

NATIONAL CONFERENCE ON ELECTRIC VEHICLES CHARGING INFRASTRUCTURE

(NCEVI-2022)

9th and 10th MAY 2022



Organized By

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**Dr. R. Saravanan
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Message from CBIT Desk

Dear Colleagues

The National Web Conference in Electrical & Electronics Engineering for a Electric Vehicle Charging Infrastructure (NCEVI 2022) was organized by Chaitanya Bharathi Institute of Technology, Proddatur, Andhra Pradesh, India, in collaboration with the AICTE, New Delhi, India.

The conference was initiated in April 2022 and Convener, coordinator, 6 members for Advisory committee and 11 members of department coordinators was formed. The convener and coordinators are identified subject expertise, took approval of their willingness to support the conference, and submitted their report to chief-Patron for approval.

The main aim of this conference was to bring together leading academicians, researchers, technocrats, practitioners, and students to exchange and share their experiences and research outputs on all aspects of Electrical and Electronics Engineering especially towards the EV and EV charging infrastructure. It was also meant to provide a premier interdisciplinary platform to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the field of Electrical Vehicles.

The conference preparations started with the call for abstracts; 30 abstracts were received out of which 28 were accepted. The next step was the call for papers, and out of 28 papers submitted by authors, 28 were accepted for oral presentations and 28 made its way to the Conference Proceedings. Selected research papers have been compiled and edited in the form of Conference Proceedings and published by IJARI Publishers.

The conference maintained a high-quality peer-review process for all the manuscripts submitted, starting with a primary evaluation that included a plagiarism check for the original contents. Rejections at this stage had either serious scientific flaws, very poor grammar or were outside the aim and scope of this Conference. Those that met the minimum criteria were passed on to experts in the domain for review. Single-blind review process was employed, where the reviewer remained anonymous to the authors throughout the process. Reviewers were requested to decide on accepting/rejecting the submitted paper, along with suggestions to improve the quality of the paper. After getting the review report, authors were informed of acceptance/rejection.

The organizing committee wishes to acknowledge the assistance and encouragement that we have received from our organizations and the many other individuals, who helped prepare this event. The success of this conference was first of all a result of the quality and the motivation of its participant. So we would like to thank all participants for their presence and for their contributing to a friendly atmosphere during this event. Our thanks are also Dr.R.Saravanan, Convener, who directed the programme. We are also very grateful to the reviewers Dr.N.Stalin, Professor, Anna University and Dr.K.Kathiravan, Associate Professor, Theni Kammver Engineering College, whose very consistent reviewing of manuscripts was of great help in improving the quality of many papers. We also owe our gratitude to the publishers of this journal for their willingness to deal with the papers of these proceedings.

It gives me immense pleasure that NCEVI 2022 has been graced with the presence of Chairman Dr.V.Jaya Chandra Reddy, Bharathi Educational Society, our Esteemed Director, Mr.V.Lohith Reddy, Bharathi Educational Society and Dr.G.Sreenivasula Reddy, Principal, CBIT encouraged, motivated and energized us with great enthusiasm.

Our special thanks go to Dr.S.Sooriya Prabha, HOD, Department of EEE for all her hard work with the preparation of the conference. I am particularly thankful to the Coordinator Mr.N.Varaprasad, Associate Professor, Department of EEE.

Faculties from CBIT Dr.S.Asalam, Associate Professor, Mr.Y.Praveen Kumar Reddy, Assistant Proferssor, all faculties and students of CBIT add the value in the successful completion of the event

❖ **-Team NCEVI -2022**

E-Conference

Call for Papers

National Conference

On

“Electric Vehicle Charging Infrastructure”

(NCEVI-2022)

(ONLINE)

On

9th and 10th May 2022 (Monday & Tuesday)

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AICTE, New Delhi

Aim

AICTE Sponsored National Conference of “Electric Vehicle Charging Infrastructure” (NCEVI 2022) is a premier National conference which aims at current challenges in Electric vehicle charging infrastructure and technical advancements with research updates and innovations which is shaping the future of mankind. This conference welcomes all kind of engineers, Faculties, technocrats and researchers from all walks of society to share their knowledge and wisdom for exploring solution of current and future challenges in EV. This platform provides an national forum for researchers to exchange of ideas in recent advances on various aspects of theories, analysis, experimentation and computational methods in EV, Charging methods and charging infrastructure etc.

Introduction:

The transition to electric mobility is a promising global strategy for decarbonizing the transport sector. India is among a handful of countries that support the global EV30@30 campaign, which targets to have at least 30% new vehicle sales be electric by 2030. An accessible and robust network of electric vehicle (EV) charging infrastructure is an essential pre-requisite to achieving this ambitious transition. The Government of India has instituted various enabling policies to promote the development of the charging infrastructure network. However, given the novel characteristics of this new infrastructure type, there is a need to customize it to the unique Indian transport ecosystem and build capacity among stakeholders to support its on-ground expansion. A contextual approach is needed to ensure the efficient and timely implementation of EV charging infrastructure, such that it meets local requirements and is optimally integrated within the electricity supply and transportation networks.

Objectives:

- To improving technology, lower costs, increasing EV infrastructure, and policy incentives.
- To address the challenges and opportunities of EVs in India
- To further encourage the transition in vehicles, from traditional combustion engines, to EVs, throughout India.
- To Understand importance and need of Electric Vehicles

- To Understand the different charging Technologies, Batteries and Connectors
- To Get familiar with Charging Infrastructure for EVs
- To Understand different types of Power Converters used in Electric Vehicles
- Study the Battery Management System and charger Communication Protocol
- Troubleshoot and locate fault in Charging System of EV
- Troubleshoot and locate fault in Charging Station

Context:

- The transport sector in India contributes around 142 million tones of CO₂ annually, out of which 123 million tones is from road transport. To mitigate climate impacts, facilitate energy security – particularly in terms of oil imports – reduce air-pollution and promote energy transition, the Government of India has issued ambitious targets towards electric mobility.
- Meanwhile, states are developing electric mobility policies and initiating pilot projects. For example, Karnataka has committed to 100% e-mobility for most vehicle segments in the city of Bangalore by 2030 while Telangana has set an ambitious goal of 100% EV migration by 2030.
- Our engineering college Chaitanya Bharathi Institute of Technology, Proddatur, Andhra Pradesh located in Rayalaseema area. Creating awareness is very urgent in current situation, especially engineering students and community. So we planned to conduct conference on Electric vehicle charging infrastructure on behalf of Department of Electrical and Electronic Engineering, CBIT, Proddatur.

Vision & Mission of EEE:

VISION: To impart knowledge in ever-changing Electrical and Electronics Engineering to promote highly competent, innovative and ethical computer professionals through excellence in teaching, training and research.

MISSION: To provide opportunities for students to work on the different kinds of hardware and software platforms prevalent in industry, with the objective of being responsive to industry needs, the programme goes beyond the curriculum prescribed by the University.

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SLOGAN OF CONFERENCE:

**“Knowledge can only be got in one way, the way of experience;
there is no other way to know”**

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Single-Input Dual-Output Three-Level DC–DC Converter for EV

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Abstract: This paper presents the development of a non-isolated single-input dual-output three-level dc–dc converter (SIDO-TLC) appropriate for medium- and high-voltage applications. 3 level Buck-Boost converter is used in order to achieve the controllable output voltages. The main merits of this project include reducing voltage stress across semiconductor devices, improving efficiency, and reducing passive components size. This converter shows very good stability, even under simultaneous step changes of the loads and input voltage. Simulation analysis of converter output voltages for various duty cycles is presented for three cases of duty cycle control range.

Keywords- Multiple converter, single input dual-output dc-dc converter (SIDOC), single-input dual-output three-level dc-dc converter (SIDO-TLC), buck-boost converter

Model of EV Battery and Charger

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Abstract: In this paper, battery and charger model of electric vehicle was introduced and the characteristic of them was analyzed. Electric vehicle can reduce emissions to protect our city environment, as well as human's dependence on petrol. Therefore, it has become one of the world's common targets to develop the technology of electric vehicle. For different research needs, proper battery and charger model are recommended.

Keywords- Electric vehicle; simulation; battery model; charger model

Implementation of OCCP Protocol for Electric Vehicle Charging Infrastructure

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ABSTRACT: The ability of the software and hardware systems to interchange information is a key factor for the success of the electric vehicle industry. Standards have been developed and are in use to ensure base level interoperability of the front-end communication and signaling processes for smart charging between electric vehicles and charge stations. The Open Charge Alliance (OCA), a group of European industries, have developed an open-source common back-end protocol, called Open Charge Point Protocol (OCPP), for charging stations to reduce and secure overall investment costs. OCPP intends to enable grid services based on smart charging. In this paper the authors provide a review of the functionalities OCPP offers and how it can be used in the electrical vehicle charging infrastructure.

Key Words: Electric Vehicle, Open Charge Alliance (OCA), Open Charge Point Protocol (OCPP)

Smart Charging Infrastructure for Electric Vehicles

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Abstract: This paper discuss the pros and cons of various proposed techniques for EVs smart charging infrastructure and also compares different available technologies in the current scenario. This paper presents a novel smart bidirectional interface equipped with multilevel cascaded power converter with embedded strategies of reverse energy integration in order to keep stress on the power grid to minimum. Future research work is also mentioned in this paper for smart charging station.

Index Terms— Electric Vehicles, Smart Grid, Smart Charging Station, Multilevel Power Converter, Efficient Energy Consumption.

A Review on Contactless Charging for Electric Vehicles

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Abstract: The limited and depleting supply of fossil fuels made the scientists around the world to look for alternatives. One such alternative is the use of Electrical Vehicles instead of conventional internal combustion engines, which are major consumers of fossil fuels. This fast emergence of electric vehicles worldwide has brought up the need for design of effective and convenient charging methods and systems for their batteries. The commonly used plug-in charging method has some limitations such as safety and operation in certain weather conditions. Researchers are in continuous search of new technology that can overcome these limitations and make the EVs more economical. Therefore, a novel method to charge the battery through induction, without any physical contact has been proposed. This paper presents a literature review on the Contactless Power Transfer technology used in EV charging. A possible future technology to improve the range using roadway electrification and in-motion power transfer concepts, which will further help in reduction in the size and cost requirement of the battery. This will help in reducing the range anxiety and will result in better satisfaction of the customer's needs and expectations.

Keywords: Electrical Vehicles, Contactless Power Transfer, In-motion charging, Inductive Power Transfer, Driving range extension

PV Based Landmines Detecting Robotic Vehicles for the Defence Force

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Abstract: The main purpose of our landmines detecting robotic vehicle is to identify the landmines for the defense field for the maximum possible area. If the landmines explode it causes severe damage to the soldiers and even causes toxic pollutants to the environment. Conventionally the robots before they are exploded in the warbased area. Here, the land mine detecting robots plays a vital role in saving the lives of soldiers. A slight modification in the conventional work is proposed here, which gives a key to solving the landmine issues in the defense field with an additional power setup for the robotic vehicle. Here the proposed work is implemented by using an AVR microcontroller arrangement in a robotic vehicle with a PV panel setup. Thus, this PV -based Robotic vehicle detects buried mines to avoid human interruption in buried mines by sending alert messages to the control center of the defense force by sharing the location with the identification of land mines using the Global Positioning System. Hence this PV-based Robotic vehicle is useful for monitoring the defense area by the control center of the defense force.

Key Words: AVR Cortex, GPS/GSM module, Landmines, Metal Detector, Solar panels, Robotic vehicle.

Electric Vehicle Charging Using Renewable Energy

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Abstract: One of the ongoing major problems is “The Hike on Petrol and Diesel Prices”. This situation is because of the depletion of the “FOSSIL FUELS”. These Fossil Fuels includes Coal, Gas and Oil etc. Due to this hike on Petrol and Diesel Prices, Engineers, Scientists and researchers are doing research on/ finding for the alternatives for the Fossil Fuels. One of the best alternatives for the Fossil Fuel is use of the Electricity. With the help of the electricity, we can run a vehicle. The vehicles which run on the Electricity are called or named as Electric Vehicles. These Electric Vehicles (Shortly termed as EVs) replaces the traditional Internal Combustion Engine (IC Engine). For Electric Vehicles also, we need intermediate charging stations like intermediate Gasoline/Petroleum filling stations for the traditional Internal Combustion Engines. Charging of an Electric Vehicle mainly depends on the location and requirement. The EVSE (Electric Vehicle Supply Equipment) change from one country to another country and it is also called as the EV charger’s specification and standards.

Key Words: Electric Vehicles, Batteries for storing, charging Levels of EV, EV charging station requirements, Wind Power generation technology.

An Autonomous Electric Car Using LIDAR Technology on E-Roads

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Abstract: In this project a simple Autonomous electric car is designed and implemented. The concept of the project was inspired by the recent surge in automated car industry. The designed car was capable of detecting the road signals and taking the right turn accordingly. To implement the whole system, the body of the car was connected to the analyzer computer via Wi-Fi where the computer can analyze the feed video frame by frame. In a real car the analyzer computer can be simply mounted on board. The whole system was capable of taking right decision with excellent accuracy using LIDAR Technology. Cars that can drive themselves without any human input have not yet been deployed on the road. It's believed that the industry will take years to develop the technology necessary for fully autonomous vehicles. In a world where charging electric cars is a key point in boosting the energy transition, other solutions can come alongside electric charging stations. One such solution is wireless charging. Wireless car charging is an enhanced version of smartphone charging with several differences. "Wireless inductive charging allows an electric vehicle to automatically charge without the need of cables. A project that could recharge electric vehicle batteries by driving over special charging strips embedded in the road. The biggest grouse with owning electric vehicles is the cumbersome process of locating a recharging station when the battery runs low, and then spending a lot of time recharging it for a long journey ahead. This problem often crosses the mind of those wanting to make a switch to the non-polluting vehicles. This new research could pave the way to changing minds and increasing the adoption of electric vehicles. A technology for charging EVs wirelessly while the vehicles are in motion. This could help save time and improve productivity.

Keywords: Autonomous vehicles; sensors; perception; weather; camera; LIDAR; RADAR; GNSS.

Different Types of Wireless Electric Vehicle Charging Methods

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Abstract: Day by day pollution is increasing which is affecting the Ozone layer. One of the reasons which affect the Ozone layer is CO₂ released by diesel and petrol vehicles. To overcome this affect we are moving towards Electrical vehicles (EV) which consists Battery. So, we need to charge the battery by Electrical vehicle charging station. They are two types of charging station wired and wireless. This Paper is about different types of wireless charging methods. Wireless charging means power transfer technology when the vehicle is moving on a road or parking on the road it automatically charge the battery based on the principle of magnetic field-based system. The receiver is attached to the vehicle it receives the energy from the transmitter.

Keywords: Electric vehicle, Inductive power transfer technology (IPT) , Magnetic field-based system , Receiver , Transmitter.

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Electric Vehicle Charging Stations in India

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Abstract: This paper review the overview of the electric vehicle chargers (EVSE) and business model become trending issue in Indian market. Electric vehicle is type of vehicle which takes power from a rechargeable energy storage device. The rechargeable storage device is charged with the help of EV chargers (EVSE). EVSE is an electrical device that converts alternating current (AC) energy to regulated direct current (DC) for replenishing the energy storage device. EV chargers are divided into two main categories: conductive (wired charging) and inductive 5. Battery (energy storage device) Grid Connection EVSE charging (wireless charging). In India there are inductive chargers for now. In this paper, EV chargers methods, charging levels, charging modes and future business model are explained clearly

Keywords: - EV Charging methods, level of charging, modes, and future business model for India.

A recapitulation on electric vehicle DC charging stations employing photovoltaic sources

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Abstract: In the following couple of years, Electrified automobiles are destined to come to be the critical aspect of the transport field. So, there is direct relation & critical dependency exists with the charging infrastructure. In parallel charging infrastructure has to be designed in such a way that to meet the huge growing demand for on Electrified automobiles to fuel them whenever and wherever necessary. Among this substructure, Charging stations photovoltaicassisted are attracting a substantial interest due to increased environmental awareness, cost reduction and rise in efficiency of the PV modules. The intention of this paper is to review the technological status of Photovoltaic–Electric vehicle (PV-EV) charging stations during the last decade. The PV-EV charging station is divided into two categories, which are PV-grid and PV standalone charging systems. From a practical point view, the distinction between the two architectures is the bidirectional inverter, which is added to link the station to the smart grid. The technological infrastructure includes the common hardware components of every station, namely: PV array, dc-dc converter provided with MPPT control, energy storage unit, bidirectional dc charger and inverter. We investigate, compare and evaluate many valuable researches that contain the design and control of PV-EV charging system. Additionally, this concise overview reports the studies that include charging standards, the power converters topologies that focus on the adoption of Vehicle-to grid technology and the control for both PV–grid and PV standalone DC charging systems.

Keywords: PVgrid charging station, Electric vehicle charging, smart grid, Vehicle to grid, Bidirectional DC converter, Energy storage unit.

NCEVI-EEE-9-5-12

Electric Vehicle Charging Storage Infrastructure

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Abstract: This paper describes electric vehicle charging infrastructure, which is an important element of the mobility market. It presents electric vehicle functional groups, where smart chargers are the most popular and provide lots of benefits in respect to offline ones. It also depicts chargers types according to a connector type, charger power and its application. It investigates communication protocols, referring to applicable electric vehicles standards. Different charging modes allow charging an electric vehicle, where a series of complex conditions are desirable in order to ensure as well as AC and DC charging with high power LEVEL. It describes OCCP protocol which ensures communication between an operator and the charger.

Key words: Electric Vehicle, Charging Station, Ac and DC charging.

Electric Vehicles Charging Infrastructure

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Abstract: Nowadays one of the major problems is fuel consumption, the day by day the prices of Petrol and diesel are increasing. This is because of depletion of fossil fuels. Due to this hike on Petrol and Diesel Prices, Engineers, Scientists and researchers are doing research on finding for the alternatives for the Fossil Fuels. One of the best alternatives for the Fossil Fuel is use of the electricity for Electric Vehicles. Electric vehicles are a relatively recent technology that is seeking for its place in the market. It has several as the reduced greenhouse emissions, fuel savings and its ease of use. The increase of the electric vehicles in the roads raises issues about their impact on the grid, in terms of power quality. This paper presents the main considerations about developing infrastructure to charge Plug-in Electric Vehicle by using different connectors.

Keywords: Plug-in Electric Vehicle, Infrastructure, Power Quality

Electric Vehicle Smart Charging Infrastructure

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Abstract - Future power systems have to meet the challenge of uncontrollable, decentralized generation through increasing renewable. Utilize energy storage to harmonize the load with fluctuating generation is an option. On the other hand in today's markets large scale energy storage systems are hard to find. The reason is assumed in the high costs. Electric vehicle utilization with smart charging could be an alternative solution, due to the secondary use of the electric vehicles battery when not used for driving. This paper will describe the electric vehicle storage capability which determinants influence the storage potential.

Key Words—Battery Electric Vehicle, Energy Storage, smart charge, Vehicle-to-grid

Electric Vehicles Charging Infrastructure

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Abstract: Today everything becoming smart, automatic and accurate in this digital world, so we are introducing some key elements in the electrical vehicle design ,the features include Gallium Nitride based power controllers and bidirectional DC to DC converters with Effective cooling design through Naturally or by forced draft, active cell balancing system with AI based controllers are useful to monitor each and every cell intelligently, active thermal management is useful to optimize the losses in the entire system, battery cooling system with non vapor liquids are useful to cool down the motor and controllers rapidly. MOSFET driven induction motors are widely used in electrical vehicles, to get better efficiency rates Synchronous reluctance motors are best choice, fast charging Super Capacitors charge within few minutes with helps in emergency and necessary situations, charging with Regenerative breaking System (RBS) provides superior backup to the electric vehicles, Superfast and ultrafast chargers are useful to charge batteries in very less time periods, High C rated Batteries which provides fast charging and high current discharge capabilities are useful in challenging situations, LED head, tail lights and indicator lights helps in battery backup by consuming very less power, door to door power stations are useful to charge vehicles in their own areas by giving little money to them, plug point connectors with copper oxide resistive technologies and waterproof rated plugs/connectors helps in the better transformation of electrical energy to the electric vehicles and finally the effective body design helps in durability and cooling aspects all these features plays a major role in handling the electric vehicle overall performance with betterment results.

Keywords: Gallium Nitride based power controllers, Bidirectional DC TO DC converters, Battery cooling system, synchronous Reluctance, super capacitors; Regenerative breaking system, High C rated Batteries, LED lights, charging stations.

Modelling of Electric Vehicle Charging Station for DC Fast Charging

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Abstract: Electric vehicles (EVs) require fast-charging station networks to allow owners to rapidly charge the battery on long-distance drives. Fast-charging electric vehicles requires a sufficiently powerful connection to the electric power grid. Modeling and control of the process for charging the electric vehicles (EVs) are reviewed. The modeling approach and the models describing the system components are detailed. A model of a charging system for EVs and plug-in electric vehicles (PHEVs) is developed.

Keywords: Fast charging EV, Model Charging Station

Charging infrastructure strategies for roll-out into electric vehicle segment on larger scale in urban areas

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Abstract: In the view of all-encompassing introduction to electric vehicles, policy makers need to take a call on how to build charging infrastructure to match up to demand. The authorities need to decide, design for the charging operational tactics to be followed. The questions need to be answered regarding how many stations, where, which type, capacity be installed. Early developments for roll-out in metro cities is quite promising, while the need for large-scale roll out in urban areas need to be yet answered. The data regarding the rate of charging, charger performance place a major roll while designing the clustered charging hubs. This paper puts an effort to explore the changes which can be brought in to charging infrastructure to solve the peak loading at service stations of urban area. The proposed solution is based on traveling pattern of urban cars. Two distinct ideas which can solve the infrastructure problems are proposed through this paper.

Keywords: electric vehicle, charging station infrastructure, EV charging Station design, urban area smart charging

Multilevel Inverter with Self-Balanced Capacitor for Electric Vehicle Application

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Abstract: A new three-phase multilevel inverter with boosting capacity for low-voltage applications such as electric vehicles and renewable energy sources is described in this article. Two low-voltage transistors, two high-voltage transistors, two diodes, and two capacitors are used in each phase of this inverter, which is powered by a single dc voltage source. All other components are rated to the dc input voltage, with the exception of the two high-voltage transistors, which can tolerate double the dc input voltage. The two types of high and low-voltage transistors work in low and high switching frequencies, respectively, using phase-disposition pulse width modulation. This is highly useful for decreasing switching losses and semiconductor switches are being chosen. The two capacitors are linked to the dc source in parallel and series alternatively, yielding a high ac output voltage with various levels, self-balanced capacitor voltages, and low voltage ripples. The topology, working principle, voltage ripples are examined. The SCMLI topology is demonstrated using MATLAB/simulink software.

Key Words: Pulse width modulation (PWM), multilevel inverter (MLI), switched-capacitor.

Drawbacks and overcome Techniques on Electrical vehicles

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Abstract: The Electrical Vehicle (EV) is a relatively new concept in the world of the automotive industry. Although some companies have based their entire model of cars around being proactive and using electricity, some also offer hybrid vehicles that work off both electricity and gas. An electric car such as Nissan Leaf, Ford Focus Electric or Tesla Model S, Chevrolet Volt is a great way for you to not only save money but also help contribute towards a healthy and stable environment. The **drawbacks of an** electrical vehicle are finding a Charging station - EV charging stations are fewer and further between than gas stations, charging takes longer, the driving range on a full charge, Higher Initial Purchase Cost, Replacing the Batteries is Expensive. The **Overcome Techniques** on Drawbacks of Electrical vehicles are Range and Charging Speed, Performance and life time, Establishing E V charging stations for every 50 KM, Taking Subsidies from government at purchasing time.

Keywords: Electric Vehicle, Charging station, Tesla Model.

Recent Development on Electric Vehicles

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Abstract: This paper provide an overview of the recent work of electric vehicle in the region. The paper describes the development and the comparison of different part of components. The major components in battery technology, charger design, motor, steering and braking are examined. The paper finally shows some electric vehicle prototype as a conclusion of the papers.

Keywords: Electric vehicle, AFS, steering system, braking system, ABS, battery management systems, BMS, Inverter

Smart Way of Electric Vehicles Charging Using Solar System

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Abstract: As the Global resources are diminishing, government agencies and the non-government agencies are pushing greenery, pollution free solution through the use of renewable energy's sources, as electric power must become less dependent on fossil fuels and transportation must become more electric to diminish carbon emission, pollution and mitigate climate change. Hence to lessen the pollution through the motor vehicles, the electric vehicles are being manufacture and in order to run the electric vehicle the fuel required is the electricity which can be storable through the use of solar energy and run these electric vehicles through the Electric vehicle smart charging station which is the promising alternative and environmentally supportable solution to meet up the energy crisis.

Keywords — sunlight-solar panel-charge controller-battery-charging point

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A Prototype Model of Arduino Based Obstacle Detection System for Blind People

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Abstract: The visually impaired or blind people are facing trouble due to their disability. It is difficult for blind people to pass their day-to-day life with their disabilities. They are being met with accidents; in the worst-case scenario, their life is also in danger. Rather than using the stick to find the obstacles, we have come up with a smart device using technology to help blind people in detecting the obstacles around them and indicate the danger. To overcome this issue obstacle detection system for the blind (ODSB) is adopted to help them in dangerous situations, by sensing the surrounding obstacles using the ultrasonic sensor. The buzzer is used in producing a sound alarm, to indicate the obstacles and the vibration sensor alerts them by producing little vibrations to sense the danger. These components are interconnected to the Arduino. The battery is used as a power source for the system. Whenever an obstacle is detected by the ultrasonic sensor within the confined range the signal will be sent to the Arduino which processes the input into output and sends it to the buzzer and vibration sensor to produce alerting sounds and vibrations respectively.

Key Words: Arduino, Ultrasonic sensor, Arduino, Buzzer, Vibration sensor, and Obstacle Detection System.

Location and Dynamic Management of EV Charging Station Using GWO

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Abstract: The inadequate charging foundation significantly blocks the improvement of the electric vehicle (EV) industry. Instructions to productively send charging stations in a city turn into a pressing issue for the government. Past refueling area models are not appropriate for satisfying the EVs' charging request. This paper proposes a area model for charging stations in light of the attributes of movement ways of behaving of metropolitan inhabitants. The model comprises of two sections: one for brief distance workers which use slow charging (SC) stations, and the other for extremely long explorers which use quick charging (FR) stations. The energy management system, renewable sources and grid are connected with Electric vehicle charging station. The energy management system control and regulates the system performance, electricity demand and supply. The Renewable Energy Sources (RES) based charging station offer helping hand to the location of charging station to meet the changing demands of the EVs. For generation scheduling and economic dispatch of the supply to charging station in this paper proposed Grey Wolf Optimization technic to reduce the losses. The GWO algorithm is very promising and has a large potential to apply a renewable system.

Keywords- Electric Vehicle (EV), Charging Station , Location of Charging Station , Renewable Energy Source , Grey Wolf Algorithm (GWO) .

Electric Vehicle Charging Infrastructure- A Review

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Abstract: In this project, we can observe that both electric vehicles and hybrid electric vehicles require an electric vehicle charger to keep the battery full, just like any chargeable device or electronic device. Electric vehicle charger pulls an electrical current from either 240 v outlet or the grid it's hard wired to and delivers that electricity to the Vehicle, just like any other appliance or device you charge by plugging into the wall. Now a days this Electric vehicle car should be mostly used because of high fuel cost. For this we can use charging stations for charging the battery of the car. In this project it has different types of charging stations and different types of batteries should be used. 1st time NIKOLA TESLA Invented the alternating current motor in the year 1887, he passed the way for the invention of the electric vehicle more than a century later. Electric vehicle could make gas-and diesel-powered vehicles obsolete by the year 2025, effectively ending the reign of the internal combustion engine. The acceptance of EV in to car culture has already begun with the Tesla Model s winning the motor trend car of the year in 2013. And with electric car sales growing by 81 percent from 2017 to 2018, it seems electric cars could be the norm sooner rather than later. Understanding how an electric vehicle works is actually much simpler than understanding how a gas-or diesel-power car works.

Keyword: Tesla Car, Electric Charging Station

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Construction and Working Principle of Electric Vehicle

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Abstract: In recent some years, Greenhouse gas problem increases day by day and also the gasoline fuel rate increases nearly about 90 Rs/li. In daily life routine, public transportation is very important but the fuel rate, some people avoid using bikes or cars. So, many automobile manufacturer and new companies put their effort to convert the conventional vehicle into electric vehicle that provide reliable solution. A vehicle is propelled with electric motors and draw power from onboard electric source is an electric vehicle. It is more durable and mechanically simpler than gasoline vehicle. It gives more fuel efficiency than gasoline because it does not produce emission like Internal combustion engine. However, automobile industry is not completely moving towards pure electric cars because there is inherent problem of existing batteries technology. For storing the electric energy, most common storage device used in Electric vehicle is battery. It can store large amount of energy in a small volume and weight. The recent report shows that there were more vehicle running on a gasoline product in past few years but now the report has been changed with increasing the usage of Hybrid and Electric vehicle. Presently people are more inclined towards the Hybrid vehicle but the future will be totally based on electrification.

Keywords: EV Construction, BLDC motors

Charging station design and location studies

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Abstract: Electric vehicles are believed to be an effective solution for reducing greenhouse gas emissions. Despite extensive study on the attributes and characteristics of electric vehicles and their charging infrastructure design, the development and network modelling of electric vehicles are still evolving and limited. This article provides a comprehensive review of electric vehicle studies and identifies existing research gaps in the aspects of theories, modelling approaches, solution algorithms and applications. This article first describes the electric vehicles' concepts, market share, characteristics and charging infrastructures. Then, the studies on traffic assignment problem with electric vehicles in the network and limited charging facilities are particularly discussed. We conclude that it is of great importance to take into account electric vehicles' special characteristics (e.g. range limit) in predicting their routing behaviour and charging infrastructure design networks.

Keywords - Electric vehicles, network Modelling, traffic assignment problem, vehicle routing problem

A Review on Electrical Vehicle, Energy Storage System, EV Charging Stations and their Impact on Grid

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Abstract: Electric vehicles (EVs) are becoming more prevalent in the transportation sector every day, but traditional internal combustion engine (ICE) vehicles still dominate. To promote the adoption of electric vehicles and achieve sustainable transportation, impediments must be removed, which include high-cost EVs, range anxiety, a lack of EV charging infrastructure, and grid pollution caused by EV chargers. The high cost of EVs is due to costly energy storage systems (ESS) with high energy density. This paper presents a detailed overview of EV technology, focusing on electric vehicle supply equipment (EVSE), energy storage systems (ESS), and electric car chargers. This paper focuses on the negative effects of EV chargers as well as possible solutions. In the final section of this paper, the international standards established by various institutions and universally adopted are discussed, and finally, the approaching advancements in EV technology are discussed.

Keywords: Electric vehicles, charge depletion, charge sustaining, internal combustion engine, Power factor, Power quality

Torque and Temperature Variation of PMSM Motor in Electric Vehicles

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ABSTRACT Electric Vehicle (EV) technology has become a promising tool in the reduction of depletion of fossil fuels. This provides a path for using electricity for vehicle propulsion and results in saving of petrol/ diesel and foreign exchange. Goal 7, '*affordable and clean energy*' of 17 UN sustainable development goals can be achieved if EV technology is implemented. EVs use electricity, stored in a battery, to power an electric motor. Experimental studies on lifetime performance of a battery storage system for EVs have become crucial to promote this technology. Multiport converter based EV charging stations are integrated with Photovoltaic power generation and battery energy storage systems.

Promotion of EV technology is possible with the design of energy efficient EVs keeping in view of the motor drive used and more sophisticated charging infrastructure of the EV. Permanent Magnet Synchronous Motors (PMSMs) are preferred for EV applications as they can provide high efficiency due to their robustness. In this paper, an attempt is made to analyze the torque produced by the PMSM motor in the electric vehicle and variation in its temperature. An observation can be made when the motor is accelerating the vehicle to the commanded speed. Regenerative braking conditions can also be observed when the motor acts as a generator. With better characteristics of motor, energy storage challenges of EVs can be faced effectively.
