ROHINI

COLLEGE OF ENGINEERING & TECHNOLOGY

FEEDERS

2023

DEPARTMENT OF EEE

MAGAZINE EDITION

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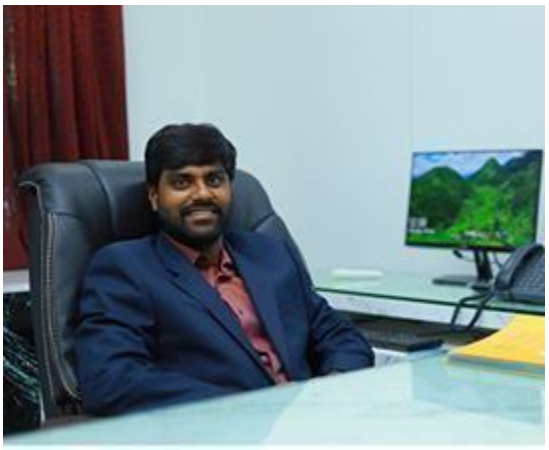

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Principal

From the Chairman's Desk

Rohini College of Engineering and Technology (RCET), since inception in the year 2012, has reached new echelons in all areas of functionality showing positive growth trend in academic discourse over the years. The motive has always been to attain the global level of excellence in scientific and technical education, fostering research, innovation, leadership qualities and entrepreneurial attitude, contributing to the advancement of the society and mankind.

As a Chairman of Rohini College of Engineering and Technology, I feel proud that the Department of Electrical and Electronics Engineering are releasing the 8th Edition of the department magazine for the academic year 2022-23. Roles and responsibilities of the students as an individual and as a team in various departmental activities together with their academic excellence shows the continual development of the department and the institution. I wish the faculty members and the students a great success with a bright future.

BEST WISHES!!!

Cordially,
Shri.K.NEELA MARTHANDAN
Chairman Rohini Groups.

From the Principal's Desk

It is a great pleasure for me that our Electrical and Electronics Engineering department is releasing a magazine presenting a glimpse of the growth of the institution on many fronts. Our students and faculties have performed exceedingly well and competent enough in all the fields. Beyond academics, the research activities are being conducted. The college also motivates and encourages staff and students to undertake research and enterprising skills. The faculty members play major role in the overall development of department and institute. The Department is committed to focus on cutting edge technology, innovations & creativity and hands on learning with an objective to convert the students from being job seekers to become job givers. In line with this philosophy, EEE department act as a bridge between the students and various electrical and electronics field-oriented organizations promoting entrepreneurial culture through their training programs, easy accessibility and funding support from time to time. I strongly believe that with the kind of impeccable system and support, the EEE department will continue to create benchmarks in pursuit of achieving academic excellence and shall soon emerge as a dream destination for Engineering aspirants.

The Department consistently provide an academic and social environment that stimulates academic excellence imbibed with cross cultural adaptability, flowering of soft skills and integration of human values & social concerns among students. In order to attain these multi facet objectives we have taken a number of steps aimed at developing the budding Engineers. This includes crafting of teaching learning modules in line with Anna University curriculum, floating of significant number of value-added programs on advanced knowledge domains and facilitating infrastructural support for incubation & innovative entrepreneurship. All these activities are effectively promulgated by highly qualified and well experienced faculties with high degree of precision.

I extend my greetings and best wishes to the faculty and students of the department and wish their endeavors my very best.

BEST WISHES!!!

Cordially,
Dr.R.RAJESH
Principal,
Rohini College of Engineering and Technology

From the HoD's Desk

The aim of our department is to be a centre of excellence in the field of electrical and electronics which will produce globally competent engineers with the moral values and technical skills for the betterment of the society. We groom our students according to the current needs of the industry. We provide real life projects to our students where they can apply intuitive, imaginative and creative ideas to find appropriate solutions to the challenges faced by our society. We open frontiers of technical knowledge and reveal new horizons of change, to broaden mind sets of our students.

Apart from the academics, our students are also engaged in various cultural, sports and literary activities at intra and inter college levels throughout the year. The Department has highly qualified faculty members providing a perfect base for raising students into true engineers that can adapt to changing industrial trends. Our faculty are at the forefront of technical education and cutting-edge research, creating thought provoking and challenging programs for our students.

I wish all our students a great success in sharing knowledge, ideas and solving important societal needs and issues. It is my sincere endeavour to provide suitable environment with transparency, impartiality and fairness to all the students of the department so that all of them can work in a responsible and coordinated manner with their full potential to make it possible to fulfil all challenges. I am sure that, working as a team, we would be able to take our department to the pinnacle of its glory.

BEST WISHES!!!

Cordially,
Dr.D.Sam Harison,
Head, Department of EEE,
Rohini College of Engineering and Technology

ABOUT THE MAGAZINE

We are delighted to present you the Eighth edition of “FEEDERS-2023” annual e-magazine of the Department of Electrical and Electronics Engineering, Rohini College of Engineering and Technology, Kanyakumari. The FEEDERS-2023 covers student articles and showcase department achievements on yearly basis. This magazine is the reflection of the imagination and creativity of the students who are involved in multifarious activities. The students can share their knowledge and ideas through this medium.

We are very proud of the work displayed here by the writers, photographers, and designers who made this issue possible. We hope you enjoy reading these articles.

----FROM THE FEEDERS-2023 TEAM

VISION OF THE COLLEGE

To be an academic institute of continuous excellence towards education and research in rural regime and provide service to nation in terms of nurturing potentially higher social, ethical and engineering companion graduands.

MISSION OF THE COLLEGE

- To foster and promote technically competent graduands by imparting the state of art Engineering education in rural regime.
- To enunciate research assisted scientific learning by dissemination of knowledge towards science, agriculture, industry and national security.

FEEDERS 2023

DEPARTMENT VISION

To create technically competent technocrats to meet the demand of Electrical and Electronics industry and societal need for the well-being of human kinds.

DEPARTMENT MISSION

- To provide knowledge and skills necessary for professional development in Electrical and Electronics Engineering.
- To promote research and creativity in the area of Electrical and Electronics Engineering.
- To promote team work and professional conduct in societal activities.

Program Educational Objectives of Department

PEO1

- Graduates of the programme will possess career in electrical and allied fields.

PEO2

- Graduates will have the ability to adapt to the growing technological requirement of the society through lifelong learning and team work.

PEO3

- Graduates of the programme will possess knowledge to pursue higher studies.

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.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems 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 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, 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 with an understanding of the limitations.
PO6	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.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions 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:** 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 Specific Outcomes (PSOs) of Department

PSO1	Ability to design and analyze various issues in power system, control and Instrumentation systems and power electronic and drive system.
PSO2	Ability to design and simulate real time problems in electrical system using modern software tools.
PSO2	Ability to apply the knowledge for the development of renewable energy to meet the demand of society.

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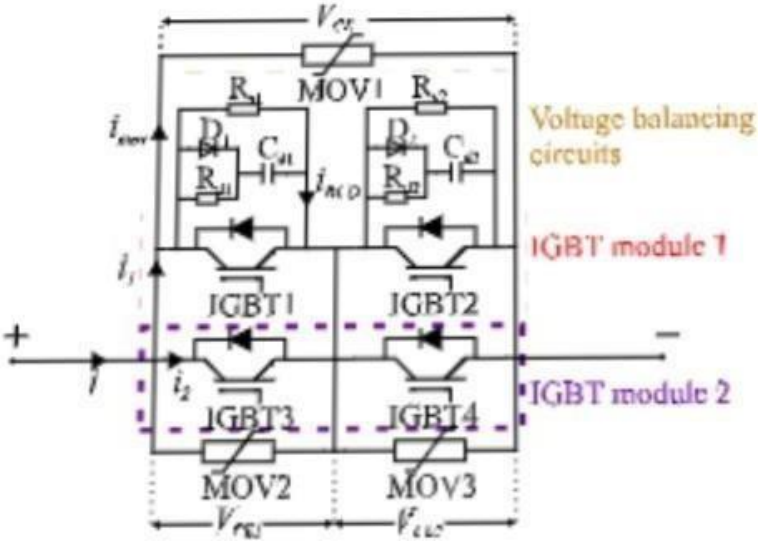
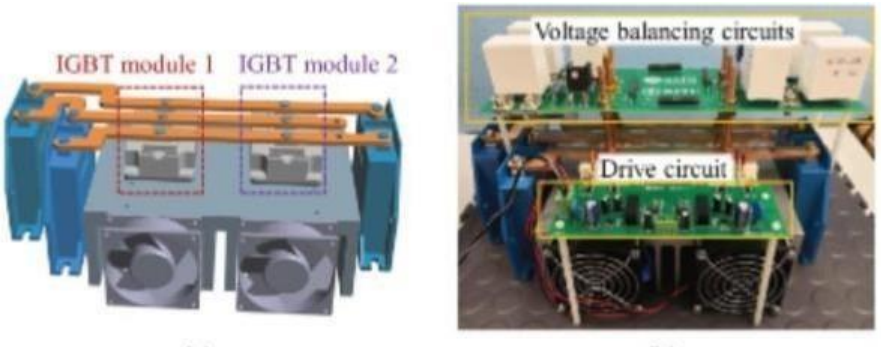
Solid state circuit breaker for DC system using series & parallel connected IGBT

MVDC systems have attracted a lot attention for the integration of renewable energy and electrification of transport due to their superior system operational performance and high-power quality. DC circuit breakers are of significant importance for the development of MVDC systems because they offer fast protection from fault conditions compared to mechanical equivalent. However, unlike AC systems, there is no zero-crossing for the current in DC systems, this makes the DC circuit breakers design more demanding. This paper presents the design of a solid-state DC circuit breaker (SSCB) in details using series and parallel configurations of IGBTs to increase the voltage and current ratings. The operation, electrical design and thermal.

Design of the SSCB are presented and analysed. A PLECS model is developed to simulate the operation of the SSCB. A 1 kV SSCB prototype is built and experimentally tested under both static and dynamic conditions. The prototype demonstrates even current sharing and voltage balancing in the experimental tests. The prototype can carry 150 A current continuously without overheating and demonstrates successful interruption of 1 kA DC current.





(a) (b)

N. NAVARAMYA,
III BE EEE/RCET

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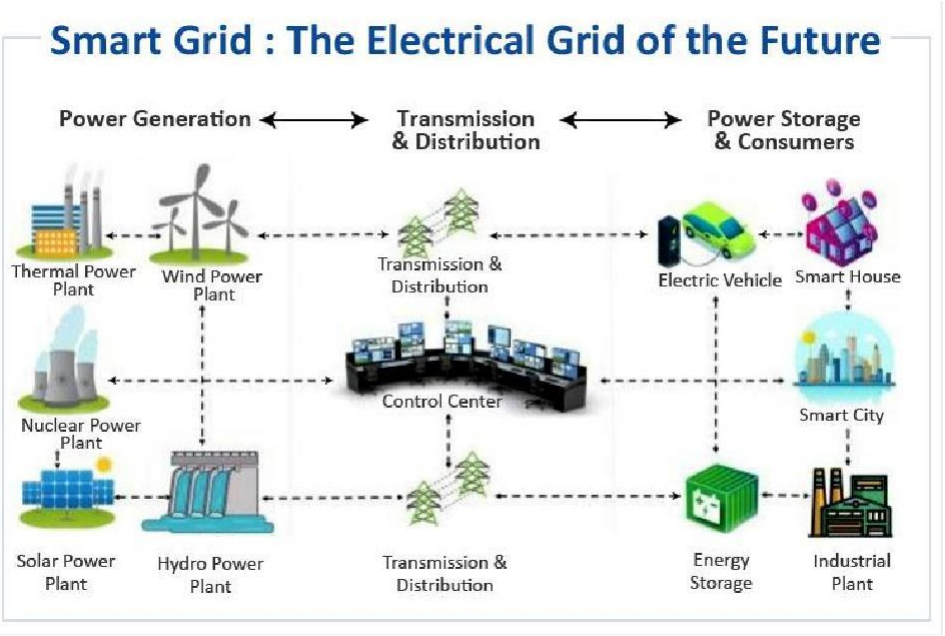
The Smart Grid

As the demand for energy steadily increases, it can no longer be met by building more fossil fuel power stations, because of their pollution and contribution to global warming. Smart grids can mitigate the problem, with their ability to integrate renewable energy sources while optimizing their handling of all energy resources – both renewable and conventional.



Energy sustainability and environmental preservation have become worldwide concerns with the many manifestations of climate change and the continually increasing demand for energy. As cities and nations become more technologically advanced, electricity consumption rises to levels that may no longer be manageable if left unattended. The Smart Grid offers an answer to the shift to more sustainable technologies such as distributed generation and microgrids.

Data can be collected in real time from line sensors, users, and generators, and communicated to a centralized control point that can perform analysis and control functions. This allows balancing of power loads, troubleshooting of outages, and management of distribution.

The transition to the smart grid is extremely crucial in order to increase the reliability of our power grid due to the expansion of renewable energy technology. The adoption of renewable energy generation due to the advancement of technology and for curbing pollution has increased generation through distributed energy resources, which is although extremely beneficial for the environment as they have a smaller carbon footprint but can cause an adverse effect on the current grid. It can also improve the efficiency of the grid, reduce losses, thus minimizing the cost of energy for the consumers.

P.GODWIN,
III BE EEE/RCET

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Electricity – Is it enough produced?

Michael Faraday, it was in 1878 when real commercially viable electricity was produced by Thomas Edison in DC lamps. In 1881, streets and houses in UK were lighted by electricity generated as hydro power, and gradually commercial production and supply started. By the end of this decade, AC electricity system was introduced due to its advantages over DC. With transformers, power transmissionat lesser currents was an advantage over DC. And since then, AC supply took over DC in every possible application.

1. **Static electricity (like lightning)**
2. **Induction by Generator-Alternator – mostcommonly used**
3. **Chemical process – like in Battery/Fuel cells**
4. **Photo-voltaic like in Solar**
5. **Thermo – from temperature – likethermocouples**
6. **Pressure – like piezo-electric**
7. **Nuclear power**

Production Levels Means of Electricity Generation

Today, we have electricity generation by various means including thermal, nuclear, hydro, tidal, wind, solar, gas, fuel and so on. Most of the electricity today is generated by Turbines (generator-alternator concept), that are driven by either steam, gas, water or wind Solar, nuclear as well as captive power from biogas or by diesel engines is also contributing to total energy needs. The demand for electricity is ever increasing for both housing/buildings and for industries/machines. In 2010, total installed capacity for electricity generation, worldwide was 5,081.446 Million kilowatts and is witnessing increase by around 5% each year. The United Stateshas long been the largest producer and consumer of electricity, with a global share in 2005 of at least 25%, followed by China, Japan, Russia, and India. As of Jan-2010, total electricity generationfor the2 largest generators was as follows: USA: 3992 billion kWh) and China: 3715 billion kWh).Electricity is a major contributor in national GDP. Not only in terms of production ofelectricity, but for running machines and equipment to produce nearly everything, even agriculture, has increased role.

Demand-Supply Gap

Global energy consumption has doubled in the past thirty years and is expected to increase by another 60% by 2030. According to the International Energy Agency (IEA) and the Organization for Economic Co-operation and Development (OECD), consumption rose from 5.5 billion toe (tons of oil equivalent) in 1971, to 10.3 billion in 2002. By 2030, global energy demand is expected to reach 16.3 billion 1.6 times that of 2002.

Need Forecast

Despite the steady rise in energy supply and consumption, over 1.6 billion people, 35.8% of the population in the developing world, still live without electricity. Predictions on energy demand in 2050 vary, but some scientists say that to provide quality life to the world, it will require three times the energy consumed in 2003.

T.JUDE MAKVIN,
III BE EEE/RCET

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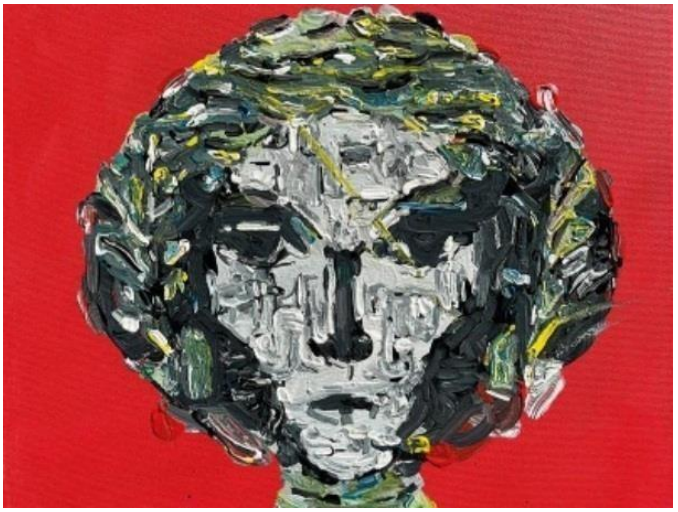
Robot creates physical paintings without human input



Robohood Inc, an art and tech start-up specializing in artificial intelligence and robotics, says it has created the world's first AI-robotic technology that enables users to create physical paintings from an idea to canvas without human involvement. The technology uses stable diffusion, a deep-learning, text-to-image model primarily used to generate detailed images guided by a text prompt. And Robohood combined this novel neural network with its software that renders and brush-paints them with robotic manipulators. The system, called the Robotic Art Studio, uses a variety of painting techniques by calculating each brush stroke and delicately mixing colours straight on to various surfaces. The results are "fine art pieces that possess a unique and cohesive style".

In fact, E&T asked Robohood to create two pieces of bespoke artwork using the technology, one depicting the neural network's interpretation of 'engineering' and the other 'technology'. "While generating these images, we deliberately chose to depict human-like motifs," Robohood says of the painting. "Our aim was to emphasize that engineering and technology are an integral part of human life, and to dispel the notion that robots will harm humanity. Instead, they will become a seamless part of our daily routine, making it more convenient and enjoyable."

N. KARTHIKEYAN,
III BE EEE/RCET

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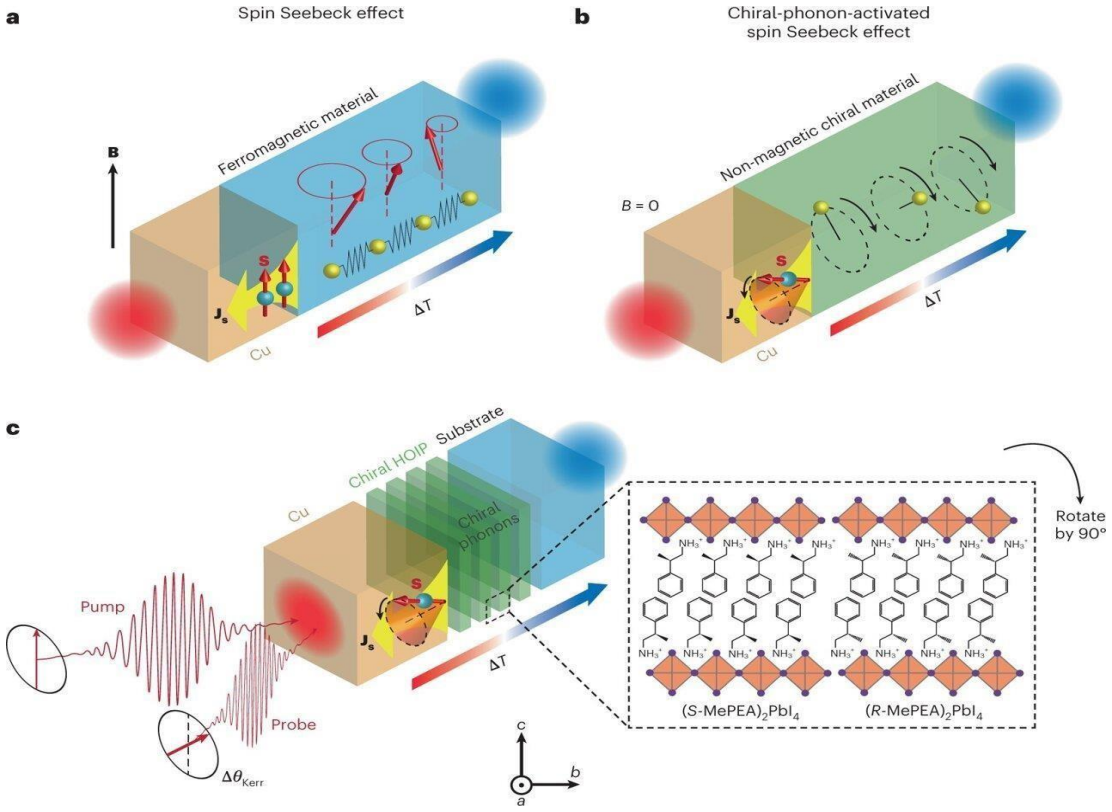
Chiral Phonons create Spin Current without Magnetic Materials



Researchers from North Carolina State University and the University of North Carolina at Chapel Hill used chiral phonons to convert wasted heat into spin information -- without needing magnetic materials. The finding could lead to new classes of less expensive, energy-efficient spintronic devices for use in applications ranging from computational memory to power grids. Spintronic devices are electronic devices that harness the spin of an electron, rather than its charge, to create current used for data storage, communication, and computing. Spin caloritronic devices, so-called because they utilize thermal energy to create spin current are promising because they can convert waste heat into spin information, which makes them extremely energy efficient. However, current spin caloritronic devices must contain magnetic materials in order to create and control the electron's spin. By applying a thermal gradient to a material that contains chiral phonons, you can direct their angular momentum and create and control spin current. Chiral phonons are used to create a spin current at room temperature without needing magnetic materials, Chiral phonons are groups of atoms that move in a circular direction when excited by an energy source -- in this case, heat. As the phonons move through a material, they propagate that circular motion, or angular momentum, through it. The angular momentum serves as the source of spin, and the chirality dictates the direction of the spin.

A.S.ABDUL RAZIQ ALI
III BE EEE/RCET

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Electrical Wiring and its Different Colours

Looking at a bunch of brightly colored electrical cables and wondering what they mean? All of you have wondered what the different colors of wires mean right? you're in luck as this article is written for people like you then. If you happen to live in the USA then you can expect the electrical wires behind your walls to follow certain color codes. The different colors will help you to identifyeach wire's function in the circuit. Understanding and knowing the electrical color code that dictateswhich wire does what is imperative not only in the correct configuration of an electrical system butit's also crucial to your safety.

1. Black Electrical Wires
   The black colored wire is designed to transfer power to the switches and outlets in all types of circuits. Black wires are also often used as switch legs in circuits, which is the connection linking a switch to the electrical load. Black wires are live at all times.
2. Red Electrical Wires
   Red electrical wire means that the secondary live wires in a 220-volt circuit, used in some types of switch legs and in the interconnection between smoke detectors that are hard wired into the power system. You can't connect a red wire to another red wire or connect a red wire to a black wire.
3. Blue and Yellow Wires
   Blue and yellow wires are used as the live wires pulled through a conduit e.g. you might see yellow wires as switch legs to ceiling fans, structural lights and outlets paired with light switches. Then blue wires are most often used as travelers for three- or four-way stitches.
4. White and Grey
   White and grey colors indicate a neutral wire. White is the color that is most often used for this function. A neutral wire connects to the neutral bus bar within an electric panel.
   You can only connect the white and grey wires to other white and grey wires. Although neutral, they can still carry current, particularly the unbalanced load-the electricity not being used and being returned to the electrical service.
5. Green Electrical Wires
   The purpose of the green wires is to ground an electrical circuit. They connect to the grounding terminal in an outlet box and run to the ground bus bar in an electrical panel. In this way, the green wires act as a failsafe, giving electricity a place to escape into the ground if a live wire within the circuit touches metal or something else conductive. Green wires can also connect to other green wires. Remember, if there's a fault somewhere in your circuit, green wires could be live, so treat them with caution.

S.AJIL
III BE EEE/RCET

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Start-up – An Initiative

What is a Start-up?

The term start-up refers to a company in the first stages of operations. Start-ups are founded by one or more entrepreneurs who want to develop a product or service for which they believe there is demand. These companies generally start with high costs and limited revenue, which is why they look for capital from a variety of sources such as venture capitalists.

Steps to do Start up:

1. Start with a Great Idea
2. Make a Business Plan
3. Secure Funding for Your Start-up
4. Surround Yourself with the Right People
5. Make Sure You're Following All the Legal Steps
6. Establish a Location (Physical and Online)
7. Develop a Marketing Plan
8. Build a Customer Base
9. Plan to Change.

Common Start-up Mistakes

a) Spending money on the wrong things.
b) Rushing through the hiring and onboarding process.
c) Acting without planning.
d) Operating without a style guide or brand persona.
e) Being afraid to test and learn.
f) Partnering with the wrong investors.
g) Giving too little or too much power to the customer.
h) Getting too big too fast.
i) Not considering your employer brand’s impact.
j) Forgetting why you got into this business in the first place.

By avoiding these mistakes, we can give a better start up.

J.P.JOHNY BABISH
III BE EEE/RCET

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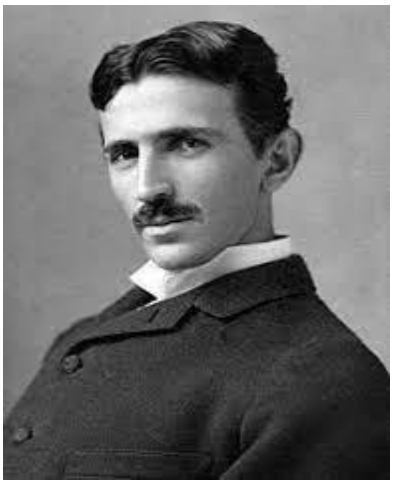
Nikola Tesla



Nikola tesla was a Serbian-American inventer. Tesla was from a family of Serbian origin. Nikola Tesla was born in 1856 in Smiljan, Croatia, part of the Austro-Hungarian Empire. His father Milutin Tesla was a priest in the Serbian Orthodox church and his mother Duka Tesla was managed the family's farm. In 1863 Tesla's brother Daniel Tesla was killed in a riding accident. He was a collage dropped out (Graz University of Technology). He was expert in High voltage high frequency experiments. He worked for a short time at the Edison Machine Works in New York City before he struck out on his own with the help of partners to finance and market his ideas, Tesla set up laboratories and companies in New York to develop a range of electrical and mechanical devices.

His alternating current (AC) induction motor and related polyphase AC patents, licensed by Westinghouse Electric in 1888. His dream is to create wireless electricity transmission across long distance. He died in 1943 January 7 at the age of 86 due to heart attack at his hotel room New York city and his body was discovered 2 days later when a maid pushed past Do Not Disturb sign. Nikola Tesla inventions constitute numerous technological breakthroughs throughout his lifetime. Born in Smiljan, Croatia, in 1856, the math and physics genius contributed innovations that continue to impact our lives daily today. He held over three hundred patents, but was only recognized for some, indicating many of his ideas were tested and failed or never became well known. In 1882, upon graduation from the Technical University of Graz and Philosophy at the University of Prague, he drew the first sketches of his idea to build an electromagnetic motor. His first job entailed retailing DC power plants for ConEd which led to his immigration to the states in 1884.

Tesla’s inventions included:

1. AC Power (alternating current)
2. Tesla Coil
3. Magnifying Transmitter
4. Tesla Turbine
5. Shadowgraph
6. Radio
7. Neon Lamp
8. Hydroelectric Power
9. Induction Motor
10. Radio Controlled Boat

L.MELBIN JOSE
III BE EEE/RCET

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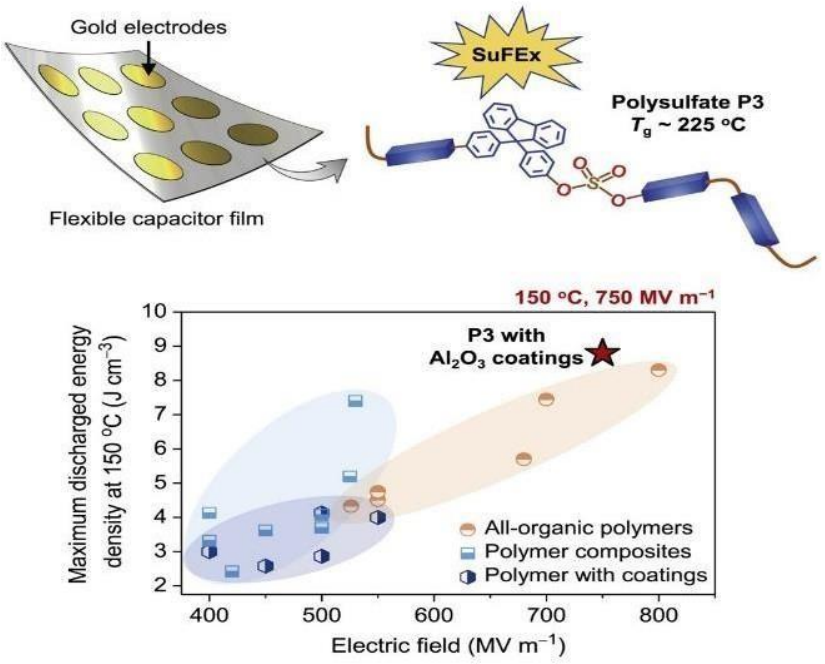
Polysulfates could find wide use in high-performance electronics components

A new type of polysulfate compound that can form thin, flexible films has properties that could make it a material of choice for many high-performance electrical components, according to a study from chemists and materials scientists at Scripps Research and the Lawrence Berkeley National Laboratory (LBNL).



In the study, published January 18 in *Joule*, the scientists found that the new polysulfates can be used to make polymer film capacitors that store and discharge high density of electrical energy while tolerating heat and electric fields beyond the limits of existing polymer film capacitors. Many of the dielectric materials in contemporary use are lightweight, flexible, plastic-like materials called polymers. The new polysulfates also are polymers, but have greatly improved properties compared to commercial dielectric polymers. The team found that capacitors made from one of the new polysulfates, when enhanced with a thin film of aluminum oxide, could discharge a high density of energy, while withstanding electric fields (more than 700 million volts per meter) and temperatures (150 degrees C) that would destroy the most widely used polymer film capacitors. The researchers noted that the heat sensitivity of standard polymer capacitors often necessitates expensive and cumbersome cooling measures in systems that use them—for example, in some electric car models. Thus, adoption of the new polysulfate dielectrics could lead to cheaper, simpler, more durable power systems in electric cars and many other applications.

M.MOHAMED FAHMI
III BE EEE/RCET

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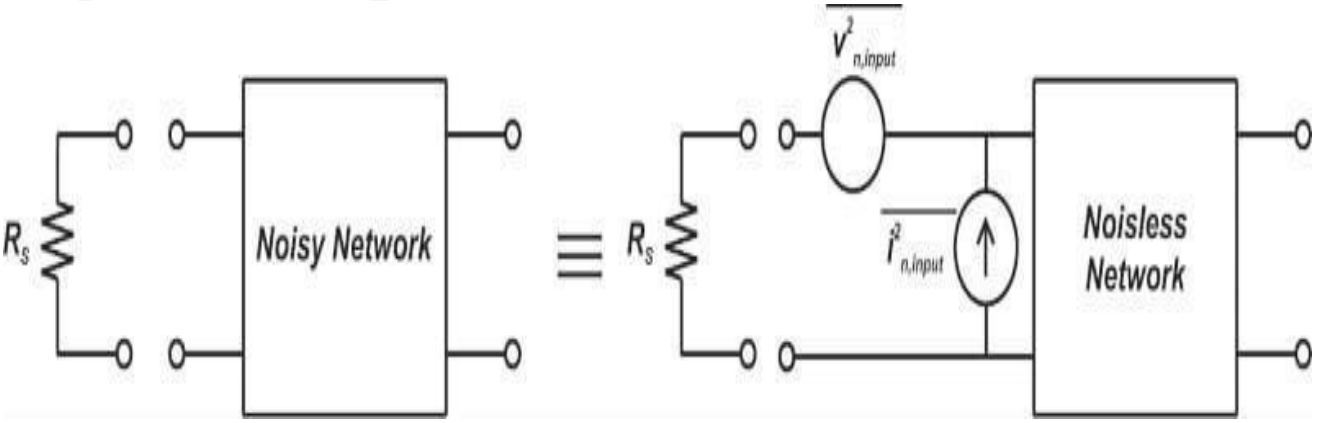
Using the Noise Figure Metric to Analyze Noise in RF Circuits

In RF design, especially discrete RF design, we normally prefer to use the noise figure concept rather than the noise voltage and current sources model. However, the above model can help us better understand noise behavior in electronic circuits and the subtleties of the noise figure metric. One key observation is that the output noise of the circuit depends on the output impedance of the preceding stage (or the source impedance, R_S).
This can be understood by considering the extreme cases of $R_S = 0$
and R_S tending to infinity ($R_S \rightarrow \infty$).



The "noiseless network" is the same as the "noisy network" except that its components (resistors, transistors, etc.) are assumed to be noise-free. By equating the output noise of the two circuits, we can find the value of the input-referred noise voltage and current sources. The two inputgenerators are sufficient and necessary to correctly model the noise of a linear two-port network forany source impedance (R_S).

AV.LOGESHWARAN
IV BE EEE/RCET

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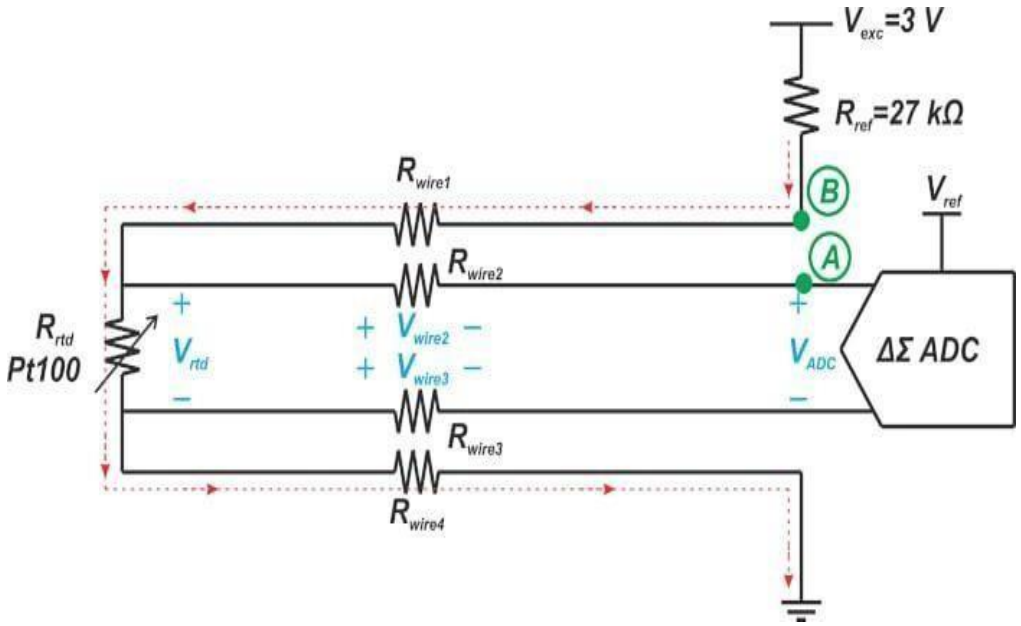
RTD Signal Conditioning -- 4-Wire Configuration, Ratiometric Measurement, & Filtering

All RTD measurement circuits require an accurate and stable excitation source, as the RTD voltage is a function of the excitation source. The voltage measured by the ADC relates to the RTD resistance by the following equation:

$$V_{ADC} = R_{rtd} \times I_{exc}$$

If the excitation current is noisy or drifts with temperature or time, the voltage across the RTD changes even when the temperature is fixed. To maintain high accuracy, the designer needs to use precision components to minimize variations in I_{exc}.



In this case, the excitation current is passed through a precision reference resistor R_{ref} to create the ADC reference voltage. A buffer is used to sense the voltage across R_{ref} without causing any loading effect on this resistor. Although the buffer is shown as an external component, it is normally integrated into the ADC chip, and an external buffer is not required.

The ratiometric circuit can work without the use of external RC filters; however, the addition of low-pass RC filters can improve the circuit's immunity to radio frequency interference (RFI) and electromagnetic interference (EMI).

P. SUBIN
IV BE EEE/RCET

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New AI-powered farming robot covers 50 acres of crops per day

French startup Meropy has developed an agricultural robot that autonomously inspects crops from both above and below, saving farmers time and money. The challenge: A lot can go wrong between the time crops are planted and when they're harvested - pests can invade a field, diseases can spread through it, and weeds can proliferate, stealing resources crops need to thrive. Regular crop monitoring can help farmers catch these problems early, before they lead to significant losses, but manually checking all the plants on a large farm can be time consuming and labor intensive. Robots that autonomously navigate fields can relieve farmers of this duty, but their tires and treads can damage crops. Satellites and drones don't carry this risk, but because they only see plants from above, they can miss issues hidden beneath their leaves. Meropy's agricultural robot SentiV is designed to overcome these issues. At just 33 pounds, the bot is light, and rather than rolling along on tires, it navigates fields on rimless spoked wheels. Because these make much less contact with the ground than the wheels traditionally used by farming robots, damage to crops is minimized. To use SentiV, farmers first set the boundaries of their field in the robot's software platform. It will then use GPS to roll across the entire area autonomously — according to Meropy, the bot can cover about 50 acres a day. While on the move, SentiV uses two cameras to image crops from above and below. Data from the cameras is analyzed by AI algorithms trained to spot threats, monitor growth, and identify signs that the plant might need more or less water and nutrients. To ensure farmers can inspect different types of crops, Meropy designed the agricultural robot to be modular - its width is adjustable, and its height can be changed by swapping in different-sized wheels. The upfront cost of the robot could potentially be offset by savings on fertilizers or pesticides, though. Data from the bot could let farmers know exactly where the chemicals are needed, keeping their deployment to a minimum, which would also be a boon for the environment.

Prof.P.JEYA KUMAR,
Vice Principal & Head-EEE

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Technological Innovations in Electric Vehicle Charging

Increasing relief from range anxiety is one factor behind rapidly rising sales of electric vehicles. Two years ago, BloombergNEF predicted 400 million passenger EVs would be on the road by 2040. The most recent report revises that prediction upward to 700 million. New investments in EV charging infrastructure, lower EV prices, continuous improvements in vehicle range, and the flow of new EV models are also spurring this growth. Meanwhile, the EV charging industry continues to innovate and attract new investment. While some innovations in the works will come to fruition in a matter of years, others are steadily improving the EV charging experience today.

Smart EV Charging

Smart EV charging delivers reliable, safe, renewable, and cost-effective energy to EVs while meeting the needs of drivers and local grids. It depends on sophisticated back-end software that captures data from EVs, networked chargers, and the grid. That data is used to optimize charging of EVs, integrate power from storage and renewable sources, and minimize impact on the grid. For buildings and fleets, site-level energy needs are also factored in. Advanced algorithms balance all these elements to dynamically distribute the lowest-cost energy when and where it's needed without compromising either local energy needs or EV charging.

Self-Healing Algorithms for EV Charging Management

EV drivers are challenging EV charge point operators and e-mobility service providers to do a better job of managing charger availability and stability and deliver a seamless charging experience. Self-healing algorithms built into an EV charging management platform can fix up to 80% of the software-related operational issues that render EV chargers unusable by drivers. Real-time issue discovery and automated self-repair maximize chargers uptime and optimize EV owners' charging experience.

Vehicle-to-X (V2X)

The idea of using the energy stored in EV batteries for other purposes started with vehicle-to-grid (V2G). V2G envisions using smart EV charging to control a two-way flow of energy between EVs and the grid. Instead of generating more power during peak times, utilities would purchase stored energy from EV owners and distribute it over the grid. During non-peak times, the EVs would draw energy for recharging. V2X extends the idea to include different use cases and destinations for power drawn from EVs, such as vehicle-to-home (V2H), vehicle-to-building (V2B), vehicle-to-farm (V2F) and vehicle-to-load (V2L).

EV Battery Technology

No blog on EV technology innovations would be complete without touching on EV batteries. Efforts continue to find an alternative to today's lithium-ion batteries that is lower cost, faster to charge, longer-lived, and does not depend on scarce minerals. New chemistries such as sodium-ionoffer promise of incremental improvement. Innovators looking for significant gains are exploring solid state batteries and new form factors such as blades. What the industry needs is that big breakthrough technology shift.

Megawatt Charging System for Big Trucks

Current ultra-fast charging solutions — 250kW and, coming soon, 350-500kW DC fast chargers — are getting passenger vehicles and light-duty trucks or vans back on the road quickly. Depending on the car, you can add 60 miles of driving with five minutes of charging or get to 80% charged in

20 – 30 minutes. Medium- and heavy-duty trucks need a lot more power. Following four years of development, the global EV standards non-profit CharIN has launched a standards-based Megawatt Charging System fast-charging connector for heavy-duty vehicles. It's designed for DC charging of up to 3,750kW, so trucks can add about 200 miles range in a half-hour charging session. That gets electric trucks close to the 500-mile range needed for a single run.

Smart Battery Management

EV batteries consist of thousands of cells, which are grouped into modules, which are connected so they act as one battery. When enough cells degrade to the point where the battery is no longer useful for powering electric vehicles, smart battery management technology can give those batteries a second life. They can be "racked and stacked" so that multiple EV batteries can act as one very large battery that can be used for local storage of energy from the grid or from renewable sources. The technology that makes this possibly combines software, sensors, and hardware to correct for non-functioning cells, optimize charging, and communicate with smart EV charging and energy management software. In this way, energy from renewables can be captured when conditions are good, stored, and integrated back into the local grid or the local EV charging infrastructure.

Dr.D.SAM HARISON,
Professor-EEE

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5G Technology: Advantages and Disadvantages

As the global telecom industry gears up for 5G technology, experts say that despite having several pros, 5G has many dark aspects that would require a detailed discussion amongst the industry leaders and governments globally.

According to the Indian government, notably, for years, global telecom operators, internet companies, and cellular operators are planning to implement and use 5G technology, for easy accessibility and feasible operations. As global technological scenarios are changing with the introduction of artificial intelligence and the Internet of Things (IoT), experts say that 5G technology will be quintessential for industrial revolution 4.0. However, as the global telecom industry gears up for 5G technology, experts say that despite having several pros, 5G has many dark aspects that would require a detailed discussion amongst the industry leaders and governments globally.

Advantages OF 5G Technology

a. High Speed- One of the major pros of 5G technology is its ability to work faster on cellular and other devices. Unlike its predecessors—2G, 3G, 4G, and 4G LTE, where downloading movies, videos, and music and streaming services would have taken hours, with 5G technology these tasks become much easier with downloading taking only a few seconds. Moreover, one sector where the 5G technology will add value is the global booming gaming industry, according to experts. An average user can use up to 20Gbps of the internet with this technology.
b. Latency- Compared to its predecessors, 5G technology has low latency which makes it easier to support other new-edge technologies such as artificial intelligence, IoT, and virtual reality, which is another major advantage of 5G technology. Furthermore, owing to its low latency it makes browsing easier, thus improving customer experience.
c. Bandwidth- With increased bandwidth, 5G technology provides seamless transfer of data, thus improving the connectivity amongst devices and the overall user experience. Moreover,

the technology provides users with a seamless transition of services between cellular devices and wireless WIFI, thus improving performance. Furthermore, a smaller number of 5G towers would also provide users with improved bandwidth.

Disadvantages OF 5G Technology

1. Limited Coverage: While 5G technology is touted to have the fastest speed, its presence in only select cities globally that have 5G towers is one of the limitations of this technology. Despite global companies and governments working for maximum cities to have the coverage of 5G, it would take years for the introduction and implementation, as the testing, trial, and set-up of 5G towers is an expensive process.
2. Weak Upload Speeds: Experts believe that despite its ability to have faster download speeds, 5G technology will have less upload speed compared to 4G and 4G LTE.
3. Battery Damages: Another limitation of 5G technology is it weakens the cellular device, by draining the battery and reducing the lifespan. So far only a few manufacturers have introduced mobile phones that are 5G friendly. While research and development are underway to manufacture 5G devices, the technology is proving to be a bane to 4G devices as it often leads to battery damage according to experts.
4. Interference With Airport And Flight Operations: In January this year, several airlines including Air India canceled their flights to the US as the telecom operators in the country were trying to roll out 5G operations in the country. One of the major reasons behind the cancellation of flights was the interference of technology with flight operations, according to the US aviation authority. Though this issue has not been encountered by other nations where 5G services have been rolled out, this makes it another limitation of 5G technology.
5. Cybersecurity Risk: Another drawback of 5G technology is it increases the risk of hacking thus impinging on cybersecurity. Moreover, lack of encryption during the connection process also makes the devices using 5G technology an easier target for cyberattacks and data theft.

5G Technology in India

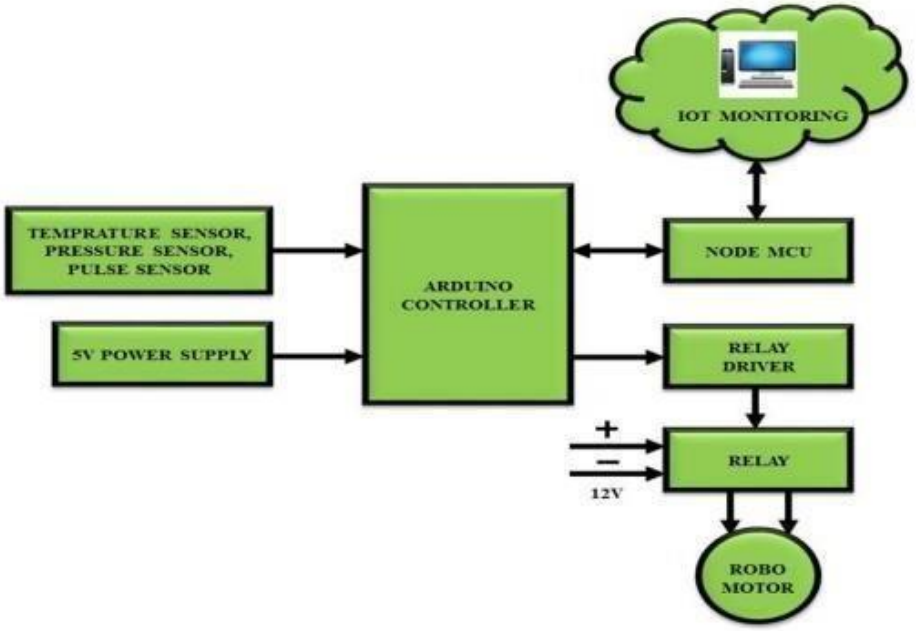
In India, 5G spectrum auction began on July 26 and concluded on August 1, with the government fetching a whopping Rs 1,50,173 crore through the bids. The government had put 72 GHz of radio waves for sale across 10 bands, of which 71 per cent have been sold. The spectrum bands that were put on sale include— low (600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz), mid (3300 MHz), and high (26 GHz). Mukesh Ambani-led Reliance Jio emerged as the winner of the bid across several spectrum bands including the covered 700 MHz band worth Rs 88,078 crore. Sunil Mittal-led Bharti Airtel fetched the second spot after buying 19,867 MHZ airwaves worth Rs 43,084 crore. While beleaguered telecom company Vodafone-Idea Limited (VIL) bought spectrum worth Rs 18,784 crore, Adani Group bought spectrum bands worth Rs 212 crore.

Dr.G.K.JABASH SAMUEL,
Associate Professor-EEE

IOT based Health Monitoring Robot for Smart Patient Management System in Hospital

It is challenging to continuously monitor patient body parameters during the current pandemic, such as temperature, pulse rate, oxygen level and blood pressure. Monitoring and Recording of various medical parameters of COVID patient outside hospitals has become Wide spread phenomenon Hence to overcome this we implemented a robot which can monitor and assist the patient using Robotic system. In our project we are monitoring pulse rate, pressure level and temperature of the patient by using respective sensors and also sends the values to IOT Cloud platform through WIFI-Module. If any changes in patient's physical conditions, it will be uploaded to cloud and alerts monitoring person through cloud. In this case, the robot provides constant assistance to patients while also wirelessly relaying information to the doctors; additionally, it allows the doctors to monitor the patient's health on their smartphones. The main objective of this work is to create a system that uses internet connectivity to monitor the COVID patient's body at any time. Thus, this will help to prevent the spreading of diseases. Hence it removes the problem of monitoring the patients suffering from communicable diseases.

In this proposed work the vital parameters such as oxygen level temperature, ECG readings which are monitored using Arduino Uno. These sensors signals are sent to Arduino Uno via amplifier circuit and signal conditioning unit (SCU), because the signals level are low (gain), so amplifier circuit is used to gain up the signals and transmit the signals to the Arduino Uno. Here COVID patient's oxygen level, body temperature, EEG is measured using respective sensors and it can be monitored in the screen of computer using Arduino Uno connected to a cloud database system as well as monitored anywhere in the world using internet source.



The proposed methodology for a robot-based patient monitoring system uses an Arduino Uno to monitor the patient's health parameters. After connecting the Arduino Uno to the internet, it is linked to a cloud database system that serves as a server. The server then delivers data to the receiver system automatically. As a result, the doctor can keep track of the COVID patient's health

parameters at all times. Any sudden increase or reduction in these parameter values can be identified early on, allowing the doctor to begin administering essential drugs right once.

From this proposed system, it is concluding that Wireless sensor technology is emerging as a significant element of healthcare services. In this proposed system a mobile physiological monitoring system is presented, which is able to continuously monitor the COVID patient's heartbeat and other critical parameters in the hospital. The system is able to carry out a long-term monitoring on patient's condition and is equipped with an emergency rescue mechanism using IoT. Thus robotic system will be digitalized. In day to day life, people are affected by various variants of COVID diseases which are highly sensitive diseases. So, people are continuously anxious about their health condition. This project deals with Internet of Things (IoT) is a growing present concept which has an effect of many aspect of human life lead to smart technology in our day to day life.

Mr.S.GOPAKUMAR
Assistant Professor/EEE

Realization of Internet of Things for Smart Cities

Internet of Things technology has been a key pillar of smart city development. As technology advances and more countries embrace next-generation connectivity, IoT technology will continue to grow and have a bigger effect on the way we live. In this article, we explore IOT and its importance for the development of smart cities. According to numbers from the Improving Internet of Things (IoT) Security with Software-Defined Network (SDN) study, there will be more than 75.44 billion connected IoT devices by 2025. With a forecast of over 7.33 billion mobile users by 2023 and more than 1,105 million connected wearable devices users by 2022, the Internet of Things is expected to grow into one of the smartest collective and collaborative systems in history. Sophisticated interconnectivity is one of the fundamental building blocks of next-generation smart city development. Citizens and governments will be connected in ways that we've never seen before. IoT will deliver huge opportunities and benefits to smart cities, but this level of interconnectivity will also bring its own set of challenges.

Internet of Things

It references the vast network of digital devices that communicate and interact with each other, and affect our daily lives. These devices include smart sensors, monitoring devices, AI programs, and actuators that can evaluate, monitor, and control certain aspects of city life. For example, data about the weather can be collected by multiple sensors, which can then be used to manage thermostats in public buildings, cutting emissions, and saving the city money. There is no uniform definition of what the Internet of Things is, and different organizations and individuals may suggest differences from one definition to the next. However, they all agree that the IoT is "a set of technologies for accessing the data collected by various devices through wireless and wired Internet networks."

Why is IOT-Internet of Things so Important for Smart Cities?

IoT is important for *every* city. Currently, the world's largest cities are Tokyo, Delhi, Shanghai, and Sao Paolo, with populations of 38 million, 29 million, 26 million, and 21 million respectively. Today, these megacities are notable because of their huge populations. In the future, there will be many more like them, with even denser populations. It's predicted that more than 60% of the planet's population will live in cities by the year 2030. It's a bold prediction and one that could spell disaster if the appropriate measures aren't taken. Large populations demand large resources. Residents will need access to water, efficient and environmentally-friendly transportation, clean air, and practical sanitation and waste management. With the clever use of smart city practices and widespread deployment of IoT technology, the cities of tomorrow will be able to meet the demands of their residents in an effective and efficient way. Connected technologies and big data can create smart solutions. These solutions can solve problems, increase the quality of life for a city's residents, and lower the consumption of resources. For a truly smart city to function at its full potential, the Internet of Things is a vital ingredient.

Examples of Smart City IOT Solutions

According to IoT Analytics, smart cities are prioritizing Internet of things technology in a number of interesting ways. The study focused on decision-makers from some of the world's leading smart cities (including Barcelona, Paris, Amsterdam, and Palo Alto) and categorized how leaders were using IoT to curb urban inefficiencies and improve the quality of life for their citizens.

The study found that the following areas were the top priorities* for city governments:

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- Connected public transport (74%)
- Traffic monitoring and management (72%)
- Water level / Flood monitoring (72%)
- Video surveillance and analytics (72%)
- Connected streetlights (68%)
- Weather monitoring (68%)
- Air quality / Pollution monitoring (68%)
- Smart metering – water (66%)
- Fire / Smoke detection (66%)
- Water quality monitoring (64%)

*Percentages shown are the percentage of included smart cities that have deployed use cases as part of a smart city initiative.

From the top 10 listed above, let's look at some examples of how cities are effectively using Internet of Things technology to solve urban issues.

Connected Public Transport

The Polish city of Lublin was awarded the title of Smart City of the Year within its population class in 2016, largely thanks to its largest smart city project: an innovative passenger information system for connected public transport. The system revolutionized the city's bus transit system. It did this by installing GSM and GPRS devices on vehicles, that transmits real-time data to a dispatchcenter software, which then relays that information to electronic displays at bus stops and to onlineportals. This resulted in more efficient public transport, cutting waiting times, and boostingreliability.

Traffic Monitoring

Managing traffic flow is one of the biggest challenges for smart cities. Thanks to IoT, there are a number of practical solutions. In Los Angeles, the city government has installed a vast network of pavement integrated sensors. These sensors transmit real-time traffic updates to a traffic management platform, which adjusts the timing of traffic signals to optimize traffic flow.

Water Level Monitoring

The city of Dublin's innovative Smart Docklands project has hundreds of exciting ideas. However, the city's flood monitoring program is one that directly affects citizens. In recent years, flooding has become a problem in areas of the city. To remedy this, the Dublin City Council searched for solutions. The result was the Low-Cost Gully Management initiative. This program saw six companies rise to the challenge of developing sensor products that can detect water levels and report flooding incidents using LoRaWAN and Sigfox technologies.

Video Surveillance

Smart video surveillance isn't a new concept. In fact, smart surveillance cameras have been around for a long time, and they're commonly used to police the world's roads and highways. ANPR (Automatic Number Plate Recognition) or ALPR (Automatic License Plate Recognition) cameras are commonly used by law enforcement to identify stolen cars, for traffic control purposes, to collect tolls, and to deter crime in general. It's true that smart surveillance cameras are becoming more advanced and may be used to predict crimes before they happen in the future. They may alsobe able to identify pedestrians and log their movements. However, heavy surveillance methods likethese aren't popular, with many citizens voicing privacy concerns and questioning the use of their personal data.

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Connected Streetlights

Connected streetlights and lighting solutions are a very popular way to boost the productivity of a smart city. The key benefits of smart lighting include a reduction of energy and maintenance costs, increased public safety, safer traffic, and a measurable environmental impact. Smart streetlights can also be used to double up as EV chargers, emissions monitors, and wireless broadband connection points. There are many prime examples of successfully connected streetlight implementations, but here are a few brief notable success stories:

- Copenhagen, Denmark - The city of Copenhagen's smart lighting solution has dramatically reduced energy costs by approximately 60%.
- Bristol, UK - In Bristol, the local government has replaced the cities original street lights with a new system. This has resulted in cost savings of over £1 million per year.

IOT Solutions help Smart Cities in the Future

The future of our cities is interconnected with the future of IoT. As city governments begin to unlock the full potential of urban data platforms, AI, smart devices, and interconnectivity, the need for IoT will grow exponentially. This will lead to efficient problem solving, smart mobility, sustainability, and more. One of the most exciting ways that IoT can benefit future cities is by reducing the need for private vehicles. With the advent of driverless cars upon us, it won't be long until efficient public transport can be made accessible to everyone, powered by IoT technology. The cars and buses of the future will be able to operate using data transmitted by street furniture or streetlights, delivering an efficient and seamless traffic flow. Though far less glamourous, the future of waste management is another way that IoT can improve our cities of tomorrow. Right now, waste collection and disposal are two of the biggest obstacles that cities have. Smart waste management solutions include route planning tools and real-time bin capacity levels that can reduce collection volumes and inform citizens on better ways to dispose of their waste. These are just two of the manyways that IoT will improve the quality of life for citizens of future smart cities.

Internet of Things for Smart Cities: Conclusion

IoT has unlimited potential. With large-scale implementation, thoughtful deployment, and careful management, IoT, urban data platforms, big data, and artificial intelligence can transform our urban hubs into smart, sustainable, and efficient spaces. The secret to the success of all sectors, from healthcare to manufacturing, and from transportation to education, is through the shared use of information. By gathering data and actuating practical solutions, our next-generation smart cities will be smarter than ever before.

Mrs. S. NITHYA,
Assistant Professor/EEE

Certain Investigations on Solar Energy Conversion System in Smart Grid

Abstract: Today the world facing the huge gap between generation and demand of electrical energy, after the huge oil crises the Renewable Energy power generation helps to fulfil the energy gap. There are different Renewable Energy resources are available in nature, form that Solar energysource plays a vital role in electrical power generation. In India huge MW of Solar parks has been installed with better efficiency but those plants are facing some power quality issues when connected to the load due to some technical reasons like equipment failure, overheating of electrical distribution system, software corruption, circuit board failure, fluctuation on voltage and frequencyetc. The Power quality is important characteristics of Renewable Energy system because now a daythe connected loads are non-linear like oscillation in frequency, voltage and harmonics due to the met and also more sensitive. The Smart Grid connection also have same problem due to various source connected to the grid such as Solar, Wind, Thermal, Nuclear etc. This article provide solutionto overcome this problem by introducing soft computing based MPPT control system, filter control system and also for three phase system. Soft computing system will provide quick and cost-effective solution for various complex problems.

INTRODUCTION

Nowadays the role of Renewable Energy is increase in the generation of electrical energy to fulfil the breach among electrical energy supply and demand. It will be the alternative resource for the fossil fuel and also called as non-conventional energy sources. The solar energy is naturally available and inexhaustible resource which is green energy because it will not emit greenhouse gases. The solar photovoltaic contains various fabrication methods which converts sunlight to electrical energy is said to be as photovoltaic effect. It will generate DC electrical power so the huge MW solar power plants are connected to the smart grid for the inverting operation. The grid connected solar PV is converts DC from PV module to AC and distribute to the consumer. Once the PV system is connected to the Grid after satisfying the consumers demand it can send the extra electrical energy to the grid. In the smart grid connection there will be fluctuation in voltage, frequency and harmonics due to the constantly changes in solar irradiation and also other sources. The grid connected PV contains Solar modules, MPPT with converter and inverter, filter and distribution line. In this system power quality is important phenomenon to show the efficiency and operating condition of grid connected PV system. The Power Quality refer that the electrical system to be work in effective and efficient manner. The important key point of the power quality is frequency, voltage, voltage flicker and current harmonics. This power quality will be affected by various sources connected in the grid like solar, wind, hydro, thermal, nuclear etc. Mostly the power quality is concern in fluctuation in frequency and voltage which happens due to inconsistent behaviour of Renewable Energy due to the habitually varying weather characteristics. The MPPT (Maximum Power Point Tracker) and grid synchronization contains same controlling algorithm. In this article soft computing technology is used to control the MPPT and filter. There are many problems while integrating solar energy conversion system to the distribution network which disturb the operation of Solar PV system. At the point of interconnection connected nonlinear loadand switching of power converter will inject current harmonics to the system. The distribution lossescan be reduced by eliminating harmonics, grid current balancing, and unity power factor operation.

The harmonics can be eliminated by using filter controlling technique. The both MPPT and Filter controlling are performed by using soft computing methodology. Soft computing is the process of group computing technology based on the human decision and natural selection which create quick and cost-effective solution to various complex problems. The MPPT is to make sure that the PV panel operating at maximum power at all circumstances. Due to the constantly meteorological change the solar photovoltaic output gets vary and it will not produce maximum power at all the time, so the MPPT will buck and boost the power and generate constant maximum power at all circumstance. A group of PV panel integrated to the grid There are various MPPT algorithms are available for power control strategy, among that based on P&O algorithm method introduced in this article, it provides best performance between accuracy and complexity.

Working of MPPT

The MPPT with the charge controller has be proposed to achieve maximum power from Solar PV panel during all circumstance. There are two different category of MPPT techniques are available which is direct and indirect technique. The indirect technique contains open circuit voltage, short circuit current and fixed voltage method. This type of tracking easily measure the periodicestimation of MPPT like the operating voltage is adjusted by using only fixed voltage method duringdifferent metrological changes to get high MPP voltage in winter and low MPP voltage in summer.Due to the seasonal changes like irradiation and temperature, it will not provide accurate performance at all the time. The open circuit voltage method is most commonly used indirect MPPT system. In this systemwhere, k refers constant and the crystal silicon value is varied from normally0.7-0.8, this method is very easy and simplest process to implement while comparing to another method . In this method every time system needs to predict new open circuit voltage V_{out} during thechanges on radiation. For this process the load must be disconnected from the PV module each timewhich leads to power losses in the system so the direct MPPT technique is preferred. The direct technique works as faster than the indirect method and it measure current voltage or power with more accurate value. There are various direct MPPT methods are available, from that perturb and Observe (P &O) process is carried to make some modification.

P&O Algorithm

The P&O algorithm is used in MPP tracking system with small perturbation is presented to make power deviation in the solar PV module. In this method, it measures output power of PV system periodically and compare with previous output power. In case, output power is more than previous power the same process is followed otherwise the perturbation will retreated. This perturbation algorithm provided for module voltage, it will check the power increased or decreased with respect to increases or decreases of module voltage. When the voltage increase, makes the power increases which implies the operating point of solar module system on left of MPP. So, the perturbation is needed to change the direction of right to reach the MPP. Contrariwise arises in voltage make to drop the power which means operating point of the solar module system on the right of MPP therefore perturbation is necessary to make left to reach MPP. Normally the MPPT is coupled between the battery and the PV module and measure individual voltage level. It governs the battery stays fully charged or not, where it is fully charged then it will stop the charging to avoid the battery from over charging and damage. If it is not fully charged, it activates DC/DC converter to start charging the battery. From the measurement of output current and voltage, microcontroller calculates the present power P_{new} and compares it with preceding measured power P_{old}. If the output power $P_{new}>P_{old}$, the duty cycle of PWM improve to remove extreme power from the PV system.

Then the output power $P_{new}<P_{old}$, the PWM duty cycle is reduced to make sure the system to go back to the earlier maximum power. The proposed method of MPPT is simple, low cost and easier to implement through better accuracy.

VSB Control

The above-mentioned P&O algorithm, force solar PV module to work under maximum power point in all circumstances. The next stage is DC power is converted into AC power with the help of the Voltage Source Converter (VSC). This VSC method is operated by using AKKF (Anova Kernel Kalman Filter) which makes harmonic reduction during the combination of Solar PV with grid connection. Main focuses of this technique is power quality enhancement, power management DC to AC power conversion and maintain synchronisation to grid. The AKKF is based on affine projection family which is quickly recognized the function of essential from the input signal. It will reduce the logic complexity, algorithm delay and computational burden by the hybridization of kalman filter and kernel trick. This controlling approach confirmed on two stage 1Φ grid tied PV system when load and batteries are connected in Point of Common Coupling (PCC) and DC link respectively. The performance of transient condition is improved by connecting the battery directly to the DC link and also it will fix voltage level in DC link. This DC link will control the battery charging current and voltage regulation during the fluctuation of voltage in the system so there is no need of extra sensor for battery charge controller. The objective of this process is Fundamental Component (FC) drawing out from grid voltage as well as load current. In this method the AKKF will filter out the harmonics components present in the system and DC offset. It will perfectly attenuate the higher and lower order harmonics present in the signal and maintain 50Hz frequency range. In this method the amplitude and the unit vector are calculated and the AKKF is aimed to filtering the voltage in grid connection which results are quadrature and in phase component of FC. To estimating Fundamental Component of load current, which may be linear or nonlinear, in nonlinear condition there will be a huge harmonic component present in the system. Hence the AKKF extract active component of the load power and also fundamental frequency. To estimate active load power, moving average filter method. In this E_f is use to amplify A_i and amplified signal is delivered through integrator and also determine the value of certain duration. Here the N_s is delay duration and f_s is sampling frequency then $N_s = f_s/E_f$. While improving transient performance of controlling technique dynamic reflection parameter of PV power is used, that will immediately reflect on changes in Solar PV power and the grid current.

PERFORMANCE OF POWER QUALITY UNDER DIFFERENT CONDITIONS

Under nonlinear load the PV power is greater than the load power so after satisfying the demand of the load, the remaining power is transferred to grid and as per the IEEE-519 standard, the THD of current must be lesser than 5%. By using this filtering method, the current and voltage harmonics has been reduced and also it obtains voltage THD as 1.3% and current THD as 1.5% under normal grid voltage. Solar irradiation experiment, there are two different situations taken under the consideration of sudden changes in irradiation. If the insolation suddenly varies from 700W/m^2 to 1000W/m^2 and another one is 1000W/m^2 to 700W/m^2, under both the situation the MPPT and AKKF controller are performing with tracking efficiency of nearly 100%. In this MPPT algorithmit takes 0.8seconds to tracking the new Maximum Power Point (MPP) in the rising of solar insolation condition and it takes 0.75seconds to track new MPP under falling of solar insolation.

CONCLUSION

The investigation on power quality in solar energy conversion system has been carried with different controlling topologies for MPPT control and filter control to improving the Power qualityof entire system under all circumstance. The P&O controlling algorithm is used in MPPT for bettertracking and to obtain Maximum power under various meteorological changes. While comparing to other algorithm P&O algorithm is easier and simple to implementation with low cost. The MPPTtracker takes 0.8 seconds under rising solar irradiation and 0.72 seconds under falling solar irradiation. The total harmonic distortion is the important phenomenon in Solar PV integrated to Grid connection, in this AKKF filtering technique the voltage and current THD is maintained under5% as per IEEE - 519 norms and also the tracking efficiency of the system is maintained nearly 100%. This type of technique provides fast and swinging free performance at all circumstance which will improve the efficiency of system.

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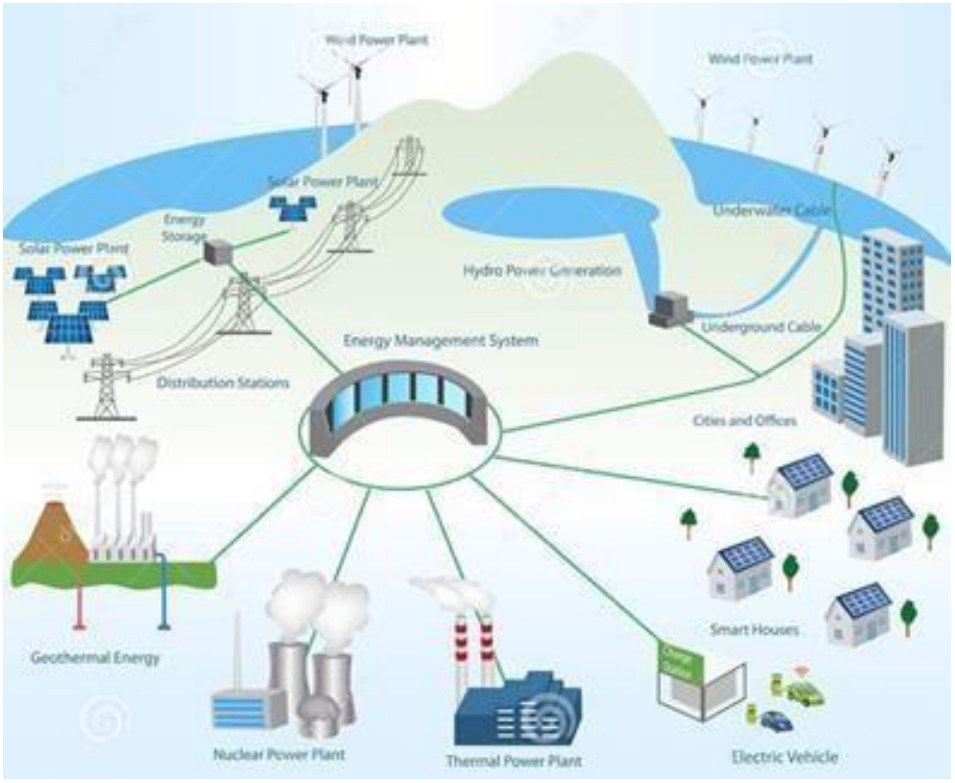
Smart Grid Technology in India

By 2040, India will be responsible for 25% of the increase in global energy demand and the country is focusing strongly on renewable energy generation and modernizing power grids.



Ushering in the grids of the future

Currently, India is the third largest producer and consumer of electricity worldwide, with an installed power capacity of 404.13 GW as of July 31, 2022. To face this evolving context, numerous projects have been launched at a local and national level to develop the grids, with greater openness to privatization and taking advantage of technological innovation. One of the first goals of this strategy is to replace residential and industrial customers' traditional meters with smart meters, a crucial component for creating digitalized, efficient, and flexible grids. The National Smart Metering Program's goal aims to replace 250 million conventional meters with smart meters. And the results are beginning to come: according to the agency's statistics, as of September 30, 2022, India had passed the 5 million smart meter milestone. As of July 31, 2022, India's installed renewable energy capacity (including hydro) stood at 161.29 GW, representing 39.91% of the overall installed power capacity. Solar energy is estimated to contribute for 57.97 GW. According to the International Energy Agency (IEA), by 2030 variable renewable sources will provide about 25% of India's total electricity generation, and this will require advanced technologies and resilient power grids. In addition, current Indian power grid infrastructure is dealing with high Aggregate Technical and Commercial (AT&C) losses, drastically cutting utilities finances, and limiting their ability to invest in critical infrastructure. As the growth of renewables is also linked to the health of Distribution Companies, the reduction of DISCOMs' technical and commercial losses through appropriate billing and collection will be critical.

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A challenge to take up

India is an ideal entry point for businesses offering advanced technologies in the smart grid sector, such as Gridspertise, the company founded by the Enel Group in 2021 to offer cutting-edge solutions in the field of electricity grid digitalization to all DISCOMs. Gridspertise leverages Enel Groups' legacy in operating distribution networks and extended experience in the installation of smart meters around the world. Gridspertise today is headquartered in Italy, with local offices in Spain, Brasil, the US and India, and delivers its technologies based on a significant intellectual property portfolio of field-proven solutions to dozens of Distribution Companies (DISCOMs) of different sizes and geographies.

Revenue Protection

Gridspertise offers innovative Meter-as-a-service solutions to partner with DISCOMs in India by a highly evolved Advanced Metering Infrastructure (AMI) system, using an ecosystem of networked meters, communication networks, data collection and management systems. AMI application uses consumer data to provide cost-saving opportunities for the utility. The solution reduces non-technical losses by recognizing consumption patterns, event sequences, and energy diversion. Meter Data Management System (MDMS) provides billing ready data, for every read, from every meter, every day. This ensures accurate billing on and off cycle each-and-every day. Gridspertise's portfolio of interoperable smart metering devices integrates the most advanced technologies available today and they are packed with multiple functionalities: bidirectional communication, management of personalized tariffs, safety measures in case of power surges and fraud oversight. In detail, Gridspertise's smart meters enable DISCOMs to use higher-performance and more resilient metering and control systems, optimizing remote operations and providing highly granular metering data; and Energy Balance functionality, which allows the DISCOMs to assess grid losses, including fraud cases and direct connections to the grid. Also the smart meterscan detect fraud attempts and report them to the central system; enable energy metering basedon increasingly complex and customized tariff structures, enable advanced energy and ancillary services in distributed generation, electric mobility, and flexibility and enable pre- payment management, or energy supply based on a pre-payment approach (energy supplied reducesenergy credits available to customers).

Power Reliability Improvement

To support DISCOMs in facing power reliability improvement, Gridspertise is promoting its QEd Quantum Edge® device, a revolutionary solution. Its high Edge computing capability and multi-purposes applications makes virtualizing several physical devices in a single platform and taking the most from all the data gathered at substation. Moreover, leveraging on real-time sampling of electrical parameters and advanced communication capabilities, QEd can be equipped with our Grid Advance Management application (GAM), helping DISCOMs to execute several self-healing schemes while avoiding modifying their own Supervisory Control and Data Acquisition (SCADA) systems. This Edge-based approach is crucial for a sustainable smart grids deployment, especially in rising economy countries where rural areas supplying and legacy central systems might likely be the weak spots to face the main challenges of the next few years.

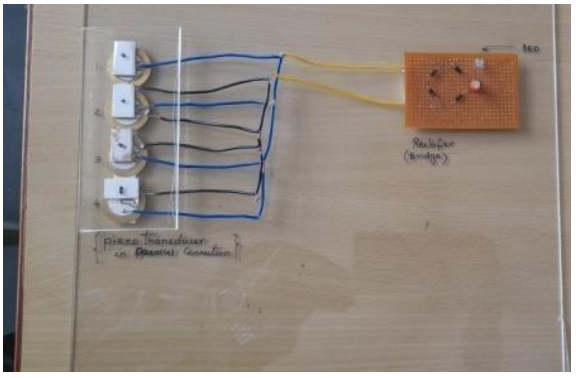
Dr.N.AMUTHA PRIYA,
Assistant Professor-EEE

FEEDERS 2023

Performance Analysis of Piezoelectric Energy Harvesting System Employing Bridgeless Power Factor Correction Boost Rectifier

Abstract:

Nowadays piezoelectric generators play an important role in self-powered systems for charging many low powered wireless and portable electronic components thus not limited by finite battery energy. This paper describes the reliable modeling of piezoelectric transducer driven by mechanical input and a power conversion circuit to harvest maximum energy. Lead Zirconate Titanium (PZT) based transducer driven by certain mechanical stress and Zero Current Switching (ZCS) Power Factor Correction Bridgeless Boost (BLB) Rectifier for rectification purpose both combined together forms an efficient energy harvesting system. PZT cantilevered based generator with tip mass of 1g/m2 is modeled to capture ambient vibration energy and convert into usable energy to create self- powering system. Piezoelectric generator is driven by mechanical vibration which causes stress in the transducer in turn generates electric energy. In addition to piezoelectric generator power factor correction BLB rectifier is used as efficient converter for rectification purpose. In this work BLB converter it reduces switching stress as well as switching losses. Furthermore, switches used in the current path are also reduced when compared to existing system Separate control strategy is used to improve power factor. A detailed analysis of piezoelectric generator employing BLB power factor correction converter topology along with control strategy is presented. The performance of energy harvesting system and output of PFC bridgeless boost rectifier are obtained by using MATLAB software package and its results are validated.



Piezoelectric power generation model

Application:

When number of transducers are connected together obviously its output power increases. Voltage increases when connected in series and when connected in parallel its current increases voltage remains constant. As transducer count increases its generated power output also increase. It glows LEDs which operates at 0.2710 W, when 100 no's transducers are connected in parallel. This can be used for powering traffic LED lightings, etc.

Mr.S.SANJU,
Assistant Professor/EEE

FEEDERS 2023

STUDENT ACHIEVEMENTS

S.No.	Year	Name	Event	Date
1.	III EEE	Mathan B	II Prize - Project Expo National Level Symposium @ Kongu Engineering College, Erode	30.03.22
2.	III EEE	Arul Raj T	II Prize - Project Expo National Level Symposium @ Kongu Engineering College, Erode	30.03.22
3.	III EEE	Gokul Krishna H V	II Prize - Project Expo National Level Symposium @ Kongu Engineering College, Erode	30.03.22
4.	III EEE	Roshan B	II Prize – Quiz National Level Symposium @ PSN Institute of Technology and Science	30.03.22
5.	III EEE	Ganesh Raja S K	II Prize – Quiz National Level Symposium @ PSN Institute of Technology and Science	30.03.22
6.	II EEE	Abdul Rahman N	II Prize – Dumb Charades National Level Symposium @ PSN Institute of Technology and Science	30.03.22
7.	II EEE	Goutham Krishna G	II Prize – Dumb Charades National Level Symposium @ PSN Institute of Technology and Science	30.03.22
8.	II EEE	Nidish Ram M P	II Prize – Dumb Charades National Level Symposium @ PSN Institute of Technology and Science	30.03.22
9.	II EEE	Sathis R K	II Prize – Dumb Charades National Level Symposium @ PSN Institute of Technology and Science	30.03.22
10	III EEE	P.Ajitha	II Prize - Circuit Debugging National Level Symposium @ PET Engineering college	28.09.22
11	III EEE	P.Ajitha	I Prize – Quiz Competition National Level Symposium @ St.Xavier's Catholic College of Engg	27.05.22
12	III EEE	S. Thomas Athisaya	I Prize – Quiz Competition National Level Symposium @ St.Xavier's Catholic College of Engg	27.05.22
13	III EEE	K.Sathiya Sivan	II Prize – Circuit Debugging National Level Symposium @ Loyola Institute of Tech & Science	01.06.22
14	II EEE	N.Abdul Rahman	II Prize - Paper presentation National Level Symposium @ Stella Mary's Engg College	13.04.22
15	II EEE	A.S.Abdul Raziq Ali	II Prize - Paper presentation National Level Symposium @ Stella Mary's Engg College	13.04.22

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16	II EEE	A.S.Abdul Raziq Ali	Cash award & II Prize – Mind Tentacles National Level Symposium @ Ponjesly College of Engg	23.04.22
17	II EEE	N.Abdul Rahman	Cash award & II Prize – Mind Tentacles National Level Symposium @ Ponjesly College of Engg	23.04.22
18	III EEE	P.Ajitha	I Prize - Quiz English Day Intercollegiate Copetition Einstein College of Engineering	23.04.22
19	III EEE	M.Amirtha Jerusha	I Prize - Quiz English Day Intercollegiate Copetition Einstein College of Engineering	23.04.22
20	III EEE	E.Evangalin	II Prize - Quiz English Day Intercollegiate Copetition Einstein College of Engineering	23.04.22
21	III EEE	S.Thomas Athisaya	II Prize - Quiz English Day Intercollegiate Copetition Einstein College of Engineering	23.04.22
22	III EEE	M.Amirtha Jerusha	II Prize – Essay Writing English Day Intercollegiate Copetition Einstein College of Engineering	23.04.22
23	II EEE	A.S.Abdul Raziq Ali	Paper presentation National Level Symposium @ Loyola Institute of Tech & Science	27.04.22
24	III EEE	K.R.Jenisha	Got ELITE + SILVER Award in NPTEL Course 'Cloud Computing'	Jan-Apr 2022
25	II EEE	N.Abdul Rahman	Got 56% in NPTEL Course 'Electric Vehicles – Part I'	Feb-Apr 2022
26	III EEE	B.Roshan	I Prize – Connections Event National Level Technical Symposium @ DMI Engineering College	18.05.22
27	III EEE	B.Roshan	II Prize – Technical Quiz National Level Technical Symposium @ DMI Engineering College	18.05.22
28	IV EEE	D.Kanirajan	I Prize – Connections Event National Level Technical Symposium @ Stella Mary's College of Engineering	18.05.22
29	IV EEE	D.Kanirajan	II Prize – Mind Genic National Level Technical Symposium @ Stella Mary's College of Engineering	18.05.22
30	IV EEE	Antony Paul	I Prize – Connections Event National Level Technical Symposium @ Stella Mary's College of Engineering	18.05.22
31	IV EEE	Antony Paul	II Prize – Mind Genic National Level Technical Symposium @ Stella Mary's College of Engineering	18.05.22
32	III EEE	S.Thomas Athisaya	I Prize – Quiz National Level Symposium @ St. Xavier's Catholic College of Engineering	27.05.22

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33	III EEE	P.Ajitha	I Prize – Quiz National Level Symposium @ St. Xavier's Catholic College of Engineering	27.05.22
34	III EEE	A.Anto Beniston	I Prize – Circuit Debugging National Level Symposium @ St. Xavier's Catholic College of Engineering	27.05.22
35	III EEE	B.Deniffa	II Prize – Circuit Debugging National Level Symposium @ St. Xavier's Catholic College of Engineering	27.05.22
36	III EEE	Abinesh A	I Prize – Treasure Hunt National Level Symposium @ Amrita College of Engineering	27.05.22
37	III EEE	Berjin	I Prize – Treasure Hunt National Level Symposium @ Amrita College of Engineering	27.05.22
38	III EEE	Femil Raj	I Prize – Treasure Hunt National Level Symposium @ Amrita College of Engineering	27.05.22
39	III EEE	Abhijith	I Prize – Treasure Hunt National Level Symposium @ Amrita College of Engineering	27.05.22
40	IV EEE	Sree Shankar	I Prize – Treasure Hunt National Level Symposium @ Amrita College of Engineering	27.05.22
41	IV EEE	S.J.Muthukumaran	Zonal Runner / Cricket Zone 19, Anna University, Chennai	Dec 2022
42	IV EEE	S.J.Muthukumaran	State Level Runner / Cricket VIT, Vellore	Feb 2023
43	IV EEE	S.J.Muthukumaran	CM Trophy Runner / Cricket District Level, Scott Christian College	Feb 2023
44	III EEE	N.Abdul Rahman	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
45	III EEE	K.Gokul Ram	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
46	III EEE	J.Hamjin	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
47	III EEE	Y.Hercin	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
48	III EEE	J.Liwin Paul	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
49	III EEE	S.Ruban	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23

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50	III EEE	M.I.Shameem Ahamed	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
51	III EEE	P.Vishwa	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
52	III EEE	M.P.Nidish Ram	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
53	II EEE	S.I.Mohammed Ismail	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
54	II EEE	R.Rakhshana	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
55	II EEE	L.Sri Devi	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23
56	II EEE	R.Vinish	Internship @ Koodankulam Nuclear Power Plant	13.02.23 to 28.02.23

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FACULTY ACHIEVEMENTS

S.No.	Name	Patent/Journal/ Conference/FDP	Details
1.	S.Gopa Kumar	Patent	Passivated Emitter Based Solar Cells for Increasing the Efficacy of Solar Energy Absorption
2.	S.Gopa Kumar	Journal DOI: 10.14704/ NQ.2022.20.10.NQ55480	Deep Learning-Based Intrusion Detection in Vehicular Ad Hoc Networks
3.	S.Gopa Kumar	Journal of The Electrochemical Society	Contemporary Progresses in Carbon-Based Electrode Material in Li-S Batteries
4.	S.Gopa Kumar	Materials Today: Proceedings journal, Elsevier	A Highly Consistent and Proficient Class of MultiportDC-DC Converter Based Sustainable Energy Sources
5.	S.Gopa Kumar	International Conference on Computing, Circuits, Energy And Materials	Fault Estimation in Power Transformer Using Optimized Neural Network
6.	S.Gopa Kumar	International Conference on Innovations in Thermal, Manufacturing, Structural and Environmental Engineering	Neural Network based predictive control of DC motor position by Newton-Raphson method
7.	S.Gopa Kumar	International Journal of Research Publication and Reviews	Rover based Patient Monitoring System during Pandemic Using IOT
8.	S.Gopa Kumar	Online FDP @ Amar Sewa Mandal's Kamla Nehru Mahavidyalaya, Nagpur, Maharashtra	ICT Tools for Effective Teaching and Learning
9.	S.Gopa Kumar	Online Workshop @ National Institute of Technology Mizoram and Indian Institute of Technology Kharagpur	Artificial Intelligence and High Performance Computing
10.	S.Gopa Kumar	ISTE approved SF-STTP/FDP Programme @ St. Joseph's College of Engineering, Chennai	Opportunities Scope and Challenges in DC Microgrids
11.	N.Amutha Priya	Award International Research Awards on Science, Technology & Mangement – INSO	Best Researcher Award

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12.	N.Amutha Priya	NPTEL Course & FDP	Electric Vehicle – Part I
13.	N.Amutha Priya	NPTEL Course & FDP	Foundation Course in Managerial Economics
14.	N.Amutha Priya	Coursera Certification Course, University of Michigan	People, Technology and the Future of Mobility
15.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Introduction to Battery Management Systems
16.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Modeling and Control of Single-Phase Rectifiers and Inverters
17.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Converter Circuits
18.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Motors and Motor Control Circuits
19.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Equivalent Circuit Cell Model Simulation
20.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Battery State of Charge (SOC) Estimation
21.	N.Amutha Priya	Coursera Certification Course, University of Colorado	Battery State of Health (SOH) Estimation
22.	N.Amutha Priya	Scopus Indexed Journal IOP Conference Series: Earth and Environmental Science	Investigation on the Acoustic Behaviour of Perlite in Concrete
23.	N.Amutha Priya	International Conference on Energy, Smart Structure and Manufacturing	Automation of Residential Appliances based on IoT using Blynk App
24.	N.Amutha Priya	Wokshop MarcelloTech	Applications of Image Processing in MATLAB
25.	N.Amutha Priya	FDTP GCE, Thanjavur	EE8501 – Power System Analysis
26.	N.Amutha Priya	FDTP Amrita College of Engg & Tech, Erachakulam	EE8591 – Digital Signal Processing
27.	N.Amutha Priya	Online FDP @ Amar Sewa Mandal's Kamla Nehru Mahavidyalaya, Nagpur, Maharashtra	ICT Tools for Effective Teaching and Learning
28.	N.Amutha Priya	International Conference on Innovations in Thermal, Manufacturing, Structural	Neural Network based predictive control of DC motor position by Newton-Raphson method

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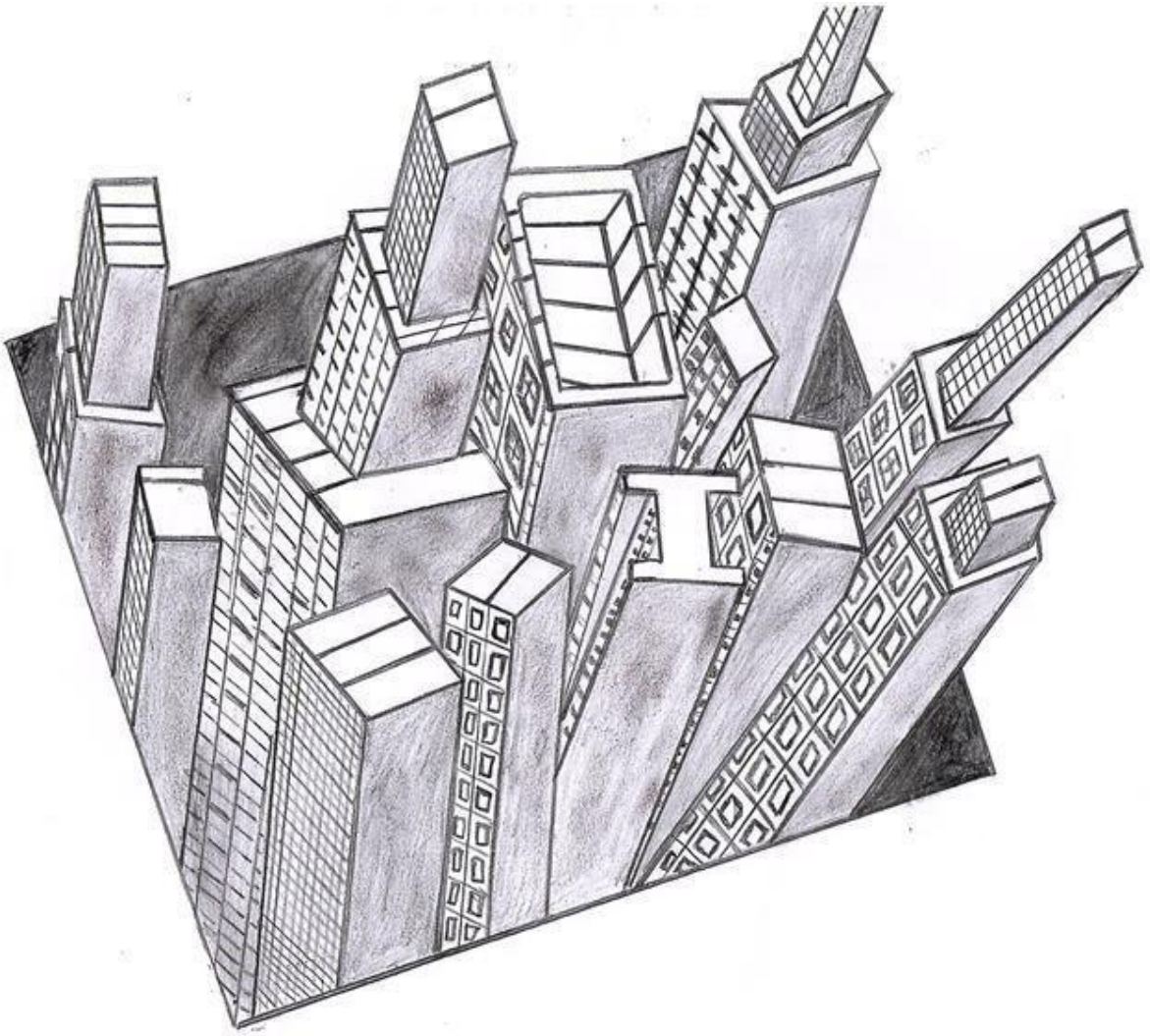
		and Environmental Engineering	
29.	S.Nithya	International Conference on Innovations in Thermal, Manufacturing, Structural and Environmental Engineering	Neural Network based predictive control of DC motor position by Newton-Raphson method
30.	S.Nithya	Online FDP @ Amar Sewa Mandal's Kamla Nehru Mahavidyalaya, Nagpur, Maharashtra	ICT Tools for Effective Teaching and Learning
31.	D.Periyasamy	International Conference on Innovations in Thermal, Manufacturing, Structural and Environmental Engineering	Neural Network based predictive control of DC motor position by Newton-Raphson method
32.	S.Sanju	International Conference on Innovations in Thermal, Manufacturing, Structural and Environmental Engineering	Neural Network based predictive control of DC motor position by Newton-Raphson method
33.	G.Murugan	Online FDP @ Amar Sewa Mandal's Kamla Nehru Mahavidyalaya, Nagpur, Maharashtra	ICT Tools for Effective Teaching and Learning
34.	G.K.Jabash Samuel	FDTP Amrita College of Engg & Tech, Erachakulam	EE8591 – Digital Signal Processing
35.	D.Sam Harison	International Conference on Global Trends in Applied Sciences, Medical and Health Sciences	Power Quality Disturbance

INDUSTRIAL VISIT

S.No.	Year	Industrial Visit
1	II BE EEE	Renewable Energy Centre, Mithradham
2	III BE EEE	KELTRON, Trivandrum

PORTRAITS



R. PRIYADHARSHINI
III BE EEE/RCET

FEEDERS 2023

K. BALA BHARATHI
III BE EEE/RCET

FEEDERS 2023

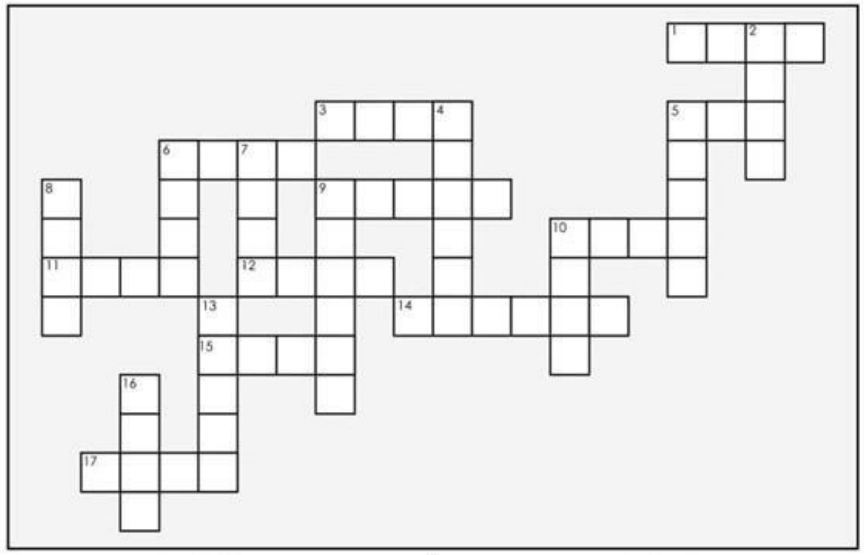
P. MONISHA JASMIN
III BE EEE/RCET

FEEDERS 2023

G.S. ABINAYA SREE
III BE EEE/RCET

R. SOWMIYA
III BE EEE/RCET

PUZZLES



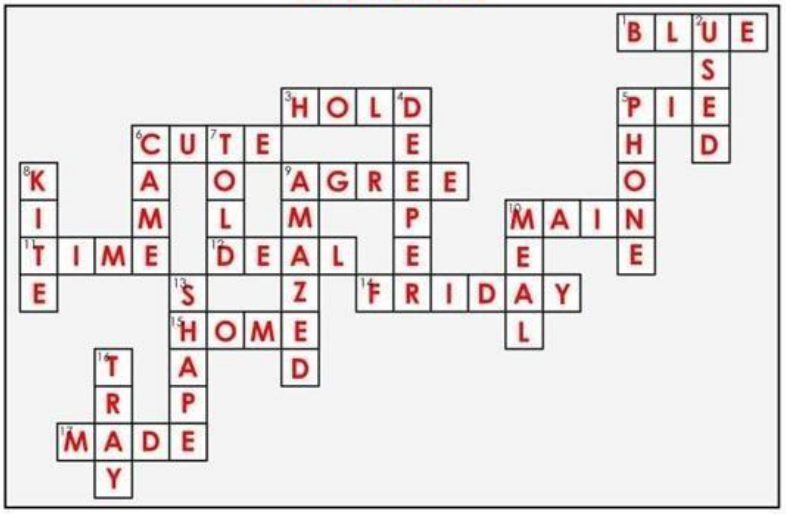
ACROSS

1. color of the sky
3. to put in your hands
5. apple and pumpkin are types of this
6. add an e to the word cut
9. unscramble: egear
10. unscramble: mnia
11. a clock tells you this
12. unscramble: lead
14. day before Saturday
15. where you live
17. She __ her bed.

DOWN

2. antonym for new
4. My pool is __ than yours.
5. use this to call people
6. past tense of come
7. past tense of tell
8. has a tail and flies in the sky
9. surprised
10. breakfast is one of these
13. a triangle is this
16. put your lunch on this

ANSWER KEY



M. EVAN FELIX
III BE EEE/RCET

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SUDOKU GAME

	3			8				1
		7	4		1		5	
9				5		2		
		2			5		1	
3			2	1		5		
5	9			6				2
		6	5		2			
		9	6				2	7
					8		6	5

ANSWER

2	3	5	9	8	6	7	4	1
6	8	7	4	2	1	9	5	3
9	1	4	3	5	7	2	8	6
4	7	2	8	3	5	6	1	9
3	6	8	2	1	9	5	7	4
5	9	1	7	6	4	8	3	2
1	4	6	5	7	2	3	9	8
8	5	9	6	4	3	1	2	7
7	2	3	1	9	8	4	6	5

P. GODWIN
III BE EEE/RCET

RIDDLES

1. What has to be broken before you can use it?
Answer: An egg

2. I'm tall when I'm young, and I'm short when I'm old. What am I?
Answer: A candle

3. What month of the year has 28 days?
Answer: All of them

4. What is full of holes but still holds water?
Answer: A sponge

5. What is always in front of you but can't be seen?
Answer: The future

6. What can you break, even if you never pick it up or touch it?
Answer: A promise

7. What gets wet while drying?
Answer: A towel

8. What can you keep after giving to someone?
Answer: Your word

9. I shave every day, but my beard stays the same. What am I?
Answer: A barber

10. I have branches, but no fruit, trunk or leaves. What am I?
Answer: A bank

M.MOHAMMED FAHMI
III BE EEE/RCET

POEMS

Electricity's Bright Fury

Electricity, a power so bright
A force that brings the world to light
From currents that flow through the air
To wires that hum with energy there

Electric sparks that dance and sing
As electrons fly on their wings
A Surge of power that brings to life
The machines that ease our strife

In homes and cities, we rely
On electrical power to survive
To light our homes and power our needs
And drive the wheels of modernity's steeds

For in this world of electricity
We have the power to set us free
To light our world and power our dreams
And bring to live a brighter scheme.

J. DOMINIK VINISH
II BE EEE/RCET

இயற்கையே....

இயற்கையே....

உன் அழகை பார்த்து வியக்கிறேன்

வானமே.....

உன் உயரத்தை பார்த்து வியக்கிறேன்

கடலே.....

உன் ஆழத்தை பார்த்து வியக்கிறேன்

உலகமே.....

உன் உருவத்தை பார்த்து வியக்கிறேன்

வியக்கிறேன்.....

லா.மெல்பின் ஜோஸ்

L.MELBIN JOSE

III BE EEE/RCET

FRIEND

எட்டி பிடித்தால் நிலவை அடைய

முடியுமோ என்னவோ தெரியவில்லை

ஆனால் ஏழு கடல் தாண்டி

தேடினாலும் உன்னை போன்ற

நண்பனை அடைய முடியாது

என் நண்பனே!!!!

N.KARTHIKEYAN

III BE EEE/RCET

நின்னை சரணடைந்தேன், கண்ணம்மா
நின்னை சரணடைந்தேன்
பொன்னை, உயர்வை, புகழை விரும்பிடும்
என்னை கவலைகள் தின்ன தகாதென..

நின்னை சரணடைந்தேன், கண்ணம்மா
நின்னை சரணடைந்தேன்
மிடிமையும் அச்சமும் மேவி என் நெஞ்சில்
குடிமை புகுந்தன, கொன்று அவை போக்கின

தன்செய லெண்ணித் தவிப்பது தீர்ந்திங்கு
நின்செயல் செய்து நிறைவு பெறும்வண்ணம்
நின்னை சரணடைந்தேன், கண்ணம்மா
நின்னை சரணடைந்தேன்

நின்னை சரணடைந்தேன், கண்ணம்மா
நின்னை சரணடைந்தேன்
துன்பம் இனி இல்லை, சோர்வில்லை
சோர்வில்லை, தோற்பில்லை
நல்லது தீயது நாமறியோம்
நாமறியோம் நாமறியோம்
அன்பு நெறியில் அறங்கள் வளர்த்திட
நல்லது நாட்டுக! தீமையை ஓட்டுக

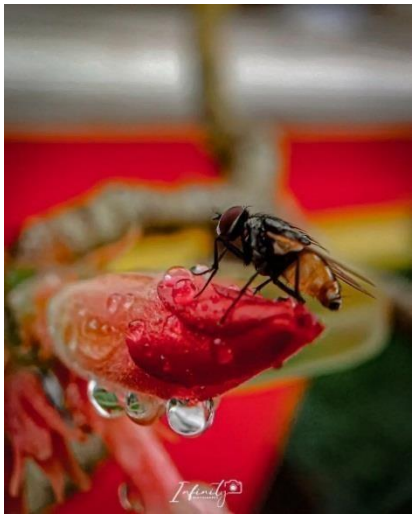
நின்னை சரணடைந்தேன், கண்ணம்மா
நின்னை சரணடைந்தேன்

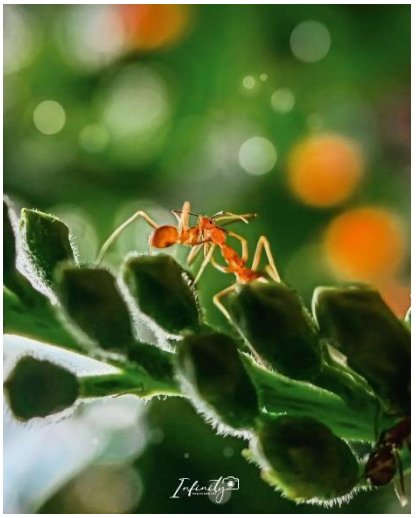
•~சுப்பிரமணிய பாரதி..

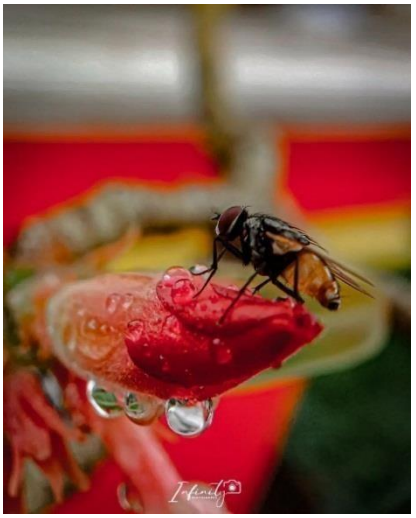
M. EVAN FELIX

III BE EEE/RCET

PHOTOGRAPHY

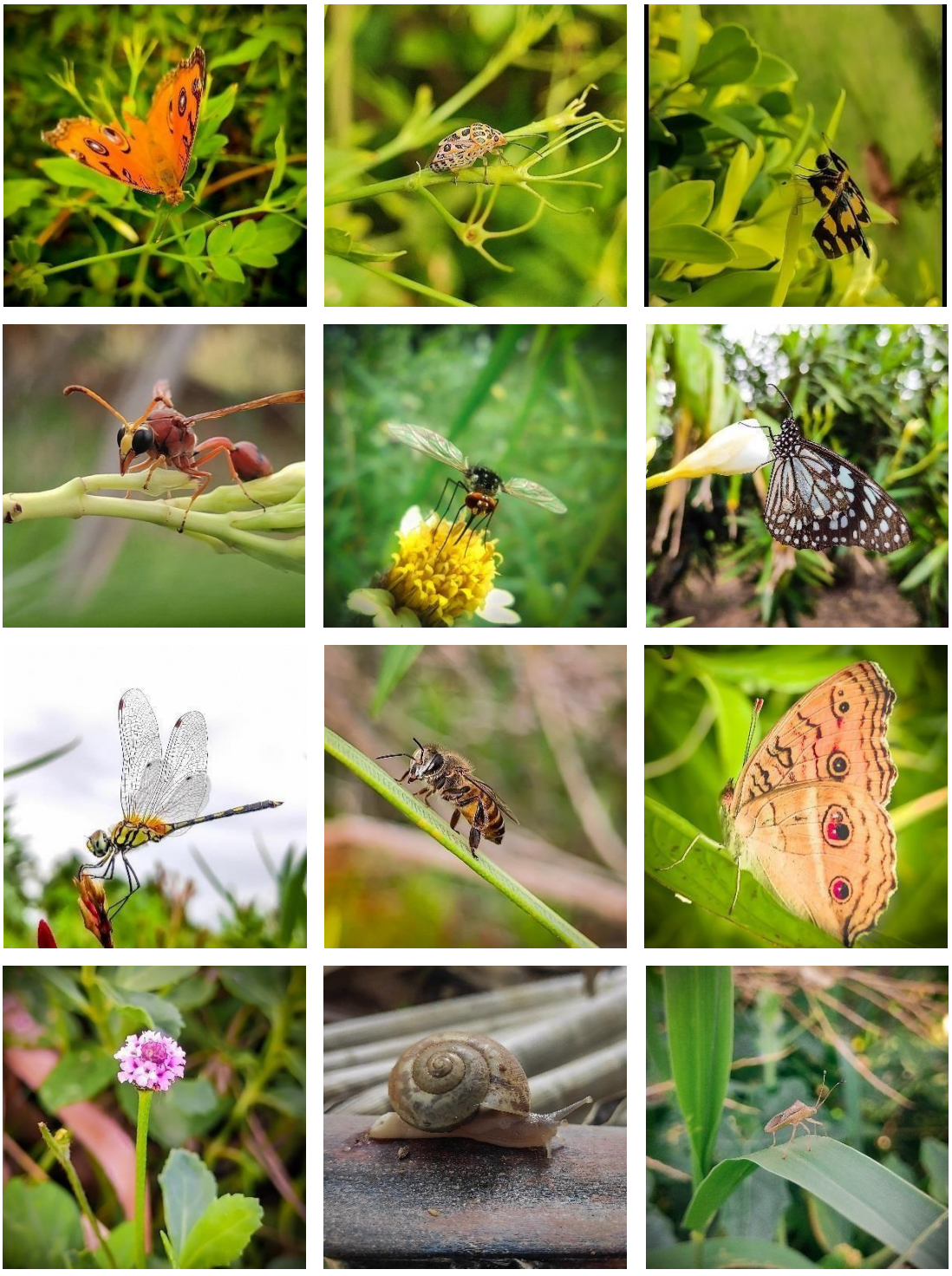




S. KANNAN
IV BE EEE/RCET

FEEDERS 2023



R.RANJITH
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ROHINI
COLLEGE OF ENGINEERING & TECHNOLOGY

ELECTRICAL ENGINEERING IS LIKE PLAYING WITH LEGO BRICKS FOR ADULTS.

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