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President
Prof. B. Santhaveerana Goud

SECTION OF ENGINEERING SCIENCES

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PROCEEDINGS
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PART II
SECTION OF ENGINEERING SCIENCES

President: Prof. B. Santhaveerana Goud

CONTENTS

108TH INDIAN SCIENCE CONGRESS

January 3-7, 2023, Nagpur

I

PRESIDENTIAL ADDRESS

President: Prof. B. Santhaveerana Goud

PRESIDENTIAL ADDRESS

ROLE OF ENGINEERS IN SUSTAINABLE DEVELOPMENT FOR A HEALTHY PLANET EARTH

Chairman Sir, Distinguished Scholars, Ladies and Gentlemen

On behalf of the Engineering Sciences Section and on my personal behalf, I welcome you all to the Engineering Sciences Section of the 108th session of the Indian Science Congress here in the RTM Nagpur University, Nagpur.

I take this opportunity to express my sincere gratitude and thanks to all the Past Sectional Presidents and Recorders and Sectional Committee members who have demonstrated trust in me and elected me the Sectional President of the 108th session.

Thank you all.

Ladies and Gentlemen, you all know that the focal theme of the 10th session of the Indian Science Congress is 'Science and Technology for Sustainable Development with women empowerment'.

We have only one planet, Earth, to support life. No second Earth has been identified so far. But efforts are underway. Earth's life supporting system keeps us alive and healthy. The air we breathe, the water we drink, the foods we eat and the medications we take are all by-products of a healthy planet. An understanding of the Earth and its working, population and developmental activities, pollution and its impact on environment, climate change and other global environmental issues and its effects on better living is required to decide the importance of science and technology for sustainable development.

Atmosphere, hydrosphere, lithosphere and biosphere are the main components of the planet Earth. It has various resources and services. Planet Earth consists of uninterrupted resources such as direct solar energy, wind, tide and flowing water. The renewable resources such as fresh air, fresh water, fertile soil, plants and animals, the non-renewable resources such as fossil fuel, metallic minerals non-metallic minerals. The stratosphere and the troposphere are the main atmospheric interactors of the biosphere. The atmosphere is a prime mean for the spatial diffusion of pollutants and a temporary mean of their accumulation until they precipitate. Hydrosphere covers around 71% of the Earth's surface and is an important accumulator of pollutants and a significant vector of diffusion. The lithosphere is the main source of pollutants since it is from where raw materials are extracted to support

life and economic activities and a permanent accumulator. Some pollutants are naturally released through sources like volcanic eruptions, while others like fossil fuels are the result of artificial extraction and combustion.

The ecosphere is the set of all living organisms, including animals and plants. They are temporary accumulators and sources for pollutants in a very complex set of relationships with the atmosphere, hydrosphere and lithosphere. The environmental system of the planet Earth in an ecological sense has the set of interactions between the elements of the biosphere, a thin layer at the surface of the Earth which supports life, where all the organisms including human beings are living.

An ecosystem can be visualized as a functional unit of nature, where living organisms interact among themselves and also with the surrounding physical environment. Humans are a major source of environmental change. The human cultural field interacts with life support systems.

All organisms including human beings on the Earth depend on Limited Resources and Ecological Processes such as biogeochemical cycles. These cycles are essential to protect the resources and works under some principles related to the mater and energy.

Overuse of common property or free access resources owned by no one or jointly by everyone in a country or area is the major problem and a tragedy of the commons. Exponential increase in population and non-availability of sufficient food and other life supporting facilities results in Hunger, suffering from diseases, lack of education. Therefore developmental activities to support life become essential.

The major development activities are agriculture, industry and commerce, leading to the development of urban centers. Such development activities affect the quality of the Earth's natural resources (soil, water and atmosphere) and lead to various social, economic and environmental problems

In the late 19th century, it was sensed the signs of severe stress on economic, environmental and social systems and has led to several significant international events culminating in commitment to sustainability with a shared commitment to sustainable development via the three pillars of economic growth, ecological balance and social progress. This has led to a focus on triple bottom line management and sustainable development. There is a growing realization that our current energy systems will need to be radically changed to fulfill energy needs

sustainably in the long-term. Many professional organizations, including engineering and scientific associations, have incorporated sustainable development into their codes of practice.

Radical changes to the way engineers see their roles & responsibilities, Integration of sustainability into mainstream engineering thinking & action, Use of natural systems as models for design &development, Inter-disciplinary approaches are essential.

Science and technology for sustainable development aim towards Energy efficient, less adverse environmental impacts, Encourage better urban and rural planning with less urbansprawl, Create long-term facilities that can be maintained at lower costs, efficient mining and petroleum operations, Organic forming and use of bio fertilizers, bio pesticides., land reclamation, drainage and improved farm operations, measure and monitor pollution, Changing to processes to reduce energy use and eliminatewaste, Designing for re-use or resource recovery, Collaborating with other industries by creating eco parks, recycle and reuse domestic waste, better solid waste management facilities, Improving treatment facilities for urban waste to be used safely for agriculture, Designing energy-efficient buildings, Designing industrial processes that are more energy efficient, Using low-energy lighting systems, Designing more efficient automobiles and public transportation systems.

There are a number of complementary tools and approaches that can be used by Engineers to aid their implementation of sustainable development by curative and preventive methods such as pollution control, reuse, recovery, recycling, waste minimization, toxic use reduction, clean technology, pollution prevention. Other useful tools and concepts to assist in implementing sustainable development includes Life cycle assessment and management, Environmental management systems, Green Chemistry, Green Engineering.

Significant progress towards sustainable development requires new technology and innovation. Engineers have a significant role in developing and using new technology and doing so in a responsible manner. Most countries in the developed world, and many countries in the developing world, have incorporated concept of sustainability in their national planning. Countries are making progress in the formulation and elaboration of national strategies for sustainable development. Engineers, because of their pivotal role in society, have a major part to play in implementation and achieving sustainable development for a healthy planet Earth.

108TH INDIAN SCIENCE CONGRESS

January 3-7, 2023, Nagpur

II

ABSTRACTS OF
PLATINUM JUBILEE LECTURE

PLATINUM JUBILEE LECTURE

URBAN RENATURIZATION FOR SUSTAINABLE DEVELOPMENT

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Over the years, urban areas have gained strong momentum in all major sectors related to environment, earth-science, agriculture and irrigation, water infrastructure, climate science, urban drainage and waste-water, solid-waste management, and natural resources systems. Out of 100 most vulnerable cities worldwide, 99 are in Asia, while India alone constituting 43% in terms of pollution, natural hazard, water shortage, extreme heat, and climate change beggaries.

United Nations sustainable development goals monitoring, targets and indicators can be well depicted using locational and areal level services. Geo-spatial technology includes satellite remote sensing, geographical information system, global positioning system, Lidar and drones for mapping and resource assessment. Although climate models does offer offers unbiased observations, however there remains a substantial gap in terms of environmental decision making at city level. Furthermore, there are constant advancements in geospatial technology, thus making more difficult for practitioners to identify true potential, and seek applications.

This paper will explore applications of emerging field of urban sustainable development for natural resources decision making with case studies from Ahmedabad, Gujarat and Noida, Uttar Pradesh cities.

Few words about Author:

Prof Dr.- Ing. Anupam K Singh has more than 29-years of professional experience as academician, researcher and consultant in water sector in India, Sri-Lanka, Germany, Poland, Egypt, Lao PDR and Indonesia. He has worked as Director, Dean- Engineering and Professor of Civil and Infrastructure Engineering. His professional interest lies in sustainable development, flood impact and risk assessment, drainage and waste-water management, irrigation and earth-system sciences, and urban planning and management. He holds a Dr.-Ing. (PhD) and MSc both from Karlsruhe Institute of Technology (KIT) Germany, PG Diploma in Urban and Regional Planning from Poland, and BTech in Civil Engineering from India.

108TH INDIAN SCIENCE CONGRESS

January 3-7, 2023, Nagpur

III

ABSTRACTS
OF
SYMPOSIUM / INVITED LECTURES

1. SCIENCE OF CITIES, ENGINEERING SOLUTIONS AND ANCIENT WISDOM

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ABSTRACT

Regional ecosystems are an organized mosaic of land-forming geologic and meteorologic processes, wild ecosystems, human dominated ecosystems, human economy and institutions, and hierarchical urban centers. Urban infrastructure (roads/transportation, buildings, energy systems) combine form and functions with suitable modelling of flows in a system of systems. Cities are built using some of the most creative and revolutionary ideas – from steel structures that scrape the sky to glass cables that enable communication at the speed of light. Phantom traffic jams are computationally intractable and software systems like SCOOT (Split cycle offset optimization technique) along with material innovations like gravel-plastics for roads, self-healing concrete, fibre reinforced polymers for roads and bridges, in-road inductive charging on roads for electric vehicles charging, piezoelectric materials for use in both paving slabs and rubber floor tiles in train stations (energy harvesting paving slabs) etc.

Material flow analysis and sankey diagrams are a method for calculating and illustrating the flow of resources through an urban area of any size. The forms (with layering of information on maps) as information make it possible immediately to interrelate the various features and qualities of the landscape and also easily quantify important spatial relationships. Forms and flows should be analyzed and understood for current and future scenarios and in combination the methods represent a trans disciplinary platform for understanding the spatial dynamics of a city.

The rural-urban linkages need to be engineered for sustainable development beyond the system boundaries (in peri-urban areas) and giving attention to environmental issues.

The ancient wisdom of learning at matriculation levels the Vyavahara ganitha (business arithmetic) (a) the simple interest, compound interest, discount, selling buying prices etc (b) the tank water management system will certainly help build and sustaining Farmer Produce Organizations (FPOs) at village panchayat levels. In an effort by state governments and federal governments the total FPOs so far functioning is only some twelve thousand, whereas there are around six lakh village/habitats are in India. The rural urban linkages evolve with such knowledge being imparted to villagers through AR/VR systems of training / education using metered original slokas.

2. WATER AND WETLAND PROFESSIONALS – PAST, PRESENT AND FUTURE

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ABSTRACT

The water crises of the 21st century is in many ways a crisis of governance; a crisis of the failure of our institutions to manage our resources for the well-being of humans and ecosystems. Institutions refer to the informal and formal norms, principles, rules and structures that society shapes in order to address the problems that affect our society. In UNESCO's scientific programme global climate change is a central theme. More specifically Water is an important theme, not only because of climate variability and change but also because of mounting pressure on water systems and water resources due to the increasing world population and a growing middle class. A central issue for the water sector is: how do you get out of the **'water box'**? How to get the **water professionals**' analysis of water problems and solutions on the political agenda? An important condition to achieve this is the competency of water professionals and others involved to make connections between different perspectives: water in relation to other issues, water as a technical issue versus water as a governance issue, and water from different angles, such as the cultural perspective.

This paper aims to provide platforms for lively academic discussions balanced with Water Professionals – Past, Present and Future needs and activities to meet new generations. Increasing access to water and sanitation is an integral part of the Poverty Reduction Strategy and Action Programme (PRSAP) and Millennium Development Goals (MDG). Is there need for global water governance? Different schools of thought have different answers to this question. From a holistic, supranational perspective, one can argue that there are four reasons for global governance. First, the Earth has one hydrological system. Second, climate change and loss of biodiversity and their underlying causes are global in nature. Third, local challenges can cumulatively lead to problematic global trends. Fourth, the direct and indirect impacts of water use may have global implications. Hence, there is need to structure global water science based on challenges emerging from global water governance.

Although wetland science has come a long way from our initial attempts to understand wetland hydrology, only a few good hydrological studies of wetland have been published The hydrological responses in wetlands are the core information in understanding of ecological engineering and environmental issues involved in wetland protection, restoration and creation. Hydrology is the prime driving force in the wetland ecosystems, but little formal hydrological data are gathered in wetlands by hydrometric authorities. There is a need for more research in hydrological processes, especially in groundwater hydrology and groundwater/surface water interaction. Wetland monitoring is an essential to understand hydrology of wetlands and also dissemination of hydrological information which allows an integrated evaluation of the vegetation and habitat conditions through wetland management. The paper focuses on hydrological strategy and number of components to be considered of importance, to develop and manage wetland resources for sustainable watershed management with special emphasis on agricultural use; which helps in understanding the state-of-the-art tasks and recommended activities to achieve the objectives and to outline future research needs. Whatever the potential benefits of wetland agriculture, development will not be permitted to expand in an unrestrained manner. Seeking to stem the progressive encroachment onto, and loss of, wetlands, the international conservation organizations strongly promote the concept of "wise use" of wetlands (FAO, 1998; Nyamathi and Hegde, 2004). Although not necessarily against agricultural development, the Wise Use Working Group of Ramsar has issued "Guidelines for implementation of the wise use concept of the Convention" which call for the establishment of national wetland policies covering all problems and activities related to wetlands.

Global Water Education and Research – Concluding Remarks includes, Bring collaborative partnership approach to higher level, Academic quality assurance! Systems thinking guiding principal to structure education, Diverse mix of occupational competencies needed, Bring cutting-edge ideas into (virtual) classrooms, Use of UN/UNESCO mandate (incl. standard setting), and Promote an open intellectual atmosphere of inquiry, creativity, diversity, innovation and critical thinking.

3. RETHINKING OF EARTHEN CONSTRUCTION FOR A LOW CARBON FUTURE

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ABSTRACT

Earth, in various forms, has been used as the main construction material since early civilization, as evidenced from the remains of the various early civilizations like Mesopotamia and Indus valley civilizations. Because of its availability in abundance, earth had invariably been the main construction material in providing housing systems in the form of fired bricks. With the invention of cement in 19th century by an English inventor named Joseph Aspidin, widespread manufacture of concrete blocks began in 1900s, and their popularity grew rapidly. The development of commercial process for manufacturing concrete blocks led to the employment of concrete blocks popularly known as Concrete Masonry Units (CMU) for many different architectural and engineering functions, since they can last long periods of time, require minimal upkeep and are fire and rot resistant. However, with time, researchers and engineers started realizing the environmental impact of using CMUs, as they are energy intensive and lead to release of Green House Gases (GHGs) through the use of cement as its production is associated with large amounts of carbon emissions and globally it accounts for 8.0% of the emissions.

Since cement has been an important cementitious material used in civil engineering works including in earthen construction, it has become one of the major contributors to carbon foot print from civil engineering activities throughout the world, a need was felt to reduce its dependence. Hence, with a concern to protect the environment, the focus is shifted from constructional convenience using cement-based materials to earth-based construction, however without the use of conventional fired bricks. Sustained concerted research efforts in this direction has led to the development of rammed earth and compressed stabilized earth blocks (CSEBs) for masonry construction as a replacement to the more energy intensive and not so eco-friendly fired bricks and CMUs.

With the recent global attention of environmental concern for climate change as being addressed through the Paris Agreement or Paris climate

accord dealing with greenhouse gas emissions mitigation to keep a tab on the rise in the global temperature, there is need for civil engineers to contribute in this global effort to popularize good practices of using eco-friendly building products and technology in lieu of. They also have to relook the current day design philosophy for a future greener society. With this intention, there is an increasing interest in civil engineering fraternity towards sustainable building technologies.

With the greater insight into the understanding of the factors contributing to the improvement in engineering properties and durability of earthen material as a construction material, the confidence level of handling earthen materials in construction sector is finding a better acceptance. To make it eco-friendlier, the focus is to try alternate stabilizers which are cost effective and reduce the dependence on energy intensive cement for stabilization, which contributes for the emission of Green House Gases (GHGs) in its production. In this direction natural stabilizers in the form of bio-enzymes and biopolymers are being tried in combination with conventional stabilizers like cement in enhancing the engineering properties of earthen materials for construction applications. This would give greater flexibility in handling soils of wider gradation and also reduce the dependence on conventional stabilizers with the use of alternative non-conventional stabilizers. This has lot of practical significance to construction industry in particular and society at large.

4. SUSTAINABLE DEVELOPMENT THROUGH ENGINEERING INNOVATIONS

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ABSTRACT

The relationship between water, food and energy security and sustainable development needs engineering innovations to maintain balance between sustainable consumption of resources and sustainable generation. The engineering processes are shifting focus from conventional extraction, exploration which resulted into exploitation of resources to renewable, recyclable and recovery techniques which are meeting the sustainable growth process. For example, India needs about 5.5 million barrels per day oil to meet its need which is extracted from the sea across the world. India is the world's third largest consumer of oil after the Us and Chaina and spent USD 119.2 billion in 2021-22 for import of 212.2 million tonnes of cruid oil. To meet power demand of India coal production during 2021-22 were 778.19 MT. The coal sources are explored from different parts of the world. The ever growing energy demand coming from economic growth lead to exploitation of resources.

The technological innovations focusing on replacing fossil fuel by renewable energy resources has offered engineering processe based on renewable feedstock, developing biotechnology based synthesis process to generate product which is comparable in cost and quality with product manufactured by conventional method. India needs to produce lit of ethanol to meet 20 percent blending in petrol by 2025 which can be achieved from renewable resources such as oil bearing seeds , maize , sugar cane juice , rice /wheat straw , corn cobs etc . The mix of energy sources such as solar, wind, biogas, tidal, geothermal, etc is offering sustainable solution to development.

The use of hydrogen fuel, deep ocean currents energy generation, construction of underground dams, creating water reservoir at mouth of river near sea , use of new resources distribution network based through piping network are few engineering innovations offering solutions to sustainable development .

108TH INDIAN SCIENCE CONGRESS

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IV
ABSTRACTS OF
ORAL PRESENTATION

1. Redundancy of Respiratory Humidification & Dysfunction of Defense Mechanisms at Upper Airways of Large Number of People Due to Cumulative Adverse Effects of Climate Change - The Root Cause of the Covid-19 Outbreak - An Engineering Perspective

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ABSTRACT

The Covid-19 has returned in the form of an outbreak of new variants. Viruses have evolved and accompanied mankind from times immemorial but seem to be increasingly threatening the survival of the human race especially in the last four decades. Various theories are available with respect to initial transmissions to humans yet none is endorsed in totality. Similarly, climate change poses the greatest threat to human health and its effects are more pronounced in the last four decades. The purpose of this perspective is to establish scientifically a correlation between the outbreak of Covid-19 or its variants and climate change.

This presentation is based on hitherto overlooked yet proven physics and engineering involved in the human respiratory humidification. Respiratory humidification is a uniquely evolved process of Natural Selection to withstand complex and dynamic environments. In animals, migration is seasonal and one of its important purposes is a search for suitable environmental conditions. But humans who are mainly responsible for Climate Change and harm to the environmental balance seem to be bound by occupational compulsions to the extent of threatening their own survival.

As Covid-19 is a respiratory viral disease, the gas exchange mechanism and human body's normal temperature and alveolar air parameters are first explained to justify its uniqueness. A step by step review of physics and engineering involved in respiratory humidification is also done. It is then analyzed in context of Climate Change of a location and its impact on inspired air parameters. Based on Meteorological Data of Wuhan; the place of Covid-19 outbreak; it is established that the Climate Change resulted in redundancy of respiratory humidification and dysfunction of associated immune defense mechanisms of many inhabitants and facilitated viruses like SARS-CoV-2 an unchallenged access to the lungs. These viruses remained in circulation till the persons with most weakened defense mechanisms presented an opportunity to breach ACE2 receptors and result in an outbreak.

Keywords- Respiratory Humidification, Climate Change, Redundancy, Dysfunction of Defense Mechanisms, Meteorological Data, Wuhan

2. Role of Women in the Clean Energy Future

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ABSTRACT

In developing countries, lack of access to energy is an impediment to the well-being and economic chances of women and girls, since it has a significant impact on their living conditions and time management. It weakens their educational and economic opportunities. As conscientious consumers, women may play an important role in the clean energy transition, notably in the home, but also in business and policy making. Women's empowerment and leadership in the energy sector could contribute to the acceleration of the transition to a low-carbon economy by supporting clean energy and more efficient energy use, as well as aiding in the fight against energy poverty. Women's participation in the economy, particularly in the clean energy sector, is encouraged in order to achieve a smooth transition to a sustainable energy system and a green economy. This article discusses the potential and obstacles that women face in this area.

Keywords: clean energy, women, gender balance, transition etc.

3. Comparative study of performance of Artificial Neural Network and Support Vector Machine supervised classifiers in classifying Ambajhari Lake, Nagpur using Landsat-8 satellite image.

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ABSTRACT

Many algorithms have been developed to classify remotely sensed data with overlapping and mixed pixels as its classification is very complex in nature. Support vector machine algorithm is the most commonly used classifier because of its ability to correctly classify the image. Now-a-days Artificial Neural Network classifier, a brain style computational model has obtained greater importance for its capability in classification of the images. The main aim of this paper is to compare the accuracy of the two classifiers in classifying the Landsat-8 satellite image. The result obtained showed that SVM with Linear kernel reported 97.40% overall accuracy, whereas artificial neural network also reported 97.13%. Here in this study both the classifier performed similarly in classifying the water body with 97.96% accuracy.

Keywords: Artificial Neural Network classifier, Support Vector machine (SVM) classifier, Linear Kernel, Polynomial Kernel, Radial Basis Function (RBF) Kernel and Sigmoid Kernel.

4. Development of low cost UV & high-intensity optical filters through parametric studies with products available in the market

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ABSTRACT

In this paper, the author explores alternative band pass filters for optical and UV regions with due attention to the hazardous aspect of radiation to both the eye and imaging systems. For studies purpose, the authors have selected few standard filters and welding glass shields for observing high intensity source, full moon as well as welding arc flames. Using the single slit, wavelength splitter (grating) and optical sensors (Web camera and Digital Lux Meter), the author studied the transmitted spectrum and intensity cut of the standard filters. In the next phase, the author developed optical filters at lab using various semi-transparent materials like cellophane papers, polymers, thin metal Oxide-Spray-Coating and their combinations. Based on the spectroscopic studies, the authors found the materials for Welding Shield, Lunar Filter and Deep Sky Filters using which one can observe welding arc flames, full moon and deep sky objects with clarity & relief to the eye on an observer.

Keywords: Optical Filter, Transmission Spectroscopy, Diffraction grating

5. Design and analysis of improved bandwidth microstrip patch antenna for wireless applications

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ABSTRACT

An improved bandwidth microstrip patch antenna is presented in this paper. With the proper selection of dimensions and positions of slot and notch on the radiating patch, the broadband property of the proposed antenna is achieved.

The bandwidth of such antenna is 30.5% with operating frequency band of 1.56 GHz to 2.12 GHz. Antenna characteristics for different inclination angles "α" are observed. The maximum gain is found to be 9.86 dBi. The simulation, fabrication and tests are done to obtain the desired performance. The simulated results are found to be in good agreement with experimental results.

Key words : Microstrip patch antenna, improved bandwidth, broadband, maximum gain.

6. 3.5 – THz quantum-cascade laser power - locking using an integrated photonic circuit for satellite application

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ABSTRACT

Terahertz-frequency quantum cascade lasers (THz QCLs) have numerous potential applications in imaging, sensing and gas spectroscopy. However, many sensing applications, for example, atmospheric sounding, require long integration times, and therefore a stable THz source power is required to achieve a high signal to noise ratio. The output power of QCLs is susceptible to drifts in the thermal and mechanical environment, optical feedback, spontaneous quantum noise, and instability in the driving electronics. To date, power locking has required the use of external modulator devices (e.g., mechanical actuators, or graphene modulators), resulting in an increase in system size and complexity. In this work, we demonstrate a fully integrated approach, based on a photonic integrated circuit (PIC) structure consisting of a racetrack resonator (RTR), coupled with a 3.5-THz QCL ridge waveguide. A second PIC device was also integrated into an external waveguide module, with radiation outcoupled using diagonal feedhorns, using a precision micromachining technique. A power-locking system was developed, in which the THz power emitted by the unmounted PIC device was measured using a bolometric detector. A proportional–integral (PI) controller was used to lock the detector signal to a reference level by setting a bias current on the RTR modulator. It shows that the system enabled stabilisation of the output power over a 600 s time-period, with a reduction of drift to ~0.1% being observed.

Keywords: Terahertz, Quantum cascade lasers, Photonics, Power-locking.

7. Circularly Etched Slit Shape Microstrip Patch Antenna for Ultra Wide Band Applications

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ABSTRACT

This study describes a high gain, very efficient Circularly Etched Slit Shape Microstrip Patch Antenna for Ku band use. A copper patch is placed over the Rogers RT5880 (lossy) substrate of the proposed antenna. The built design has a return loss of -35 dB, a gain of 4.95dBi at a resonant frequency of 13 GHz, a voltage standing wave ratio of 1.09 and an efficiency of roughly 90%, as indicated in simulation results. This suggested antenna is intended to improve the capabilities of Ku band applications, which are also used in wireless applications. This design, simulation, and analysis were carried out using Computer Simulation Technology programme (CST). We observed that, this patch antenna performs better in terms of gain, directivity, and return loss.

Keywords: Microstrip Patch Antenna, Return Loss, Radiation, Ku-Band

8. Single Microstrip Patch Antenna Using Split Ring Resonators in X-Band

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ABSTRACT

The following paper proposes a microstrip patch antenna that uses gapped split ring octagonal resonators as the metal patch. Microstrip transmission feed line is used as the feeding technique and results in a low and distinct return loss of -35.971 dB at 8.843 GHz (X-band). A VSWR value less than 2 dB guarantees increased power efficiency. The radiation pattern of the antenna yields a gain of 5.8 dBi. For simpler representation, it is also denoted in polar form consisting of spherical angles Theta and Phi. The microstrip antenna thus has a high performance. It therefore has numerous scopes of study in X-band applications like MIMO antenna designs, 5G technology and biomedical applications.

Keywords: Microstrip Patch Antenna, Split Ring Resonator, Return Loss, Radiation Pattern, X- Band

9. Battery management system for lithium ion battery used in electrical vehicles

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ABSTRACT

The battery management system (BMS), as an important link between battery pack, vehicle system and motor, is one of the important core technologies of new energy vehicles. The response and treatment of BMS to faults directly affects the safety and reliability of electric vehicles. This paper focuses on the accuracy, timeliness and reliability testing technology of BMS fault response, based on the hardware-in-the-loop simulation environment and the actual test environment. Study different BMS in battery system fault condition (such as over-charge, overdischarge, over-temperature, over-current) under the condition of the response as a result, the analysis of fault report speed, protect reliability key parameters such as response time and response. The test results show that the BMS applied to ternary battery system is obviously faster than the BMS applied to lithium iron phosphate battery system to diagnose faults and alarm time.

With the promotion of China's "peak carbon and carbon neutrality" target, PV power generation is gradually entering the era of price parity, and cost will no longer be the main obstacle to its scale development, but grid consumption will become the main factor to restrict its further development. In order to further promote the consumption of PV and realize the low carbon transformation of microgrid, this paper establishes a game pricing model led by Photovoltaic Cluster (PVC) based on the response of power demand, carries out the research on the optimal scheduling of PV in microgrid by establishing the game relationship among grid, PVC and users. Firstly, a new IEEE 33-node arithmetic simulation model is built, and secondly, three PVCs are divided among the nodes, and the feasibility of the model is verified by solving the optimal tariff strategy through genetic algorithm.

Key words: Photovoltaic cluster, Game pricing, Optimal scheduling, Demand response, Energy storage, Battery energy storage, Hybrid energy storage, Dual chemistry, Lead–acid, Li-ion, Batteries thermal management systems, Heat pipes, Phase change material.

10. An Insight into Techno-Economic and Feasibility Analysis of Wind/Solar Integrated System-A Review

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ABSTRACT

This review paper describes a Hybrid renewable energy system, "Wind and Solar Hybrid Power System" that harnesses both sunlight and wind energy to provide efficient and reliable output. A Wind and Solar hybrid system is a reliable energy source because it uses solar energy as well as wind energy to create a stand-alone energy source that is dependable and consistent. There are different types of panels and wind turbines available and their selection takes place in such a way that both will give output even when the wind speeds are lesser or in the presence of very less solar irradiance. This paper illustrate an optimization method of generation of power from this hybrid PV/Wind system based on the MPPT (Maximum Power Point Tracking) algorithm for the constant voltage method. The main objective of designing this type of system is to increase stability and efficiency. In this paper, technical and economic aspects of the hybrid system are reviewed and discussed based on HOMER software, and this software is used for the measurement of the economic optimum and performance optimum when meeting the needs of the load.

Keywords : Solar PV System, Wind Energy System, Hybrid PV/Wind System, Optimization using MPPT Controller, Technical Analysis using HOMER Software

11. Lithium-ion Battery Thermal Management System using Thermoelectric module and Microcontroller.

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ABSTRACT

Electric vehicles (EV) develop fast and became popular due to their zero emission and high tank-to-wheels efficiency. However, some factors limit the growth of the electric vehicle, especially performance, cost, lifetime and safety of the battery. Therefore, the management of batteries is important in order to reach the maximum performance when operating at various conditions. Battery Thermal Management is one among the key function of BMS system of battery. during this the various thermal aspects of battery such as Heating, Cooling, Ventilation and Vibrations of battery is regulated to take care of the constant battery temperature at require level during the battery Charging and Discharging process to ultimately improve its Life Cycles and efficiency. The cycle life goes down slowly below 10°C due to anode plating causing sluggish chemical reactions and drops off quickly above 60°C due to the breakdown of electrode materials. Thus, Generally the temperature must be controlled between 20°C and 40°C to make sure the performance and cycle life for the chemical batteries like Lithium-ion.

Rate of warmth transfer by Convection and conduction can be enhanced by the liquid fluid transfer through the heat exchangers instead of direct air cooled. to enhance cooling/heating power of passive liquid systems, there are two possible upgrades. One is thru thermo-electric modules, which can be introduced here. the most purpose of this paper is to develop a BTMS model for balancing the different cooling and heating circuits within the battery pack to fulfil the performance requirements.

Thermo-electric module can convert electric voltage to temperature difference and vice-versa. Here the previous effect is adopted, meaning it transfers heat through the module by consuming electricity directly. Some fans with cooling and heating tubes are installed to enhance heat transfer by forced convection. It's easy to modify between cooling and heating operation. to realize that, the poles of electrodes have to be reversed and also the temperature is maintained by regulating the voltage supply to the modules in four stages, with the assistance of PIC18F458 microcontroller. Which makes this technique universal and

can be adopted in any EV at any atmospheric conditions. The combine a passive liquid cooling system with thermo-electric module, the combined system is in a position Cool-down the battery even lower than the intake air temperature, but the facility is still limited to around some hundreds of watts and less than one

Keywords :- Battery Thermal Management system (BTMS), Thermoelectric module, PIC18F458 Microcontroller, Heat exchanger, Battery Cycle life, Electrical vehicle

12. Potential of Green Hydrogen and Its Generation by Atmosperic Moisture

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ABSTRACT

Understanding the contribution of green hydrogen and its potential future low carbon society. Making availability of Hydrogen at the domestic and commercial level, by making its extraction easier by converting renewable energy into hydrogen fuel using atmospheric Electrolysis or Biomass method. Enriching the hydrogen society for by adopting the various efficient and most economical ways of generation of hydrogen. One of the best way is to put back all Hydrocarbons and petroleum fuels with green hydrogen as industrial fuel. Hydrogen plays a key role in many industrial applications and is currently seen as one of the most promising energy vectors. Many efforts are being made to produce hydrogen with zero CO2 footprints via water electrolysis powered by renewable energies. The conventional coal gasification and steam methane reforming (SMR) process for hydrogen production are undesirable due to huge emissions of CO2. Thus, cleaner technology based on Thermal decomposition of Biomass or Electrolysis of water, are the need of today's Hydrogen Revolution. Also then making the proper storage and utilization of hydrogen by best suitable methods to get optimum results is essential to complete the hydrogen cycle. One of this way is by using the solar energy to extract the water molecules from the atmospheric moisture and powering it for electrolysis to extract the green hydrogen from moisture collected with maximum solar to hydrogen (STH) efficiency, just like plants do in nature through photosynthesis.

Keywords: Atmospheric moisture, Biomass, Electrolysis, Hydrogen, Low carbon society, STH efficiency, SMR (Steam methane reforming).

13. Towards the development of miniature low cost vacuum casting setup for Titanium casting

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ABSTRACT

Rising costs of health care are attributed to an increasing number of medical procedures with great complexity and costly instrumentation. Novel materials and devices must be developed to reduce the time, economic cost, and physical pain associated with invasive orthopedic surgery. Casting of titanium is no simple task when one considers thousands of foundries in existence producing cast parts from other metals. The difficulties are that titanium must be handled more carefully because molten titanium is very reactive to liquids, gases and solidus. At present, consumable vacuum arc melting offers the only suitable commercial method of producing titanium casting. The rapid contamination of titanium at elevated temperature by oxygen and nitrogen and the severe damage to ductility by small percentages of such contaminants requires that melting of titanium be done in the absence of air. Because liquid titanium is an extremely effective solvent, problems of containing the molten metal within a crucible during the melting operation are encountered.

This study introduces a new vacuum casting setup used to cast titanium casting. Experiments were conducted with aluminum alloy to investigate the accuracy of the setup. Implant fabrication is carried out with the aid of machining process which is difficult to machine, if the shape is intricate. Casting is one of the best routes to cast the complex geometry with the application of rapid prototyping technology. The proposed setup in this paper for the casting of titanium under vacuum was designed and developed in-house, equipment opted and setup design after thermodynamic calculation for a vacuum chamber and minimizes required vacuum level for melting of Ti. Melting is by induction furnace, metal is directly poured with the help of bottom pouring crucible mechanism mold prepared by zircon sand, and the pattern used for mold making is made on rapid prototype machine having acrylonitrile butadiene styrene (ABS) material. A promising new technique for direct melting and pouring of titanium alloy for medical implants was emerged from this study. This research demonstrated the feasibility of direct melting and casting of the Titanium alloy by vacuum technology.

Keywords: Titanium, vacuum casting, Implant, bottom pouring, Rapid prototyping.

14. The Problems of Right Hand Driving and Remedy.

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ABSTRACT

It is said that pedestrians should walk on the right side of the road in order to see the vehicles coming from the opposite side. If pedestrians are also walking on the right side of the vehicle, the driver's position should be on the left side of the vehicle. It is difficult for the driver sitting on the right side of the vehicle to know the exact position of the pedestrian on his left side.

Buses do not have doors in most places in India. Do not close the doors. Due to this, a large number of passengers are seriously injured and die every year due to falling from the vehicle, people getting out of the vehicle after the vehicle starts moving and climbing into the vehicle. Since the driver's position is on the right side of the vehicle, it is not possible to see what is happening on the left side of the vehicle properly. The driver sitting on the right side has to turn his head to the left side to look at the mirror on the left side. This makes it impossible to look at the left side mirror at the same time and pay attention to the vehicle coming from the opposite direction in front. This causes an accident. If the driver's seat is on the left side, if you look in the mirror on the immediate left side, you can see people getting in and out and the vehicle coming in front at the same time. In India, vehicles stop and park on the left side. Two-wheeler drivers put their left foot on the ground and lean to the left. This also causes more inconvenience and danger to pedestrians walking on the right side.

Keywords: pedestrians, right hand driving, safety, drivers seat, accident.

15. Implementation Of Technology In Healthcare System And Future Scopes

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ABSTRACT

This paper reviews Health. The main objective is to discuss the Major keywords given below. Another objective is the use of various types of AI/SENSORS based health facilities. Till now most times sensors used to be a part of health and various activities but now it has been replaced by AR and VR setups which made it very easy. This paper reviews about Sensors, Tech health, Printed Organs, Voice assistant in health, AR/VR, Nano technology. Big Data which is making an impact in the world in mere future. Also, a new concept of 3-D printed organs which connects with the environment and implants organs into human body. This technology is also called as Bioprinting the current state is not such good making an organ to implant into human body. Also, the reason behind bringing this technology is the next version of traditional 3-D printing.AI based voice assistant may also help in health by just giving a part of voice commands to the environment, especially older people can use it which helps them.AI will be leading from the front in all types of industries/sectors rather than health. Mind uploading is a futuristic technology which creates an environment with humans and machines, a neurotic environment which enables to store it as a permanent data for the future generations. Nano Technology is a combination of biology and nano particles are used to treat various tare used to treat various types of diseases. This technology is currently emerging and will a part of future inventions for development and treatment. Big Data is one of the biggest amounts of information on a given topic. Big data helps the health sectors to learn people's lifestyle needs and helps health sectors to service and produce it accordingly. Big data provides a large information to biomedical research to makes patients get cured fastly. Big data also gives future predictions to the upcoming pandemic.

Using of sensors and AR/VR techniques would help us to reduce times in the process. These techniques can be used to make our health much better. Tomorrow we may see this as the above given technologies as a part of daily usage.

Keywords: Genomics, Sensors, Tech health, Printed Organs, Voice assistant, AR/VR, Nano technology, Big Data, Mind Uploading.

16. Design of LiFePO4 Battery by Using Active Balancing Method for Hybrid Electrical Vehicle

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ABSTRACT

The demand for vehicles in the market is increasing with the increase in population and the economy of people. The vehicles are gradually using fuel such as petrol or diesel to run the engine during the demand for various vehicles in the market is increasing within the increase in population and economy of people. The combustion of various harmful gases is produced like carbon dioxide, carbon monoxide, Sulphur dioxide, etc.

In this project, we are implementing the technique of modified moped from Internal Combustion Engine (ICE) to hybrid electric vehicles (HEV). The main equipment is composed of a 1 kW motor with a sine wave converter and 1.843kW of LiFePO4 battery are calculated from weight and velocity requirement. The battery packing and heat generation evaluation by using the principle of thermodynamic law and simulation model with solid works is illustrated.

Battery balancing management is important since it has a crucial role in the power battery management system operation. The battery balancing management aims to make every single cell's battery capacity consistent, extend battery cycle life and improve battery usage efficiency. This project proposes an active balancing charging module with continuous and controllable isolation on the basis of related research work. The structure and principle of the active balancing charging module are analyzed and explained in detail. A battery testing system and LiFePO4 battery are used for the testing. The experimental results show that the active balancing module performs well in the charging process compared with the battery pack without balancing and the efficiency of the module is high. There is both theoretical and value in the research.

The project's main aim is to give a clear idea of the exact efficiency of the LiFePO4 battery.

Keywords — LiFePO4 cell, Active balancing, Battery management system.

17. Electricity Generation in Road Transport Using Pressure-Based Sensors

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ABSTRACT

Energy is a basic requirement for the modern world's development. To fulfill the regular need for energy, we must create a system that produces power without harming the environment. This study seeks to demonstrate how man has used and optimized kinetic energy. According to studies, the globe has depleted its energy supplies. Fossil fuels harm the environment. Nuclear energy necessitates the careful treatment of both raw and waste materials. The emphasis is currently shifting toward non-polluting renewable energy sources. This study seeks to demonstrate how energy may be created, stored, and consumed utilizing road transport pressure or any other type of pressure[1]. The number of automobiles going over speed bumps on roadways is rising on a daily basis. It is possible to tap the energy and generate electricity by converting the speed breaker into a power producing unit. The produced electricity may be utilized to light the lamps near the speed breakers, which will be a huge help to the remote settlements. As a result, the piezoelectric effect is a reasonable idea. It is a novel concept with promising potential in the field of sustainable energy. It is reasonably priced and simple to install, plus it recycles otherwise useless kinds of energy. The parameters provided here are approximations, and subsequent experiences have demonstrated that a higher quantity of energy may be created by similar techniques.[2]

Keywords: Piezoelectric effect, energy harvesting, renewable energy source, smart road, heavy traffic correlation

18. Non-Newtonian fluidization in binary solid mixture

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ABSTRACT

Liquid-solid fluidized beds are extensively used in the chemical and processing industries. Fluidization of non-spherical binary particle beds with non-Newtonian pseudoplastic liquid was investigated. An aqueous solution of the sodium salt of carboxymethyl cellulose (SCMC) at differing concentrations 0.4-0.8 kg/m3 was used as the liquid phase in two columns with an internal diameter of 0.054 m and 0.072 m, respectively. The binary mixture of sand (differing in sizes) was prepared by mixing two different-sized sand in various weight ratios. The effects of different operating parameters were investigated. An empirical correlation has been developed to determine the minimum fluidization velocity with acceptable statistical parameters. The applicability of GA-ANN modelling has been investigated.

Keywords: Minimum fluidization velocity, non-Newtonian liquid, Effective viscosity, GA-ANN

19. Adsorptive Removal of Crystal Violet from Synthetic Medium using Water Hyacinth Root

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ABSTRACT

Synthetic dye-containing industrial wastewaters have become one of the most significant sources of pollution in the environment. In the present study, Water Hyacinth (WH) Roots are used as a bio-adsorbent to remove Crystal Violet (CV) in the batch mode and fixed bed continuous column process. The hyacinth roots are characterized by BET, SEM, EDX, FTIR, XRD. WH is an aquatic plant; hence the roots can adsorb dyes from running water and stagnant water. The effects of various operational parameters were investigated. The different kinetics, isotherms and thermodynamics parameters were tested.

Incineration was safe for the disposal of used adsorbents. Incinerated ash was transported to brickyard and road construction site to use as material. The hyacinth roots are suitable for dye adsorption for small and medium-sized industries in rural India and 3rd World countries.

Keywords: Hyacinth root, Crystal Violet, Batch study, Column study

20. An Idea to Design New Age Electric Vehicles to Overcome Existing Challenges in India

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ABSTRACT

An electric vehicle drive train has a drive motor to generate linear motion of the vehicle and an energy storage device to provide power for the motor uses. Present design takes advantage of the powerful wind force generated by the vehicle motion. Wind driven turbine of particular design is mounted to rotate the wind energy capturing devices, conveniently installed on vehicle to transform wind energy into electrical energy for feeding such energy into the battery pack. Thereby driving range is extended of the vehicle between external charging cycles. This invention is energy-efficient and cost-effective as well as an environment-friendly approach.

Keywords: Electric vehicle, Wind-force, Wind turbines, Energy-efficient, Cost-effective.

21. Possibilities and Technologies of Solid Waste Management in Cold Region

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ABSTRACT

Proper solid waste management is an important activity for any civilized society. Improper management adversely affects human health, environment and ecosystem. SWM is a more complex and challenging task in cold and hilly regions compared to tropical and plain regions, as it affects the process of collection, storage and biological activity, respectively. The increase in tourism and urbanization has led to major challenges of solid waste management in cold regions and urban centers. Lack of proper SWM facilities in some places led to open burning, illegal dumping affecting the ecosystem. This paper emphasizes on re-use and resource recovery methods using waste for energy production as a viable option for sustainable development. Possible improvement of existing SWM practices through revised SWM rules, community participation and promoting initiatives like 'Ban of single use plastic' can eliminate illegal and unhygienic practices and impact on environment.

Keywords:- Cold Region, solid waste management, ill effects, ecology, resource recovery, sustainability, waste to energy.

22. Industrial History of India & Engineering Developments In The World

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ABSTRACT

Engineering Developments are the prerequisites of industrial developments. Presentation is divided into two parts :- Engineering Developments In The World & Industrial History Of India. Industrious nature of man connotes his inherent creativity. Presentation proceeds right from the definition of Industry up to future of Indian industries. Objectives of this paper is to make the youngsters know as to how much painstaking efforts had been exerted by the past industrialists in adverse conditions of those olden days. Most of the scientific inventions and discoveries were from Europe and America. Sciences were applied to develop various technologies, transferred to businessmen to put those to work in industries on commercial line. But raw materials like iron ore and cotton were transported from India to England before 1947, that were converted into equipments and machineries and sent back to India obviously at higher costs, but this had given spur to Indian industrialists. Industrial development here was possible due to the fact that Indians are the best businessmen in the world. Though machineries were available from England, they intelligently tackled the task of making industries viable. A typical irrelevance also persists in Indian, Asian industrial field that highly educated persons are lacking in necessary adventure whereas barely modicum of education is more adventurous to go for industries and ready to bear risks. All industrialists are broadly categorized into : Academic Industrialists & Commercial Industrialists; the reasons therein are explained. Future challenges before Indian industries and possible solutions are also discussed. In Indian economics, the prospects of industrial civilization is multi-farious and its advantages are integratively contributing to the country's well being.

Key words :-Definition of industry, industrious nature, inherent creativity, scientific inventions and discoveries in Europe & America, iron ore, cotton, viable industries, Academic Industrialists & Commercial Industrialists, future challenges before Indian industries and possible solutions, country's well-being, etc.

23. Satellite Technology and Application Improved Indian Economy in Many Folds

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ABSTRACT

Indian Space Research Organization (ISRO), Department of Space is the nodal agency for the Space Research activity. Main responsibility is to provide data on Earth Observation and Location based Services using NavIC constellation, Disaster Management Support Programme (Cyclone and Floods Mapping & Monitoring, Landslide Mapping & Monitoring, Agricultural Drought, Forest Fire, Earthquakes, Extreme Weather Monitoring and experimental Forecasts and so on), mobile communication, satellite communication, TV etc.

Polar Satellite Launch vehicle being used to keep the satellite in Polar orbit. IRS (Indian remote sensing) series of satellites, that has enabled unique applications of space based imaging are, Cartosat-1 & 2, Resourcesat-1 & 2, Oceansat-1 & 2, Risat-1, Megha-Tropiques, SARAL, Scatsat, INSAT series, and host of other satellites. Geo stationary Satellites being used for the various communication applications.

This paper highlights the space technology developed in india, satellite applications in the area of communication, agricultural, rural and urban development, satellite Navigation etc.

Key word : satellite, ISRO, Earth observation, communication, Launch vehicle, remote sensing, INSAT, Ocean Sat

24. Tri-Hybrid Electricity Generation Method for EV Charging station by using MFC, Solar and Wind Energy

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ABSTRACT

This paper reviews Microbial Fuel cell, Solar & Wind energy. First objective is to discuss microbial fuel cell. Second objective is to put forth various experiments done by me in generating electricity through microbial fuel cell. Till now majority of Microbial Fuel cell are using graphite as anode and cathode separated by Proton exchange membrane. I have used Graphite and Magnesium as electrodes for generating electricity in single chamber without any membrane. This MFC can be used for various applications. Also a new concept of generating electricity with solar panels and using the area beneath it for generating energy with MFCs, while at the same time a small wind turbine while be used as a third hybrid electricity generating partner. This technology can revolutionize the current energy production method. Also the reason behind bringing this technology into light is to show that it is green, free, hazard free, flexible, compact and unending availability. One can generate electricity at home for own consumption. This generated energy is going to be utilize for charging of Electrical vehicles at different places.

Microbial cell is a very easy and simple method to get energy from soil. This battery generates voltage of 1.5 to 1.8 volts. It is totally green and renewable. This energy can be used to turn on led lights, buzzers, calculators, digital watches etc. Tomorrow we may see this energy being used in many Gadgets (as energy requirement for electronics devices getting reduced day by day). This paper is a result of 7 years of research and development, trial and error and infinite ideas.

Keywords: Microbial fuel cell, Renewable energy, Free energy, perpetual energy, non-conventional energy, EVCS Electrical Vehicle Charging Station

25. Development of Sandwich Structures for Defence technological applications

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ABSTRACT

New materials are the building block of Defence technologies. Emergence of sandwich composite materials has made it possible to design and develop defence technological items. Radome is a protective housing material system between antenna and the environment where sandwich configuration of composite material plays important role to protect Radar items with minimal impact to the performance of the antenna. It is generally a structural, weather proof enclosure that protects a radar antenna from environment. It also preserves vehicle aerodynamics strike protection, and maintains stealthy attributes. Optimum composite material is an extremely important, critical component of a reliable and highly functional radome antenna system. The major design parameters for radome included rigidity, insulation, vibration and thermal and mechanical shock resistance. FRP honeycomb sandwich composites are suitable material to meet these requirements. In this backdrop, based on an adhesive and fabric screening program, a rubber-modified special resole adhesive and a flexible grade plain weave glass fabric were found suitable for the fabrication of a glass-reinforced plastics honeycomb core structural constituent material. Sandwich structures of different densities have been fabricated. A regression analysis has been made to correlate the mechanical properties (M) with the density (p) for a wide range of sandwich structures based on honeycomb as cellular plastic core material. An analytical model of the form $M = K\rho n$ was derived, with two empirical constants K and n. The density exponent n was found to remain between $1 \leq n \leq 2$ in all cases. An equation was also derived to correlate thermal conductivity with density. The dynamic mechanical analysis (DMA) results revealed that the glass transition temperature of the matrix thermosetting resin associated with the sandwich structure was found to be higher than that of the corresponding facing laminate or the cured cast resin. In recent times, rapid expansion of the use of FRP composites in the area of sandwich and micro-sandwich structure has

opened up new areas of engineering applications like armour, ballistic composites, drone structures, radomes, synthetic wood and even transparent windscreen for aircraft. Sandwich structures based on honeycomb and/ or syntactic structural foam are important materials for construction of Radome and many hi-tech items of interest to the designer. The discourse also highlights the details of emerging areas of special kind as referred above and also of optically transparent sandwich composite materials for the development of windscreen of light combat aircraft (LCA, Tejas) and armour systems.

108TH INDIAN SCIENCE CONGRESS

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V
ABSTRACTS
OF
POSTER PRESENTATION

1. Role of chemicals in Petroleum industry

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ABSTRACT

The Petroleum industry deals with exploration, production and transportation of crude oil. The oil industry requires new innovative technologies for production of crude oil & gas. Oil field chemicals plays a very vital role in Exploration, drilling & production to ensure smooth production and transportation of petroleum and petroleum products. Oil field chemicals offers exceptional applications in operations including drilling, cementing, Stimulation, improved oil recovery and crude oil transportation in extreme environmental conditions. The paper intends to highlight some of the issues in petroleum industry and how new generation of chemicals can rectify these issues and provide long-lasting solutions.

Keywords : Petroleum industry, Drilling fluids, Production, Well stimulation, Oil field chemicals

2. Treatment of Oilfield Scales in Petroleum Industry

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ABSTRACT

Scale formation is one of the major issues in oil industries which is responsible for a decline in production and economical loss. Scale deposits can vary from mild scaling tendencies to extreme. The scale deposit causes a reduction in formation pores, declining productivity and eventually blockage of the wellbore and hence unexpected downtime if it is allowed to persevere. More deposition leads to low operational efficiencies and create a major issue in the industry. There is a need to build up a better management strategy to deal with the issue. Scale prevention method should be implemented from initial stages rather than letting it build up and then apply a remedial action. Also descaling tends to be economically expensive procedure. Methods should be implemented which can reduce or nullify the scale deposition process in the initial stages, so that it doesn't adheres the production. The concept of scale formation needs to be studied to avoid wrong choices as remedial action which could be risky for production. This review reflects on the scale formation and its impact on oil industry.

Keywords: Scales, Scale inhibition, Scale treatment, Scale occurrence, Scale formation, Scale deposition

3. Synthesis and Application of Pour Point Depressant from natural fatty acid as Viscosity Reducer for the Crude Oil of Onshore field

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ABSTRACT

Crude oil having high wax content causes problem during production, storage and transportation. When temperature decreases, waxes separates out from the crude oil and deposit on the wall of the tanker or pipeline, decreasing the flow of crude oil. Worldwide different methods are used to minimize the problem for smooth transportation of crude oil. Present work aims to determine the effect of laboratory synthesized pour point depressant which improves the property of waxy Crude oil of Ahmedabad field. The chemical additive is synthesized from natural fatty Acid which are Polymer additives used to decrease the crystallization of wax. Also Flow assurance is one of the major technical challenges in oil and gas production operations. The Transportation of waxy crude oil faces great challenges due to shear and temperature dependency. Some PPD were synthesized from natural fatty acids and characterized through GPC, FTIR.

Keywords – Pour Point, Pour Point Depressants, Flow improvers, wax, crude oil

4. Additive Manufacturing and Sustainable product deign

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ABSTRACT

The emergence of Additive Manufacturing (AM) techniques opens up a number of possibilities that could be very advantageous to designers and improve the sustainability of items. Many of the production limitations that may previously have jeopardised a designer's ability have been eliminated by additive manufacturing technology, to create the thing they had in mind. Additionally, products can be highly personalised for the consumer. Thus once more potentially extending their longevity by boosting their appeal, pleasure, and attachment. As AM technology advances, more novel materials are become available. However development of AM, the field of product design could undergo significant change

Keywords: Additive manufacturing, sustainable product, product quality, mass production

5. Role of Nano Crystalline Spinal Ferrite Material in Switch Mode Power Supply as Magnetic Energy Storage device to improve the efficiency.

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ABSTRACT

Herein, the magnetic properties such as Saturation magnetization [Ms(emu/gm)], Magnetic moment [Mr(emu/gm)], Coercivity [Hc(Oe)], are reported for the series [Cux Co(constant) Ni0.8-x Fe2O4] where constant=0.2 with x=0.2, 0.4 and 0.6 of nano crystalline spinel ferrites, synthesized by Sol-Gel auto-combustion technique .High purity metal nitrates are used for synthesis and citric acid as a catalyst. The variation in the Saturation magnetization [Ms(emu/gm)], Magnetic moment [Mr(emu/gm)], Coercivity [Hc(Oe)] are studied at room temperature due to the effect of substitution of Cu2+ density 'x' in [(Ni0.8-xCux Co(constant))Fe2O4]. The nano crystalline spinal Structural of ferrite material is confirm Fourier Transform Infrared Spectroscope (FT-IR). The magnetic properties are studied by using Vibrating Sample Magnetometer (VSM). The variations in the magnetic properties of the prepared ferrite material are discussed. The fabricated nano crystalline material is use as ferrite core in an inductor coil.

Keywords - Sol-gel auto-combustion, FT-IR, VSM, Voltage, Current

6. A Hybrid STAT-COM with Wide Compensation and DC-Link Voltage

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ABSTRACT

In this project, a hybrid-STATCOM in three-phase power system is introduced and discussed as a cost-effective reactive power compensator for medium voltage level application. Because of these prominent characteristics, the system costs can be greatly reduced. In this thesis, the circuit configuration of hybrid-STATCOM is introduced first. Its V–I characteristic is then analyzed, discussed, and compared with traditional STATCOM.

In the consideration of the reactive power compensation range and the avoidance of the potential resonance problem, the system parameter design. After that, a control strategy for hybrid STATCOM is proposed to allow operation under different voltage and current conditions, such as unbalanced current, voltage dip, and voltage fault. Finally, simulation and experimental results are provided to verify the wide compensation range and the good dynamic performance of the proposed hybrid-STATCOM.

The size of components used in STAT-COM is less than the components used in the SVC. The output current of STATCOM can be controlled up to the rated maximum capacitive or inductive range. DC-link voltage and current and ultra apacitors current and voltage, load current ultra capacitors allows recovering energy for the proposed structure supplying and absorbing the power peaks through many benefits can be expected.

Keywords: Hybrid-STATCOM, low dc-link voltage, STATCOM, wide compensation range.

7. Automatic wireless power transfer technology for Electric Vehicle

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ABSTRACT

Electrical vehicles are a recent trend in electrical world. EVs help to reduce fossil fuel consumption and hence preventing emission of Green House Gases. The development of Electrical vehicles, electrical hybrid vehicles are in high demand due to their increased benefits and they are ecofriendly. The main barrier to this development are high price, weight, volume, driving distance, and limited investment in charging infrastructure.

Electric vehicles, traveling range and charging process are the two major issues affecting its adoption over conventional vehicles. With the introduction of Wire charging technology, no more waiting at charging stations for hours, now get your vehicle charged by just parking it on parking spot or by parking at your garage or even while driving you can charge your electric vehicle. As of now, we are very much familiar with wireless transmission of data, audio and video signals so why can't we transfer power over the Air. Thanks to great scientist Nikola Tesla for his limitless amazing inventions in which wireless power transfer is one of them. Shaped magnetic field in resonance (SMFIR) technology enables electric vehicles to overcome these limitations by transferring electricity wirelessly from the road surface while vehicle is in motion. This work describes the innovative SMFIR technology used in the Korean Advanced Institute of Science & Technology online electric vehicle and wireless electrical vehicle charging lane in UK. Electric power transmission is the bulk movement of electrical energy from a generating site, such as a power plant, to an electrical substation. The interconnected lines which facilitate this movement are known as a transmission network.

Keywords: Electric Vehicle, Wireless charging Transportation, SMFIR, Battery, WPT, Eco friendly

8. Artificial Intelligence in Cyber Security

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ABSTRACT

This paper discussed about the use of artificial intelligence (AI) in cyber security. With the increase in automation cyber security has become a major concern. Threat to cracking passwords and sensitive data is risk for organizations and institutions. There is a big concern to find perfect solution and to stop these day by day increasing crime in this digital world. With recent advancement in AI the risk of cyber attack and crimes grow exponentially. AI has been appiled in almost every field of science and engineering.AI has created a big revolution till date. There is risk of increasing cyber attacks, as AI is also udes by the hackers making cyber attacks "Inteligent cyber attacks".

The large amount of data and process cannot be handled by humans without the help of Artificial intelligence (AI). It is not easy to effectively defending the ever increasing attacks in cyber networks with conventional fixed algorithmic software. In this case AI can play a major role by providing flexibility and learning capability to software by using its various methods. Machine learning is the building block of artificial intelligence (AI). AI can pre-detect and take immediate actions on cyber attacks. As it quickly receives the alerts of site attacks and quickly recover. AI plays a major role in storing anonymous amount of data. The time to time verification of data and information ensure that your data is preserved and can be recovered easily.

This paper mainly covers the possibility of replacing cyber security by AI, with its various application and future scope.

Keyword: Artificial intelligence, cyber threats, cyber security, Security protection, Automation, machine learning.

9. Implementation of artificial intelligence in judicial system

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ABSTRACT

The Judicial System in India is under tremendous pressure. As of May 2022, over 4.7 crore cases are pending in courts across different levels of the judiciary. In present scenario judicial system in India is getting stuck to resolve the pending cases.

The only solution to this problem in to introduce artificial intelligence in judicial system; initially it will introduce as an assistance tool. But in later stages it can be use as complete solution for complete solution for complete judicial procedure and judgement.

The solution is to development of the algorithm which includes all kind of laws and rules which is the part of Indian judicial system i.e., Indian Constitution, civil codes, criminal codes etc. The Artificial Intelligence provides data for verification in software. The Judiciary System is in need for a huge help as the human work is not that efficient as per needed. The Solution for each individual case is impossible to result in few hours, so the use of artificial Intelligence will be useful for our Constitution of India.

Keywords: Artificial Intelligence in Judicial System, Cases, Algorithm.

10. The Internet of Things: Mapping the value Beyond the Hype.

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ABSTRACT

By blending physical and digital realms, the Internet of Things (Iot) vastly expands the reach of information technology. The myriad possibilities that arise from the ability to monitor and control things in the physical world electronically have inspired a surge of innovation and enthusiasm. The sweeping changes that Iot can bring to how companies manage physical assets, how consumers attend to their health and fitness, and how cities operate have also inspired visions of a very different future, as well as a good deal of hype. McKinsey has been involved in the Internet of Things over the years and we have seen how rapid advances in technology and know-how have exceeded our expectations—and yet how difficult it will be to obtain the greatest benefits of Iot implementations, which require creating highly complex systems and coordinating technology, investment, and talent across both space and time. The Internet of Things has the potential to fundamentally shift the way we interact with our surroundings. We conducted this research to examine in detail how the Internet of Things can create value, and in the process we have uncovered novel findings about how that value can be captured by companies, people, and economies. Using detailed bottom-up economic modeling, we estimated the economic impact of these applications by the potential benefits they can generate, including productivity improvements, time savings, and improved asset utilization, as well as an approximate economic value for reduced disease, accidents, and deaths.

Keywords – Internet of things, Coordinating technology, Sweeping Changes.

11. Women empowerment in india

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ABSTRACT

Indian women science Congress has done a great work till date. First women's science Congress was inaugurated by Nirupama Rao the great women who is retired civil servant. Women empowerment has been thoroughly discussed in the last two decades it refers to Increasing and improving the social, economic, political and legal strength of the women, to ensure equal -rights to the women. Women are significant contributors to the growing economy. The full participation and partnership of both women and man is required in productive and reproductive life. In all parts of the world, women are facing threats to their lives, health and well-being as a result of being overburdened with work and of their lack of power and influence. The current status of women empowerment is very disbalance across the various segment of the society. Literacy plays a important role in promoting women's right, Various Measures have been taken by ways of enacting laws and implementing policies to empower Women, but still there is a big gap that needs to be filled by way of implement more stronger

Keywords: Women Empowerment, Literacy, Urban, Rural, Adult education, Sexual abuse, Domestic Violence, Physical abuse, Social Struggle, Government Role, Status of Women

12. Wireless petroleum and field monitoring Using gsm technology

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ABSTRACT

The project is used to monitor a multiple remote petroleum oil field tanks status by using wireless communication based on embedded technology. our project is designed for the compact embedded security sensors using wireless remote multiple petroleum. Where we have to use the multiple sensors to monitor the petroleum tank status like oil theft, filtered oil, power failure alarm and some wireless points are used for the security of this petroleum tank. The project split into two sections which provide the automation of wireless security system. One of those projects is wireless remote transmitter section and another one project is wireless central monitoring system. The transmitter section was placed on each remote petrol tank and the central monitoring area is placed by the central unit of receiver. The wireless transmitter section contains wireless oil controlling shutdown alarm, oil filter mechanism, power failure alarm, oil controlling running, and wireless monitoring of oil.

Keywords: - Management of security system, Wireless communication, Embedded technology.

13. Post Covid-19 Engineering Education System-Impact on Students life of Urban and Rural India

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ABSTRACT

In Covid-19 everywhere all Engineering education system turned in to online education (Online teaching-learning) because of which their education level rises to the high level and to improve their level of education multiple advance software solutions came in to the society, but these all changes and updations came in to only Urban areas of India where the resources were available with the parents whereas in rural part of India the situation was quite different in covid-19 period and after covid-19.

In most of the rural areas where the resources where not available the education stopped for almost two consecutive years, which is a very bad for the society. RES was completely on hold in covid-19. Whereas in Urban areas because of plenty of resources were available students become more smarter by using technology. They got various experiences with multiple opportunities. UES become more faster for the students those who were having an opportunity to use all resources they have in the form of DOE.

It has influence in our society such as helped a lot of people who cannot come to the seat of education, and it has its pros such as gives us with an chance to develop technology skills for teachers and students, and cons such as It is known that online education is not for all people, not for the uncontrolled educated or inflexible instructors, and there is a difference between online education and traditional education, and it has types.

Keywords - OES-Online education system, PCE-Post covid education, DOE- Digital online education, RES-Rural education system, UES-Urban education system, PC-Post covid.

14. Industrial automation-The Future of Technology.

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ABSTRACT

Automation is an automatic control in something in which industry uses fewer human labors and more machinery for operations. Biggest benefit of automation industries is that it saves human energy and gives more accuracy and also improved quality. Factories or industries can go fully automatic using AI (Artificial Intelligence), IOT (Internet of Things) or Robotic Automation. As we are moving forward to seek the more advance level of industrial revolution or so-called industrial revolution 4.0 or also 4th iteration of industrial revolution, the technology is getting more and more advanced. The tasks which were managed by humans previously are now done by the machines. This new age is the automation age and thus to gain more accurate results in fields like space, crafting, automobile etc. the automated machines are used. Industrial Revolution 4.0 mainly focuses on automation and thus a massive increase in demand of goods like cars, lenses, and electronic devices etc. have increased.

These goods take a lot of time to manufacture if done by the hand manufactures. So, here's when the automation comes in action automating the process of manufacturing and decreasing the human contact can speed up the process and helps fulfil the demand in time.

Keywords: AI (Artificial Intelligence), IoT (Internet of Things), Robotics, Indutry4.0.

15. Solar Powered smart Arduino-IOT Charging station for E-Vehicles

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ABSTRACT

We Introduce smart charging station for Electric vehicles. Electric charging station is an element in an infrastructure that supplies electric energy for the recharging of electric vehicles, such as plug-in electric vehicles, including electric cars, plug-in hybrids, etc. Charging stations are inevitable part of electric vehicle ecosystemIn case of India, with road network of 54,72,144 kilometers, the country needs nationwide network of charging stations for electric vehicles as government is planning to sell only EV's by 2030. In current Situation of EV's(Electric Vehicles) there are many problems to recharging battery. That's why people refer petrol and diesel fuel Vehicles Due to less sources of fuel like petrol and diesel obviously need of EV,s (Electric Vehicles) in future In this system we are making smart charging station for electric vehicles(EV's) BMS(battery monitor system) checks current Volts of battery . If vehicles needs recharging , consumer gets message on android phone. Consumer can search nearest smart station using google maps Also can check Waiting time for charging slots of particular station Using Android app consumer can book slot of charging station And easily consumer get recharge battery using this system Using this architecture we can implement smart charging station for Electric Vehicles(EV).

Keywords : BMS - Battery monitoring system

16. To be an entrepreneur for women empowerment

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ABSTRACT

The purpose of this article is to evaluate the entrepreneurship development for women of India, and comparing its performance against leading countries also to produce induction of which entrepreneurial elements should be addressed and how much effort needs it to light end. India should be focused on opportunity perception, start-up skills, and networking to improve its entrepreneurial performance by developing an education policy that focuses on entrepreneurship. The phenomenon of population aging has taken hold and has become an increasingly important social and economic issue in India. Thinking about the population the important factor arise is women employment. It is necessary to be able to determine exactly who entrepreneurs are before we can run into other things, study them, count them, provide special loans for women and calculate how and how much they contribute to our national economy.

Keywords: Empowerment, employment for women

17. Solar PV Plant Re-Powering: Mission Transform-Nation

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ABSTRACT

India is blessed with abundant soar energy (over 5000 trillion KWh/Year) which is many times more than the total energy consumption of the country, and if harnessed efficiently, the country is capable of producing trillion-Kilowatts of electricity. Solar energy is extremely beneficial as it is non-polluting and its generation can be decentralized. There is need to come together and take initiatives to create technologies for a greater use of these sources to combat climate change by reducing the emission of greenhouse gases.

There are two basic type of solar PV plant repowering. The First is for existing plant and second is for extending the life of new plants at the end of their initial design life which is projected at about 20 to 25 years.

In this study the solar PV plant design aspects along with its annual performance is elaborated. The various type of power losses (temperature, internal network, power electronics, grid connected etc.) and performance ratio are also calculated. The performance result of the plant are also compared with the simulation values obtained from PV-syst and SAM software.

Building a robust system id somewhat at odds with building a cheap least cost system. The advantages are O&M labor and project risk are reduced as potential income is increased while dramatically reducing system defects, faults and failures. In other words, they have a superior plant availability throughout their life cycle.

The growing energy demand in developing nations has triggered the issue of energy security. This has made essential to utilize the untapped potential of renewable resources. Grid connected PV System have become the best alternatives in renewable energy at large scale. Performance analysis of the grid connected plant could help in designing, operating and maintenance of new grid connected systems.

Keywords: Energy Security; Photo-Voltaic (PV); Re-Powering; PV Simulation Software; SAM (System Advisory Model); Performance Ration; Grid Connected PV System

18. Effect of Hydrocolloides On Fat Absorption On Batata Wada

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ABSTRACT

Batata wada is popular Indian vegetarian fast food in Maharashtra, India. It is literally means potato fritters. It consists of a potato mash patty coated with besan, then deep-fried and served hot with chutney. While preparing batter of besan hydrocollides were added in the concentration range of 0.5%, 1.0% & 1.5%. Among all the hydrocolloids studied at different levels for preparation of Batata Wada, it can be concluded that Batata Wada formulated with 1.0% MC were found statistically significant over all other hydrocolloids in oil uptake with optimum sensory quality characteristics. It becomes quiet stable at level of 1.0% formulation in remaining hydrocollides i.e. CMC, HPMC. Thus, Batata Wada with low fat and low calorie content with better acceptance can be prepared in order to meet the demand of low fatty foods, of health cautious consumers.

In Texture analysis profile, hardness and stickiness values found at the level of formulation of 1.0% of MC, CMC, HPMC is quiet stable as compared to other level of formulation.

Keywords : Batata wada, hydrocolloids, texture analysis profile, oil uptake, sensory quality.

19. Green Building Technology to Move towards Environmental Sustainability

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ABSTRACT

Demand for natural resources to meet human needs has increased exponentially in recent decades, leading to overuse and exploitation of natural resources and ecological imbalance. In some sectors the change has reached an irreversible level. Construction activities account for half of all energy consumption and raw material consumption worldwide. Commercial and residential buildings account for about 40% of energy consumption, 76% of electricity consumption and 50% of water consumption. If this situation continues, the ability of the global ecosystem to sustain future generations may become a problem. Building construction accounts for the lion's share of resource consumption and major waste generation is from domestic activities. The use of certain non-recyclable materials has posed serious environmental and health problems. Hence the concept of green building has evolved. It is for the welfare of people including stake holders, workers, site staff and general public. The main concept is effective use of various natural resources, protecting the health of the inhabitants, reducing waste products and degradation of environmental quality. Different organizations have developed different technologies and evaluation criteria for green building construction. The government has rolled out several support schemes to encourage such technologies to move towards sustainability.

Keywords: Green building, sustainability, reuse, recycle, conservation, eco-friendly, ecosystem, health, assessment, rating, certification.

20. Memory Enhanced Smart Antennas for Mobile Communications

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ABSTRACT

This paper focuses on the interaction and integration of several critical components of a mobile communication networks using smart-antenna systems. This wireless network is composed of communicating nodes that are mobile, and its topology is continuously changing. One of the central motivations for this work comes from the observed dependence of the overall network throughput on the design of the adaptive antenna system and its underlying signal processing algorithms. In the framework of control methods for adaptive phased-arrays. The paper deals with complex communication scenarios by considering a memory-enhanced cooperative algorithm. Compared to existing approaches where far-field interferences are taken into account, the proposed analysis considers a more realistic situation where the jamming sources are located either in the near-field or in the far-field of the receiving antenna.

21. Women Empowerment in Dhalavaipuram Women Looms Cluster

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ABSTRACT

Women Entrepreneurs in Micro Manufacturing Enterprises in Dhalaivaipuram, Virudhnagar District, Tamil Nadu who are manufacturing garments have to dependent on Common Facility Centre like Looms to increase their Technology, value addition and productivity by adopting Cluster Development Approach. They formed Dhalavaipuram Women's Looms Private Limited to make use of common facility center through Technology interrelationships for cost minimization and profit maximization by converting looms into garments. The objective is to study on the Technology to be adopted by Dhalavaipuram Looms Cluster and Difference in Differences (DID) on the control variable and experimental variables on productivity after Government of India and Tamil Nadu Policy Intervention. The value chain analysis was studied and cluster map were formed. The methodology adopted is by collection of data from 33 Manufacturers and using statistical analysis like CAGR, Descriptive, Correlation, Trend, Regression Analysis and also Structural Equation Modelling. Physical Performance is an increasing trend for no. of units, employment and Production and also for Financial Performance like Turnover as per increasing CAGR. To conclude, as per new Technology Intervention by using machineries like Air Jet Looms, Drop Wire, Air Compressor, Humidification Plant, Knotting and Dressing Machine and value chain analysis the profit earned per member increases. The difference in difference (DID) of the control group (who have not undergone Cluster Development Approach) and Treatment Group (who have undergone Cluster Development Approach) have much difference in differences on no. of units, employment, production and turnover and there is increase in productivity due to adoption of latest technology in cluster development approach by experimental group by managing latest technology in common facility center available in the Cluster. The interrelationships / cluster approach made by cluster

members to make use of Infrastructure, Procurement, Technology, Production and Marketing successfully.

Key words- Dhalavaipuram Women's Looms Cluster, Technology Intervention, Cluster Development Approach, Difference in Differences.

22. A Study on Impact and Scope of Technology in Industry 4.0

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ABSTRACT

Industry 4.0 is a strategic initiative introduced by the German government. The goal of the initiative is to transform the industrial manufacturing through digitalization and exploitation of potentials of new technologies. An Industry 4.0 production system is thus flexible and enables Individualized and customized products. The aim of this paper is to present and facilitate an understanding the impact of technology in industry 4.0 in Indian firms and business, to analyse the drivers and enablers of Industry 4.0 and to study the importance and scope of technology in Industry 4.0. In order to achieve industry 4.0, this study reviews the developments in robotic and automation technology as Industry 4.0 is mostly driven by robots and automation technologies, which is acknowledged by many businesses, research institutions, and academic institutions.

Keywords: Industry 4.0, Big data, Cyber-physical systems, robotics, automation, smart-factory.

23. Effective Use of Supper-capacitor Backup in Solar Inverter for Small offices of rural India

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ABSTRACT

There are repeated power failures in sub-urban and rural parts of India. It causes inconvenience for rural people. As official work, some of the online tasks could not finish within a prescribed time. Sunlight is the major natural source of renewable energy. Solar photovoltaic panels based systems have been used for the past few decades for electricity generation. Maintaining a lead acid battery is a tedious and costly task. Effective use of a super-capacitor and a dry battery is presented in this paper. The result shows the improvement in backup power for a limited period of time in the solar inverter, which will be useful in small offices.

Keywords: Solar energy, PV panel, super-capacitor, offline solar inverter, renewable energy.

24. Automatic Operation of Fire Suppression and Emergency Exit of Electrical Bus

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ABSTRACT

The main idea behind this paper is to propose a model focusing on cost effective design and application of an Automatic Fire Extinguishing System and Emergency Fire Exit for Electric Bus. As we see that lots of bus accidents killed the peoples because of safety issues and in this project we invented a automatic operation of safety equipment's in bus and when the fire takes place the system works with in sec and supressed the fire. We use the Sensors which would be placed across the bus, if bus catches fire the sensor detect and activate the linear actuator. System monitoring using the Alarm Panel at the driver's seat. The alarm panel monitors the fault and will alert the driver in the event of fire and then all fire extinguisher are operate automatically. And at the end it provides safety to the human and bus too.

25. Deep Fake detection model

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ABSTRACT

Deep learning has been successfully applied to solve various complex problems ranging from big data analytics to computer vision and human-level control. Deep learning advances however have also been employed to create software that can cause threats to privacy, and can be used in various malpractices. One of those deep learning-powered applications recently emerged is “deepfake”. Deepfake algorithms can create fake images and videos that humans cannot distinguish them from authentic ones. This poster focuses on providing with the deepfake building algorithms, and the methods to tackle this complex problem with effective model building techniques. We present extensive discussions on challenges, research trends and directions related to deepfake technologies. By reviewing the background of deepfakes and state-of-the-art deepfake detection methods, this study provides a comprehensive overview of deepfake techniques and facilitates the development of new and more robust methods to deal with the increasingly challenging deepfakes. This project aims to guide developers to train a deep learning based deepfake detection model from scratch using Python, Keras and TensorFlow. The proposed deepfake detector is based on the state-of-the-art Efficient Net structure with some customizations on the network layers, and the sample models provided were trained against a massive and comprehensive set of deepfake datasets.

26. Nios II Based System for the Playing of Wave Files on FPGA.

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ABSTRACT

The motivation behind this study is the impact made on today's social media by music players, which include features like portability, size and equalizer functionality for the best possible sound output quality. The objective of this study is to develop a system that reads the wave files present on the Secure Data (SD) card, adjust the equalizer settings incorporated on it, and play them on the speaker with the best possible quality sound output. This can be done with the help of the SD card slot provided on the DE2 board, and its implementation on the board using Altera's SoPC (System-on-a-Programmable-Chip) Builder in the Altera Quartus 9.1 environment. Nios II is a 32-bit soft-core embedded processor architecture designed specifically for the Altera family of FPGAs. Programming of the Nios II processor will be done using the Nios II 9.1 IDE tool.

Keywords: Embedded processor, Nios II embedded design, SoPC builder, and system on a programmable chip builder.

27. Self-Healing Scheme for Distribution System Using PLC

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ABSTRACT

Self-healing schemes in the context of power distribution systems have the objective of performing fault location, isolation, and service restoration in an automated fashion, i.e., without (or with limited) distribution system operator and repair crew intervention. Some of the intrinsic benefits of this smart distribution technology are increased reliability due to outage duration reduction, more efficient use of personnel and resources (crews, operators, vehicles, etc), and increased operational flexibility. Reliability is naturally increased since less time is needed for locating and isolating faulted feeder areas, as well as for restoring customers located on healthy feeder sections. Self-healing schemes are an inherent part of the Smart Grid and are expected to play a fundamental role in modern and future distribution systems. It is worth noting that the switchgear technology (protective and switching devices, including adaptive protection), sensors, enterprise systems and communications infrastructures required for the implementation of self-healing schemes represent the basis for the execution of other smart distribution) applications such as automated system reconfiguration and optimization. Therefore, a growing number of self-healing projects are being implemented by utilities as part of their power delivery modernization plans

28. Reverse power Protection of an Alternator

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ABSTRACT

Today's complex power scenario demands uninterrupted supply for consumer. Therefore generator is the ultimate source of today's life and its function is of heart of power system. Hence it needs the maximum protection from the occurring faults. The generator used is a synchronous machine which can either run as generator or motor depending upon the form of input energy. These generators are synchronized with the bus-bar that is the grid. These are number of faults which may cause heavy damage to generator and simultaneously to the economical situation. The faults are described in the table. Some Abnormal condition and protection system Following are the possible circumstances in which reverse power condition may arise.

During reverse power condition alternator runs as synchronous motor and the turbine acts as a load. Motoring protection is mainly for the benefit of PM and load coming on the generator bus-bar while motoring reverse power protection measures the power flow from bus-bars to the generator running as a motor. Normally the power taken in most cases is low of the order of 2% to 10% of noted power, power factor and current depends on excitation level.

A single element directional power rely, sensing the direction of power flow in any one direction, phase is sufficient. The setting depend on the type of prime mover.

Keywords – PM – Prime mover, Grid (busbar)

29. Wireless charging of electrical vehicles

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ABSTRACT

Now a days world is shifting towards electrified mobility to reduce the pollutant emissions caused by non-renewable fossil fueled vehicles and to provide the alternative to pricey fuel for transportation. But for electric vehicles, traveling range and charging process are the two major issues affecting it's adoption over conventional vehicles.

With the introduction of Wire charging technology, no more waiting at charging stations for hours, now get your vehicle charged by just parking it on parking spot or by parking at your garage or even while driving you can charge your electric vehicle. As of now, we are very much familiar with wireless transmission of data, audio and video signals so why can't we transfer power over the Air.

Basic principle of wireless charging is same as transformer working principle. In wireless charging there are transmitter and receiver, 220V 50Hz AC supply is converted into High frequency alternating current and this high frequency AC is supplied to transmitter coil, then it creates alternating magnetic field that cuts the receiver coil and causes the production of AC power output in receiver coil. But the important thing for efficient wireless charging is to maintain the resonance frequency between transmitter and receiver

Keywords – T&R – Transmitter and emitter

30. Isolator Operator Indicator

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ABSTRACT

This project is about the maintenance of the transformer. As we go in rural areas there is working and maintenance of the transformer. If there is short circuit so maintenance work is carried out. When there is discussion between two wireman, so there is no device to interact with each other and in hilly areas sometimes the workers face network issue at that time we can use this Device. It is applicable in flat areas only that's why we use RNF24.The devices used in this detector are Arduino, Voltage sensor, NRF24Arduino-It refers to an open source electronics platform or board and the software used to program Arduino is designed to make electrons more accessible to artists, designer and anyone interested in creating interactive objects or environments. Project and user community that designs and manufactures single board and microcontroller and microcontroller kits for building digital devices. Voltage sensor- voltage sensor is the sensor used to calculate and monitor the amount of voltage in an object. voltage sensor determine the Ac voltage or DC voltage level. we are using two voltage sensor because to fluctuate when the signal will be displayed. NRF24-The Nordic NRF24 is a family of silicon integrated radio transceivers operating in the 2.4GHz band, the Most popular one being the NRF24 Lo1.This is the core element of some extremely cheap module. it is used because it runs on frequency. Its min frequency is 500 and we are using two nRF24 so it will be both 1 km.

Keywords – NRF 24 – The Nordic nRF24 is a family of silicon integrated radio transceivers operating in the 2.4GHz band.

31. Interdisciplinary Skills of Engineering

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ABSTRACT

Of course, no engineer can be expert enough to be deal with these issues on her or his own. An essential engineering skill is being able to recognise the limits of one's competencies and to procure expertise where necessary, working with people from different sectors and cultures. A project of this level of complexity and political sensitivity will never leave everyone happy. But it is a central feature of engineering projects that choices involve trade-offs. Engineers must work is imperfect circumstances with competing demand. All of this demonstrates that engineers must be able face in many different directions Engineering is not just understanding and applying scientific theory, I believe it's time to redefine the package that makes up the term 'engineering skills'.

We must all work to ensure that the public, especially young people understand the dynamic role of the professional engineer in making a difference and shaping the future of society. And engineering students need to be alert to the broader impacts of what they do. We must teach our engineers to understand the workings of the worlds of business, politics and public policy. We not prepare students for real world problems in all their complexity, I firmly believe that opening minds so wider issues will help engineering departments, like hosts here this evening, to continue to attract the very best student. 'Opening engineers' minds to these wider issues will also be of benefit to society.

My view is that engineers must be more involved in thinking through the relationship between their work and broader society. The motor car example shows how political and economic concerns outside engineering have a profound impact on engineering. The BTC pipeline example shows that engineers can have an equally profound impact on politics and economics Engineers cannot predict the future. But we can use our expertise to have a positive influence on that future.

Key Words: - Ability of exploring content or problem solving

32. Hot and Cold Water Dispenser Plant Using Peltier Module

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ABSTRACT

In the present study, the results of a cold□hot water dispenser with a thermoelectric module system (TMS) is presented. This device can be used to cool water without use of refrigerants. And simultaneously heating can be achieved from the hot side of thermoelectric module to heat the water, this is due to heat absorption and rejection using peltier element. The cold□hot water dispenser with thermoelectric module system consists of a cold water loop, a hot water loop, a coolant loop, and a thermoelectric module. The cooling and heating capacities obtained from the cold□hot water dispenser with TMS are compared with those from a conventional cold□hot water dispenser with a compression refrigeration system (CRS).Compared with the conventional electrical power generators, thermoelectric module offers many advantages, such as environment friendliness, reliability, and absence of moving parts. The cold and hot sides of thermoelectric modules are developed and utilized, especially, to enhance cooling capacity in electronic components. On the other hand, the power input is a function of the cold and hot sides of thermoelectric modules, and the power consumption of these modules is high. As compared with the conventional cold□hot water dispenser with CRS, the cold□hot water dispenser with TMS can be operated at the minimum cold water temperature of 10 to13°C and the maximum hot water temperature of 65°C. The obtained results are expected provide guidelines to design cold□hot water dispensers with TMS.

We have designed the energy, cost and space efficient and also eco-friendly (no greenhouse gas emission) Thermo electric module system, which can provide heating and cooling of water simultaneously. In this project we have used Peltier module based on the Peltier effect, so that we can use the electrical energy to heat as well as cool the water simultaneously. Basically, The Peltier effect is a temperature difference created by applying a voltage between two electrodes connected to a sample of semiconductor material. This phenomenon can be useful when it is necessary to transfer heat from one medium to another on a small scale. The Peltier effect is One of three types of thermoelectric effect (i.e. Thompson effect, Seeback effect, Peltier effect)

Key Words :- Peltier module, Peltier effect, Heating Side, Cooling Side, TMS (Thermoelectric Module System), Eco-friendly, Efficient etc.

33. Wireless AC Power Detector

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ABSTRACT

In Industries accident takes place due to leakage of electricity. The accidents can be avoided by using the wireless AC line detector. The motive of this project is to detect presence of electricity wirelessly. The concept of working behind this project is that a live wire has alternating current flowing through it. These also radiate from the wires and hence can be felt by a nearby sensing circuit which is properly tuned to do so.This simple project has the capability to sense a flow of alternating current around its vicinity without even having a physical contact with the live wire. The concept of working behind this project is that a live wire has alternating current flowing through it. These also radiate from the wires and hence can be felt by a nearby sensing circuit which is properly tuned to do so. The project has an antenna which does this task of receiving these radiated waves. The AC signal from the input is then superimposed on this bias voltage to vary the bias current. Then, the amplified output is taken from the collector and emitter. Variations in the bias current are amplified in the output current. Recall that a voltage divider is simply a pair of resistors. The received waves are then converted into a human recognizable form with the help of a processing circuitry.

Thus the circuit gives an audio visual signal in the form of pulsating buzzer and LED to let the user with the device inspecting the live wire know that there is a current flowing through the live wire. An antenna is an important part of any circuitry which is intended to receive incoming wireless signals. The radiated AC line signals are received by this antenna. These signals are then amplified and fed to the LED blink circuit section. Hence when the LED starts blinking the person testing the wire can know that the wire is Live and hence should be played safe with.

Key Words :- LED - Light Emitting Diode ; AC - Alternating Current

34. Sleep detection and Alarming System using Deep Learning

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ABSTRACT

Using a deep learning technique, we can develop a model which will alert driver and prevent accidents. When a driver is tired of too long route and feeling sleepy in that case our system will warn driver and in spite of that if driver wont wakeup it will automatically stop the vehicle. In that from any dataset of close eye and open eye use in these models. In these dataset various aspects of eyes and from that model sense using python programming language, we edit a time for alarm and in that model some future scope is there, when alarm is activated then all indicators of vehicle turn on and using various technique stop the vehicle in some duration. Its very useful to prevent accident on road. In future we transform to EV and one benefit is stopping the car when alarm is on is quite easy than internal combustion engine vehicle. Artificial intelligence techniques are generally use for various model to prevent accidents and maintain safety for ourself.

Keywords- EV: Electric Vehicle

35. Health Monitoring System using 7 segment display and Aurdino Microcontroller

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ABSTRACT

This study is to introduce developing a new system that monitors heartbeat rate and also body temperature at the same time via mobile phone. The heartbeat sensor was initially designed to measure internal temperature and heartbeat rate of human body which is highly related to heat stroke and heart attack access. The cognition behind this current study is to determine the impact for the implementation of this monitoring device towards the children body temperature state. Heat stroke condition can be caused by body overheating where usually as a result of prolonged exposure to or physical exertion in high temperature. This is the most serious form of heat injury, heatstroke and it can occur if body temperature rises to 104 F (40 C) or higher. The results obtained undeniably implicit that the body temperature increased significantly when children to expose to the environment and heart attack cases cause the persons heart to beat in the dangerous rate at the wrong moment. Thus, the importance of this device evaluated through lecturers, parents and students perspectives was 90% respectively.

It continuously provides following information's to doctors.

1) Heart Pulse Rate

2) Temperature of Human body

So in this way doctors can take action immediate action if necessary. The normal body temperature of a healthy human is 98c. This project gives indication to doctor when the pulse rate start fluctuation just below or above the normal pule rate which is 72pulse/mint. The project presents the design and implementation of micro controller based heart beat and temperature monitoring system using fingertip sensors.

Keywords – SPPU- Savitribai Phule Pune University

36. Smart traffic density controller using microcontroller

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ABSTRACT

In present, vehicular traffic is increasing throughout the world, especially in large urban areas. As the number of road user's increase constantly and current resources & infrastructures being limited; a smart traffic control will become a very important issue in the future. These needs have led to an ever increasing demand for an "intelligent" traffic control system. Therefore, optimization of traffic control to better accommodate this increasing demand is needed. Our project will demonstrate the optimization of traffic lights in a city using wireless sensors. Traffic light optimization is a tough problem. With multiple junctions, the complexity increases as the state of one light node influences the flow of traffic towards many other nodes. We proposed a traffic light controller that allows us to control and study different situations of traffic density. We sense the density of traffic using infra-red sensors. The key role behind the implementation of the "Traffic density based light control system" is to make use of an AT89C51 controller which performs processing of the real time data provided by the infra -red sensors, eventually controlling the traffic flow via the LED traffic lights. Traffic congestion is increasing on the road day- by- day. As a result of which, two main issues arises. The issues are no traffic, but still need to wait Heavy traffic jams. These problems occur due to fixed control on traffic. This research will aim to control the traffic according to the density, but in manner of programming which is already fixed in the system. Engineering Sciences

Keywords: Infra-red Sensors, LED's, 89C51Microcontroller, Digital Display.

37. India s Largest E-Commerence Platform "Paytm"

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ABSTRACT

Paytm is one of the India's largest mobile commerce platform. They started their journey by offering mobile recharge and utility bill payments. Today it offers a full marketplace to consumers on its mobile apps with the introduction of shopping platform on its mobile wallet recharge app. Paytm is deepening their roots in Indian e-commerce market. With a very short span of time, there are over 25 million registered users and are expected to double by the end of this year. Paytm's success is followed by adverse challenges in the face of banks and e-tailors like Flipkart, Snapdeal who are on the path of introducing their own mobile wallets. In order to survive and grow in the market Paytm is developing effective marketing strategies and are expanding their operational competitiveness. Thus, taking a step closer to their aim of strengthening their user base.

Keywords: Paytm Wallet, Banking apps, M-Wallet, E-Commerce market, Online Payments

38. Prevent Rail Accidents via Monitoring Tracks And Gates

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ABSTRACT

The increased growth in the railway sector has resulted in an increase in the train traffic density across the world. This has resulted in the increase in the number of accidents involving trains. In this paper, the proposed system includes several features which prevent train accidents.

Fire detection, detaching of couch automatically when fire is detected in it, automatic railway gate control and track continuity. This system makes use of, fire sensor and other embedded systems. In this system way avoids manual errors and provide ultimate safety to road users. Gatekeeper not necessary and automatic operation of the gate through the motor. The mechanism works on a simple principle.

Railway industry has a valuable role in economic development of each country. India's massive rail network is hit by an average of 300 accidents a year. Accident management in railway decision making has to consider the following two issues to avoid or mitigate the damages

1. Accident prevention and development of an alarming system to predict and alarm before the occurrence of accidents.

2. Reduction of negative effects of accidents after its occurrence through proper emergency and management services.

Railway accidents are often taking place. The reasons are of different types. Improper signaling is the main reason. Very big economical losses are to be faced. So, the precautions are to be taken in order to avoid, such incidents.

Keywords – MSBTE - Maharashtra State Board of Technical Education

39. Diagnostics and Investigation of Performance of 3-Phase Induction Motor on Voltage Unbalance and Stator Inter-Turn Short Circuit Fault.

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ABSTRACT

The induction motor is important driving force in industry. Induction motor operates satisfactorily under balanced normal conditions. It's operating and maintenance cost is low. During operation, various stresses are developed in induction motor which may cause failure of the motor. So, there will be huge revenue loss, as there is contentious variation in supply system due to any unbalance in distribution system. Due to some reasons, if the voltage unbalance exceeds the 3% than the limiting value, then it will be harmful for induction motors. It is essential to diagnose the performance of the motor on unbalanced supply conditions and stator inter-turn short circuit fault. In this paper induction motor model is derived for symmetrical and asymmetrical fault conditions to diagnose the performance at unbalanced supply voltage and stator inter-turn short circuit fault.

As time moves, the machine develops major faults and disturbs the production line leading to major financial losses and production instability. To overcome these losses, the fault should be found out before to it rather than becoming into a major fault. Diagnostic of induction motor fault at early stage of occurrence of fault will prevents the unwanted breakdown.

In this paper, Motor Current Signature Analysis is used as the fault detection method to detect the fault. Motor electrical current signature analysis is sensing an electrical signal containing current components that are direct by-product of unique rotating flux components. Tests are performed online without interrupting production with motor running under the load at normal operating conditions.

Keywords: induction motor, inter-turn faults, balanced and unbalanced conditions, motor fault diagnostics, motor current signature analysis.

40. A Basic Touch-Sensor Screen System

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ABSTRACT

The touch-sensor technology is about using our fingers or some other pointer, to view and manipulate information on a screen. On a conventional system, with every mouse click, the operating system registers a mouse event. With a touch-screen system, every time your finger touches the screen, a touch event is registered.

A basic touch-screen system is made up of three components:

1. A touch sensor
2. Controller
3. Software driver

The touch-sensor is a clear panel, which when touched, registers a voltage change that is sent to the controller. The controller processes this signal and passes the touch event data to the PC through a bus interface. The software driver takes this data and translates the touch events into mouse events.

A touch-screen sensor any of the following five mechanics: resistance, capacitance, acoustics, optics and mechanical force.

Today's thoughts are again around user interface. Efforts are being put to better the technology day-in and day-out. The Touchless touch screen user interface can be used effectively in computers, cell phones, webcams and laptops. May be few years down the line, our body can be transformed into a virtual mouse, virtual keyboard and what not??, Our body may be turned in to an input device!

Keywords :- capacitive sensors, resistive sensors, acoustic sensor and other's sensor's etc.

41. Comparison between Traditional Education & Online Education

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ABSTRACT

Now everywhere all kind of Students turned to online teaching-learning because of which their education is rise to the high level in their jobs and them to take qualifying courses or improve their level of education.

It has influence in our society such as helped a lot of people who can not come to the seat of education, and it has its pros such as gives us with a chance to develop technology skills for teachers and students, and cons such as It is known that online education is not for all people, not for the uncontrolled educated or inflexible instructors, and there is a difference between online education and traditional education, and it has types.

It is highly important to say that learning is no longer confined within the four walls of a classroom. The instructor, armed with a textbook, is no longer the sole source of educational experience. It is also known that Information resources are everywhere, often separated from the learner by time and space. Online Education defines the process of connecting learners with these remote resources. No one can deny that Learning is a lifelong pursuit where training and retraining become strategies for both individual and corporate success. It is noted that there are a variety of Online Education solutions for every educational need. It is thought that some people agree that Online Education has come a long way and opened new vistas in the field of education, some researchers are still questioning the value of learning through non-traditional means. Whatever is the case, there are various opinions to consider and they are all true in their own right.

This search for the purpose of to show people different between online education and traditional education. Many people prefer traditional education than online education.

In Technical Education NBA & MSBTE are important for Maharashtra where everything is decided as per the need of rules and regulation. The exam in Online mode is conducted through MCQ type which is simplest way of conduction of exam whereas in Traditional exam student has to appear for the exam in classroom.

Keywords - MCQ- Multiple choice Questions, NBA- National board of Accreditation MSBTE - Maharashtra State Board of Technical Education

42. Sensitivity Analysis for 14 Bus Systems in A Distribution Network with Distributed Generators

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ABSTRACT

There has been a formidable interest in the area of Distributed Generation in recent times. A wide number of loads are addressed by Distributed Generators and have better efficiency too. The major disadvantage in Distributed Generation is voltage control- is highlighted in this paper. The paper addresses voltage control at buses in IEEE 14 Bus system by regulating reactive power. An analysis is carried out by selecting the most optimum location in placing the Distributed Generators through load flow analysis and seeing where the voltage profile rises. Matlab programming is used for simulation of voltage profile in the respective buses after introduction of DG's. A tolerance limit of +/-5% of the base value has to be maintained. To maintain the tolerance limit, 3 methods are used. Sensitivity analysis of 3 methods for voltage control is carried out to determine the priority among the methods

In this voltage control for a 14 bus distribution system with DGs connected has been studied. A comprehensive approach for controlling voltage is taken into account by presenting three different methods: Reducing reactive power, introducing reactors and switching off capacitors. The coordinated voltage control based on sensitivity analysis has been done here. It has been observed that sensitivity factor is lowest in case of switching off of capacitors and highest in case of addition of reactors for the 14 bus system. Thus a priority based chart for reactive power control has been established from which it can be easily inferred that in case of a sudden increase in voltage while operation with DGs, the first and foremost priority should be switching on reactors.

Keywords – IEEE:- Institute of Electrical and Electronics Engineers DG's Distributed Generators

43. An Automatic Operation of AB Switch Using PLC and SCADA

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ABSTRACT

Now a days in the transmission lines are ON/OFF are the major and important part in the power system. And also maintenance of the transmission line is also important part in transmission line. In the earlier system for the fault like overloading of the transmission line AB switches are used. The main disadvantage of old AB switch, is they can only operate manually. It require man power and it has less reliability so, we are introduce automatic AB switch for the protection of overhead line against overload fault it is operated by PLC system. This AB switch can operated remotely and no man power required on the fault location. It is more reliable and efficient than the old AB switches.

In this system automatic air break switch is applied on the overhead line network. This switch is operated by PLC automation system. This AB switch is installed on transmission line before the main feeder in substation. This switch is very useful to detect and overcome the fault of overloading on transmission line. When on overload condition is occurs AB switch automatically raised and it open the circuit to protect the line. It after 5 second it again close the circuit. If the fault is bypassed then it continuous the supply but the fault is not to be overcome then beep the alarm and then we got to know the occurred fault is savior. This AB switch is very reliable and increase the flexibility of line. Due to PLC automatic it is much easier to access the system and maintain it. Engineering Sciences

Keywords – PLC :- Programmable Logic Controller AB :- Air Break switch

44. Smart Street Light Network Using Industrial 4.O Technology

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ABSTRACT

Generation, transmission and distribution of electrical energy involve many operational losses. We can define the losses in generation technically but distribution and transmission losses cannot be precisely quantified with the sending end information. This illustrates the involvement of nontechnical parameter in transmission and distribution of electricity. Moreover technical losses occur naturally and are caused because of power dissipation in transmission lines, transformers, and other power system components. Technical losses in Transmission & Distribution are computed with the information about total load and the total energy bill. While technology in the raising slopes, we should also note the increasing immoral activities. The system prevents the illegal usage of electricity. At this point of technological development the problem of illegal usage of electricity can be solved without any human control using IoT. With the implementation of this system will save large amount of electricity, and there by electricity will be available for more number of consumer then earlier, in highly populated country such as India, China. Power theft can be defined as the usage of the electrical power without any legal contract with the supplier.

Keywords: Power Theft, Fault Detection, IoT, Street light, Wireless technology.

45. Smart Door Using Temperature Sensor and Oximeter

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ABSTRACT

Due to the successful emergence of the internet of things, sensor-based smart door using Temperature Sensor and Oximeter. A usable non-contact IR temperature sensor that can measure the body temperature without any physical contact is implemented. This paper describes a working prototype of Smart Door using Temperature Sensor and Oximeter system using MLX90614 temperature sensor, DIY Arduino with Oximeter MAX30100 where Ultrasonic Sensor is used for the distance measuring. In this prototype sensor, data is acquired and analysed to give proper feedback to the person with its temperature and oxygen level. The sensor vitals are collected and sent to the Arduino using shielded cable i.e., through wired communication, respectively. Analysis of a person's vitals based on ambient Temperature and Pulse gives a person's real-time temperature and Pulse condition so that if the condition is not normal, then the buzzer and red LED will flash so that preventive measures can be taken to avoid further complication. Per user, data can be saved in the system database for further reference.

Keywords: DIY Arduino, LED, Oximeter, prototype, Smart Door, Temperature Sensor.

46. A Review on Carbon Nanotubes and its Applications

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ABSTRACT

In the field of nanotechnology, carbon nanotubes are the one of the most unique invention and carbon nanotubes are significant material for future. It has been discovered in 1991, because of its huge production they have attracted many industries and companies towards itself. Carbon nanotubes are used in nanotechnology, membranes, capacitors, polymers, metallic surfaces, ceramics, nanomedicine etc. Carbon containing sp2 hybridisation having different structures. graphite is well known example of it but now beside graphite, carbon can form closed and open cages with honeycomb arrangement. Carbon nanotubes are made up of carbon and it is a tube shaped material. its diameter is too small and is measured by nanoscale. The main motive of this paper is to highlight synthesis, properties and toxic effects of carbon nanotube.

Keywords: Nanotechnology, carbon nanotubes, nanomedicine, Hybridization, MWCNTs etc.

47. Will Physical books be gone in the next 5 years ?

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ABSTRACT

It's going to be really interesting to see the future of education, not just because of the covide-19 situation but also the students and faculties using Social media & internet on a very large scale.

As per the today's scenario social distancing is very important to everyone. Everyone is trying to use the social distancing rule compulsory so there is no use of books nowadays. Everyone prepares everything online, even if they are scanning the good books and making them available online in the form of PDF. This kind of practice will definitely change the scenario about using library books. Students and teachers will definitely use a lot of online books in the coming future. But does it really mean we will forget to use physical books in the next 5 years ? I don't think so. Because the smell of books is unforgettable in my opinion, yes I still remember when I was in engineering, whenever I had purchased any of the new books, I used to smell it. Can't forget the touch feeling of the new book. I still remember the important underlines made on all my old books. Whenever I open that page I recall everything. So Physical book is the most important even if everything is available online.

Finally I would like to say physical books can't be gone in the next 5 years in future because of love of physical books from the readers.

Keywords - PDF- Portable Document format, MCQ- Multiple choice Questions, NBA- National board of Accreditation MSBTE - Maharashtra State Board of Technical Education

48. Internet of Things in Agriculture

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ABSTRACT

This literature review on Internet of Things (IoT) in agriculture and food, provides an overview of existing applications, enabling technologies and main challenges ahead. The results of the review show that this subject received attention by the scientific community from 2010 on and the number of papers has increased since then. The literature on IoT in agriculture and food is very much dominated by Asian scientists. In other continents, the concept of IoT was up to recently mainly adopted by non-agricultural scientists. The application area of food supply chains is addressed most frequently, followed by arable farming. Most papers report the results of explorative studies or they present IoT systems that are designed or implemented in prototypes and pilots. The literature reviewed focuses on sensing and monitoring, while actuation and remote control is much less addressed. The findings indicate that IoT is still in its infancy in the agriculture and food domains. Applications are often fragmentary, lack seamless integration and especially more advanced solutions are in an experimental stage of development. Important challenges to overcome this situation include (i) integration of existing IoT solutions by open IoT architectures, platforms and standards, (ii) upscaling the usage of interoperable IoT technologies beyond early adopters especially by the simplification of existing solutions and make it more affordable for end users, and (iii) further improvement of IoT technologies to ensure a broad usability in the diversity of the agri- food domain.

Keywords - Internet, information technology, sensing, control, precision farming, food chains, consumer information.

49. Advance Security System for Cars

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ABSTRACT

The rapid development of electronics provides secure environment to the human in present day of life. Using this development in the field of electronics “Advanced Vehicle Security System With Theft Control” is designed to reduce the risk involved in losing the vehicles and providing accident notification which will reduce the rate of deaths. An efficient security system is implemented for anti-theft using an embedded system occupied with a Global Positioning System (GPS) and a Global System of Mobile (GSM). The user interacts through this system with vehicles and determines their current locations and status using Google map. The user can track the position of targeted vehicles on Google Maps Map. Using GPS locator, the target current location is determined and sent via Short Message Service (SMS) through GSM networks to user by sending SMS user can automatically demobilizes the car by disconnecting the ignition key supply from the car battery. In addition we have given the finger print sensor and car l the user cannot start the car without the green tick from the figure print sensor or license detector the user cannot start the car. If in worst conditions the cars get stolen the user can lock the engine of the car by our engine locking system.

Keywords: Global Positioning System, Global System for Mobile communication, Identity detector, Short Message Service Engine lock,

50. Case Study on DALL-E 2: Science Fiction and Empirical Reality A Key to Future

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ABSTRACT

When we all first gained access to the internet, we got struck by the sense of having the key of summoning anything in existence in just seconds! It was too much to comprehend. Now, fast forward years later we've reached the stage where we discovered the mankind's entire known history. We have turned AI for answers: a new perspective, a world where our collective consciousness leads to a new era. Here is where DALL-E 2 comes in. DALL-E 2 is an example of how imaginative humans and clever systems can work together to make new things - amplifying our creative potential. But when we merge SCIENCE FICTION and FACTS together; the results may be surprising. Who knows maybe we can find something that was beyond human research and be a MAJOR BREAKTROUGH!

Keywords: Artificial Intelligence and Machine Learning, Artistic Transformation, Future of Art, Internet.

51. Identification of CSF for TPM Implementation- A TPM Model Overview

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ABSTRACT

The aim of this paper is to study the Total Productive Maintenance (TPM) implementation and identify the road map for the same. The study and analysis of TPM model, Overall Equipment Effectiveness (OEE) Process losses focused on the extraction of critical success factor (CSF). The identified major CSF rebelliously contributes to the success of TPM.

This study also focused on the TPM criteria and their checklist, which provides the guideline for TPM implementation and shows an examination of how TPM fits into the overall manufacturing system. The step by step TPM implementation program encounters the difficulties and achieves the TPM benefits.

The implementation of TPM should not be seen as a short term fix to production problems. The full deployment of a TPM program typically takes years. Following the implementation of TPM through to fruition requires a focus on the costs of equipment over its entire life cycle. The elements of life cycle costs include acquisition costs, operating costs, maintenance costs, and conversion/decommission costs.

Keywords: Total Productive Maintenance, Overall Equipment Effectiveness, Critical Success Factor

52. Automated Digital Jewellary with AI – Techno-Fashion Jewellary

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ABSTRACT

Lately, wearable gadgets have been on boom, but it has been observed that today's generation abandoned these gadgets in a short span of time. The reason behind deserting these gadgets is seen to be sense of gadgetry look and these technical accessories are not suitable for everyday use.

Jewelry is worn as a symbol of attraction and attachment. "DIGITAL JEWELLARY" is a fashionable accessory with implanted artificial intelligence. Digital jewelry will give you a elegant look with multiple appliances. Microprocessors and sensor chips embedded in the ornament and will perform various task of your cell phones.

This digital jewelry will be designed according to the demands or prerequisites of the user. You can design your digital ornaments in the desired pattern. Your digital smart jewelry can be your portable mobile phone in the form of wearable, attractive accessories.

Hence ultimately, digital jewelry will make you technically updated and look stylish at the same time.

53. A Review on Smart Electrical Vehicle Charging Station

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ABSTRACT

In recent years with the rapid development of the electrical vehicle (EV) of new energy industry, higher requirements are put forward for convenience, safety and reliability of the charging of electric vehicles. Wireless power charging is done by inductive coupling. Inductive coupling can done in both stationary and dynamic conditions. By re-configuring the transformer and altering high frequency, energy is being transferred with low energy loss and fewer demands on the primary circuit. Sufficient power for the battery can be transferred by the primary to the secondary without sufficient energy loss. Electric power is then transmitted to the chargeable battery which is electrically coupled to the secondary circuit through the air core transformer. In case of shuttle bus services, buses can be charged when it waits at bus station. It can also be implemented in rental taxi parking. Thus, the battery in electric buses only needs enough charge to go to the next stop. This decreases the battery size and promotes significant cost saving in electric vehicles. This technology enables efficient opportunities in charging stations, for predefined routes and planned stops reducing down the time of charging. The dynamic charging will promote the use of electric vehicles and reduce petroleum fuel consumption. Delays in traffic signals can now be provided with longer periods of charging and even when the electric vehicle is in movement. Bad weather conditions like rain and snow do not affect the charging capabilities of electric vehicles.

Key Words: WCS, BMS, V1G, IDE, GPS, GSM

54. Fabrication and Characterization of Asymmetric Porous Membranes Based on PLA/POSS Prepared through Nonsolvent Induced Phase Separation

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ABSTRACT

A facile nonsolvent induced phase separation (NIPS) method is used to prepare polylactic acid nanocomposite membranes. SEM analysis shows that all the prepared membranes have asymmetric structure comprising finger like macropores. The XRD and DSC analysis reveals crystalline nature of the membranes. The incorporation of POSS particles in the PLA matrix showed enhancement in the tensile properties and crystallinity of the PLA membranes. The nanocomposite membranes also exhibit good wetting property, whose WCA decreased with increasing POSS content. Furthermore, PLA/POSS nanocomposite membranes demonstrated an excellent oil absorption capacity of about 88%. Hence, it may be useful for the water purification.

Keywords: Nonsolvent induced phase inversion, Polylactic acid, Trisilanolphenyl POSS, water purification

55. Design and development of Carbon cloth based solid contact ion selective electrode for trace level detection of Atrazine in ground water samples

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ABSTRACT

A biomimetic potentiometric sensor for trace level detection of Atrazine was developed. The ionophore used to detect Atrazine in our study is Atrazine based molecularly imprinted polymer (MIP). Non- imprinted polymer (NIP) was also synthesized as a reference in our study. The MIP and NIP was characterized using FTIR technique and FESEM. The composite sensing film consisting of plasticizer, MIP, PVC and lipophilic additive was made on the selected area of carbon cloth using the method of drop casting and the air-dried film is ready to use. The developed sensor is suitable for octamolar detection of Atrazine.

56. CARBON--Capture, Storage, and Distribution

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ABSTRACT

C02 accounts for around 79% of total greenhouse gas emissions. Human activities have forced us to alter the carbon cycle by introducing more C02 gases and sinking carbon absorbers i.e forests, soil, etc. To stop climate change shortly we have to switch from conventional energy to renewable and sustainable sources of energy, but retrofitting existing plant technology for carbon capture and storage (CCS) is a need of the hour. This increase in emissions can create valuable feedstock for the industry like fertilizer, pharmaceutical, and petrochemical by innovating carbon capture facilities. Carbon capture and storage remain a core component of national and global emission scenarios. This article is an in-depth research on current technology, equipment for carbon capture, challenges such as design, development, and scaling up potential associated, and also the development of the Metal-organic framework (MOF). The overarching goal is to generate a balanced solution to any engineering problem. If an engineering project benefits one of the major aspects of “Carbon Capture” but ignores the others, we have a lopsided system that creates tension, instability, and new problems in the long run.

Keywords - Development, Engineering, Carbon dioxide, Carbon Capturing and Storage, Metal-Organic Framework.

57. Study of Metamaterials on Physics and Engineering

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ABSTRACT

The metamaterials are artificially engineered structures with unusual electromagnetic properties. In this paper, we review the implementation of isotroper metamaterials that exhibit a negative permittivity and a negative permeability, thus leading to a negative index of refraction. Specifically, the paper focuses on transmission line metamaterials which are planar structures comprising a network of distributed transmission lines loaded periodical with inductors L capacitor C, in high pass configuration. The periodic unit cell is much smaller than the wavelength, thus leading to an effective medium in which the lumped loading elements can be either discrete or printed. Based on such negative-refractive-index transmission line metamaterials, several fundamental properties of physical sciences and engineering based microwave devices having broadband properties are explained.

Keywords: Metamaterials, permittivity, permeability, composite materials, negative index material, negative refraction, lenses, microwave phase shifters, microwave broadband antenna and microwave balun.

58. Effect of Al2O3 & CeO2 Nano-Additives on Performance and Emission Characteristics of Diesel Engine Fueled with Neem oil-Biodiesel

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ABSTRACT

Due to the rapid depletion of petroleum reserves, many countries recommended the use of vegetable oils as diesel engine fuel. The best way to use edible and non-edible oil as a diesel fuel is to convert it into biodiesel. Biodiesel is a fuel which can be used instead of diesel fuel as an alternative for the existing system of CI engines. The usage of biodiesel causes a few disadvantages like high nitrogen oxides, utilization of high fuel and higher density. To conquer these problems some promising nano-additives are identified for having been used in the production of biodiesel. However, the addition of Nano particles will possibly enhance the performance and reduce the emissions. Therefore, the present investigation focuses on the influence of Al2O3 & CeO2 nano-additives on the performance & emissions characteristics of CI engine fueled with methyl esters of Neem. As nano-additives Al2O3 and CeO2 contain high oxygen content, it leads to complete combustion of fuel thereby increasing performance & reducing the oxide formation. In the experimentation, 50ppm, 100ppm of Al2O3 & CeO2 nano-additives were mixed in methyl esters of Neem. Subsequently, the fuel blends of Neem biodiesel (B20N) alone and Neem biodiesel with 50ppm, 100ppm of Al2O3 & CeO2 nano additives in CI engine were employed. The results revealed that, there is a increase in the break thermal efficiency and decrease in specific fuel consumption

for B20N & B20N additive blends. Significant reductions in the parameters like CO, UBHC and NOx emissions are attained at B20N in conjunction with 50ppm, 100ppm of Al2O3 & CeO2 Nano-additives blends as compared with diesel. However, there is a slight increase in NOx emissions for B20N & B20N additive blends.

Keywords: CI Engine, Neem Biodiesel, Al2O3 nano-additive, CeO2 Nano-additive.

59. Regression Analysis of Energy Saving by Air-Phase Change Material Heat Exchanger

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ABSTRACT

Energy consumption for thermal comfort in buildings has grown a lot in the past few years. Because of the increase in energy consumption and its environmental hazards; research for sustainable buildings is an absolute necessity. Air-Phase Change Material-based heat exchanger working on the principle of free cooling is used to reduce the energy consumption for space cooling. To optimise energy saving, full factorial experimentation is done by selecting four independent variables. This paper presents Multiple Regression Model of the experimental data. The analysis is done in Minitab 19 which shows good agreement between the predicted response variable and the observations.

Keywords: Phase Change Material, Heat Exchanger, Free Cooling, General Linear Model, Regression

60. A Review on Cow Dung Log Making Machine Development

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ABSTRACT

This paper present a review on Cow Dung Log making machine. Now a day's use of bio-mass as a renewable energy source widely increased. Cow dung log can be used as fuel for many purpose such as cooking, heating boiler chamber and also used as manure. Making logs by hand using cow dung is a traditional activity followed in rural India from ancient time. But this process is more time consuming and low production rate activity, it is necessary to use alternative source of energy for making cow dung log. This paper aims to compare and review on available cow dung log making machine and propose to use a alternative source of energy i.e. cow dung log making machine energized by Human Powered. It provides gainful employability and capability of earning to the people of rural & urban area in the interest of economical development.

Keywords: Biomass, cow dung log, alternative source, human powered.

61. Testing and Inspection of Electrical operated overhead Crane up to 16Tons used in Industries.

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ABSTRACT

Load testing and inspection of overhead cranes is required by many safety regulations, national consensus standards and manufacturers. It is the purpose of the annual condition inspection to ensure that the overall structural, mechanical and electric components of the equipment have been maintained in a safe and serviceable condition and are functioning properly It is the purpose of the load test to ensure by actual overloading that the equipment is capable of safely lifting and moving the rated load through all designed motions. The Factory act recommends that load testing be performed once in every year.

62. Design and Construction of Hybrid Dryer for Few Agro Products

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ABSTRACT

Fruits and vegetable growth is of highly significant in agriculture nowadays, becoming a substantial source of income for producing countries. Agricultural products viz, fruits and vegetables are now the income source for farmers with more income but less shelf life it becomes an obstacle for the farmer after the shelf life end. Agriculture products viz fruits and vegetables are the main sources of energy. They are rich in minerals, vitamins being biological material in their composition, and structures. Physical characteristics changes according to the season, soil, climate, and post-harvesting difference, etc. that's why Agriculture product can be preserved by several methods. Drying and dehydration are the oldest methods of agriculture product preservation, which include controlling its moisture content. The main objective of drying food is to prolong its shelf-life beyond that of fresh material using the hybrid dryer. Research in hybrid dryers has made up of remarkable and concludes that the design and construction of hybrid drying is more effective for agro products.

Keywords— Hybrid, Agricultural Products, Drying, Dryer, Solar Energy, Electricity

108TH INDIAN SCIENCE CONGRESS

January 3-7, 2023, Nagpur

VI

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Hem Chandra Guha	1969
K K Majumdar	1968
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V Cadambe	1962

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N N Sen	1960
M Datta	1959
C S Ghosh	1958
G P Chatterjee	1957
B N Dey	1956
B B Bhoumik	1955
H N Srivastava	1954
S K Sircar	1953
J N Basu	1952
M S Thacker	1951
D R Malhotra	1950
M Sengupta	1949
N Sen	1948
H P Bhaumik	1947
P H Kurar	1946
Karunamay Ray	1945
J J Ghandy	1944
N V Modak	1943
B B Bhowmik	1942

Engineering

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