BEE0361	PEGASUS 2023 CMC Vellore	Runners Up	Runners up at PEGASUS -2023
14	Harshwardhan Jha	20BEE0144	Innovation Themes VIT, Vellore	Winner	Winner 16 Innovation Themes
15	Omansh Baranwal	20BEE0040	International Space Drone Challenge 2024, Coimbatore	First	Space Robotics Society (SPROS) at PSG iTech, Neelambur, Coimbatore,
16	Ishaan Chandra Saxena	20BEE0157	ICEMCE-2023 Madurai	Paper presented	Paper presented
17	Kavin P	22BEE0361	VIBRANCE 2024 Chennai	Third	Third position in Hockey
18	Sankara Bhavani	22BEE0114	VIBRANCE 2024 Chennai	Third	Women Swimming 50Mts Butterly
19	A Chethan Reddy	20BEE0197	Axis Bank LLM Bankathon	Second	Cash prize of Rs.1.5 Lakhs
20	Sandal Kotawala	14BEE0036	IIT-M Research Park's Auditorium	Innovative Award	CavinKare MMA Chinni Krishnan Innovation Awards

DETAILS OF EVENTS WITHIN THE STATE AY2023-24

S.No	NAME	Regn. No.	Event Name &Place	Position	Award Detail
1.	Omansh Baranwal	20BEE0040	International Space Drone Challenge 2024, Coimbatore	First Position	PSG iTech, Neelambur, Coimbatore
2.	Siddharth Pany	21BEE0179	NIT Trichy	Participation in Makeathon	Participation in Makeathon, RISEE -2023
3.	Kartik Raj Gupta	21BEE0369	IIT Madras	Participated	Shaastra Programming Contest
4.	S Harini Hemavarshini	20BEE0183	Idea -O-Lite Sriperumbudur	Finalist	Presented a paper and finalist
5.	A Anirudh Bharadwaj	21BEE0411	VIT Vellore	Solo-First Winner	Ideathon
6.	Jhanvi Gupta	21BEE0053	VIT Vellore	Research award	Dr.APJ Abdul Kalam award for the month of October 2023
7.	Jahnavi Vikash Jain	21BEE0158	VIT Vellore	Second	Yantra, VIT Vellore
8.	Devesh Shevde	21BEE0234	VIT Vellore	Second	Participated in VDAT 2024
9.	Devanshu Sharma	20BEE0191	Space Robotics Society (SPROS)	First position as Team ROVERX	First position worldwide and 40000 INR prize money
10.	Devesh Shevde	21BEE0234	Space Robotics Society (SPROS)	First position as Team ROVERX	First position worldwide and 40000 INR prize money

11.	Shaurya Chandra	20BEE0314	Space Robotics Society (SPROS)	First position as Team ROVERX	First position worldwide and 40000 INR prize money
12.	Mehak Mahajan	20BEE0389	Kshatriya Electric	Social Media Award	Human powered Rover- ADIX- Innovative Idea
13.	Harshwardhan Jha	20BEE0144	VIT Vellore	Winner	Winner at 16 Innovation Themes
14.	Bhange Om Kumar	20BEE0131	VIT Vellore	Winner	Winner at 16 Innovation Themes
15.	Hannah Ajish	23BEE0071	VIT Vellore	Participation certificate	Power Electronics and EV an Equation!
16.	Jhanvi Gupta	21BEE0053	VIT Vellore	Research Award	“Open-Source Electricity Trading through the Lenses of a Developing Country” in Scopus Indexed Journal in the month of December 2023.
17.	Swapneel Chatterjee	21BEE0266	IIT Madras	First	SAARANG 2024
18.	Divya Jagwani	21BEE0126	Yantra Hackathon	First	First prize in Prudentia Hackathon
19.	Jhanvi Gupta	21BEE0053	VIT Vellore	Third	Third prize in Bolt Hackathon
20.	Sucharita De	21BEE0197	VIT Vellore	Participation certificate	Poila Boisakh participation

21.	Mohit Pankaj Mundra	21BEE0128	VIT Vellore	Participation certificate	Participation at YantraIgnitia Hackathon
22.	Sabarinath P S	23BEE0029	VIT Vellore	Participation certificate	Participation at Codexcryptm
23.	Kuldip Bag	21BEE0013	VIT Vellore	Participation certificate	Short Term Course on EV Powertrains
24.	Anuj Verma	22BEE0197	IRC, Coimbatore	Participation certificate	International Rover Challenge, Coimbatore
25.	Jhanvi Gupta	21BEE0053	VIT Vellore	First	First prize in Prudentia Hackathon,
26.	Tushnika Chattopadhyay	21BEE0005	VIT Vellore	Participation certificate	BLOG-A-THON Tech competition and Winter LLM Bootcamp
27.	Samridhi Chittora	23BEE0026	VIT Vellore	Participation certificate	Yantra (Code4Change Hackathon) , VIT Vellore
28.	Soumyadeep Chatterjee	21BEE0278	VIT Vellore	Participation certificate	Exploring MATLAB-Simulink

3.2 FACULTY ACHIEVEMENTS

Patent Details:

Sl. No	Patent Title	Date	Status
1	Renewable energy mounting system	21-05-2024	Filed
2	Hybrid microbial-photo-electrochemical based sustainable hydrogen production system from wastewater	09-05-2024	Published
3	System and method for controlling an active suspension system in a vehicle	05-04-2024	Published
4	Semi-transparent gas chamber	05-04-2024	Filed
5	Multi-gas sensor housing	05-04-2024	Granted
6	Solar vertical tower garden	01-03-2024	Granted
7	Modular portable solar power station	31-01-2024	Granted
8	An autonomous multipurpose agricultural rover powered by flexible solar photovoltaic sheet.	19-01-2024	Published
9	5-level loop inverter with feasible commercialization attributes	11-12-2023	Filed
10	CNN network based drone system for disaster rescue operations	27-11-2023	Published

11	Portable wind-solar powered EV charging station	21-11-2023	Granted
12	TEG based energy device to convert air conditioner exhaust into electrical energy	25-10-2023	Published
13	Intelligent urinary catheter bag support	23-07-2023	Granted
14	Multilevel inverter for generating 7-level output voltage	16-05-2023	Published
15	Handheld text to braille converter device for visually challenged	28-12-2022	Published
16	Contact-less device for determining respiration rate	10-06-2022	Granted
17	Flexible distance wireless charger for electrified vehicles	13-02-2020	Granted
18	Current fed fuel cell powered high voltage charging circuit for electric vehicles	26-11-2019	Granted
19	Seat position adjusting mechanism for lifting and shifting a seat of a wheelchair	09-12-2018	Granted
20	Development of low cost & portable module for VGA projectors by using mobile phone & FPGA	12-11-2013	Granted

4.1 STUDENT PROJECTS

S.NO	REG.NO	NAME OF THE STUDENT	GUIDE NAME	TITLE	TYPE
1	20BEE0001	S SIDDHARTH	Dr. CHINMAYA SAHU	Design And Analysis Of Modular Wheeled Robot	Inhouse
2	20BEE0002	S VIVEK	Dr. YEDDULA PEDDA OBULESU	BMS For electric vehicles	Inhouse
3	20BEE0006	PRAKRITI DEY	Dr. YEDDULA PEDDA OBULESU	Comprehensive Analysis of Battery Management System Testing Procedures and Integration of Raspberry Pi with Rotary Switch RS009A-N1124BAAKT	Inhouse
4	20BEE0009	MAHESH D NAMBOODIRI	Dr. BALAMURUGAN S	Variable Sinusoidal Waveform Generation using FPGAs for Future Space Missions	Inhouse
5	20BEE0010	SIDDHANTA MONDAL	Dr. BALAMURUGAN S	Development of IoT-based Sensor Nodes to Monitor Weather Parameters for Space Missions	Inhouse
6	20BEE0016	DIPTANSHU DE	Dr. BALAMURUGAN S	FPGA-based Dyadic Variable Bandwidth Filter	Inhouse
7	20BEE0019	RITIK KUMAR	Dr. RAVI K	Solar Power Generation and Its Integration with Grid and Battery	Inhouse
8	20BEE0021	MATHEESH M	Dr. KARTHIKEYAN A	Text recognition from image using FPGA	Inhouse
9	20BEE0023	P AKASH	Dr. PONNAMBALAM P	Waste segregation using image processing and stm32 with 0V7670 DCMI	Inhouse

				Integration	
10	20BEE0024	ANMOL REHAAN	Dr. RAJINI G.K	Internship at LG Electronics R&D	Inhouse
11	20BEE0026	PRITHWISH PRADHAN	Dr. JITENDRA KUMAR GOYAL	Robust Controller Design For A 2 D.O.F Helicopter System	Inhouse
12	20BEE0028	JOHNY JOHN	Dr. MANIMOZHI M	Development of Mapping and Autonomous Navigation Robot	Inhouse
13	20BEE0030	GOGI REDY ROHITH	Dr. YEDDULA PEDDA OBULESU	Single Stage Grid-Connected Buck-Boost Photovoltaic Inverter for Residential Application	Inhouse
14	20BEE0034	ANTARA NAIK	Dr. HIMADRI LALA	UAV Payload and Safety Management System	Inhouse
15	20BEE0035	ANCHA YOHITHA SAI	Dr. MARIMUTHU R	Real-Time Flu Detection using Cough Sounds and Machine Learning	Inhouse
16	20BEE0037	VIJENDRA SINGH	Dr. Dr. SATHISHKUMAR K	Grid-Integrated EV Charging System with Bidirectional V2G and G2V Capabilities	Inhouse
17	20BEE0038	P GOWTHAM KIRAN	Dr. YEDDULA PEDDA OBULESU	Single Stage Grid-Connected Buck-Boost Photovoltaic Inverter for Residential Application	Inhouse
18	20BEE0039	MANEEL CHAUHAN	Dr. RAVI K	Solar power generation and ints integration with grid and battery	Inhouse
19	20BEE0040	OMANSH BARANWAL	Dr. YEDDULA PEDDA OBULESU	Design of a Single Switch High Gain DC-DC Converter	Inhouse
20	20BEE0050	AKASH SINGH	Dr. RAVI K	Solar power generation and it's	Inhouse

				integration with grid and battery	
21	20BEE0051	RAJ VEER GAUTAM	Dr. SATHISHKUMAR K	Grid Integrated Electric Vehicle Charging System with Bidirectional G2V and V2G Capabilities.	Inhouse
22	20BEE0053	SHRUTI SURESH NAIR	Dr. VIJAYA PRIYA R	Enhanced Radar Switching Circuit with Advanced Semiconductor Technology	Inhouse
23	20BEE0054	ARHAM VIRENDRA DODAL	Dr. MARIMUTHU R	Efficient approximate multiplier design and analysis for Image Processing application.	Inhouse
24	20BEE0059	DIBYAN GOSWAMI	Dr. SELVAKUMAR K	Initial Rotor Position Estimation and Validation for PMSM	Inhouse
25	20BEE0075	S K RISHVANTH	Dr. SELVAKUMAR K	Real Time V/F Technique Based Speed Control of BLDC Motor	Inhouse
26	20BEE0080	R DHANUSH	Dr. SATHISHKUMAR K	R&D of automation using futuristic technologies	Inhouse
27	20BEE0081	WINSTON ARFIN V	Dr. PONNAMBALAM P	Waste Segregation Using Image Processing and STM32With OV7670 DCMI Integration	Inhouse
28	20BEE0082	PRAKHAR RAI	Dr. JACOB RAGLEND I	Design Of 8-Bit Approximate Multipliers And Their Application In Image Multiplication	Inhouse
29	20BEE0085	GAUTAM KARTHIK V	Dr. RAJA SINGH R	Cyber secured IoT interfaced Indirect Field Oriented Control for Induction Motor	Inhouse

				Drive	
30	20BEE0087	SANKALP GUPTA	Dr. MRUTUNJAYA PANDA	PV Integrated DC MicroGrid	Inhouse
31	20BEE0092	AMIT KUMAR	Dr. ARUNKUMAR G	Solar PV Fed Isolated SEPIC Converter For Standalone Inverter Applications	Inhouse
32	20BEE0093	SONAL SINHA	Dr. HIMADRI LALA	Techno Economic Analysis of EV Charging Infrastructure	Inhouse
33	20BEE0102	ADWYCK GUPTA	Dr. RAJA SINGH R	Development and testing of RTL code of Event data collector module for enhanced data concentrator	Inhouse
34	20BEE0104	MAYANK P SHAH	Dr. TAPAN PRAKASH	Application of IoT in Indian Stock Market for trading and investing	Inhouse
35	20BEE0105	ARKA DEY	Dr. MEIKANDASIVAM S	Hybrid MPPT Controller for Solar PV System	Inhouse
36	20BEE0113	RAHUL PRIYADARSHI	Dr. JITENDRA KUMAR GOYAL	Mitigation of Mismatched Disturbances using Funnel Controller Technique	Inhouse
37	20BEE0115	S NITHEESH KUMAR	Dr. MRUTUNJAYA PANDA	Decentralization of DC microgrid using solar PV array	Inhouse
38	20BEE0117	TAKEY AASHUTOSH BALASAHEB	Dr. MAHALAKSHMI P	Safety Vision: An AI-based System for Enhanced Safety and Security in Diverse Environments	Inhouse
39	20BEE0118	SRI SHIVA RAM N	Dr. CHAMAN LAL DEWANGAN	Piezoelectric energy harvesting in electric vehicles	Inhouse

40	20BEE0120	GOUTHAM SAJEETH	Dr. RAJA SINGH R	AI Assisted power quality disturbance prediction and RUL estimation of induction motor drives	Inhouse
41	20BEE0124	GANESH SAHU	Dr. VIJAYA PRIYA R	Technoscan	Inhouse
42	20BEE0125	TIWARI MAHEK AKHILESH	Dr. PRABHAKAR KARTHIKEYAN S	Automated validation of parameters	Inhouse
43	20BEE0127	SHUBHAM SHARMA	Dr. INDRAGANDHI V	Comparative Analysis of various MPPT Algorithms on PV and Wind Systems	Inhouse
44	20BEE0128	PANCHAL DRUMIL HASMUKH	Dr. VINODH KUMAR	Data driver non-linear control for rotary flexible joints	Inhouse
45	20BEE0129	SATYAJIT MONDAL	Dr. MARIMUTHU R	Electronics Development for NIMS Instrument	Inhouse
46	20BEE0131	BHANGE OM KUMAR	Dr. ALBERT ALEXANDER S	ABS Operation in an EV Two-Wheeler using the Traction Motor and Controller.	Inhouse
47	20BEE0132	SARTHAK MATHUR	Dr. MAHALAKSHMI P	Safety Vision: An AI-based System for Enhanced Safety and Security in Diverse Environments	Inhouse
48	20BEE0139	RAJVEER MOHAPATRA	Dr. GNANAVIGNES R	Investigation of Electronic Stability Control Performance in a vehicle in extreme conditions of Tire Inflation, Speed and Weight Distribution	Inhouse

4.2 PUBLICATIONS

S No	Faculty Name	Paper Title	Authors	Journal
1	Dr. Srihari Mandava	Prediction and Analysis of Household Energy Consumption Integrated with Renewable Energy Sources using Machine Learning Algorithms in Energy Management	Jain N.; Sharma S.; Thakur V.; Nutakki M.; Mandava S.	International Journal of Renewable Energy Research
2	Dr. Rama Prabha D	Investigation of the Mechanical Properties of Hybrid E-Glass and Mohair Fiber Reinforced Epoxy Composites	Babu T.N.; Shyam S.; Prabha D.R.; Kaul S.; Kalsara N.	International Journal of Automotive and Mechanical Engineering
3	Dr. Chitra A	Investigation on reliability of classical industrial motor drives using GoldSim Monte Carlo reliability workbench	Raghavendra Rao N.S.; Chitra A.	Circuit World
4	Dr. Rajini G.K	Effect of the Fiber Bragg Grating Based Dispersion Control on the Transmission Length of Pico Second Optical Pulses in a Single Mode Fiber Link	Sudhakar M.V., Rajini G.K.	Nonlinear Optics Quantum Optics
5	Dr. Abhishek G	IoT enabled industrial fault monitoring and prediction	Ranjan H.; Gudipalli A.	International Journal on Smart Sensing and Intelligent Systems

6	Dr. Kowsalya M	An Analysis of Positive Switching Impulse Voltage and negative streamer growth in point-sphere gap towards Valve Hall	Kumar V.K., Kowsalya M., Ra I.-H., Samanvita N., Singh A., Kumar V.P.	PrzegladElektrotechniczny
7	Dr. Rani C	Intelligent Energy Management across Smart Grids Deploying 6G IoT, AI, and Blockchain in Sustainable Smart Cities	MithulRaaj A.T.; Balaji B.; R R S.A.P.; Naidu R.C.; Rajesh Kumar M.; Ramachandran P.; Rajkumar S.; Kumar V.N.; Aggarwal G.; Siddiqui A.M.	IoT
8	Dr. Manimozhi M	A Polynomial Series-Based Data Aggregation and Spectrum Aware Clustering Technique for a Combined Model of WSN and Cognitive Radios in IoT Applications	Kalburgi S.S.; Manimozhi M.	SSRG International Journal of Electrical and Electronics Engineering
9	Dr. Mageshvaran R	Performance of bidirectional ON-Board Charger in Electric Vehicle: A review	Sethuraman R.; Rudhramoorthy M.	e-Prime - Advances in Electrical Engineering, Electronics and Energy

10	Dr. Mathew M. Noel	Novel Darknet traffic data synthesis using Generative Adversarial Networks enhanced with oscillatory Growing Cosine Unit activated convolution layers	Pradeep C A., Amali D G.B., Noel M.M., Ghalib M.R., Subramaniam P.R., Venugopal C.	International Journal of Cognitive Computing in Engineering
11	Dr. Thirumalaivasan R	Modal Analysis of Strong Resonance in Multi-Machine System with Power System Stabilizer	Naik J.S., Thirumalaivasan R.	SSRG International Journal of Electrical and Electronics Engineering
12	Dr. Janaki M	Hardware-in-the-Loop Simulation of Grid Connected Modular Multilevel Converter Using Real Time Simulators	K S., M J.	International Journal of Intelligent Engineering and Systems
13	Dr. Rajini G.K	Optimized Deep Learning based Approach for Enhanced frame work of Automated Diagnosis of Diabetic Retinopathy	Ravala L.; Rajini G.K.	Research Journal of Pharmacy and Technology
14	Dr. Rajini G.K	Enhanced Data Preservation in Light Field Hyperspectral Images through Combined Sparse Discrete Wavelet and PRN	Anjaneya P., Rajini G.K.	International Journal of Intelligent Systems and Applications in Engineering
15	Dr. Abhishek G	Skin Cancer Classification Using CNN	Raj S., Varshney A., Gudipalli A.	International Journal of Intelligent Systems and Applications in Engineering

16	Dr. Abhishek G	IoT-based Smart Pill Reminding System	Nagchandi A., Kher P., Gudipalli A., Tiwari A.	Recent Advances in Computer Science and Communications
17	Dr. Indragandhi V	IoT based monitoring system for DFIG based wind turbines under voltage dips	Vairavasundaram I.; Ramu S.K.; Stephenraj J.P.; D O.P.; Irudayaraj G.C.R.	e-Prime - Advances in Electrical Engineering, Electronics and Energy
18	Dr. Albert Alexander S	Development of a Digital Twin Framework for a PV System to Resolve Partial Shading	Karunanidhi B., Ramasamy L., Alexander Stonier A., Sathiasamuel C.R.	Mathematical Problems in Engineering
19	Dr. Mahalakshmi P	Diabetes Prediction Using Machine Learning and Flask	Raju N.K.K.; Krishnamurthy K.; Bhagavath B.P.; Shankar N.; Janani A.M.; Avinash N.; Ray A.; Mahalakshmi P.	Biomedical and Pharmacology Journal
20	Dr. VijayaPriya P	A comprehensive review of various MLI topologies to minimise the THDs for FACTS applications	Tejasvi B.; Vijayapriya P.	International Journal of System of Systems Engineering

21	Dr. Rama Prabha D	MECHANICAL BEHAVIOUR OF ISTLE FIBRE COMPOSITE REINFORCED WITH EPOXY AND E-GLASS AT DIFFERENT FIBRE ORIENTATIONS	Prabha D.R.; Babu T.N.; Shinde A.; Joshi R.; Kalonia Y.	Journal of Chemical Technology and Metallurgy
22	Dr. Amutha Prabha N	Colorization of Grayscale Images using Deep Convolution Neural Networks	Gudipalli A., Sujatha C.N., AmuthaPrabha N., Khanikhar K.	International Journal of Intelligent Systems and Applications in Engineering
23	Dr. Ravi K	A review of FACTS device implementation in power systems using optimization techniques	Chethan M., Kuppan R.	Journal of Engineering and Applied Science
24	Dr. Monica Subashini M	A multiclass deep learning algorithm for healthy lung, Covid-19 and pneumonia disease detection from chest X-ray images	Mohan G., Subashini M.M., Balan S., Singh S.	Discover Artificial Intelligence
25	Dr. Srihari Mandava	Resilient data-driven non-intrusive load monitoring for efficient energy management using machine learning techniques	Nutakki M., Mandava S.	Eurasip Journal on Advances in Signal Processing
26	Dr. Ponnambalam P	Analysis of area saving and efficiency enhancement of photovoltaic system combined with thermoelectric generator	R P., P P., K K.	e-Prime - Advances in Electrical Engineering, Electronics and Energy

27	Dr. Ponnambalam P	Speed Control of Sensorless Induction motor based on Grey Wolf Optimizer Fractional Order Controller using MRAS based Speed Estimation	Saravanan T.Y.; Ponnambalam P.	International Journal of Electrical and Electronics Research
28	Dr. Rajini G.K	Improved Brain Tumor Diagnosis and Classification Using VMS Integ-Net	Kesav O.H., Rajini G.K.	International Journal of Intelligent Systems and Applications in Engineering
29	Dr. Rajini G.K	Detection of Kidney Stone and Estimation of its Size using Image Segmentation Techniques	Jain S., Rajini G.K., Rahul S.G., Rajkumar R., Velmurugan S., Jasmine PemeenaPriyadarsini	Journal of Advanced Research in Applied Sciences and Engineering Technology
30	Dr. Rajini G.K	Enhancing Brain Tumor Detection and Classification with Reduced Complexity Spatial Fusion Convolutional Neural Networks	Kesav O.H., Rajini G.K.	International Journal of Intelligent Engineering and Systems
31	Dr. Abhishek G	Colorization of Grayscale Images using Deep Convolution Neural Networks	Gudipalli A., Sujatha C.N., AmuthaPrabha N., Khanikhar K.	International Journal of Intelligent Systems and Applications in Engineering

32	Dr. Uma Sathyakam P	Performance, comprehension and applications of hematite-based photoanodes in PEC water splitting	Mushtaq M.; Sathyakam P.U.; Vijayaraghavan R.	Next Materials
33	Dr. Mrutunjaya Panda	Autonomous Control of Voltage and Frequency in Parallel Inverters of Microgrid	Panda M.; Bhaskar D.V.; Salkuti S.R.	e-Prime - Advances in Electrical Engineering, Electronics and Energy
34	Dr. Albert Alexander S	Improving the Groundnut Oil Extraction Efficiency using RSM and Central Composite Design (CCD) Optimization Techniques	Maheswari C., Shankar S., Alexander S.A., Ramani G., Maheswari P.	Journal of Engineering Science and Technology Review
35	Dr. Albert Alexander S	Impact of cotton dust, endotoxin exposure, and other occupational health risk due to indoor pollutants on textile industry workers in low and middleincome countries	Subramaniam S., Raju N., Ganesan A., Rajavel N., Chenniappan M., Stonier A.A., Prakash C., Pramanik A., Basak A.K.	Journal of Air Pollution and Health

5.0 AWARDS & RECOGNITION

S No	Faculty	Awarding Agency	Name of Award	Award Type
1	Dr. Saravanakumar R	Samsung prism	Samsung prism	Recognition
2	Dr. Sharmila A	World Scientist and University Rankings 2024	AD Scientific Index	Recognition
3	Dr. Amutha Prabha N	Taylors University	Adjunct professor	Recognition
4	Dr. Sharmila A	Sri Venkateshwara College of Engineering	Session Chair for 15th International conference on recent engineering and Technology	Recognition
5	Dr. Sharmila A	Journal of Medical Engineering and Technology	Associate Editor	Recognition
6	Dr. Tapan Prakash	Graphic Era University Dehradun	Certificate of reviewer	Recognition
7	Dr. Prabhakar Karthikeyan S	Anna University	Member Board of Studies	Recognition
8	Dr. Venkata Lakshmi Narayana K	VIT	Merit Award and Merit Scholarship of M Tech	Awards

9	Dr. Prabhakar Karthikeyan S	Springer	Springer Reviewer Certificate	Recognition
10	Dr. Prabhakar Karthikeyan S	Centre for Research Anna University	Anna University	Recognition
11	Dr. Uma Sathyakam P	IETE	Life fellow IETE	Fellowship
12	Dr. Himadri Lala	ICPSET 2024	Organizing Committee Member	Recognition
13	Dr. Rani C	Department of Telecommunication Government of India	Quantum Technology Working group Department of Telecommunication Government of India	Recognition
14	Dr. Kowsalya M	International Academic Excellence Awards	Best Researcher Award	Awards
15	Dr. Albert Alexander S	IEEE Madras Section	Best Researcher Award	Awards
16	Dr. Rashmi Ranjan Das	VIT University Vellore	Technical Reviewer	Recognition
17	Dr. Sharmila A	IEEE and ACM Collaborative International Conference	Technical Reviewer	Recognition

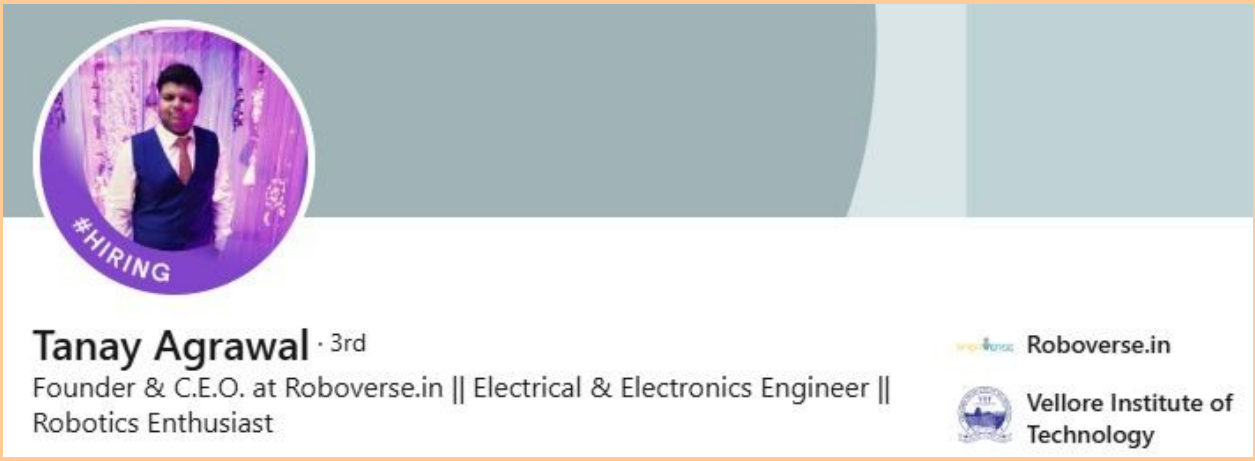
18	Dr. Albert Alexander S	Department of Telecommunications Government of India	Member of National Working Group on Quantum Technology NWG QT	Recognition
19	Dr. Monica Subashini M	Institute of Electrical and Electronics Engineers	IEEE Medal of Honor	Fellowship
20	Dr. Monica Subashini M	Institute of Electrical and Electronics Engineers	Young Professional	Recognition
21	Dr. Albert Alexander S	International Journal of Power Electronics and Drive Systems Q3 Scopus Journal	Associate Editor	Recognition
22	Dr. Prabhakar Karthikeyan S	EBA Erode	Subject Expert for Faculty recruitment	Recognition
23	Dr. Sharmila A	Jerusalem College of Engineering	Distinguished Alumni Award	Awards
24	Dr. Sharmila A	VIT	Judge during model making event in InoVIT 24	Recognition
25	Dr. Uma Sathyakam P	Anna University	Doctoral committee member	Recognition
26	Dr. Sharmila A	Journal of Medical Engineering and Technology	Editorial Board member of one of the Taylor and Francis Journals	Recognition

27	Dr. Uma Sathyakam P	VIT	VIT Service award for 10 years and above	Recognition
28	Dr. Albert Alexander S	IIT Madras	Reviewer for Ideas to Impact Challenge	Recognition
29	Dr. Himadri Lala	SIGMAA 2023	Organizer of a special session on Emerging trends in hybrid renewable energy systems and EV	Recognition
30	Dr. Arunkumar G	Sona College of Technology Salem	BoS Member	Recognition
31	Dr. Monica Subashini M	Francis Xavier Engineering College	Member of Professional Body	Recognition
32	Dr. Geetha M	Stanford University and Elsevier	World s Top 2 Percentage Scientists Outstanding Researcher Award	Recognition
33	Dr. Prabhakar Karthikeyan S	IEEE	Session Chair	Recognition
34	Dr. Albert Alexander S	iPACT 2023	Best Paper Award	Awards
35	Dr. Ravi K	IEEE	Session Chair For IEEE International iPACT23	Recognition

36	Dr. Dhanamjayulu C	Universiti Malaya Kuala Lumpur	IEEE Conference	Recognition
37	Dr. Monica Subashini M	VIT and University of Malaya	Technical Reviewer	Recognition
38	Dr. Monica Subashini M	Vellore Institute of Technology	Research Award for contribution towards h index	Awards
39	Dr. Thiruvenkadam S	Simplilearn	Certificate of Achievement	Recognition
40	Dr. Geethanjali P	Sengunthar Engineering College	Department Advisory Committee Member	Recognition
41	Dr. Arunkumar G	VIT	BoS Member	Recognition
42	Dr. Ruban N	Sri Shanmugha College of Engineering and Technology	Subject expert for Board of Studies	Recognition
43	Dr. Sharmila A	VIT	Judge for Hackathon in Pre GraVITas	Recognition
44	Dr. Albert Alexander S	AAC	International Expert for Accreditation	Recognition
45	Dr. Albert Alexander S	IEEE India Council	Academic Mentor	Recognition

46	Dr. Venkata Lakshmi Narayana K	Office of Academic Research VIT	Dr APJ Abdul Kalam Award	Awards
47	Dr. Kowsalya M	International Fuzzy Systems Association	Best Presentation Award	Recognition
48	Dr. Sonam Shrivastava	Hindawi portfolio of journals	Reviewer for the Hindawi portfolio of journals	Recognition
49	Dr. Arunkumar G	Sona College of Technology Salem	BoS Member	Awards
50	Dr. Sharmila A	VIT	Resource person for Skill enrichment program	Recognition
51	Dr. Monica Subashini M	IQAC Karunya Institute of Technology and Sciences	Member of Professional body	Recognition

6.0 ALUMNI SPOTLIGHT



B.tech in Electrical and Electronics Engineering, VIT, Vellore Campus, 2019-2023.

https://www.roboverse.in/, Phone +91 89605 85385, Email sales@roboverse.in

B.Tech in Electrical and Electronics Engineering, VIT, Vellore Campus, 2016-2020.

CEIR Mobility Private Limited is a deep tech start-up that has redefined motor technology to revolutionize global energy utilization. At CEIR Mobility, our vision is to lead the charge in transforming every electric propulsion systems with our intelligent and scalable motor technology. We are the foremost provider of high-performance, and energy-efficient electric motor solutions that power a cleaner, cost effective, and efficient future for industries globally. Our visionary motor architecture delivers unrivaled performance, efficiency, and compactness.

7.0 CREATIVE CORNER

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

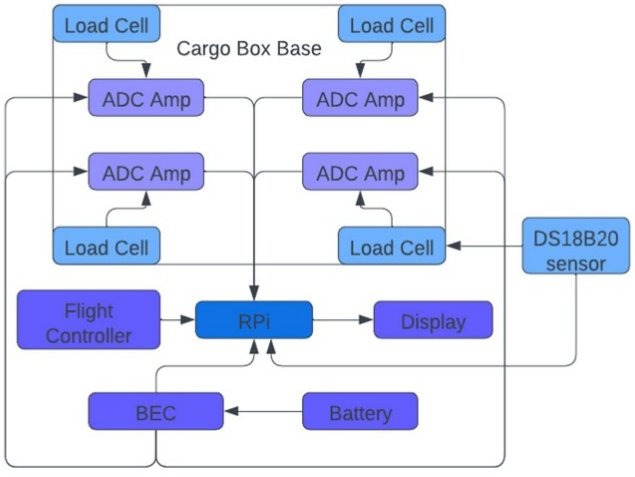
School of Electrical Engineering (SELECT) VIT Vellore

UAV SAFETY AND PAYLOAD MANAGEMENT SYSTEM

ANTARA NAIK - 20BEE0034

Operating Unmanned Aerial Vehicle (UAV)s in remote environments poses unprecedented challenges, particularly concerning safety and operational reliability. In this paper, we present a novel system designed to enhance the safety and stability of UAV operations in such environments. This paper proposes a system designed with features to address critical concerns. It includes a payload calculation model coupled with a visual representation of its centre of gravity to enhance its flight stability. The weighing system incorporated 4 bar full-bridge load cells with a total capacity of 80 kg. These are utilized as parameters in a pre-arm safety check to prevent take-off in situations where the payload weight exceeds the drones rated capacity or the centre of gravity falls outside the safe operational zone. Essential flight controller data about drone health and status is displayed to the user in real time, eliminating the need for a ground station in remote areas. The key to the system's reliability is that it can operate in no network areas, and in a temperature range of -30 °C to 80 °C. It contains adjustments for temperature creep to maintain accuracy in extreme conditions. The system is able to handle not just a heavy payload, but a large volume as well.

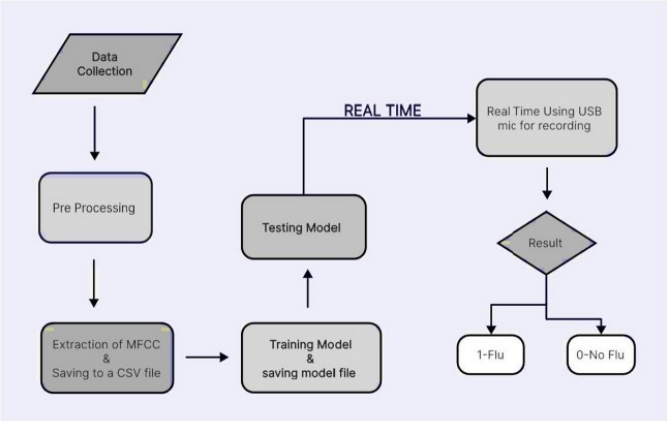
The system is able to measure and display the centre of gravity (COG) of the payload with a precision up to 1cm in two dimensions. The system designed is lightweight and easy to install in a drone cargo box, and can be implemented on a large scale Using the expertly chosen components, the system can seamlessly fit into the UAV ecosystem without requiring an external power supply that could potentially increase the all up weight of the UAV as it can be connected to the UAV battery system. This is possible due to the BEC which ensures a smooth power supply.



REAL-TIME FLU DETECTION USING COUGH SOUNDS AND MACHINE LEARNING

ANCHA YOHITHA SAI (20BEE0035), ANUSHA ABRAHAM (20BEE0295)

This project provides an advanced real-time cough sound classifier developed by combining healthcare and technological advancement knowledge for rapid detection of influenza. The framework enables seamless integration of a USB microphone with a laptop and then a three-stage processing paradigm: pre-processing, spectral analysis through Mel-Frequency Cepstral Coefficients (MFCCs), and the k-Nearest Neighbour (kNN) analysis power algorithm. Our vision is to exceed an 80% accuracy rate in flu diagnosis, representing a new high in flu detection approaches. By filtering out critical features from cough sounds, we go through a maze of audio pre-processing to specific spectral analysis through MFCCs - followed by a challenging path that allows us to explore subtle patterns. In machine learning, kNN is a beacon that can learn from the acoustic world by distinguishing subtle flu features. The realization of our efforts culminates in tremendous success by exceeding accuracy targets and providing a powerful diagnostic tool capable of unravelling flu nuances with unfailing precision. This will represent a monumental step forward in public health preparedness and bring a scalable, easy-to-use and irreplaceable resource to the fight against the difficult challenges of influenza.

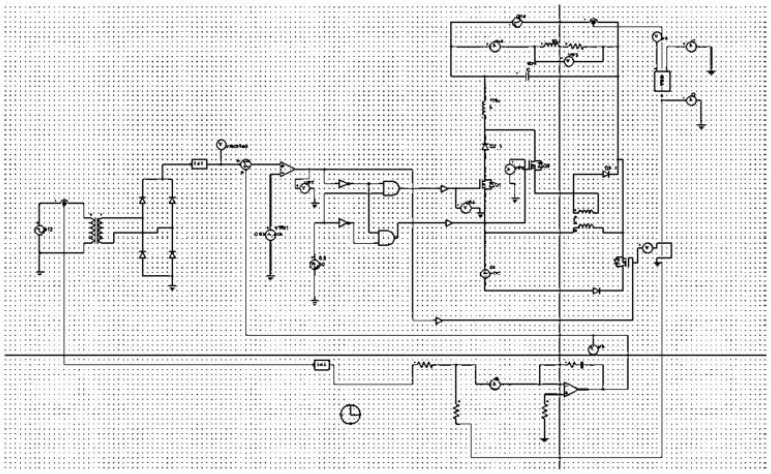


The project aims to develop a valuable preliminary influenza assessment tool by combining existing research, adopting a user-cantered approach and exploring areas of innovation. This system could have a profound impact on public health as it will be available and usable for influenza detection. This project's focus on portability and real-time analysis makes it promising for early detection of influenza in any setting.

SINGLE STAGE GRID-CONNECTED BUCK-BOOST PHOTOVOLTAIC INVERTER FOR RESIDENTIAL APPLICATION

GOWTHAM KIRAN P (20BEE0038), GOGI REDY ROHITH (20BEE0030)

Introduces the design of a three-switch single-stage grid-connected buck boost photovoltaic inverter tailored for residential applications. The innovative inverter design aims to enhance the utilization of photovoltaic arrays, reduce costs, minimize size, simplify control, and improve efficiency. By employing a combination of sinusoidal pulse width modulation (SPWM) and square wave signals under grid synchronization conditions, the inverter efficiently converts DC power from photovoltaic sources into usable AC power for grid connection. A closed-loop SPWM control scheme regulates the inverter's output current, ensuring stable operation. The mathematical modelling, detailed design, and simulation of the inverter using PSIM software validate its performance in feeding sinusoidal current to the utility grid across a wide range of input voltages. The proposed inverter's simplicity, reliability, and cost effectiveness make it a promising solution for residential photovoltaic systems, offering advantages over conventional four-switch inverters. Further physical testing and implementation of the inverter are planned for future validation.



PSIM model of Single Stage Grid-Connected Buck-Boost Inverter

Energy consumption per person is rising exponentially in the twenty-first century as we advance in technology, population, and economic development, yet our energy supplies, such as fossil fuels, are depleting quickly. In order to meet our energy needs, we must thus consider other strategies (such as the use of renewable energy sources). In this project we implemented a Single stage single phase PV Inverter with only three switches reducing the losses, cost and size of the circuit. The inverter is connected to the grid so that the excess is fed into the grid and reduces the electricity bill.