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International Conference

on

**Startup Ventures:
Technology Developments**

and

Future Strategies

SV-TDFS

08th-09th October 2018,

| Manipal University, Jaipur

Organized by

Manipal University, Jaipur

and

Institute For Engineering Research and Publication (IFERP)



SV-TDFS

INTERNATIONAL CONFERENCE ON STARTUP VENTURES: TECHNOLOGY DEVELOPMENTS AND FUTURE STRATEGIES (SV-TDFS)

Jaipur, Rajasthan

08th – 09th October 2018

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Manipal University Jaipur

Prof. (Dr.) S N Sharan
Conference Chair & Director SEEC



WELCOME MESSAGE

I will like to express my profound sense of gratitude, privilege and honour for being requested to give the inaugural message for this pioneering initiative of skills-knowledge-technology dissemination platform, what has been named as International Conference on Start-Up Ventures for Technology Developments & Future Strategies. (SV-TDFS-2018).

I, on the behalf of my organizing team, invoke all the participants to take full advantage of this forum which has been created for the first time in the history of the region in sync with the PM's vision of empowering the nation by creating an eco-system for nurturing interdisciplinary-scientific and technological entrepreneurship in this country with immense potential and prospects.

The prime focus of this conference is to create a sustainable problem-solving platform for the start-ups in the domains of Electric Vehicles, Smart Systems Pharmaceutical, Allied Engineering, Functional Device Technology, etc.

I hope that this initiative is continued for years to come, seeing the urgency of the time which demands that systematic handholding of all the budding and blooming technological entrepreneurs be done by the leaders of the nation.

We can't abnegate this responsibility if we as academicians are really interested in creating a legacy for this country (nay this planet) in a sustainable, scalable, and symbiotic way.

I will again extend my heartfelt gratitude to the entire team for this incredible and painstaking effort for their wonderful contribution.

I wish you all a very happy learning and entrepreneurship.

.

(Dr. S. N. Sharan)

From Director's Desk



Rudra Bhanu Satpathy

Director,

Institute For Engineering Research and Publication,

On behalf of **Institute For Engineering Research and Publications (IFERP)** and in association with **Manipal University** Jaipur, Rajasthan, I am delighted to welcome all the delegates and participants around the globe to **Manipal University Jaipur** for the "**International Conference on Startup Ventures: Technology Developments and Future Strategies (SV-TDFS)**" which will take place from **08th -09th October '18**

It will be a great pleasure to join with Entrepreneurs, Research Scholars, academicians and students all around the globe. You are invited to be stimulated and enriched by the latest in research and development while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the reviewing committee, coordinator (**IFERP & M.U.J**) and all the people involved for their efforts in organizing the event and successfully conducting the International Conference and wish all the delegates and participants a very pleasant stay at **Jaipur**.

Sincerely,



Rudra Bhanu Satpathy

Preface

The ***International Conference on Startup Ventures: Technology Developments and Future Strategies (SV-TDFS)*** is being organized by ***Manipal University Jaipur, India*** in association with ***Institute For Engineering Research and Publication (IFERP)***.

It is gratifying to know that SV-TDFS 2018 was a notable event which brings academicians, researchers, engineers, industry experts and students together.

Covering broad range of topics in various domains the conference will be a perfect platform to share experience and foster collaborations across industry and academia to evaluate current and emerging trends across the globe.

The International Conference attracted over 176 submissions. Through rigorous peer reviews 75 high quality papers were recommended by the committee. The Conference applied focus on the tools and techniques for the developments on current technology.

We are indebted to the efforts of all the reviewers who undoubtedly have raised the quality of the proceedings. We are earnestly thankful to all the authors who have contributed their research works to the conference. We thank our Management for their wholehearted support and encouragement. We thank all the members of our local organizing Committee, National and International Advisory Committees.

SV-TDFS 2018

Keynote Speakers

Prof. Bhim Singh

Dean (Academics), Department of Electrical Engineering, Indian Institute of Technology Delhi, INDIA

Prof. Vladimir S. Pavelyev

Head of Department of Nano Engineering, Samara National Research University, Samara, RUSSIA

Dr. Ajay Agarwal

Sr. Principal Scientist, Nano Biosensors Group CSIR-CEERI, Pilani, INDIA

Dr. M Sugunalakshmi

Sr. Principal Scientist, CSIR-Central Leather Research Institute, Adyar, Chennai, INDIA

Invited Speakers

Dr. Vesna Lavtižar

Laboratory of Maritime Environmental Management, Research center for Inland Seas, Kobe University,
JAPAN

Dr. Prabhas K Yadav

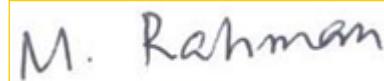
Technical University Dresden, Dresden, Germany and Manipal University Jaipur, INDIA

It gives me great pleasure to send you a very sincere message of support and good wishes to the organizers of SV-TDFS 2018, The 1st International Conference on Startup ventures: Technology Developments and Future Strategies (SV-TDFS), to be held at Manipal University, Jaipur, Rajasthan, India on 08th - 09th October, 2018, with the collaboration of Institute for Engineering Research and Publication (IFERP), Technoarete Research and Development professional association.



The innovative aim of SV-TDFS 2018 is to provide an international open forum for the researchers, academicians, practitioners, startup ventures and technocrats in academia as well as in industries from different parts of the world to interact, exchange concepts, prototypes, innovative research ideas and share the outcomes of their research work which could especially contribute to the academic arena and further benefit the business and industrial community, and as a whole helping the society.

I extend my hearty wishes to the SV-TDFS 2018 for a huge success in its endeavour of promoting the Startup ventures. I also thank the organisers for their untiring efforts to make the conference successful!



Prof (Dr.) Mustafizur Rahman

NUS Singapore

Founder of Mikrotool Ltd. Singapore



प्रो. भीम सिंह

संकायाध्यक्ष, शैक्षिक तथा
प्रोफेसर, विद्युत इंजीनियरी विभाग

Prof. Bhim Singh

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4th October, 2018



MESSAGE

I would like to congratulate and extend my best wishes to Manipal University Jaipur for organizing SV-TDFS 2018, the 1st International Conference on Startup ventures: Technology Developments and Future Strategies (SV-TDFS), to be held at Manipal University, Jaipur, Rajasthan, India on 08th - 09th October, 2018, with the collaboration of Institute for Engineering Research and Publication (IFERP).

SV-TDFS 2018 is first unique conference of its own kind which is trying to bring academicians, scientists and technocrats from various domains ranging from agriculture to industry, to provide the solution of the common man's basic problem at one platform and also discuss the challenges in their respective domains. The theme of the conference is very significant in the present scenario.

I sincerely hope that this conference will deliberate and discuss all the different facets of this exciting topic and come up with recommendations that will lead to a better, healthier, merrier world.

I wish the conference great success.

Prof (Dr.) Bhim Singh

Dean Academics,

Indian Institute of Technology Delhi

New Delhi



सीएसआईआर-केन्द्रीय इलेक्ट्रॉनिकी अभियांत्रिकी अनुसंधान संस्थान

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सं/No.:SSA/FSNE/JA/2018

दिनांक/Dated: October 03, 2018

Jamil Akhtar, Professor AcSIR

Chief Scientist & Head,

Flexible and Non-Silicon Electronics Group

(FlexEANS@CEERI)

Tel: 01596-243135, Fax: 01596-242294



MESSAGE

The International Conference on “Startup Ventures: Technology Developments and Future Strategies” (SV-TDFS) is being organised by Manipal University Jaipur during October 08-09, 2018. The title of the conference has direct relevance to the current need of ever progressing societies at global level. Concept of smart cities is driven by digital age of industrial advancement for which India in particular is expected to play a lead role owing to dedicated young minds equipped with vibrant diversity in socio and economic domains to serve a larger section of human beings living on this part of planet Earth. I am sure the participants of the conference in either capacity will be exposed to current status of technological advancement made in laboratories and the possibilities to bridge the gaps for their commercialization.

With a strong hope for a constructive dialogue between R&D and manufacturing personnel, I wish the event will be ever successful, meeting all designated goals.

I congratulate SV-TDFS team to organise the conference well in time.

(Jamil Akhtar)



Indian Institute of Technology Kanpur

National Centre for Flexible Electronics

Dr. Siddhartha Panda

Professor, Chemical Engineering

Coordinator, National Centre for Flexible Electronics (NCFlexE)

Post Office: I.I.T Kanpur – 208016 (India)

It gives me an immense pleasure to write this welcome message. I was delighted to learn that Manipal University Jaipur, with the collaboration of Institute for Engineering Research and Publication (IFERP), is organizing an International conference, 1st of the series, on 08th and 09th October, 2018, on the topic “Startup Ventures: Technology Developments and Future Strategies”.



The theme of the conference will definitely provide an excellent opportunity for the young researchers to expose their work to international community, receive sincere feedback from peers of different parts of the world, and to open up the scope for new research collaborations among the different participants across the globe and invited delegates.

India, being the second largest populated country across the globe, technological start-ups can solve many everyday problems and also improvise and uplift our human resources, empowering them to get better skills personnel and make them entrepreneurs to solve more problems or solve it in a better way.

I am sure that the delegates, experts, students and researchers will all tremendously benefit from the deliberation of this conference in a warm and friendly environment.

Siddhartha Panda



सीएसआईआर-केन्द्रीय इलेक्ट्रॉनिकी अभियांत्रिकी अनुसंधान संस्थान

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Head, Nano Biosensors Group

दिनांक/ Dated: 04th October 2018

Message

At the outset, I would like to congratulate SV-TDFS-2018 team for organizing an international conference to link technologists, venture capitalists and future strategy planners. I am sure the forum will bring various researchers and academicians closer to the startups, industrialists and venture capitalists during two days deliberations and interactions. This is an excellent opportunity for all, to plan activities jointly to solve societal problems, in the innovative way.

I wish the conference the grand success.

Dr. Ajay Agarwal



Manipal University Jaipur

Prof (Dr) G. K. Prabhu
President
Manipal University Jaipur

Dated: October 04, 2018



MESSAGE

I am happy to learn that an International Conference on “Start-up Ventures: Technology Developments and Future Strategies”(SV-TDFS) is being organised by Manipal University Jaipur on October 08-09, 2018. This conference is a step towards in achieving our vision in becoming a world-class academic and research institution in order to produce human capital of high caliber. This conference will be a good starting point for new start-ups and international universities to interchange knowledge and skills in different areas of Pharma and Health Engineering, Automobile, Allied Engineering and Device Technology. We are looking forward to find new solutions in this area and forecast future trends in order to realize new ideas & aspiration to contribute to global needs.

I would like to quote here a line by Mr. *Dag Hammarskjöld*

“Never look down to test the ground before taking your next step; only he who keeps his eye fixed on the far horizon will find the right road.”

– Dag Hammarskjöld

My heartiest congratulations and felicitations to the organizing team of SV-TDFS for their initiative and hard work in making the conference a success. I wish you all a fruitful discourse.

Dr. G. K. Prabhu
President
Manipal University Jaipur

***International Conference on Startup Ventures:
Technology Developments and Future
Strategies***

Jaipur, Rajasthan, 08th – 09th October 2018

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ABSTRACTS

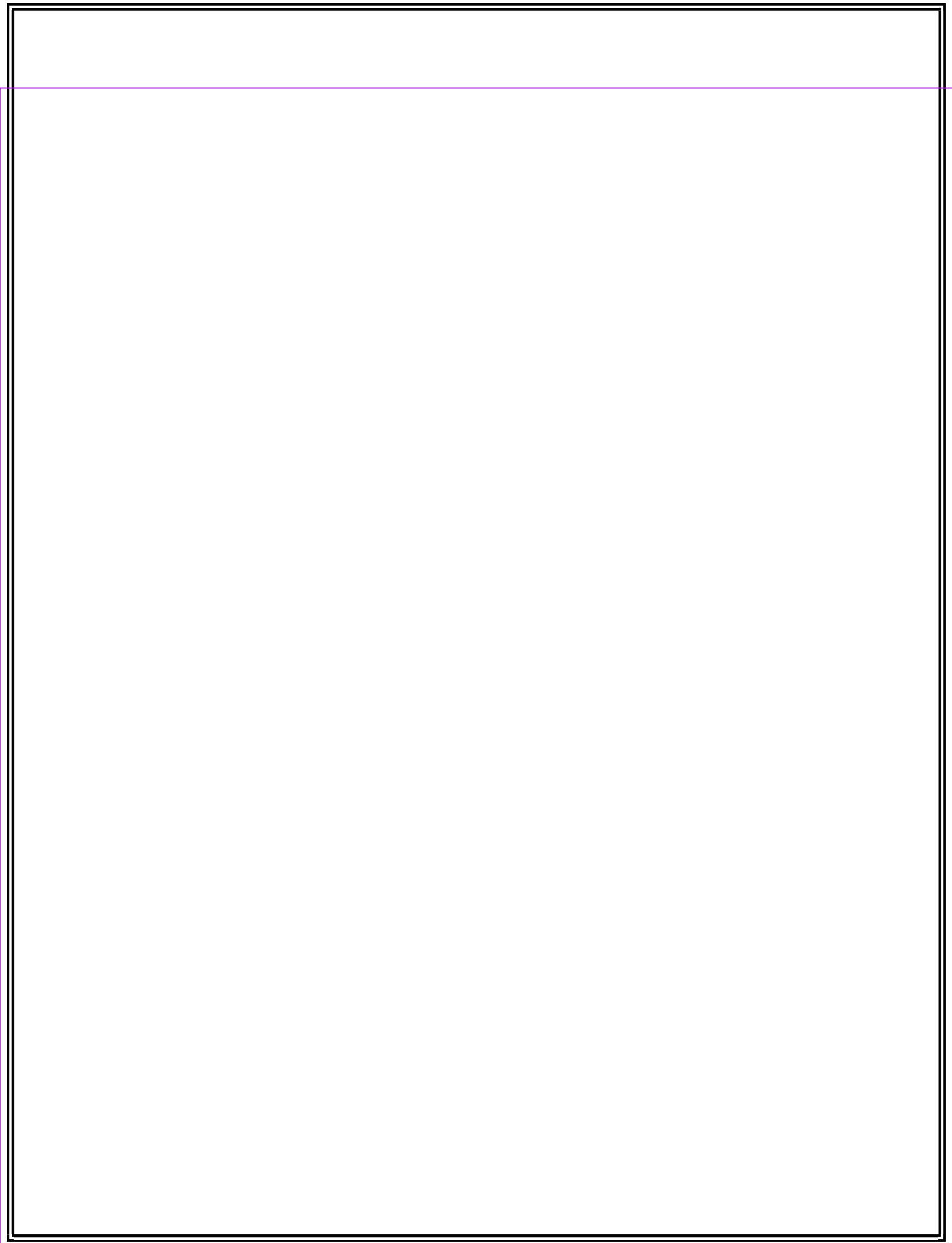
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InGaAs based HEMT for Future High Performance and Low Power Circuit Design

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Abstract:-

Purpose – The purpose of this work is development of future scaled FinFET for low power and high performance circuit design. As Internet of Thing (IoT) sensors and circuits are deployed at remote locations and works at high frequency band, the application also requires real time solution. The power is also the prime issue in IoP applications because these are battery operated or self-power devices. The Indium Gallium Arsenide (InGaAs) based semiconductor device fulfill all above state requirements. Gallium Arsenide (GaAs) used to reduce the power need and Indium (In) is used to improve the performance of the device hence InGaAs fulfil the need of IOT applications.

Design/methodology/approach - As InGaAs is the compound material that can be fabricated on Silicon wafer and fabrication technologies for InGaAs device is already proposed and successfully fabricated by many researchers. In this work, To develop the device, first deposit InAlAs using sputtering then deposit thin film of the InGaAs using atomic layer deposition (ALD). The laser lithography is used for device dimension. The ion etching is used for device pitch development. The device dimensions are shown in Table I as per the ITRS prediction for 2019.

Findings – This device provides very good performance and also reduces huge power budget moreover it also allows high-k material as gate insulator like hafnium oxide (HfO_2), aluminum oxide (Al_2O_3), magnesium hydroxide (Mg_2O_3). that further reduces the gate leakage current. The

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also helps to increase the gate control over channel hence increases the inversion charge. These inversion charge increases the ON current.

Research limitations/implications – The InGaAs based NMOS device has around 2200 to 4000 cm²/Vs mobility but PMOS has around 600 cm²/Vs hence this is the major disadvantage but it is very useful with domino logic.

Practical implications – Write now it is pure simulation work for process testing and application of the work in the next phase we will fabricated it at Indian nano user program (INUP), Govt. of India at IISc Bangalore center. We have already submitted the project.

Originality/value – It is original work and design and develop as per the exiting CMOS technology hence it can directly use with the CMOS fabrication technology along with silicon also.

Keywords:- InGaAs, HEMT, FinFET, Silicon, thin film, high performance, IoT.

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Novel Power Coefficient for Extracting the Maximum Power in Wind Power based Doubly Fed Induction Generator (DFIG) using Vector Control

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Abstract:-

This Paper presents the behaviour of the Doubly fed Induction generator for extracting the maximum power using vector controlled mechanism. This paper presents the controlling of rotor and grid side converter through conventional method of gate triggering by using d-q theory. The paper includes the simulation model of Doubly fed Induction generator and further the maximum power extraction from the wind is estimated by using power coefficient which is completely dependent on pitch angle, tip to speed ratio(TSR). The novelty in power coefficient has design to harness the maximum power. Firstly, the model of Doubly fed Induction generator is developed incorporate wind turbine as mechanical input and then vector controlled method is used. The Doubly fed induction generator are broadly used in wind power applications which are more robust, reliable and very efficient system. The complete system is implemented using MATLAB software tool.

Keywords:- Doubly Fed Induction ,Machine, Vector Controlled, TSR,

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Feasibility Analysis of 100 kW Solar Power Plant for Chandigarh, India

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Abstract:-

The electricity demand is increasing worldwide with a fast pace. Accomplishment of this growing demand with renewable energy sources is gaining importance globally due to it's negligible pollutant emission. In this work, solar power potential is analyzed for Chandigarh. A 100 kW photovoltaic plant is analyzed for selected area with different PV panel combination for finding optimal solution of power generation. This selected area is having a good solar radiation reception potential of 5.07 kWh/m²/day annually at annual 25.4oC temperature. The plant is designed with fixed axis orientation and has tilt of 31°. The plant has potential to export 156120 kWh of electricity to the grid with performance ratio of 76%.

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Response of Monopolar HVDC System in Presence of Single Double-Tuned DC Filter

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Abstract:-

Study of the response of an HVDC system to various conditions, types and locations of fault on the system is basic to developing suitable protection techniques and algorithms. This paper presents a study of the behavior of monopolar HVDC system in the presence of a single double-tuned dc filter. CIGRE Benchmark model for monopolar HVDC system has been simulated on PSCAD/EMTDC for the study. Five different fault locations, viz. three dc line faults (two faults near the line ends and the third fault at the middle point of the line) and two ac side faults (one near the rectifier and the other near the inverter), and five different values of fault resistance (ranging from 0 to 2000 ohms) have been considered. It has been observed that incremental current and incremental power in the HVDC line can discriminate only mid-line dc faults from ac fault. Also, incremental current can discriminate between rectifier-side ac fault and inverter-side ac fault for all values of fault resistance, whereas incremental power can do so only for lower values of fault resistance (0 ohm and 10 ohms). Transient energy can discriminate dc line faults at all locations from ac faults with all values of fault resistance. However, transient energy can discriminate rectifier-side ac fault from inverter-side ac fault only for low values of fault resistance (0 ohm and 10 ohms) and not for high values. This study can be very effectively used in developing a protection algorithm/algorithm. The study can be further extended to analyze the performance of HVDC system in the presence of any type of the dc filter and for any length of the line.

Keywords: - Fault Resistance, Incremental Current, Incremental Power, PSCAD/EMTDC, Transient Energy.

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Economic Viability Solar PV Power Plant in Distribution System

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Abstract:-

Silicon is definitely, the most common material used in solar cells. Distributed Generation (DG) based on Solar Photo Voltaic (PV) cells enhance the voltage stability and economical profit as well as reduce the carbon emission. This paper indentifies the optimal location of PV base DG in 13-Bus distribution system, using the nature base Particle swarm Optimization (PSO) algorithm. This paper also presents the overview of the process of manufacturing of PV cell. The main objective of this paper is that to demonstrate the economical benefits of optimal PV based power plant. Results prove that the PV base power plant improves the technical performance as well as economical performance of the system.

Keywords:- PSO, PV, Voltage Profile, Economical Benefits,

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Effect of Inertia Weight of PSO on Optimal Placement of DG

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Abstract:-

Integrating Distributed generation (DG) at appropriate location can reduce power loss of the system also voltage profile can be improved. Optimal allocation of DG has two parts, i) optimal location of DG, ii) optimal capacity of DG. In this paper Particle Swarm Optimization (PSO) is used for optimization. During optimization effect of inertia weight of PSO on the optimal placement of DG is demonstrated in this paper. For detailed study, IEEE 33-bus radial distribution system is considered and impact of integration DG in the system is also shown.

Keywords:- Distributed Generation, Particle Swarm Optimization, Inertial weight, IEEE 33-bus, Radial Distribution System.

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Single Stage High Brightness LED Driver with Improved Power Quality

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Abstract:-

A single switch single stage 24watt power supply is presented to run a light emitting diode (LED) load. In this power supply, the Zeta converter is operated in continuous conduction mode (CCM) to get desired output voltage and a proportional integral (PI) controller is designed to make system stable. The need of proposed controller is justified from stability analysis of the system with the help of small signal average modeling. A simulation model of the proposed LED driver is also carried out in MATLAB/SIMLINK using sim-power toolbox environment for a universal ac input mains. The results confirm a constant current of 0.4amp at output with improved power quality parameters such as power factor (PF) and total harmonic distortion (THD). All outcomes lie under the limit of IEC 61000-3-2 standards that verifies the theoretical analysis.

Keywords:- Continuous Conduction Mode (CCM), LED Driver, Power Factor (PF), Small Signal Average (SSA) Modeling, THD, Stability, Zeta dc-dc Converter.

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Experimental Profiling of Temperature and Luminosity inside Greenhouse using Wireless Sensor Network

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Abstract:-

Monitoring and control of climatic variables inside a greenhouse (GH) play crucial role in quality production of crops in the green-house (GH). Measurement and monitoring of major GH variables, such as temperature, humidity, soil moisture, light intensity and CO₂ in atmosphere, has been generally carried out using a central data acquisition system to which all sensors are individually wired. This technique involves huge cabling and lacks flexibility of adding sensors in future. This paper presents a detailed methodology and results of experimental measurement and profiling (both temporal and spatial) of temperature and luminosity inside a laboratory model of GH using a wireless sensor network (WSN).

For the experimental work, the GH was divided into two rows, row 1 and row 2, with three zones of equal dimensions in each row. At the center of each zone one wireless sensor node was placed for measurement and acquisition of temperature and luminosity in that zone. A WSN was created with these six wireless sensor (WS) nodes (or motes) and one network coordinator (NC). Profiling of temperature and luminosity was carried out under uncontrolled as well as controlled environmental conditions. Two controlled conditions were created. In the first case only temperature was controlled by placing a heater at the center of GH. The second case involves simultaneous control of temperature and luminosity, for which an incandescent lamp was placed in each zone of row 1 while all the zones of row 2 were covered with a tinted plastic sheet. Data was gathered from all the six WS nodes in each controlled case as well as in uncontrolled environment. Surface profiles of both temperature and luminosity were drawn in Lab VIEW on

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the basis of collaborative processing of the data. The experimental results so obtained are correlated with the expected theoretical profiles.

The use of WSN and Lab VIEW for collecting and processing the data, respectively, provides remarkable flexibility in terms of addition and deletion of WS nodes. Moreover, no wiring is needed for power or signals.

Keywords:- Collaborative Data Processing, Greenhouse Variables, Profiling, Wireless Sensor Node, Wireless Sensor Network.

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Single Stage Isolated Zeta Converter (SS-IZC) Circuit with Improved Power Factor for LED's Application

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Abstract:-

Light emitting diode specifically White LED has gain a lot of attention from both academics and industrial sector due to its high efficiency, environmental friendly, and long lifecycle. This is a feasible alternative for conventional bulbs and tubes in domestic, industrial and commercial lighting. However, implementation of this new source requires various parametric regulation. This proposed single stage isolated zeta converter (SS-IZC), with power factor correction maintains constant output for the load of 36 Watts LED, and follow the IEC61000-3-2 standard. The proposed SS-IZC is operating in DCM and controlled with PWM (Pulse width modulation), for power factor improvement and low THD, and obtain more than 0.9 power factor and THD less than ten percentages

Keywords:- Single Stage Isolated Zeta Converter (SSIZC), Power Factor (PF), Pulse width Modulation (PWM), Universal AC input, Discontinuous Conduction Mode (DCM), Total Harmonic Distortion (THD).

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Policy Impact on Generation of Renewable Energy

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Abstract:-

The energy consumption is increasing throughout the world. The renewable energy is potential answer to meet the increasing demand. Fossil fuel are diminishing with fast pace and greenhouse gas emission potential. So, the world is promoting renewable energy generation. In this work, government policy impact is assessed for renewable energy promotion. The 4% subsidy on solar, increases approximately 1200% of solar energy generation in 23 years' term and 4% subsidy on wind, increases 69% in wind power generation. The case, on per ton CO₂ emission by fossil fuel based plant is also reducing the use of non-renewable power energy uses.

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Objective Functions of Distribution Network Expansion Planning - A Comprehensive and Exhaustive Review

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Abstract:-

Utmost of elucidation about the research accomplished in an article is cleared from the objective function of the planning problem. An objective function is a mathematical expression which describe the existing condition of a system with numerous variables, in which alteration of these variables result in optimized value largest or smallest, depending on the problem or desired value. That value may be obtained by minimizing or maximizing the objective function. In this paper, a review has been carried out on objective functions of distribution network expansion planning (DNEP). Besides most prominent objective, i.e. investment or expansion cost minimization, a numerous other objective functions are also listed and elaborated in the paper. These objective functions have been classified into five main categories: financial, income related, technical, optimal size & location and social & economic objectives. The selection of objective function clearly shows increasing penetration of distributed generation (DG), distributed energy storing systems (DESS) and fuel cells with renewable technologies. Most of the reviewed articles regarding DNEP highlight these objectives in details, however; not all fields have been covered in any single work on DNEP. This review article aims to address this gap so that widespread DNEP can be achieved with flawlessness. Most of the objective functions are in practice today while others are still under exhaustive investigation. This survey article recommends utilizing these classifications to obtain impeccable DNEP. Substantial information has been offered of research work done in the field of DNEP through this review article which will mitigate the impending researchers from the difficulties of getting apposite supervision.

Keywords:- Distribution Network Expansion Planning, Distributed Generation, Objective Function, Optimal Power Flow.

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Robust Throttle Control of Hybrid Electric Vehicle

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Abstract:-

In recent past years, growing carbon emission caused by vehicle and scarcity of oil resources gives attention of all researchers to investigate low pollution, improved fuel economy type vehicle such as hybrid electric vehicle (HEV). In this paper speed control of nonlinear hybrid electric vehicle using different control technique has been employed to improve the efficiency of vehicle by controlling the throttle position. The controller like Proportional-Integral-Derivative (PID), Artificial intelligence based fuzzy controller, robust controller (H_{∞}) and their comparative performance analysis has been done on the basis of rise time, settling time, and zero steady error in MATLAB-Simulink.

Keywords:- Hybrid Electric Vehicle (HEV), H_{∞} , Fuzzy Logic, Robust Control.

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Speed Control of DC Motor using Chopper Based on Fuzzy Logic

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Mohammed waris²**

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Abstract:-

This paper presents the speed control of DC Motor using fuzzy logic controller based on chopper devices mainly boost converter. The DC motor consist of armature and field winding in which armature winding is controlled by using boost converter which is triggered by fuzzy logic controller which consist of 3x3 rule and the input are change in error and rate of change in error and output is firing angle. The fuzzy logic controller gives smooth, reliable, efficient speed controlling of DC motor. The complete system is designed with SIMULINK MODEL 2KW DC motor.

Keywords:- Fuzzy Logic, DC Motor.

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Disease Detection with the Help of Modified Clinical Decision Support System (CDSS)

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Abstract:-

Proposed CDSS is to provide assistance to technicians. With this approach, patient data is presented with the help of CDSS and used to analyze and diagnose with the problem. It works using CBR (Case Base Reasoning) and using DDSS (Diagnosis Decision Support System). In this paper existing CDSS has been modified which is language friendly, maintain large data base, giving it a shape of an app, making it more secure so that no one can make fool of any patient and build up a large involvement so that worldwide doctors can work on it and can give better advice to any patient from anywhere.

Keywords:- CDSS, CBS, DDS

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Design and Implementation of Drug Identification Smart System Using Voice Assistance

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Abstract:-

The purpose of the paper is to prevent the drug interactions such as Adverse Drug Reactions (ADR) by using our technological solution which will help the treating doctors / physicians to explore the details of drugs in order to find out life threatening effects such as allergies, Adverse Drugs Reaction complications and the contraindications related to liver and renal defects and harmful side effects during pregnancy or lactation.

Keywords:- Adverse Drug Reactions - ADR, Intensive Care Units – ICU, Out-Patient Departments – OPD, In-Patient departments – IPD.

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An Analytical Study on Health Care Mining Frameworks: A Survey

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Abstract:-

Growth in the domain of medical information processing and the unbound demand of advanced medical diagnosis for predictive analysis is demanding a framework for processing and managing the medical information. The expectations from the framework, by the researchers and professionals, are a complete end-to-end solution of the healthcare information and enable the beneficiaries for advance rule based pattern mining. A gigantic number of researches are been carried out in the search of the most cost effective and region independent process for the same. Nevertheless, the appropriate and most generalized framework is yet to be proposed. Thus is work makes an attempt to classify the existing framework based on the usability and propose a novel process flow for the same. The major outcomes of this work are establishing the workflow and evaluate the performance outcome in order to provide a higher level of healthcare system to save precious human life.

Keywords:- Data Mining, Rule Based Mining, Predictive Analysis, Healthcare Mining Workflow, Pattern Mining.

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Comparison of Tablet Quality Prepared by Using Granulation Technique and by using DC Grade Excipient

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Abstract:-

Purpose – The purpose of this work is to prepare Diclofenac Sodium tablets 50 mg and generate a comparative evaluation using direct compression and wet granulation techniques.

Design/methodology/approach – Diclofenac Sodium solid tablets 50 mg were formulated by two methods namely, (i) Direct compression using two different DC grades (Directly compressible) for each formulation and (ii) Wet granulation using conventional excipients. Tablets were prepared and assessed for description/appearance, flow properties, hardness, friability and disintegration time (DT).

Findings – All the formulations have shown the results within specification limits. However, the tablets which were produced by direct compression method disintegrated very rapidly when compared to those prepared by the wet granulation method and appearance was good with smooth finish without any rough surfaces.

Research limitations/implications – The Direct compression method is used for the low dose drugs and the active pharmaceutical ingredients which are thermolabile and moisture sensitive. Direct compression also helps in minimizing the unit operations, with improved yield and enhancing the tablet quality.

Practical implications – The method is useful to enhance product stability, improved appearance of product, faster DT and decreases the production time and manufacturing cost phenomenally.

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Originality/value – The work is an outcome of comparative studies of wet granulation and direct compression. The proposed Direct compression method replaces the costly and time consuming wet granulation method. Tablets produced by Direct compression methods have a constant reproducibility in the results meeting predetermined specification consistently.

Keywords:- Wet Granulation, Direct Compression, DC Grades, Product Stability.

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Development of Hot Melt Extrusion Technology for the Solubility Enhancement of Poorly Aqueous Drug

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Abstract:-

Purpose – Solubility enhancement of poorly aqueous soluble drugs for improved oral absorption has become a challenging task for the scientists in the development of pharmaceuticals. The main goal of this study is to investigate the effect of the hydrophilic polymers on the poorly water soluble drug to enhance its solubility through the technique of hot-melt extrusion.

Methodology – The poorly aqueous soluble drug selected for this study was Norfloxacin and the hydrophilic polymers selected for this study were Polyox WSR 301, HPMC E5, Carbopol 980 and PEG 6000. Based on the literature and preliminary trials, the drug and the polymer were mixed at a ratio of 1:2 respectively and the mixture was processed through OMICRON 10 P (STEER Engineering Pvt. Ltd. Bengaluru) twin screw extruder.

Findings – The obtained solid dispersions were subjected to the saturation solubility study for 48 hours. All these polymers have enhanced the solubility of Norfloxacin when compared to the pure drug. Among these mixtures, Norfloxacin-Polyox WSR 301 combination has shown highest solubility followed by PEG 6000 and Carbopol 980.

Research limitations – The technique may not be a cost-effective when compared to the other laboratory methods to prepare solid dispersions.

Practical implications – Hot melt extrusion technology is a significant industrial approach for the solubility enhancement of poorly aqueous soluble drugs as it is a continuous method to generate these solid dispersions.

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Originality/value – This research work is of prime importance as the application of this hot melt extrusion technology using these polymers for the solubility enhancement of Norfloxacin has not been reported in the literature.

Keywords:- Hot-Melt Extrusion; Solid Dispersions; Solubility Enhancement.

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Comparative Study of Structural and Sheetmetal Combination Bracket on Elevator Rail System

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Abstract:-

Context: - Combination brackets are used for fixing car and Counterweight guide rails to the shaft wall to provide smooth and safe travel for side counterweight position.

Purpose: - The objective of this study is to compare the deflection and stresses value of the structural and sheet metal Combination bracket arises due to effect of forces imposed on the guide rail by the Car guide shoe.

Methodology: - Finite element method was performed for Structural and Sheet metal combination bracket to evaluate stress and deflection using SolidWorks Simulation software. Analytical calculation has been performed to calculate the forces acting on rail considering the case of safety gear operation as per EN 81-1.

Research findings: - From this analysis, it has been found that structural combination brackets are stiffer compare to those made up of sheet metal.

Limitations: - Stress and deflection values shall be varied for different car cabin sizes. A case study of Car Size 1100x2000 mm for 13 passenger capacity rated load has been considered.

Originality/value: - This analysis results provides the possibility of selecting most reliable rail bracket for guide rail fixation

Keywords:- Elevator, Guide Rail, Brackets, Rail Fixing, Finite element method, Safety Actuation, SolidWorks

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Quantitative Analysis of Vibrations in Moving Bed 3D Printers

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Abstract:-

3D printers are being explored by many of the industrial giants and daily customers as an excellent replacement for some of the traditional inefficient, costly and waste producing techniques of manufacturing. Although, still at a premature state of development, and being thoroughly researched upon, there is lack of data concerning the physical strength or a proper machine design development for this 3-axis automated machine. Other, while being able to create a robust machine, over-utilize the resources. In this paper, we attempt to explore how analysis of vibration using minimal equipment could refine the quality of 3D printing as well as how would one improve the design to yield best results.

Keywords:- Vibrational Currents, Moving Bed Structure, Fixed Bed Structure.

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Analytical Study of MEMS/NEMS Force Sensor for Micro robotics Applications

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Abstract:-

The purpose of this paper is analytical study of microcantilever based force sensor using piezoresistive sensing element. Microcantilever based force sensor is a low cost, highly sensitive leads to improve the reliability, repeatability and cost effectiveness of MEMS/NEMS technology, which makes it suitable for micromanipulation application such as microgripper and micro robotics. The dimension of fixed part of sensor is $1000 \mu\text{m}^2$ with height of $200\mu\text{m}$. The microcantilever have dimensions $130 \mu\text{m}$ length, $40\mu\text{m}$ breadth and $50 \mu\text{m}$ height along with piezoresistive sensing element mounted on it. The range of force per unit area applied of it is $5 \times 10^{-9} \text{ N/m}^2$ which is sensed by cantilever, can be observed from simulation results. The amount of force required by microbot for micromanipulation is in the Micro-Netwon to Nano-Newton.

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A State-of-the-Art Strategy for Improved Biobutanol Production by Clostridium Acetobutylicum NRRL B-527

Pranhita R. Nimbalkar¹, Manisha A. Khedkar¹, Prakash V. Chavan^{1*} and Sandip B. Bankar²

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Abstract:-

The growing environmental concerns of fossil fuels and their unavoidable depletion have led to search for alternative renewable resources which can help to reduce country's energy dependency. Moreover, biofuels being environmentally safe, has an enormous potential to replace conventional petro-fuels. Biobutanol is one of the interesting biofuels that offers many advantages over bioethanol like higher calorific value, low vapor pressure, and good affinity with gasoline in varied ratio. However, conventional acetone-butanol-ethanol (ABE) fermentation process observed major challenges viz. low butanol concentration, yield, productivity, and solvent intolerance resulting in a high overall production cost, thus impeding its commercialization. To alleviate these concerns, effect of stimulator namely folic acid was investigated in present study to enhance butanol titer. Initially, different concentrations were screened and 10 mg/L folic acid supplementation showed highest butanol production of 10.78 g/L with total solvents to be 18.91 g/L. Folic acid addition was also optimized to get surplus improvement in final product concentration. Overall, a significant step up in biobutanol production was accomplished by induction of essential cellular components

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Keywords:- Biobutanol, Clostridia, Energy, ABE fermentation, Folic Acid.

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Sentiment Extraction and Analysis Using Machine Learning Tools-Survey

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Abstract:-

Sentiment search is clearly abstract cornerstone and essential administer in identifying user's importance preferences. To get the quality of the product, position in evaluations is precondition. Normally, if item's studys express constructive idea, the produce perhaps with bigger rating to some populous qualification. By analyzing the user considerations, their sentiments suggest unique experts to some target user in agreement the user culture. LDA is truly a Bayesian approach represented particularly to create the unification of studies, topics and discussions. In this paper, we have discussed about various machine learning tools and techniques for the better understanding of the concepts and efficient processing of sentiments from the huge data sets.

Keywords:- Ratings, Sentiment Distribution, Item Reputation, Reviews, Rating Prediction, Recommender System, Sentiment Influence, User Sentiment

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Classification of Human Bones Using Deep Convolutional Neural Network

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Abstract:-

In human body, there are total 206 types of different bones. Each bone has its own importance. It is very important to correctly identify human bone and then suggest treatment. To classify the human bones, we will use Musculoskeletal Radiographs (MURA) dataset. MURA dataset is one of the largest public radiographic image dataset. MURA dataset contain total 14,836 x-ray images of 12,173 patients. These all images belong to seven different categories of bones such as figure, elbow, hand, forearm, humorous, wrist and shoulder. This paper aims to present a novel classification method using deep convolutional neural network (DCNN).

Keywords:- Deep Convolutional Neural Network, Polling, Flatten, Full-connection.

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Structural and Optical Properties of Si Nanostructures

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Abstract:-

In this paper, we report a cost effective and facile approach to synthesise silicon nanostructures by metal assist chemical etching. Structural and optical properties of silicon nanostructures were investigated for the different etching time. Field emission scanning electron microscopy (FESEM) reveals transferred morphology of Si nanostructures on sheet and porosity depends upon etching time. An intense and broadband UV and Visible photoluminescence spectra from these nanostructured was observed and suggest the optically active nature of transferred Si nanostructured. Broadening and asymmetric shifting of Raman line shape a corresponding to silicon nanostructures confirmed the quantum confinement of phonon. The sizes of nanostructures were estimated 4.7 nm and 3.4 nm for different etching time by analytical model through a frequency shift in Raman spectrum. The presented work aids our understanding of tuning of optical properties of silicon NSs and its transferred may provide a platform for optoelectronics devices for various applications including bio sensing.

Keywords:- MACE, Silicon Nanostructures, and Quantum Confinement

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Review of Various Artificial Intelligence Techniques and its Applications

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India

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Abstract:-

With the upgrading needs of automation and prediction requirements in the industries, automation for improving the quality of the product and prediction of the product cycle to make product more economical. Now a days the use of artificial intelligence techniques becoming crucial to apply in the industries which makes the products more reliable, robust and economical. This paper deals and explains the different techniques of artificial intelligence. Also covers the review of the different applications of these techniques in the industries. This paper covers the review of Artificial intelligence techniques applied in the different fields like civil engineering, biomedical engineering, mechanical engineering, electrical and electronics engineering and many more

Keywords:- Machine learning (ML), Artificial intelligence, Supervised learning, Unsupervised learning, Support Vector Machine (SVM), K- Nearest Neighbor (KNN) Artificial Neural Network (ANN), FUZZY etc..

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Development and Performance Analysis of Conformal UWB Wearable Antenna under Various Bending radii

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Abstract:-

Antennas for off-body wearable applications needs to be flexible and its electrical characteristics should be stable in different body postures, different bending or stretching environments. Therefore, the designed antenna should be such that, even if the antenna is bent frequently, it should operate properly. In this paper, a conformal UWB antenna is reported which has been optimized to be conformal to any body shape and size. The proposed antenna has been designed on RT Duroid substrate with dielectric constant of 2.2 and loss tangent 0.0009. The thickness of the material is 0.127 mm. Due to low thickness; it can easily be bent and mounted on curved surfaces. The size of the antenna is 35 × 31 mm². To accomplish the design process, two different bending radii have been considered to bend the proposed antenna. The two bending radii of 25 mm and 50 mm have been chosen; one corresponding to the arm of a healthy child of around 5 years age and another corresponding to a healthy person of age about 35 years with medium built. The simulated radiation efficiency and total antenna efficiency are more than 60% for the bending at 25 mm and 50 mm radii in the UWB frequency range from 3.1 GHz to 10.6 GHz. The gain of the proposed antenna for both the bending radii is changing from 1.4 dB to 5.3 dB. The return loss of the proposed antenna is obtained for 25 mm and 50 mm bending radii of curvatures and it is below 10 dB in UWB range. A prototype of proposed antenna has been fabricated and tested on Rohde & Schwarz 40 GHz VNA. Measured results are in close agreement with simulation results.

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Keywords:- Ultra Wide Band Antenna, Wearable Antenna, Conformal Antenna.

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Bio-Printing

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Abstract:-

Purpose – We have observed on a major level the failure of the organs and not able to find the appropriate organ which leads to the death of the patients hence there is always a hope that as we do metal printing can't we go for an organ printing and develop the entire organ which will function as the same as that of the original organ. Design/methodology/approach – The paper will focus on how you can improve the current technology used in the metal technology printing and apply it to print tissues on an initial level and develop it for further culture growth and then to develop a complete organ that would be a major breakthrough in the era of entire mankind.

Findings – Compared with non-biological printing, 3D bioprinting involves additional complexities, such as the choice of materials, cell types, growth and differentiation factors, and technical challenges related to the sensitivities of living cells and the construction of tissues. Addressing these complexities requires the integration of technologies from the fields of engineering, biomaterials science, cell biology, physics and medicine. Research limitations/implications. Technological challenges include the need for increased resolution, speed and compatibility with biologically relevant materials. As we move away from the modification of preexisting technology and begin to design 3D bioprinters to handle specific biological components, the range of compatible materials can be extended, and methods to deposit materials and cells with increasing precision and specificity need to be developed

Practical implications –.integration of technologies from the fields of engineering, biomaterials science, cell biology, physics and medicine. 3D bioprinting has already been used for the

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generation and transplantation of several tissues, including multilayered skin, bone, vascular grafts, tracheal splints, heart tissue and cartilaginous structures. Other applications include developing high-throughput 3D-bioprinted tissue models for research, drug discovery and toxicology.

Keywords:- Additive Manufacturing, Tissues, CT Imaging, Cells etc.

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Experimental and Simulation Analysis of Piston Coated with Approach of Composite Material

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Abstract:-

Cylinder is main component of automotive, which changes over warmth and weight vitality freed by fuel burning into mechanical works. The cylinder part mechanism is the most complex segment of the automotive. It's the moving component that is contained by utilizing a chamber and is shaped fuel-tight by approach of cylinder gem dealer Piston that exchanges the ignitable gases quality to the pole. To support the intensity of the motor there's a desire to have a look at concerning the cylinder. So many researches are done to decreases the piston weight and also increases the piston life and performance of working, from the previous research works in this paper taken advanced composite material aluminum silicon carbide coating to piston to increasing the life and heat transfer rate and pressure withstanding limits on combustion time the an 3d model made on a cylinder by developing the model in CATIA software, plan format PC code and that we did the auxiliary load investigation by approach of building utilization of different substances in conjunction with composites on cylinder in ANSYS WORKBENCH PC CODE. After getting the results next step is fabricate the original proto type of model experimentally conducted the tests.

Keywords:- Cylinder, Catia, Ansys, Aluminum Silicon Metallic Lattice.

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Structural and Mechanical Characteristics of Latex Assisted Thermally Exfoliated Graphene Oxide Reinforced Elastomeric Nanocomposites

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Abstract:-

Carbon black is used in various formulations with different elastomeric material to customize the performance properties of materials. However, with increasing demands for performance improvement, growing competition, and imminent government regulations, carbon black is unable to fulfil the stringent requirements. Besides, as a filler, carbon black has limitations in terms of performance enhancements, and a large filler content is often prescribed. To this end, this study has focussed on development of Thermally Exfoliated Graphene Oxide (TEGO) reinforced engineered natural rubber (NR)/poly butadiene rubber (PBR) blend nanocomposites. Ultrasonication assisted latex mixing process was used to incorporate the nanofillers. Further, high speed mechanical perturbation and probe sonication were employed to ensure efficient dispersion of TEGO nanofillers, followed by co-coagulation of the nanofiller dispersed latex blends. A systematic variation of TEGO content was carried out to investigate the effect of incorporation of the nanoparticles within the elastomeric matrix blends. The microstructure and static mechanical properties of the nanocomposites were then evaluated. Fourier transform infrared spectroscopy (FT-IR) studies indicated possible chemical interactions between the functional groups present in the blended elastomers and TEGO. Scanning electron microscopy (SEM) revealed microstructural details of the nanocomposites which in turn could be attributed to superior mechanical behaviour of the developed elastomeric nanocomposites. Thermogravimetric analysis (TGA) further revealed

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enhanced thermal degradation behaviour of the elastomeric nanocomposites. Overall, the results have established that with a small loading level of TEGO. Novel material and process optimization along with appropriate dispersion methods used in this study has the potential to achieve better efficient elastomeric nanocomposites.

Keywords:- Natural Rubber, Thermally Exfoliated Graphene Oxide, Mechanical properties, Nanocomposites

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Controlling Air Conditioner by Sending Secure Messages using MQTT Protocol and Mosquitto Server

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Abstract:-

Purpose – This paper explains how the Air Conditioner (AC) is controlled remotely by sending secure messages through MQTT protocol and Mosquitto server. To provide security, Transport Layer Security (TLS) is used. TLS sends secure and encrypted messages between MQTT client and server.

Design/methodology/approach Transport layer is used as Transmission control protocol (TCP) by MQTT. MQTT client uses Transport Layer Security (TLS) to push secure and encrypted messages through mosquitto server.

Findings This method provides a way of sending secure messages to control the Air Conditioner.

Research limitations/implications The IOT devices are light weight, so they require specific protocols to communicate with each other. Different protocols are available viz MQTT, COAP, XMPP and AMQP. MQTT is an efficient protocol to provide machine to machine (M2M) communications.

Practical implications It is useful to increase the reliability between MQTT client and server.

Originality/Value In general we send messages without encryption that lead to security issues.

Keywords:- IOT, M2M, MQTT, TLS, Mosquitto

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Optimization of Organic Waste Collection for Generation of Bio-Gas Using IoT Techniques

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Abstract:-

India is facing some major challenges in waste collection, segregation, transportation, treatment and disposal. Hence, there is a need to spread awareness about waste disposal and define better waste management techniques in India. The purpose of this paper is to utilize Internet of Things (IoT) for waste management and optimized collection of wet (biodegradable) waste to produce bio-gas. It focuses on improving the current waste management system by using ultra-sonic sensors, arduino-UNO and EC-GSM. Collection and segregation of waste in an optimized way is necessary because wet waste can be useful in producing bio-gas which in turn can be used to produce clean electricity and natural gas. Lastly, the paper also gives emphasis on cost analysis of this method to calculate revenue generation.

Keywords:- EC-GSM, Ultrasonic Sensor, Arduino UNO, IOT, Bio-gas, Bio-CNG, Wet Waste

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A Relative Survey on Handover Techniques in Mobility Management

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Abstract:-

Innovation is advancing at a speedier pace and necessity for web organizations at whatever point wherever is needed by the mobile users. To impact this vision and to offer best services to a mobile users while changing point of connection, the effective mobility management procedures must be composed. Two key aspects to accomplish mobility administrations are handover and location management. Therefore, we need to have an efficient mobility management system among heterogeneous wireless networks where several wireless networks can interoperate to provide users with good Quality of Service (QoS). In this paper, the issues which are distinctive and correlated to mobility administration for the next coming frameworks are stressed and also highlighted the uncertain zones to guarantee the proficient mobility management.

Keywords:- Location Management, Handover, Mobility Management, Mobility Management Models, QoS.

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A Compact Multiband Rectangular Microstrip Antenna for UWB Applications

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Abstract:-

This paper presents a design of rectangular slot antenna with defected ground structure (DGS) loaded, which covers entire range of ultrawide band (UWB). The area of proposed antenna has total size of $33 \times 35.5 \text{ mm}^2$ and is printed on FR-4 substrate with dielectric constant ($\epsilon_r=4.4$) and loss tangent 0.02. Proposed structure renders wider impedance bandwidth extended from 2 GHz to 10.7 GHz for -10 dB return loss ($VSWR < 2$) with multi bands in frequency ranges 1.9 to 2.17 GHz ($f_c=2.1$, UMTS), 3 to 4 GHz ($f_c=3.5$, WiMax), 5.2 to 6.5 GHz ($f_c=5.8$, WLAN) and 7.1 to 7.9 GHz (X-band downlink satellite communication band) respectively. The antenna design parameters like return loss, VSWR, gain, and bandwidth are improvised to an acceptable limit with reasonable radiation pattern by using CST V.17 EM simulator. The proposed UWB antenna is fabricated and measured. The measured results are in good agreement between simulated ones.

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Identification of Software Defects based on Software Matrix using Pre-Processing Automation for Neural Network Based Techniques

Amjan Shaik^{1*}, Ch. Madhu Babu², Niladri Sekhar Dey¹ and K. Purnachand¹

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Abstract:-

With the growing demand for high quality software in industries with lower time complexity and lower requirements for memory consumptions, the need for identifying the defects in the software cannot be ignored. The software development industry deploys huge manpower to estimate, detect and resolve the defects in the software to match the customer requirements and ensure the quality in the product. The process involves development and testing in iteration to detect the defects in the software. However, the process of detection and resolving the defects is long resulting in various problems like mismatching the cost estimations in the upcoming development modules. Whereas, an automatic prediction technique based on the pre-generated software defect matrix can be deployed to correctly or nearly correct predictions to help in estimating the defects may raise in the upcoming modules. Hence in this work we try to investigate and understand the data mining techniques for defect prediction in software development. This work also results in modification notes to the existing processes by deploying a unique pre-processing technique for the defect matrix data using cumulative and normalized distribution of the initial data. The work will demonstrate the improvements in the existing works with the proposed pre-processing techniques.

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Dual Arm Robotics Platform (DARP): A Reprogrammable Robotics Platform – a Dire Need of Consumer Robotics

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Abstract:-

Purpose – The latest technological innovations in robotics has sparked a revolution in consumer robotics. The purpose of this paper is to analyse and discuss the innovative applications of the developed Dual Arm Robotics Platform (DARP) as a consumer robot and compare other models on basis of functionality and prowess of a reprogrammable consumer robotics platform such as DARP.

Design/methodology/approach – Prototypes of DARP (Dual Arm Robotic Platform) were built using standard fabrication methods and compared with other consumer robots on basis of interactivity within controlled environment. Attempts were made to replace more than one consumer robot with DARP alone.

Findings – The DARP (Dual-Arm Robotics Platform) has substantial capacity to transform into a successful consumer robot and prominent potential to replace the need of multiple robotic platforms in one household.

Research limitations/implications – This robotic platform requires extremely precise servos for complete exploitation of its performance potential, a restriction regarding the price of such motors available in domestic market.

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Practical implications – The discussed platform, with its potential to be reprogrammed, can perform the tasks of several consumer robots and thus emerge as a successful consumer robot, cementing its path in upcoming consumer robotics revolution.

Originality/value – The platform is denouement of manually fabricated mechanics using conventional machinery and hand tools while Raspberry Pi 3 forms its reprogrammable control unit.

Keywords:- Consumer Robotics, Arm Platform, Dual, DARP, Hardware, Artificial Intelligence.

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SCADA and Its Application in Power Generation and Distribution System

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Abstract:-

Natural resources are fast depleting as they try to maintain our growing energy needs. A large extent of their emissions contribute to pollution bringing about a revolution in the power energy scenario. The use of solar, wind and hydropower has the dual advantage of reduction in energy costs and a clean environment. Using the advantage of the natural cycle of seasons and daylight hours, consumers are connected to different types of power plants via a Grid. The monitoring and control of the grid load and plants is done using a SCADA system. This system ensures uninterrupted supply at minimum cost.

Keywords: - SCADA, PLC, Human Machine Interface (HMI), Contactor, Motor, Power Generator.

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Analysis and Design of Solar Photovoltaic Systems and its Applications by using different MPPT Techniques

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Abstract:-

This paper presents 40KW solar photovoltaic design and displaying the output curve with different parameters i.e. temperatures and irradiations. The different MPPT techniques are used and make comparison among these techniques by using solar PV modeling to get better results using in matlab simulation tool boxes. This paper is useful for solar PV modeling and power electronics converter design. In this paper, the perturb and observe method and incremental conductance method is compared to get maximum output in terms of voltage, current and power of photovoltaic array and using feedback PI controller to regulate the output of different power electronic converters i.e. buckboost and cuk converters. The comparative analysis confirms the best method by studying the performance.

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Cost Benefit Modeling of AB₂X₄ (A= Cd; B= Ga; X= S, Se) Solar Photovoltaic (PV) Materials

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Abstract:-

Present paper focus towards implementation and commercialization of emerging solar PV technology with cost effective manner. Energy band gap, absorption coefficients and module implementation cost for 1KW solar power plant for ternary AB₂X₄ (A= Cd; B= Ga; X= S, Se) solar photovoltaic (PV) system is investigated here. All the material related calculations are carried out using density functional theory [1] and cost related calculations by using mathematical expressions. By performing a comparative cost study between proposed materials based solar photovoltaic module and crystalline-based solar photovoltaic module we concluded that present material will be cost effectively commercialized as compare to Crystalline Si.

Keywords: - Solar PV, Cost, DFT,

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Comparative Study of Configuration Techniques to Address the Effect of Partial Shading on Solar PV Systems

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Abstract:-

Purpose: – As per energy efficiency of a photovoltaic (PV) system is concerned, partial shading play an important role. Under partial shading condition, the modules of a PV array receive different levels of solar irradiation, as a result power generation of a PV system decreases, these losses in PV modules can be reduced by altering the topology of the modules within the array. The modules can be interconnected in many ways like Series Parallel (SP), Bridge Linked (BL), Total Cross Tied (TCT) Honeycomb (HC) and their hybrid connection like SP-TCT and BL-TCT connection in an array to increase the output power. The purpose of this paper is to present all the configuration that have been reported in literature and effect of partial shading on solar photovoltaic systems are mentioned and compared.

Design/methodology/approach: - There are six configurations with 6×4 and 4×4 array of solar photovoltaic panels to be discussed. Six configuration are Series parallel (SP), total cross tied (TCT), bridge linked (BL), and honey comb (HC) and their hybrid connection like SP-TCT and BL-TCT. All the simulation models are built in the MATLAB/SIMULINK environment.

Findings: – Six simulations were performed to determine the impact of shadow on SP, TCT, BL, HC, BL-TCT and SP-TCT topologies. The results shows in terms of power versus voltage curves 6×4 and 4×4 array of solar photovoltaic panels under partial shading condition for above mentioned topologies. BL topology results are in between SP and TCT topologies results .TCT

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results shows better performance in partial shading conditions for 4×4 array and SP results shows better performance in 6×4 array.

Practical implications:— The power-voltage characteristics of a 6×4 and 4×4 PV array are obtained by using Matlab/Simulink and are presented for six different configuration. The power voltage characteristics of the proposed configuration is smoother and contains less number of local maxima, hence the accurate tracking of global maximum is simpler.

Originality/value: - The validation of the simulation and theoretical results guarantees the successful working of this technique in hardware implementation. It is confront that this work will be a source of valuable information for photovoltaic researchers working in this area, this paper makes a comparative study of the available interconnections among the modules of a shaded photovoltaic field and how they impact power production. As a result, a clear relationship between the interconnections of the PV modules and their power output is proposed.

Keywords: - Photovoltaic Cells, Partial Shading, Power Enhancement, Global Peaks, Total Cross Tied (TCT) Series Parallel(SP), Bridge Link(BL) and Honey Comb(HC).

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Photovoltaic Applications through Multi-level Cascading of DC/DC Converters

**Abhinav Saxena^{1*}, Parveen Poon Terang¹, Vasu Garg¹, Shreya Srivastava¹ and
Anurag Singh²**

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Abstract:-

In this paper cascading of the different multilevel converters is presented through photovoltaic application using DC-DC converter. Initially the photovoltaic cell is designed based on solar PV module and further the output of the solar PV module is connected to the different DC-DC buck boost converter in cascading manner so as to absorb the maximum power from the solar PV module. The complete system is discussed in higher efficient manner which the whole body compatible, reliable and sustain for anticipation of the faults.

Keywords: - Cascading, Multilevel, Converter, PV Array.

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Grid Connected-Photovoltaic System (GC-PVS): Issues and Challenges

Bhuwan Pratap Singh, Sunil Kumar Goyal* and Shahbaz Ahmed Siddiqui

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Abstract:-

Smart grid is the key technology for an effective utilization of the Renewable Energy Sources (RES). The utilization of RES for the generation of electricity is increasingly gaining interest of researchers during the last decades. The main reason behind this is global incentivization, the increasing price of petroleum products, climate issues and deregulations in the energy market. As the Government of India, (MNRE i.e. Ministry of New & Renewable Energy) is targeting to generate 20000 MW power through grid-connected solar PVS by the year 2022 therefore, the main focus in this paper has been presented on power generation through grid-connected PVS. The emerging smart grid technology has enabled the grid-connected PVS as an evolving process in today's world for electrical power generation. However, apart from so many advantages, there are several issues and challenges associated with the integration of PVS to the electric utility grid hence, the investigation to find out available possible solutions to overcome these issues becomes essential in order to enhance the performance of grid-connected PVS. The most severe constraint associated with this emerging technology is its high penetration level. If during low load conditions there is some mismatch found between the real power output and the load profile characteristics of PVS then it may result into large reverse power flow, high power losses or severe voltage violation. In this paper, several issues and challenges associated with the integration of solar PVS with the electric utility grid are presented. A discussion and conclusion based on the literature review has also been presented at the end of this article.

Keywords: - PVS, MPPT, DGs, RES, Grid-Integration, Utility.

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Hybrid Human Powered Power Generating Unit by Using Multiple Transducers

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Uttar Pradesh-201306 India

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Abstract:-

This paper provides concept of capturing the different kinds of energy conversions that can be in form of motion, physical force, heat energy and solar energy and converting it into electrical energy. Possibly provide an endless supply of energy to an electronic device has captivated many researchers and has brought forth a growing amount of attention to power harvesting. The hybrid human powered power generating unit is an electronic device, purpose of proposed model is to supply electricity for charging devices when the user is out of reach to the charger or charging port. This device basically transforms many different kind of energies to electricity (direct current) example piezoelectric plate produces electrical energy when mechanical force is applied on it and another we have Peltier plate (thermal electric generator) which transforms temperature differences into electrical energy. The proposed model is very much portable, so any individual easily can carry with them. This device does not need any external power supply to charge it, because this device made up of four energy inducing elements or can say transducers and one buck booster which step up the output voltage of the energy produced or induced by the generating elements assembled with a super-capacitor. This device is very useful in the situation where the person doesn't have power source around and need to charge any electronic device. This device can replace your heavy power bank with this light weighted device. Anyone can easily use this electronic device simply by squeezing it and shaking horizontally, these all physical movements induces electrical energy and got stored in super capacitor and further consume by the charging devices.

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Keywords: - Transducers, Energy Harvesting, Electronic Device, Human Powered, Energy Conversion.

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Automatic Moving Floor for Smart Rooms

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Abstract:-

This paper presents Automatic moving floor of a room for smart homes; invention is provided to solve the problems like moving of heavy furniture in homes, cleaning of floor everyday and to help the old people to roam around the room. The complete invention consists of two disconnected parts namely, CoS (Control System) box and the Tiles. Tiles arranged in the form of an array, having high torque motors internally and set of gears. There will be a false floor just beneath the main designed purposely for several instructions (like cleaning of tiles, moving of tiles, etc.) to work upon. The CoS box is a control system that listen, record, analyze the data given by the user and finds the best suitable solution from the array with given conditions. The CoS box contains a microphone and a touch panel to give instructions, then it provides a suitable way or path for the tiles to move from starting point to desired locations within the room. The instructions to the CoS box can also be given through an android application to have more user-friendly interface.

Keywords:- Automatic Floor; Home Automation; Smart Homes; Smart Hospitals, Tiles; Pressure Sensor; Gear Combination; Cos Box; Microphone; Moving Floor; False Floor.

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Design of Read Circuitry for Nonlinear Smart Sensors

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Abstract:-

Any sensor that senses a physical parameter produces an output electrical parameter. To convert this response of the sensor to a measurable level it must be amplified. It is a desirable property to have a linear relation between the input and the amplified response of the sensor. This paper discusses with mathematical modeling of nonlinear response and its application to thermistor, pressure/humidity sensors. Amplification is performed using Op-amp circuits. Analog signal is then converted into digital signal by successive approximation register converter having resolution of 8bit. The read circuitry for linearization of the amplified signal from a thermistor is designed and simulated using multisim. A prototype unit can be built to monitor the weather condition at a place without the use of microcontrollers and can be displayed.

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A retrofit design of safety and stability mechanism for two wheelers

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Abstract:-

This paper presents a retrofit design of a mechanism which helps in achieving the safety and stability of the two wheeler vehicle. The aim of the mechanism is to avoid the two wheeler from fall/skid and also work as an attachment for physically challenged drivers. The mechanism is a hydraulic system clubbed with linkages, where an extra two small sized wheels will be grounded to provide safety from fall and give stability to the two wheeler. The proposed retrofit mechanism would replace the double stand of the vehicle. These extra wheels will move along with the vehicle, hence provide the required stability. This will be a replacement of the costly attachments which the physically challenged driver adds to their vehicle. The shock absorbers would be included accordingly in the mechanism. The probable improvements on deploying the said mechanism on a two wheeler will provide easy riding, as the vehicle self-stabilize itself when the small wheels are grounded. This will help the less abled riders to easily ride the vehicle with no worries of grounding their feet. This idea developed by the authors is a result of conceptualization and brainstorming. A number of designs were developed, studied and three designs were shortlisted based on the feasibility of the mechanism. Finally, a better design is proposed for further implementation.

Keywords: - Stability mechanism, Safety, Two wheeler, Hydraulic system.

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Experimental Investigation on Effects of Chemical Additives on Rheological Behaviour of Fine Particle Bottom Ash Slurry

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Abstract:-

The pipeline transportation of slurry is one of the sustainable modes of transportation. Particulate flow through pipeline gaining popularity because of eco-friendly nature and less maintenance charges. For long distance slurry transportation, it requires large capacity pumps and encountered with huge pressure loss along pipeline. Slurry transportation with higher solid mass concentration also leads to sedimentation of particles. Higher concentration BA slurry have settling characteristics which results in high pressure loss and also the sedimentation bed needs more power for flow in pipeline. This loss can be minimised by improving the rheological properties of slurry flowing through pipelines. Rheological behaviour of the slurry is highly influenced by chemical additives and hence flow behaviour of slurry in pipelines can be changed. The focus of this research is to experimentally examine the effect of chemical additives and higher shear rate over the rheological behaviour of fine particle bottom ash slurries. Cetyl Trimethyl Ammonium Bromide (CTAB) and Sodium Salicylate (NaSal) are used as chemical additives in slurry samples. Experimental results show that the rheological properties of BA slurry are very much affected by chemical additives, shear rate and particle size range of BA. Combined effect of shear rates and dosages of chemical additives were investigated and gives encouraging results.

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Keywords: - Slurry Transportation, Shear Rate, Rheological Behavior, Chemical Additive, Pressure Drop.

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Neodymium Magnetic Shock Absorber for Two Wheelers Automobiles

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Abstract:-

This paper presents a research work on magnetic suspension system of two wheelers Automobiles, which are conventionally depending upon spring type, Hydraulic and Pneumatic suspension systems. The magnetic suspension system uses permanent Magnets or Electro Magnets as passive dampers, which are used to reduce displacement and acceleration of sprung mass in order to improve ride comfort. Proposed suspension system can absorb more number of shocks and variations are absorbed with more accuracy, has no problem of leakage of oil like hydraulic shock absorber. Therefore, these make the efficient work of vehicles and ensure less maintenance cost.

Keywords: - Suspension System, Neodymium Magnet, Damping

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Simulation and Experimental Studies of MPC for Level Control of Modified Quadruple Tank System

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Abstract:-

Model Predictive Control (MPC) has been a powerful control strategy as has already been proved with simulation and experimental studies. In this study, MPC has been explored for the level control of a nonlinear benchmark quadruple tank system. MPC has been applied as a real-time control strategy for set point control and disturbance rejection. Rigorous simulation studies have been carried out and compared with those from the use of decentralized PI controller. To validate the results, real-time experimental studies have also been carried out for two possible configurations. The application offers a new look at the performance of the MPC for complex systems control.

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A Review on Implementation of Six Sigma Techniques in Manufacturing Industries and Benefits Derived

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Abstract:-

We know that manufacturing industries are evolving with a rapid pace and most of them have centralized their focus on their product quality. Considering the world scenario and increasing competition all over the world among the established industries, there is a demand that the quality of the product must be best to meet the arousing standards. Six Sigma is one of the best methodology that can reap the seeds of success for the industries. This paper is a review of several case studies of manufacturing industries that have implemented Six Sigma in their respective fields. It highlights the benefits incurred by the industries by implementing various tools and techniques used in Six Sigma. It also focuses on the factors that industries should keep in mind for selecting the methodology to be followed as per requirement, so that Six Sigma approach could be properly implemented. This review paper provides the advantage of having an acquaintance with the tools and techniques used under different phases of Six Sigma approach.

Keywords:- Six Sigma, DMAIC, Business Strategy, Critical Success Factor, Manufacturing Industries.

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Experimental Analysis of the Influence of Antioxidant on Performance and Emissions of CI Engine Fueled with Waste Fried Oil Methyl Ester

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Abstract:-

The prospect of Leftover Deep-fried Oil based fuel production is very eye-catching for energy conversion. However, biodiesel is vulnerable to oxidative degradation due to autoxidation in the existence of oxygen, which hampers its extensive usage. Addition of antioxidant is a probable answer to achieve clean burning and improved combustion characteristic of biodiesel. An objective of the research paper is to experimentally study the influence of antioxidant accumulation to WFO biodiesel on diesel engine performance. WFOME was produced through transesterification process. Two monophenolic antioxidants, 2, 6-di-tert-butyl-4-methylphenol (BHA) and 2(3)-tert-butyl-4-methoxy phenol (BHT), were added at 950 ppm absorption to B40 (40% WFOME and 60 % diesel) for this investigation. Increased oxidation stability of B40 was noticed with addition of antioxidants without causing any significant negative effect on properties of WFOME. A 3.8 kW (5 HP) diesel engine was selected for this experimentation. The outcomes illustrate that antioxidant-treated B40 produced 2.15% to 4.78% higher brake thermal efficiency and BSFC by 2.08 % to 4.74% compared to untreated B40. BHA and BHT generating an average decrease in oxides of nitrogen emission of 4 ppm to 8 ppm in comparison to B40. However, compared to B40, mean increases in carbon monoxide and hydrocarbon emissions of 8.54 –17.08% and 7.73– 14.95%, respectively, were observed.

Keywords:- Antioxidant, Waste Fried Oil, Performance, Emissions.

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Design and Analysis of Petrol Engine Piston Pin

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Abstract:-

The Piston pin which connects the piston to the connecting rod in a conventional internal combustion engine, is subjected to a combination of shearing and bending loads, and also Piston pin is expanded due to high temperatures produced in piston cylinder. Due to this, movement between the piston and connecting rod is constrained. The main objective of work is to focus on modelling and analysis of Piston pin by varying material and geometry. Many works are carried out by using alloys in the analysis of Piston pin such as aluminium, forged steels and titanium. The thermal expansion of the Piston pin is reduced by using a material Inconel 718 in form of layers. The solid model of Piston pin is created in CATIA V5. Thermal analysis is carried out for the Piston pin and thermal expansion is calculated. Parameters are compared for both the existing material and Inconel-718 material. The simulation results are validated with the theoretical results. From the results, the thermal expansion is lesser in Inconel-718 material than the 20Cr alloy steel and also which is within the allowable limit. Hence Inconel-718 material is selected as the most suitable material for Gudgeon pin.

Keywords:- Expansion, Alloy Steels, Coefficient of Thermal Expansion, Piston Pin.

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Mathematical Model Development of Modified Flow Dispersion Stress Tensor in 2-D Curvilinear Flow Domain

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Abstract:-

For 2-D simulation of curvilinear flow field, use of momentum equations involves flow dispersion stress terms. Dispersion Stress terms take into account the effect of secondary flow variation arisen due to integration of the product of discrepancy between depth averaged velocity and the true velocity distributions. The objective of this paper is to present empirical mathematical functions to evaluate these terms. These terms can be incorporated in the 2D depth averaged flow equations as an additional source/sink term. In this work, the derivation is done to get revised set of empirical relations are later used in development of enhanced 2D numerical model in part-B of this paper. When compared with earlier investigations, the proposed formulations are simplified and numerically compatible. It is expected that modified formulation for flow dispersion stress tensor will lead to more realistic and improved simulation of flow field in curved flow domain.

Keywords: -Flow Dispersion Stress Tensor, Secondary Flow, Depth Averaged Flow Equations, Boundary Fitted Coordinate System.

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Design and Implementation of LiFi Communication System

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Abstract:-

In recent years, Visible Light Communication technology is considered to be complimentary to Radio Frequency (RF) technology. More specifically, Light Fidelity (LiFi) based Visible Light Communication system appears to have enhanced wireless capability so as to realize IoT, 5G Cellular System conforming to communication system requirements such as high data rate, low latency etc. A recent development in solid state lighting technology has significantly influenced LiFi system Architecture. In view of these developments, we propose to carry out a study on feasibility of deploying LiFi technology along with the existing RF infrastructure. We emphasize to look for designing full-duplex LiFi Indoor communication module, utilizing Multiple White Light Emitting Diode (WLED) based lighting equipment and integrate the module with network edge devices such as PC, smart phones for establishing efficient communication systems.

Keywords: - Visible Light, Light Fidelity, WLED, Indoor Communication, Full Duplex, Edge Devices.

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Smart Crop Management System (SCMS) using Raspberry-PI

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Abstract:-

Purpose: – In India and across the developing world, food requirements, and thus dependency on agricultural output, are increasing with the increase of population. Unfortunately, farm productivity is decreasing largely due to misuse of artificial chemicals (fertilizers, pesticide) and exploitation of natural resources (water, soil etc). In such a scenario, an effective Crop Management System (CMS) becomes indispensable. With Internet of Thing (IoT) becoming more economical, it is now possible to develop an efficient Smart CMS or SCMS.

Design/methodology/approach: – In the project, a primitive prototype IoT unit constituting of a Raspberry-Pi unit, a soil moisture content (or humidity) sensor, monitoring system (Wireless Sensor Network or WSN) interfaced to web/and mobile app was developed.

Findings: – For a proof of concept, the unit was then tested (hydrating and dehydrating) on a single Tulsi plant. The initial results indicated the effectiveness of the system in acquiring humidity data and transmitting them to the web/mobile-interface for result analysis, visualization and prognosis.

Research limitations/implications: – The project is a work in progress and at current state limited with a single sensor. Ongoing works of the project includes adding light intensity and temperature sensors to the current unit. Future works will include development of efficient algorithm to translate acquired data required for an effective CMS.

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Practical implications: – The project in the completed form will be help in decision making of agricultural processes (soil preparation, crop nutrition, climate maintenance etc) such that harvesting can be significantly improved.

Originality/value: – The project presents a very cost effective (cheap equipments) and easy-to-use (data acquisition and analysis) and understand (visualization) approach to solve a massive problem that is prevalent in an agricultural sector.

Keywords: Crop Management System, IoT, Wireless Sensor Network, Raspberry Pi

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Advancement in Energy Meter Reading

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Abstract:-

Advance meter reading (AMR) is considered to be as biggest platform for utilization in the electric domain for attaining the highly efficient solution for proper reading measurement with best optimization solution. Most common adopted system which can be synthesis in the AMR projects involve radio frequency/power line carrier/broadband over power lines for ended connection from the DCU to the multimeters and transmit the data to different receiver end by general packet radio service/ fiber networks. This architecture beginning in the past 10 years particularly because early mover utilities wanted dedicated communication network which they could control. In the present decade internet has reached door to door in all residential and commercial system then best way to make the system more effective. Connect the internet and broadband connection to the meter that's gives certain vision to the smart grid that gives smart connectivity and reduces the entrepreneurship cost.

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An Improved Outlier Detection Mechanism for Hierarchical Key Management in Hierarchical Mobile Ad-hoc Networks (MANETs)

Adarsh Kumar¹, Alok Aggarwal^{1*}, Neelu Jyoti Ahuja¹, Neeraj Chugh¹ and Himanshu Chaudhary²

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Abstract:-

Purpose: – The purpose of this paper is to present an outlier detection mechanism for hierarchical key management which utilizes hybrid (public and private) key management scheme for implementing lightweight cryptographic primitives in hierarchical MANETs. Further, a comparative analysis of key management schemes is to be performed for identifying an efficient key management scheme for hierarchical MANETs.

Design/methodology/approach: – In key management methods, public and private group key management schemes are integrated at local level (subgroup) and global level (network). These key management schemes uses various topologies for minimizing communicational and computational costs. After implementing an efficient key management scheme, outliers in network are identified using packet analysis at medium access layer (MACL), network layer (NL) and application layer (AL).

Findings: – It is observed that Teo and Tan key management approach with shamir's threshold key distribution mechanism is an efficient approach key management scheme for group authentication and hierarchical key management. Further, a minimum improvement of 9.7% and 0.91%, and maximum improvements of 25.3% and 101.7% are observed for Average

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Packet Delivery Rate (APDR) and Average Throughput (AT) respectively in a network of 1000 nodes.

Research limitations/implications: – The proposed method requires three sequential analysis of outlier detection schemes at different layers of MANET protocol stack because single scheme per layer is not efficient in identifying outliers in proposed network.

Practical implications: – The proposed key management method is useful for MANETs in group authentication and implementation of lightweight cryptographic primitives with secure key. Further, outlier detection mechanism can be extended for identifying various active and passive attacks.

Originality/value: – This work is an outcome of research work done for replacing conventional key management approaches and identifying over or under performing nodes in MANETs. The proposed work is cost effective solution.

Keywords: - Outliers, Inliers, Attack Detection, Density-Based Clustering, QOS.

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Hybrid approach for Digital Watermarking using Intelligent System and Discrete Wavelet Transform(DWT)

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Abstract:-

This paper shows the preservation of integrity, authenticity of intellectual property is Digital Watermarking. Different methods proposed to hide the secret information through different conventional techniques used to implement Digital watermarking But the main quality parameters to be considered during watermarking is imperceptibility and robustness and how to satisfy the trade off between these two contradicting characteristics. The recent trends in technology are increasingly in the realm of intelligent system due to its ability to learn from experience, handling uncertainty, reasoning, providing security and ability to adapt according to current data. To improve robustness and visual quality of watermarked image, this paper presents the hybrid approach of intelligent system(DFIP) and DWT (Discrete Wavelet Transform) using digital watermarking system in frequency and spatial domain. Comparative analysis of Hybrid system is observed under fuzzy logic and DWT to show the robust performance of the system and system watermarking works better in low frequency range for hide the secret information by collectively hold the complete data through the information available from the given source.

Keywords:- Digital Watermarking, DWT (Discrete Wavelet Transform), DFIP (Digital Fuzzy Image Processing) , Fuzzy Logic.

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An Inventory Model with Variable Demand for Non- Instantaneous Deteriorating Products under the Permissible Delay in Payments

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Abstract:-

In today's competitive business deal the demand for any product is positively affected by its displayed stock level and the suppliers normally gave permission his/her retailers a delay in respect to payment. We develop an inventory model to stem the auspicious conditions under which permissible delay in payment and displayed stock level beneficial for the manufacturer industry and business markets. In this decision model, for the permissible delay period; the retailer is permitted to postpone the payment for the products, which was bought without paying any interest. In particular, we analyze in this study the optimal replenishment policy for non-instantaneous deteriorating products with variable demand. Furthermore, the results reveal that the optimum cost and time with the help of a numerical example which demonstrate the model with sensitivity analysis is carried out.

Keywords:- Inventory, Variable Demand, Deterioration, Non-Instantaneous Deteriorating Products, Permissible Delay in Payment.

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A Survey on Multilingual Script Identification

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Abstract:-

Now a day's information technology and Internet of Thing's becomes a part of our daily life and we are closely connected with the world through internet. This made the multilingual scripts identification a burning research topic in the field of image processing and pattern recognition. Multilingual scripts identification is a challenging task, where system has to identify distinct scripts written on a single piece of paper or in a single document. Thus, script identification process has different phases as: identification of a suitable method, global and local feature extraction, accurate classification, training and testing of a system, adopted approaches, time taken by the system, authenticity of data sets etc. This research article is presenting a comprehensive review of the research progress in the field of multilingual script identification and present valuable contributions have been made so far by different researchers. However, this study will help the researchers to understand, what acknowledgeable work has been done so far in the field of multilingual script identification and what kind of obstacles are there to face to develop a concrete solution for the multilingual script identification and recognition problem for both handwritten as well as printed scripts.

Keywords: - Multilingual Identification, Script Recognition, Word Recognition, Character Recognition.

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A Survey on Emerging Cyber Threat Intelligence Platforms

Adarsh Kumar¹, Alok Aggarwal^{1*}, Neelu Jyoti Ahuja¹, Neeraj Chugh¹ and Himanshu Chaudhary²

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Abstract:-

Purpose:– The purpose of this paper is to present comparative analysis of cyber threat intelligence platforms and their features. This survey will include comparative analysis of existing ontologies for cyber threat collectors/sensor, data enrichment and data analytical techniques used for raw data analysis and community models for sharing cyber threats, intelligence and countermeasures.

Design/methodology/approach:– Firstly, this work performs comparative analysis of various data sensors designed for collecting raw data from different networks: wired, wireless and mobile. Secondly, detail analysis is performed on various interfaces designed to map ontologies into schemas. Thirdly, efficient methods for data analysis are considered for comparative and detailed survey. These method extracts threat information from raw data. Lastly, various cybersecurity community models are analyzed with an aim of identifying an efficient cyber threat sharing model.

Findings:– It is observed that ontology based data sensor mechanisms are more efficient as compared to taxonomy models. It helps in identifying various cyber threats in stipulated time period. In another observation, it is found that decision tree based data analytical techniques are more efficient for critical infrastructure based cyber threat intelligence systems as compared to other machine learning techniques. Further, open source community for cyber threat sharing is efficient if it allows everyone to share their threat information, create groups for specialized interests and keep logs of every subscriber.

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Research limitations/implications:– The proposed survey is performed for open source and commercial cyber threat sharing platforms however various ontology models are available for intrusion detection systems in cyberspace. This work may be extended for other ontology models, deep learning threat analytical models and quality based threat sharing communities for non-IT sectors like: gas plants, water and electricity supply system etc.

Practical implications:– The proposed cybersecurity platform is useful for various practical systems where need of cybersecurity is increasing day by day. For example, Supervisory Control and Data Acquisition (SCADA) systems like: energy, oil/gas, transportation, power, water and waste water management systems etc.

Originality/value:– This work is an outcome of research work done in developing cyber threat sharing platform sponsored by SEED funding in UPES, Dehradun. The proposed survey is helpful in identifying appropriate cyber threat sharing platform for different applications.

Keywords:– Cyberspace, Threat Intelligence, Intrusion Detection, Data Analytics, Communities.

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A Survey on Word Recognition for Devanagiri Scripts

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Abstract:-

Handwriting recognition is a hotly debated topic which not many systems can run and execute. Handwriting recognition is used for bank check recognition, postal address interpretation, etc. Handwritten word/script recognition is one of the interesting fields based on the image processing and pattern recognition application. Every state Government has to follow the tri-scripts principle of the Indian Constitution, containing a national script (Devanagari), official script (Roman), and a regional state script. Indic devaganari scripts are the least recognizable scripts which very few systems are capable of doing. This paper gives a detailed procedural overview on various tools and techniques used for the recognition of Indic Devanagari scripts so far and achieved attainable accuracy. However, this study will help the researchers to understand, what acknowledgeable work has been done so far in the field of word recognition and what kind of problems are to face to develop a concrete solution for the word recognition problem for both handwritten as well as printed Devanagari scripts.

Keywords:- Devanagari, Indic Script, Word Recognition, Image Processing, Handwriting Recognition.

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Analysis of an Inventory Model with both the Time Dependent Holding and Sales Revenue Cost

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Abstract:-

The research paper explores the possibility of long-life products on inventory model with variable demand rate. We established a new scheme for maximum life time product, their deterioration rate is considered as a function of maximum life time. The main conception behind the planned inventory model is: time dependent holding and time dependent sales revenue cost for finding the optimal total profit with the optimal cycle. Finally, numerical example and sensitivity analysis are demonstrate that the proposed mathematical model result and realize the effect of variation in optimal total profit function with respect to several parameters used.

Keywords:- Inventory, Demand, Maximum Life Time, Variable Holding Cost and Sales Revenue Cost.

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Gain Characteristics of InGaAsN Quantum Well Heterostructures with GaAs and InP Substrates

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Abstract:-

This paper reports the effect of substrate on the optical gain characteristics of InGaAsN material based quantum well (QW) heterostructure. In order to study the substrate effect on the optical gain, two substrates, namely, GaAs and InP have been chosen. Taking into account both of the substrates, the quantum mechanical approach (k.p method) has been adopted to calculate the confinement of the carriers associated with quantum well and the optical gain. In addition, for InGaAsN/InP heterostructure, the cladding effect has also been observed. The simulated results exhibit that the substrate has played a very important role in modifying the optical gain characteristics due to the existence of strain which comes into play due to the lattice mismatch.

Keywords:- Optical Gain, Strain, Lattice Mismatch, InP, GaAs, InGaAsN

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Finite Element Analysis of Circular Silicon Diaphragm

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Abstract:-

Miniaturization of sensing devices not only reduces the size, but also enhances the performance and reliability in sector of automation, space, weather monitoring and forecasting. It has become important for scientist and researchers working in the field of micro-electro-mechanical system area to simulate the structure before actual fabrication. This paper reports about the performance of proper meshing required to lead the exact results of simulated circular silicon diaphragm with the help of finite element method. In this paper, we have shown that the proper meshing of the circular silicon diaphragm has shifted the vibrating frequency of the diaphragm under different pressures applied.

Keywords:- Sensors, Meshing, Frequency, Displacement.

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Current and future aspects of ZnO based core-shell heterostructures for optoelectronics devices

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Abstract:-

Purpose:- This paper presents the recent progress in this field of core-shell composites based on ZnO nanostructures for optoelectronics devices application.

Design/Methodology/approach:- Bottom-up and top-down approach have been used for ZnO thin film synthesis. In the recent years, many deposition techniques are being used to synthesize ZnO thin film such as RF Sputtering, E-beam evaporation technique, RF thermal plasma, Sol-gel Process etc. RF Sputtering is the mostly used for growing thin film structures of ZnO for device application. The ZnO thin films are characterized for structural and optical properties with X-ray diffraction [XRD], field emission scanning electron microscopy [FESEM], scanning electron microscopy (SEM) and X-ray photoelectron spectroscopy (XPS).

Findings:- Recently the Zinc oxide (ZnO) nanoparticles attracted the researchers, because of its high excitation binding energy (60meV) at room temperature and large bandwidth. ZnO has the wide band gap energy of 3.37 eV with the high conductivity and it is low cost, environmentally friendly, easy to synthesize, non-toxic and transparent to visible spectrum range, which makes it a popular material for electronics, photonics, optoelectronics, acoustics and sensing applications. The study introduces that the optical and luminescence properties of ZnO mainly depend on the selection of the impurity for doping, the parameters of the synthesis and relative treatment of the sample.

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Research limitations/implications:- Further studies are required for improvement in the efficiency and device performance. It can be improved by the application of different electrolytes and doping of ZnO films for improvement of charge carrier transport properties.

Practical implications:- In many respects, ZnO is considered to be an alternate material to widely use wide bandgap material GaN for device applications, because of its relatively low preparation cost and better optical properties.

Originality/value:- The study is an outcome of various research articles on ZnO and their fabrication work using conventional approaches in the R&D environment. The study shows that there is the large opportunity for research in the field of ZnO based optoelectronics devices to improve device efficiency.

Keywords:- Nanotechnology, Optoelectronics, ZnO Nanoparticles.

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Simulating 1.55 μm Optical Gain in Type-II InAlAs/InGaAs/GaAsSb Nanoscale Heterostructure

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Abstract:-

In this paper, we have proposed and designed a type-II “W” shaped InAlAs/InGaAs/GaAsSb nanoscale heterostructure and simulated optical gain theoretically at the wavelength $\sim 1.55 \mu\text{m}$ (wavelength of near infrared region). The designed heterostructure contains two quantum wells (width $\sim 2 \text{ nm}$) of InGaAs material. To solve the carrier’s localities within the heterostructure, k.p method has been adopted. The other calculations have been carried out to determine the dispersion of carrier’s energies and the optical gain characteristics. The simulated results suggests that the designed heterostructure is capable to emit the radiations of $\sim 1.55 \mu\text{m}$ wavelength and can be utilized in optical fiber communication systems.

Keywords:- Optical Gain, InGaAs, InAlAs, GaAsSb.

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Effect of Fe Doping on Magnetic Behavior of SnO₂ Nanoparticles for Spintronics Applications

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Abstract:-

Doping of magnetic ion (Transition metal) in oxide based semiconducting material at nanoscale level serves a variety of spintronics based applications. To understand the effect of dopants on the magnetic behavior of semiconducting oxides, we have synthesized Fe doped tin oxide nanoparticles with 1 and 2% doping concentration via chemical co-precipitation method and then magnetic measurements have been taken through Superconducting quantum interference device (SQUID) at 5K and 300K temperatures for both the samples. Various magnetic parameters such as saturation magnetization (M_s), coercivity (H_c), remanent magnetization (M_r) have been extracted from the obtained hysteresis loops and found reduction in their values with increasing doping concentration which might corresponds to the tuning of oxygen defects created due to the substitution of dopant ions in the host lattice. In this way, our study can contributes to fulfill the necessity of ferromagnetism based applications such as data storage devices, gas sensors, communication, quantum computation etc.

Keywords:- Dilute Magnetic Semiconductors, Transition Metals, Spintronics, SQUID, Ferromagnetism, etc.

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Bandstructure Effects in the Electronic Transport of Silicon Nanowire FET in [100] and [110] Transport Orientations

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Abstract:-

An electronic transport study about band structure effects of silicon nanowire field effect transistors (Si-NW FETs) in [100] and [110] transport orientations has been done. A dispersion calculation has also been done for a $sp^3d^5s^1$ hybridized tight binding model coupled to a Poisson solver. For the evaluation of I-V characteristics, a ballistic model has been used. For [100] and [110] transport oriented nanowires, the total gate capacitance is decreased by 30%. The carrier velocity is affected by both [100] and [110] transport oriented nanowires. The velocities depend on degeneracy and effective mass of the dispersion. In our study, we have used 3nm thick nanowire oriented in [100] and [110] directions. The [100] oriented nanowire gives better ON-current performance as compared to [110] oriented nanowire. We have studied the valley splitting effects which can lift the degeneracies of 3nm wires. The effective mass which changes with various transport orientations and quantization, is increased with quantization for [100] while it is decreased for [110] transport orientated nanowire.

Keywords:- Silicon Nanowire, Tight Binding, Band Structure, Injection Velocity, Nano FETs, Effective Mass, Quantum.

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A Quad Band Polarization Independent Ultrathin Metamaterial Absorber

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Abstract:-

In this paper, we propose a quad-band metamaterial electromagnetic wave absorber structure consist of square rings resonators arranged in two dimensional periodic arrays with a metallic ground plane. Under normal incidence this structure manifests four sharp peak absorptions at 3.75, 5.05, 7.35 and 8.96 GHz with peak absorptivity of 94.28, 99.67, 99.98 and 99.90% respectively. This structure with four-fold rotational symmetry in design provides nearly 100% absorption for all angle of polarization. Moreover, This Structure is polarization insensitive and shows high absorption (over 90%) for oblique incident angles up to 45°. Corresponding to the highest frequency the absorber is ultra-thin and uses commercially available FR-4 as substrate. The designed quad-band absorber can be used in many possible applications such as thermal emitters, sensors, receivers, shielding, spectroscopic detection, hazardous materials phase imaging and prohibited drugs and many defense applications etc. It can be easily manufactured with simple PCB manufacturing techniques.

Key words:- Metamaterial; Microwave Absorber; Quad-Band; Polarization-Insensitive.

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Development of Safe sSBR Based Green Compounds with LPCA and HPCA

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Abstract:-

The flash point of a volatile liquid is the lowest temperature at which it can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. The flash point is not to be confused with the auto ignition temperature, which does not require an ignition source. The fire point, a higher temperature, is defined as the temperature at which the vapor continues to burn after being ignited. Neither the flash point nor the fire point is related to the temperature of the ignition source or of the burning liquid, which are much higher.

The flash point is often used as a descriptive characteristic of liquid fuel, and it is also used to help characterize the fire hazards of liquids. "Flash point" refers to both flammable liquids and combustible liquids. There are various standards for defining each term. Flash and fire point is one of the important criteria for determining the process safety while handling the rubber compound during mixing, calendering, extrusion etc. Higher flash and fire point of oils always indicates good process safety. High flash and fire point of oils may be due to presence of carbonyl groups, alkaloids groups. In this work, general study will be carrying out with One Regular oil and Two eco-processing oils (low poly cyclic aromatic). The effect of these processing oils in Solution SBR base compounds will be also studied like. To study Physico-chemical Analysis of Oils will be according to ASTM or ISO.

The flash/ fire point, results are shown in Figure. 1 All the oils show flash and fire point higher than 200°C, whereas LPCA oil No 2 show higher than HPCA oil (Oil No.1). Flash and fire point is one of the important criteria for determining the process safety while handling the rubber

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compound during mixing, calendering, extrusion etc. Higher flash and fire point of oils always indicates good process safety. High flash and fire point of oils may be due to the presence of carbonyl groups, alkaloids groups etc. Such groups are absent in the case of oils No2, where major groups are long chain alkyl type.

It can be concluded that LPCA oils can be used in a natural rubber, sSBR compound at the level of 2 to 5 phr (per hundred gram of rubber) with adjustment in cure package. LPCA oils can be alternative of HPCA oil, any effort of using the same will give rise to benefit of cost as well as environment protection.

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Optimization of Process Parameters of Graphene based Piezo resistive Pressure Sensor using Design of Experiment

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Abstract:-

Graphene pressure sensors has been steadily rising due to its recent growth in biomedical field. High sensitivity, wider working range, linear output, small size are some of the desirable features of a pressure sensor. Sensing element plays an important role in the designing of the pressure sensor. In this study, graphene is utilised as a material for sensing element with variable thickness such as monolayer, bilayer and multilayer. In this study, various input process parameters such as pressure, temperature and dimensions (length, breadth and thickness) are taken, which affects the output voltage of pressure sensor. Output voltage is calculated with wheat stone bridge configuration. Optimum combinations of input parameters and the output response of sensor is calculated using Design of Experiment (DoE) and their significance is calculated using analysis of variance (ANOVA). Simulation in COMSOL is done to validate the predicated results.

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Graphene as Emerging Material for High Speed Energy Storages Devices

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Abstract:-

At present, provoking energy and environmental issues, such as the depletion of fossil fuels, pollution and global warming are ringing alarm bells to human society. Therefore, renewable energy storage and conversion materials, as well as their devices, are highly required [1]. In this context, these problems can be overcome in two ways. Firstly, energy can be effectively converted from its infinite sources, such as the oxygen reduction reaction (ORR), solar power and water to applicable forms, such as electricity or fuel. To achieve this goal, fuel cells, solar cells and water splitting catalysts are of most concern [2–3]. Secondly, environmental benignity, low cost, and high performance are required by energy storage devices. Due to large surface area, good thermal and chemical stability, high conductivity and mechanical flexibility, graphene-based materials have been widely employed as energy storage devices. In this article, we mainly discuss the synthesis and unique electrochemical properties of graphene and its application towards lithium based different types of batteries, super capacitors and ORR for fuel cells.

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Crowd sourcing in Academics: Benefits and Challenges

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Abstract:-

Recently, there have been major advances in internet based information and communications technologies. This has led to significant improvements in educational organizations to reach their goals. Crowd sourcing is a newly emerging method to provide any services like ideas, feedback, collection of data and survey by the large group of people especially through online instead of designated employee. Crowd sourcing method is already used in other industries for various purposes but it is still needed an attention in academics. This paper concentrates on the crowd sourcing technique that can be utilized in universities. This paper explores at how educational organizations are using crowd sourcing as part of their activities and their challenges and issues

Keywords:- Crowd sourcing, Educational institutions, social media application, crowd creation, crowd voting and crowd funding.

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Active Noise Control Technique

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Abstract:-

In the current paper, an attempt was made to explore the active noise control technique to reduce the volume of an unwanted noise propagating through the environment using an electro-acoustic system using measurement sensors such as microphones and output actuators such as loudspeakers. Since the noise signal usually comes from ambient, so that it is possible to measure the noise near its source. The goal of the active noise control system is to produce an "anti-noise" that attenuates the unwanted noise in a desired quiet region using an adaptive filter. After implementation, the simulation results were obtained in MATLAB. This problem differs from traditional adaptive noise cancellation in two ways. Firstly, the desired response signal cannot be directly measured; only the attenuated signal is available. Secondly, the active noise control system must take into account the secondary loudspeaker-to-microphone error path in its adaptation.

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Generic IoT Platform for Analytics

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Abstract:-

Internet, since its root has reclassified the manners by which the world collaborates today, countless devices speak with each other which make our life simple and thus improve this world a place to dwell. The Internet of Things (IoT) is the system of physical gadgets, vehicles, home machines and different things implanted with hardware, programming, sensors and network which empowers these objects to interface and trade information. Today the world has swung to a place where each and everything should be associated.

This paper discusses, how a generic IoT platform has been developed to get the data from various sensors from agricultural lands and conversely control the devices from distant places using Internet. For e.g., a smart plug can help you save and monitor your energy consumption by showing energy statistics. Sensors fitted in agricultural lands has been chosen to test the quality of the IoT platform.

Keywords:- Node Red, Raspberry Pi, DHT11, Node js.

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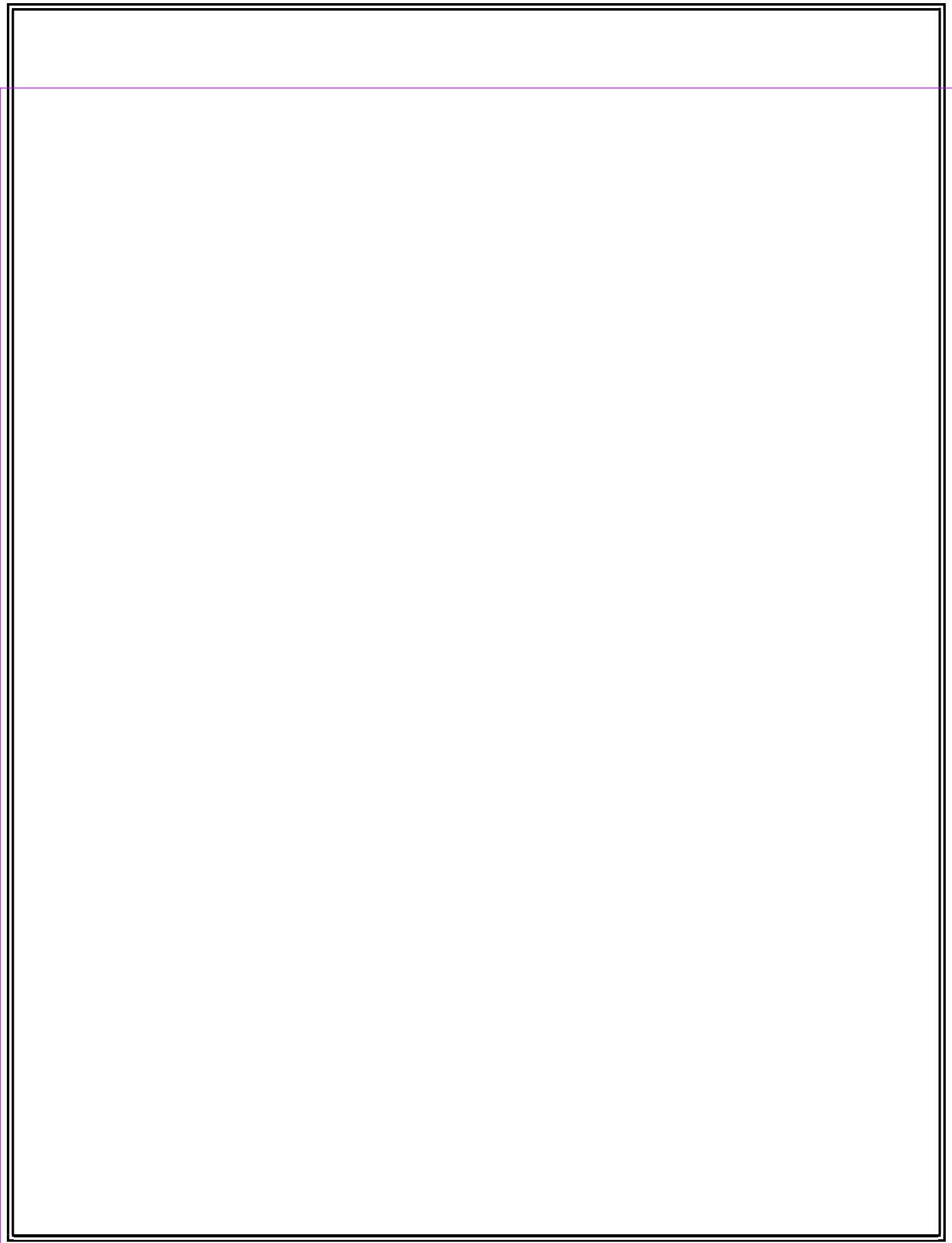
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