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ANDHRA LOYOLA INSTITUTE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

(Accredited by NAAC & NBA, Affiliated to JNTU Kakinada)

MESSAGE FROM THE HOD

I am gratified to know that the department of Electrical and Electronics Engineering is bringing the technical magazine of this academic year. This is a productive technical material and subsidiary skill developing tool for the students. I wish this Magaz“EEE”ne a very big success in all their ventures. I also applaud the coordination and efforts made by the editorial team.

Dr. G. Naveen Kumar, Professor

EDITORIAL MESSAGE

It is an occasion of immense pleasure for the Department of Electrical and Electronics Engineering to publish the first volume of magazine for the academic year 2021-22. The Editorial board of department of EEE wants to thanks all the faculty members and students who have made this issue a success by providing an article for the first volume.

This magazine focuses on the recent trends evolved in the field of Electrical and Electronics engineering & wants to provide advanced knowledge and awareness among the students about the same. The Editorial board also wants to thanks the Management of the Institute and Head of the department for inspiring us to go forward in publishing this magazine.

Editors:

Dr. G. Naveen Kumar, Professor

Mrs. V. Anantha Lakshmi

Mr M. Rama Krishna

Student Coordinator:

Mr N Manideep

Ms. G Amulya

Department Vision:

To prepare competent and knowledgeable Electrical and Electronics Engineers by ensuring quality education with skills and character to serve the society.

Department Mission:

M1- To provide quality teaching and services that render students a supportive environment.

M2- Making the effort to mould the students to be the problem-solvers, to be able to apply engineering principles to electrical systems.

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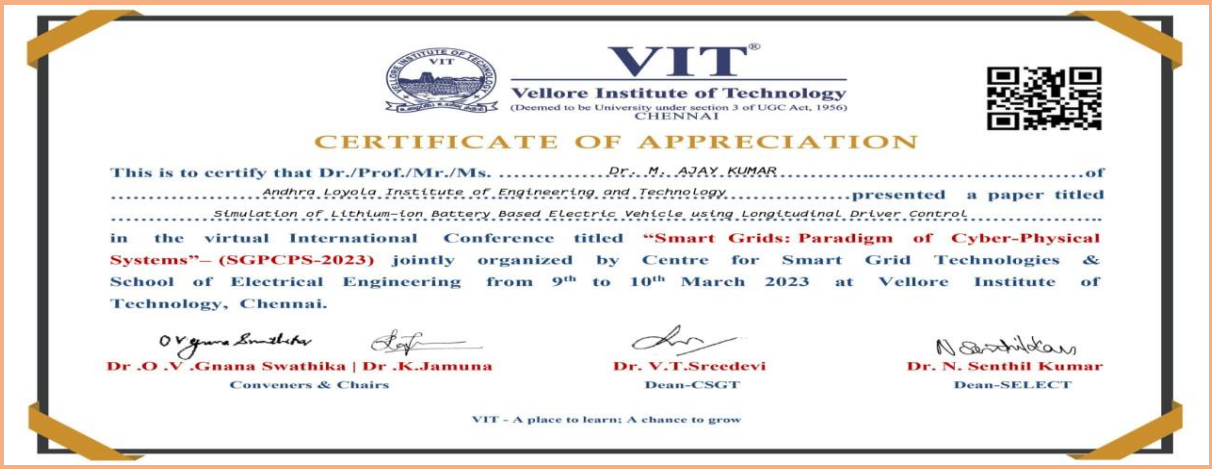
Simulation of Lithium-Ion Battery Based Electric Vehicle with Longitudinal Driver Control

M.Ajay kumar P.S.S.R. Lokesh

Currently, vehicles are primarily used for transportation purposes. Electric vehicles have been common in various countries since the year 2000, and remain a constant topic for the research community because of their importance in the present scenario. In this paper, a systematic modelling equation are described for estimating the ratings of battery in an electric vehicle. Lithium-ion battery is included in the design procedure due to its good performance with respect to the power storage capability. Also, it has high efficiency and high-temperature performance. A longitudinal driver control is used in the design procedure of a speed-tracking controller. This feature allows for tracking and analysis of drivers over time in order to improve performance. According to the reference and estimated speeds, the block generates normalized acceleration and braking commands that fall within a range of 0-1. Initially, a physical modelling has been done in order to improve its efficiency; afterwards, a dynamic- model for an electric vehicle is designed and implemented in MATLAB-simulation software. In order to assess the overall performance of electric vehicles, such as the starting process or running at different speed, the simulation results were observed for different conditions.

KEYWORDS: Lithium -Ion Battery, Longitudinal Driver, Electric vehicle



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CERTIFICATE OF APPRECIATION

This is to certify that Dr./Prof./Mr./Ms. Dr. M. AJAY KUMAR of Andhra Loyola Institute of Engineering and Technology presented a paper titled Simulation of Lithium-Ion Battery Based Electric Vehicle using Longitudinal Driver Control in the virtual International Conference titled "Smart Grids: Paradigm of Cyber-Physical Systems"– (SGPCPS-2023) jointly organized by Centre for Smart Grid Technologies & School of Electrical Engineering from 9th to 10th March 2023 at Vellore Institute of Technology, Chennai.

Dr .O .V .Gnana Swathika | Dr .K.Jamuna — Conveners & Chairs
Dr. V.T.Sreedevi — Dean-CSGT
Dr. N. Senthil Kumar — Dean-SELECT

VIT - A place to learn; A chance to grow

Article by

P.S.S.R. Lokesh

Guided by

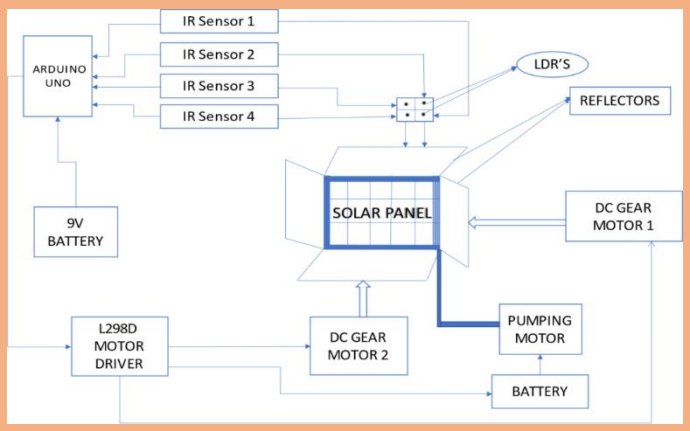
Dr M.Ajay kumar

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Arduino Based Solar Tracking System with Aluminium Foil Reflection and Cooling System for Improvement of Efficiency

P Manoj Venkat, Dr G Naveen Kumar

Dwindling nature of fossil fuels led many countries to search for new and alternative sources of energy. Solar energy is a clean, eco-friendly and abundantly available energy source. The useful forms of solar energy are either heat or electricity. The electricity demand is increasing every day. The conversion of solar energy to electricity through PV module is becoming popular but overprice of cells and lower efficiency hinder its use in developing countries. To reduce high cost per unit electricity, one way is to improve the performance of PV systems. New cost-effective mirror reflecting linear focusing solar concentrator may be a good solution. As mirror boosted radiation intensity over the panel is more, the consequence is increased temperature of the panel. But panel temperature above 25°C reduces the open circuit voltage and decrease efficiency. Thus, proper cooling is needed to improve the panel performance. This work presents the comparison of performance of a mirror reflected solar panel (MRSP) with automatic cooling and tracking. As the mirrors are fixed to the panel the incident radiation will be obstructed by the booster. Thus, a tracking mechanism can be developed to focus the sun light approximately in perpendicular direction. The values of current and voltage can be measured under different conditions of tracking. The output power was calculated and the values were compared for various combinations. From the results it could be depicted that tracking with only reflection and only cooling gives higher power than tracking without reflection or cooling; but while tracking with reflection plus cooling the power increase is much more than any other combination. The average increment of power by using tracking with reflection plus cooling is about 59.71%



Article by

P Manoj Venkat

Guided by

Dr G Naveen Kumar

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Healthcare Monitoring and Management System

S V Ravindra Reddy, Dr G Naveen Kumar

Nowadays Internet of Things is bringing a revolution in the infrastructure of technologies. The IoT-based health monitoring system is essentially a patient monitoring system in which he can be supervised 24*7. Remote Patient Monitoring arrangement enables observation of patients outside of customary clinical settings (e.g. at home), which expands access to human services thus bringing down costs. Healthcare is given extreme importance by each country with the advent of the novel Corona Virus.

Recently there has been a spike in the use of smart phones and along with that, wearable sensor remote health monitoring has evolved quickly. IoT not only helps in preventing the spread of disease but also in getting a proper diagnosis, even if the doctor is present at a remote distance By facilitating effortless interaction among various modules, IoT has enabled us to implement various complex systems such as smart home appliances, smart traffic control systems, etc. We need to monitor the patient parameters from remote distances using various sensors. The data given out by the sensors are then sent over to the cloud for further access via a Wi-Fi module (inbuilt or externally connected). This is to be done to reduce the critical time of testing patient parameters before any major operation.

The main objective of Healthcare Monitoring and Management System is to develop, design, and implement a smart patient healthcare monitoring system. The sensors used here are embedded in the body of the patient to sense the parameters like the heartbeat and temperature. These sensors are connected to a master unit, which calculates all of their values. These values are then transmitted by leveraging IoT cloud technology, to the base. From the base station, these can be easily accessed by the doctor present at some other location. Thus based on the temperature and heartbeat values, the doctor can decide the state of the patient and appropriate measures can be taken.

Keywords:
Health Monitoring, IoT.

Article by
S V Ravindra Reddy
Guided by
Dr G Naveen Kumar

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Ocean Drone

V Naveen, D Ravi Kiran

Ocean Drone is the Combination of a ship and sail. It is powered by Sun and Wind so its a combination of two Renewable energies. Here, we will steer by GPS charged route and it has vertical wing (fin like fish) for navigation and direction. We have to such material which can withstand worst weather conditions and storms in ocean. It can have following parts.

1. **Anemometer:** An anemometer is a device used for measuring the speed of wind, and is also a common weather station instrument. The term is derived from the Greek word anemos, which means wind, and is used to describe any wind speed instrument used in meteorology.
2. **Pyranometer:** A pyranometer is a type of actinometer used for measuring solar irradiance on a planar surface and it is designed to measure the solar radiation flux density (W/m2) from the hemisphere above within a wavelength range 0.3 ?m to 3 ?m.
3. **Hygrometer:** A humidity sensor (or hygrometer) senses, measures and reports both moisture and air temperature. The ratio of moisture in the air to the highest amount of moisture at a particular air temperature is called relative humidity.
4. **Pyrometer:** A pyrometer is a type of remote-sensing thermometer used to measure the temperature of a surface. Various forms of pyrometers have historically existed.
5. **Barometer:** A barometer is a scientific instrument used in meteorology to measure atmospheric pressure. Pressure tendency can forecast short term changes in the weather. Numerous measurements of air pressure are used within surface weather analysis to help find surface troughs, high pressure systems and frontal boundaries.

Keywords:

Drone, Solar, Wind.

Article by

V Naveen

Guided by

Mr D Ravi Kiran

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

V-Gate Magnet Motor

V Uday kiran

V-Gate magnet motor is based on the perpetual motion, which is intended to generate a rotation (***without external energy supply)*** by means of permanent magnets on rotor and electromagnets on stator, which is in Experimental stage.The principle of operation is simple; one magnet pushes the other magnet, placed on a wheel, while accelerating it. This motion will reset a ***V-gate shape*** that causes the acceleration, creating an infinite loop. In V-gate, typically two lanes of magnets are placed in V-shape. One lane has north side upward and other lane have south side upward. When we place an electromagnet with opposite poles on the joint side of gate starts moving towards opening as shown below.

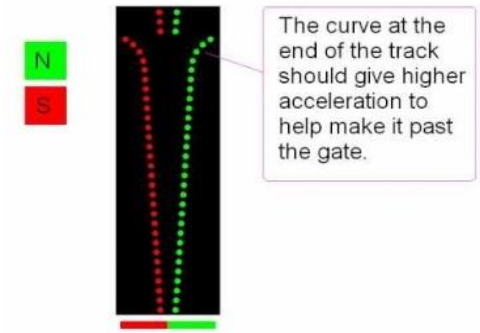

Fig 1 :Straight V-Gate

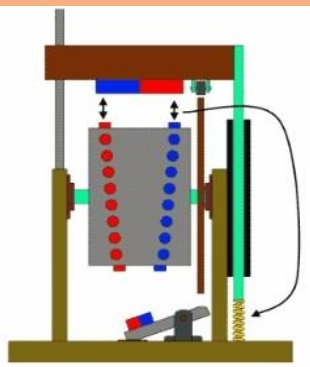

Fig 2 : Cylindrical V-Gate

Salient features:

- ✓ Low cost of operation since there is no cost of fuels.
- ✓ The machine is very light weight.
- ✓ It is eco-friendly in nature.

For more information: *https://www.youtube.com/watch?v=YFu6qNX9C1k*

ARTICLE BY

V Uday kiran

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Smart Phone Controlled Metal Detector Vehicle with GSM And Arduino Interfacing

L.Karunakar T Nagendra

This work is mainly used for finding metal elements. In army for detecting the land mines the soldiers use handled metal detector so that sometimes the land mine was exploded. That way the soldiers are died. For solving this problem, this project is used. This project have advanced alert system that is message alert. This is designed by using Arduino technology. In this project the metal detector is connected to Arduino board, the hole circuit is placed on one robot car. This car is controlled by Bluetooth by using radio technology with Bluetooth module. When the metal detector detects the metal the Arduino send message to mobile by using GSM module. This project obtains only one Arduino board because all three application programs are merged in only one board. Using this project, we can find valuable treasures at under land and covered areas and also detect the land mines at un- manned areas. This project also used for security purposes.

Key Words: Land mine detection; treasure detection; message alert

Article by

T Nagendra

Guided by

Mr L.Karunakar

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Design And Simulation of 100kw Hybrid Grid Connected Solar PV System by Using Matlab/Simulink

L.Karunakar Sk.Mubasher Uddin

This work proposes the Simulation idea of 100kW grid-connected solar PV system by utilizing MATLAB/SIMULINK. Solar array characteristics depend on the sunlight radiation and temperature these are in nonlinear nature its power is shifts consistently with climate evolving conditions. In this condition, MPPT is utilized to track the most extreme power from the solar array. This Performance assessment of this system is talked about and after that control the output current of the inverter utilizing voltage source converter controller.

KEYWORDS: PV array, MPPT Algorithm, boost Converter, Inverter, System Control, Grid-tied.

Article by

Sk.Mubasher Uddin

Guided by

Mr L.Karunakar

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Under Ground Cable Fault Detection by Using Arduino

L.Karunakar, P Pragna

In this work, a way for sleuthing underground cable fault distance locator is done by using microcontroller. The aim of this project is to determine the distance of underground cable fault from base station in kilometres. This project uses the simple concept of ohm's law. When any fault like short circuit occurs, voltage drop will vary depending on the length of fault in cable, since the current varies. A set of resistors are therefore used to represent the cable and a dc voltage is fed at one end and the fault is detected by detecting the change in voltage using a analog to voltage converter and a microcontroller is used to make the necessary calculations so that the fault distance is displayed on the wireless (Mobile) display.

KEYWORDS: Underground Cable, Underground Cable Fault, Arduino, Wireless Fault Detection

Article by

P Pragna

Guided by

Mr L.Karunakar

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Busbar Protection schemes for Substation

P Pragna

The busbar play an important role in power transmission and distribution. These are employed as a central distribution point for all feeders. If there is a fault, current on the busbar becomes high, resulting to mechanical destruction which would affect all feeders. A dedicated busbar protection scheme is required to overcome the problems such as loss of loads and long time to clear the faults.

The different types of Busbar protection schemes are

1. System protection used for busbars
2. Frame-Earth Protection
3. Differential Protection of busbars
4. Reverse blocking/ interlocking protection

1. System protection used for busbars:

It consists of overcurrent or distance protection. It can also be used as back up protection by using time grading where slow protection is required. Time grading ensures that the circuit breaker nearest to the fault always opens first, by choosing an appropriate time setting for each of the relays.

2. Frame to Earth Protection:

There are three types of frame to earth protection

i. Single-busbar frame to earth protection:

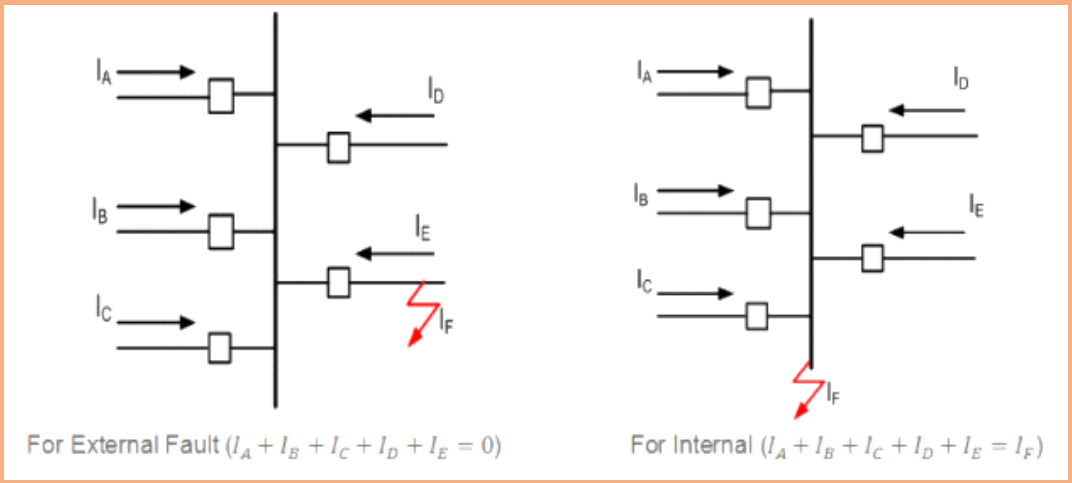
ii. Frame-earth protection

iii. Frame-earth scheme in double bus substation

1. **Differential protection of busbars:**

Differential protection operation directly uses the Kirchhoff's Current Law where it is required that the currents going into a node are equal to current leaving the node.

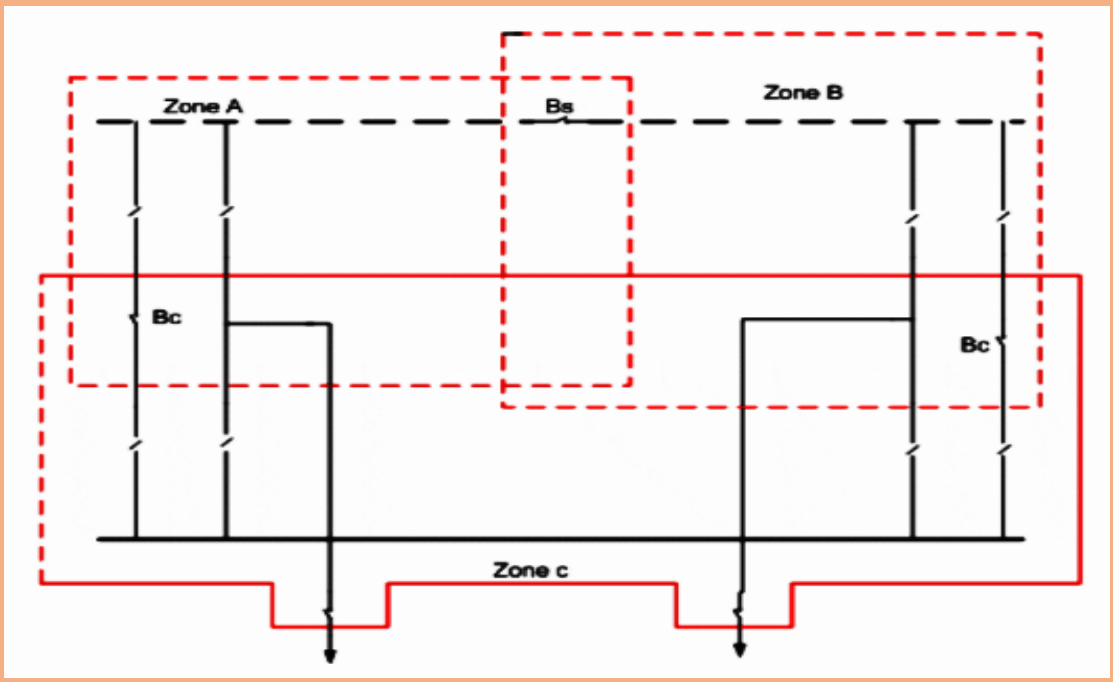
When the sum of the currents is not equal to zero by comparing their magnitude or phase the difference is referred as a fault current.



Differential Protection of Bus-Bar

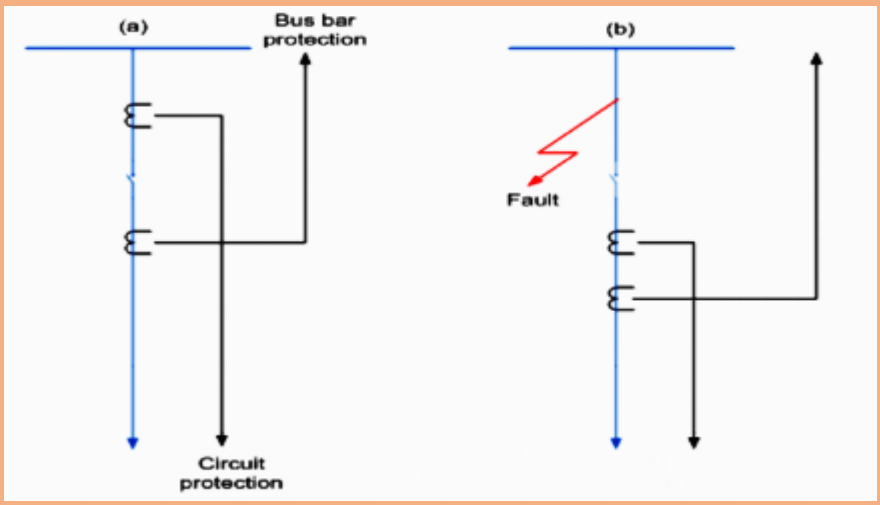
The different types of differential busbar protection are

1. **High Impedance Differential Protection:** It uses the voltage across the differential junction points.
2. **Low Impedance Differential Protection:** It do not require dedicated CTs. It has capability to tolerate substantial CT saturation during external faults. It also provides relatively high tripping speed.
3. **Differential Protection for Sectionalized busbars:** It is required that divided bus utilizes separate circulating current.



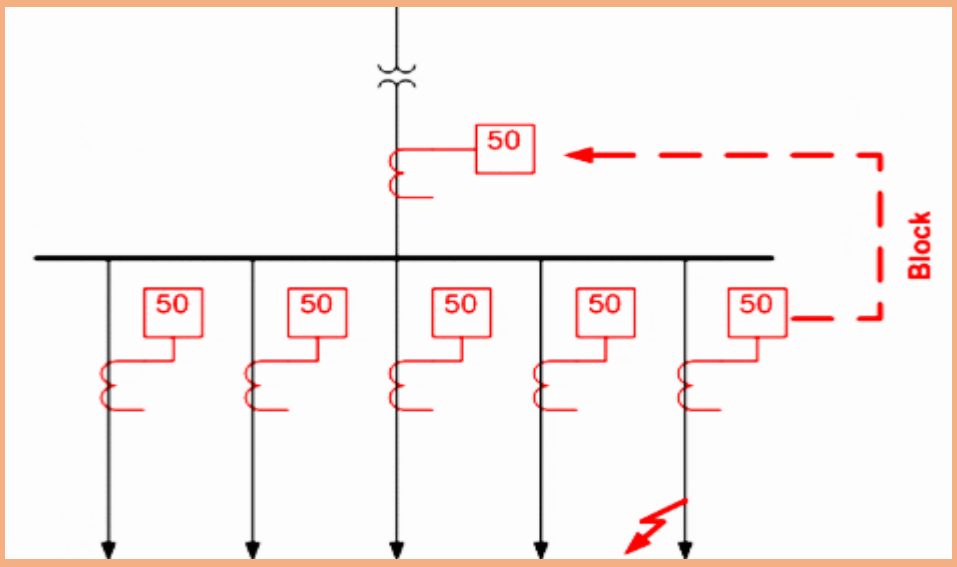
Zones of Protection for sectionalized Busbars

4. **Location of current transformers:** The system is designed in such a manner that where the zones overlap there should be a circuit breaker across to cover both zones. With this system CTs must be installed on both sides of the circuit breaker.



Placing of current transformers before and after Circuit Breakers

4. Reverse blocking/ interlocking protection: In a distribution busbar system, when a fault occurs it was cleared by time delay protection upstream relays. The introduction of numerical technology, a simple protection scheme such as busbar blocking scheme can be applied to protect a distribution system with a single source.



Reverse blocking/ interlocking protection

Article by

P Pragna

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Hardware Implementation of An Axial Flux Motor

Ramesh Kumar Mente, K. Jyothi

The goal for the research is to adopt new technologies that have greater engineering benefits and reduce environmental damage. This project is aimed towards addressing the issue faced with the present type of conventional motors, which is overcome by developing a different design aspect of axial flux motor. Gearless and small motors operating at speeds above 10000 rpm are finding many applications nowadays. The axial flux motor is one of the competitors in electrical motors. Axial flux permanent magnet (AFPM) motors are compact and lightweight compared to radial flux motors and hence, are considered for various high-speed applications. Eliminating the stator core minimizes the associated high-frequency losses, and hence, coreless AFPM motor can be an option for high-speed applications. The Axial flux motors have many advantages over conventional motors but, the most important reason for not using axial flux motors as much as radial flux motors is difficulties observed in fabrication.

Key Words: Permanent Magnet, Axial Flux, Potentiometer, Non-Overlap Winding, Open slot

Article by

K. Jyothi

Guided by

Mr Ramesh Kumar Mente

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Implementation of Safety & Protection for Women With GPS & GSM Module using Arduino

Ramesh Kumar Mente, K. Naga Durga

The aim of this work is to implement hardware for the protection and safety of women. None of the existing humanitarian mobile application exactly contains the features that a victim needs in times of danger or immediately after victimized. It is a lamentable perception that there has been a significant increment in crimes against women in the previous decade. The reason can be credited to the time gap between the real-time of the crime and its time of reporting to the ascendancy. In present days, an evil break is made when ladies venture out with a niggling apprehension in their brains about their safety.

The Defense isn't the only measure that can help against this increasing abuse. A security solution that creates a sense of safety among women needs to be devised. In an instance of an attack, it is largely reported that women are immobilized. There is a need for simpler safely solutions that can be activated as simply as by pressing a switch and can instantly send out alerts to the near one of the victims. “When safety and security are concerned”, a smart phone becomes a powerful tool to prevent violence against women. Keeping these in mind, apps have been developed which is dedicated to providing relief to the person in trouble

In this system, we used a GPS module to access the location of the user. Three pushbuttons are implemented to define the types of an accident victim is facing. When the user faces any hassles in any place, it can push any of these three buttons, the microcontroller will receive it and send a SMS. We use Arduino UNO R3 to control the whole system.

Keywords: GPS and GSM Module, Gadget, Arduino-Nano, Push button.

Article by

K. Naga Durga

Guided by

Mr Ramesh Kumar Mente

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Capacitance & Tan Delta Measurement of Power Transformers.

Y Gireesh

Power transformers play a crucial role in substations and switchyards, and the failure of any of these components can have a significant impact on the reliability, availability, and cost of power supply. The society's reliance on electricity for development continues to grow, utilities face increasing pressure to meet the rising demands for a dependable power supply. These Economic considerations play a substantial role, leading utilities to adopt a common policy of maximizing the utilization of existing networks to minimize capital expenditure on new equipment.

The literature reveals that transformer failures often stem from insufficient maintenance, improper operation, severe weather conditions, and manufacturing or design defects, rather than simply insulation aging. The challenges, utilities must implement a **systematic Operation and Maintenance (O&M) approach** that incorporates diagnostic tests to assess the condition and conduct health check-ups on equipment. The primary goal of condition monitoring tests is to identify early signs of incipient faults, aging development, or other issues, enabling operators to take timely and appropriate action to prevent major failures. The outcomes of various **diagnostic tests**, including **dielectric response methods,** for the condition assessment of power transformers.

- The condition of the insulation is essential for secure and reliable operation of your transformer i.e., **measurement of capacitance and dissipation/power factor** helps you to determine insulation condition in bushings or between windings.
- There is a possibility of change in capacitance which cause aging and degradation of the insulation, coupled with the ingress of water, increase the amount of energy that is converted to heat in the insulation. The rate of these losses is measured as **dissipation factor**.

Article by

Y Gireesh

Above article was published in Department of EEE under Loyola Electrical Engineers Student Chapter

Internal Combustion Engines vs. Electric Vehicles

R Akanksha

The automotive industry is undergoing a transformative shift, with the emergence of electric vehicles (EVs) challenging the dominance of internal combustion engines (ICE). This article gives information about the contrasting features of these two propulsion technologies, examining their impact on energy consumption, environmental sustainability, and the future of mobility.

1. Performance & Efficiency: Internal combustion offers high power output and quick refueling times, so their efficiency is limited to 20-30% efficiency, with a significant portion of energy lost as heat during combustion but Electric vehicles are renowned for their instant torque delivery and smooth acceleration. It has fewer moving parts and higher energy conversion efficiency 90% of electrical energy into motion. Therefore, EVs offer superior performance metrics compared to ICE vehicles.

2. Environmental Impact: Internal combustion engines are notorious for their emissions of greenhouse gases (GHGs), including carbon dioxide (CO2) and pollutants such as nitrogen oxides (NOx) and particulate matter. These emissions contribute to air pollution, climate change, and adverse health effects. Electric vehicles produce zero emissions, resulting in cleaner air quality and reduced greenhouse gas emissions. However, the environmental impact of EVs extends beyond vehicle operation, encompassing battery production, charging infrastructure, and electricity generation. Efforts to decarbonize electricity grids and improve battery recycling are crucial for maximizing the environmental benefits of EVs.

3. Energy Consumption and Infrastructure: Internal combustion engines rely on fossil fuels, necessitating a vast infrastructure for extraction, refining, and distribution. Gasoline and diesel refueling stations are ubiquitous, providing convenience for ICE vehicle owners. Electric vehicles require charging infrastructure, including home chargers, public charging stations, and fast-charging networks. The EV charging infrastructure is expanding rapidly, challenges remain in terms of range anxiety, charging times, and grid capacity. However, advancements in battery technology and charging infrastructure are driving the widespread adoption of EVs.

4. Economic Considerations: Internal combustion engines have a lower upfront cost compared to electric vehicles, making them more accessible to consumers. However, the total cost of ownership, including fuel and maintenance expenses, may be higher over the vehicle's lifetime. Electric vehicles typically have a higher initial purchase price but offer lower operating costs due to cheaper electricity and fewer maintenance requirements. Government

incentives, subsidies, and declining battery costs are making EVs increasingly cost-competitive with ICE vehicles.

So, the transition from internal combustion engines to electric vehicles represents a paradigm shift in the automotive industry, driven by concerns about energy security, environmental sustainability, and technological innovation. While ICE vehicles continue to dominate global markets, the rapid growth of EVs signals a fundamental transformation in transportation patterns. As policymakers, manufacturers, and consumers embrace the shift towards electrification, the future of mobility promises to be cleaner, greener, and more sustainable.

Article by

R Akanksha

Electric Vehicles

M Rupavathi

Electric vehicles (EVs) are cars that run on electricity instead of gasoline. They use electric motors powered by rechargeable batteries, which store energy for driving. EVs produce fewer emissions than traditional cars, helping to reduce air pollution and combat climate change. They offer cost savings in the long run due to lower fuel and maintenance costs. EVs are an environmentally friendly alternative to conventional vehicles and are becoming increasingly popular as technology advances and charging infrastructure improves. There are three main types: Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), and Hybrid Electric Vehicles (HEVs).

Benefits of Electric Vehicles (EVs):

1. Cleaner Air: EVs produce zero tailpipe emissions, reducing air pollution and improving air quality in cities and communities.
2. Cost Savings: They have lower operating costs compared to traditional cars, with cheaper electricity replacing expensive gasoline and fewer maintenance needs due to simpler mechanics.
3. Quiet Operation: EVs run silently, contributing to quieter streets and neighbourhoods, enhancing the overall driving experience.
4. Energy Efficiency: Electric motors are more efficient than internal combustion engines, converting more energy into driving power and reducing energy waste.
5. Reduced Dependence on Fossil Fuels: By using electricity as fuel, EVs decrease reliance on finite fossil fuels, promoting energy independence and security.
6. Climate Change Mitigation: EVs help reduce greenhouse gas emissions, playing a crucial role in mitigating climate change and achieving environmental sustainability.

The future of electric vehicles (EVs) looks promising as advancements in technology and infrastructure continue to accelerate their adoption. With ongoing innovations in battery technology, EVs are becoming more affordable, offering longer driving ranges, and faster charging times. Governments and industries worldwide are investing heavily in EV research, development, and charging infrastructure to

support their widespread adoption. As concerns over climate change and air pollution grow, EVs are expected to play a significant role in achieving cleaner, more sustainable transportation systems. In the future, EVs have the potential to revolutionize the automotive industry, providing cleaner, quieter, and more efficient mobility solutions for people around the world

We conclude that Electric vehicles offer a promising solution to the environmental challenges of transportation, providing cleaner, more sustainable mobility options. With ongoing technological advancements and increasing global support, EVs are poised to play a pivotal role in shaping a greener and more efficient future for transportation.

Article by

M Rupavathi

Technology News - 2022

➢ 3-Nanometer Chips Arrive

Taiwan Semiconductor Manufacturing Co. (TSMC) plans to begin producing 3-nanometer semiconductor chips in the second half of 2022. Right now, 5-nm chips are the standard. TSMC will make its 3-nm chips using a tried-and-true semiconductor structure called the FinFET (short for "fin field-effect transistor"). Meanwhile, Samsung and Intel are moving to a different technique for 3 nm called nanosheet. At one point, TSMC's sole 3-nm chip customer for 2022 was Apple, for the latter's iPhone 14, but supply-chain issues have made it less certain that TSMC will be able to produce enough chips which promise more design flexibility to fulfill even that order.

News Credits: IEEE Spectrum, 2022

➢ 6-Gigahertz Wi-Fi Goes Mainstream

Wi-Fi is getting a boost with 1,200 megahertz of new spectrum in the 6-gigahertz band, adding a third spectrum band to the more familiar 2.4 GHz and 5 GHz. The new band is called Wi-Fi 6E because it extends Wi-Fi's capabilities into the 6-GHz band. As a rule, higher radio frequencies have higher data capacity, but a shorter range. With its higher frequencies, 6-GHz Wi-Fi is expected to find use in heavy traffic environments like offices and public hotspots. The Wi-Fi Alliance introduced a Wi-Fi 6E certification program in January 2021, and the first trickle of 6E routers appeared by the end of the year. In 2022, expect to see a bonanza of Wi-Fi 6E enabled Smart Phones.

News Credits: IEEE Spectrum, 2022

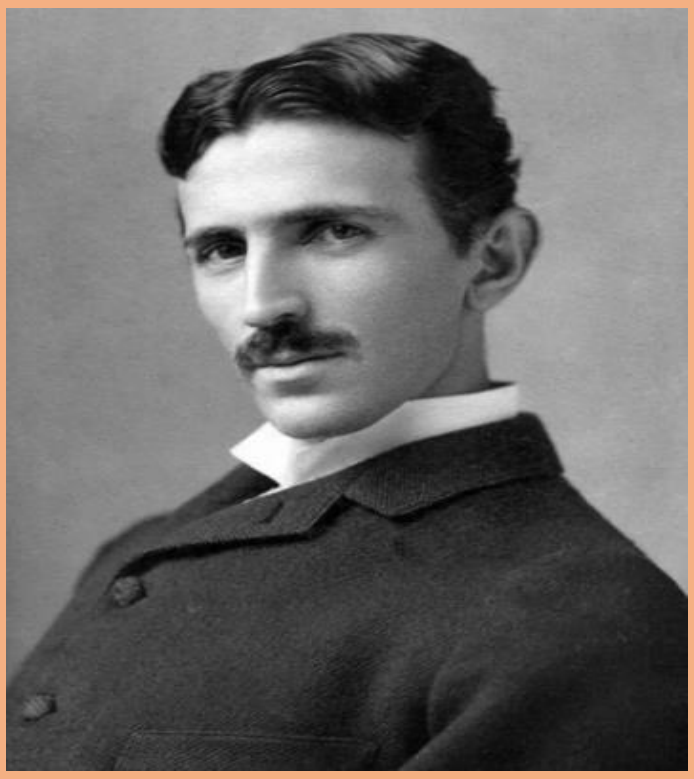
➢ Worldwide renewable energy capacity rises 10% in 2022. but much more is needed

Global renewable energy capacity increased by 9.6% last year, but much more is needed. Wind and solar power accounted for 90% of the net additions, and almost half of the new capacity was added in Asia.

The additions lifted total renewable energy capacity to 3,372 gigawatts (GW) at the end of last year, which was 295 GW higher than the previous year. China was the largest contributor, with 141 GW.

News Credits: International Renewable Energy Agency, 2022

Nikola Tesla (1856-1943)



Tesla was a Serbian-American inventor, electrical engineer, mechanical engineer, and futurist who is best known for his contributions to the design of the modern alternating current (AC) electricity supply system. He was also a pioneer in the development of wireless communication and radio technology.

Tesla was born in Smiljan, Croatia, which was then part of the Austro-Hungarian Empire. He studied electrical engineering in Austria and later worked for the Edison Machine Works in the United States.

In the late 1880s, Tesla began his own research into AC electrical systems, which eventually led to the development of the Tesla coil, a device that produces high-voltage, low-current, high-frequency alternating-current electricity.

Tesla also made significant contributions to the field of wireless communication. He developed the Tesla oscillator, a type of electrical circuit that generates high-frequency, high-voltage electrical currents, and the Tesla transformer, which is used to transmit electrical energy wirelessly.

Despite his numerous inventions and contributions to science, Tesla died penniless and relatively unknown. However, his legacy has been rediscovered in recent years, and he is now recognized as one of the most important inventors and scientists of the 20th century.