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Sl. No.	Title of the collaborative activity	Name of the collaborating agency with contact details	Name of the participant	Year of collaboration	Duration	Nature of the activity
1	Electric Vehicles Charging Stations' Architectures, Criteria, Power Converters, and Control Strategies in Micro grids	Electronics 2021	Dominic Savio Abraham, Rajesh Verma, Lakshmikhandan Kanagaraj, Sundar Rajan Giri Thulasi Raman, Narayanamoorthi Rajamanickam, Bharatiraja Chokkalingam, Kamalesh Marimuthu Sekar and Lucian Mihet-Popa	2021		Research paper publication
2	A Novel Design on Non-isolated High-Gain Interleaved KY-Converter with Enhanced Dynamic Performance	IEEE International Conference on Innovative Computing, Intelligent Communication and Smart Electrical systems (ICSES - 2021)	G.T. Sundar Rajan , V. Sivachidambaranathan, J. Barnabas Paul Glady , A. Ramesh Babu , S. D. Sundar Singh Jebaseelan and Ganesan Subramanian	2021		Research paper publication
3	Optimization of Energy and Security in Mobile Sensor Network Using Classification Based Signal Processing in	Journal of Signal Processing Systems	Ramesh.S, S.Nirmalraj,Murugan, S., Manikandan, R., & Al-Turjman, F	2021		Research paper publication

	Heterogeneous Network					
4	Proportionate Maximum Versoria Criterion-Based Adaptive Algorithm for Sparse System Identification	IEEE Transactions on Circuits and Systems II: Express Briefs	Radhika, S., Albu, F., Chandrasekar, A.	2021		Research paper publication
5	Parameters Optimization of Dissimilar Friction Stir Welding for AA7079 and AA8050 through RSM	Advances in Materials Science and Engineering	M. Kavitha, V. M. Manickavasagam, T. Sathish , Bhiksha Gugulothu , A. Sathish Kumar,Sivakumar Karthikeyan and Ram Subbiah	2021		Research paper publication
6	Energy Forecasting of Grid Connected Roof Mounted Solar PV Using PVSOL	Proceedings of the 2021 IEEE International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems, ICSES 2021	M. Kavitha,D. Godwin Immanuel,C.R. Edwin Selva Rex, V. Meenakshi, M. Pushpavalli, Supriya Singari, Vinoba Baskaran	2021		Research paper publication
7	Analysis of novel multi-input KY boost converter	Materials Today: Proceedings	M.Pushpavalli,N.M.Jothi Swaroopan,P.Sivagami,P.Abirami,M.Kavitha,V.Geetha	2021		Research paper publication
8	Stability Analysis of Multi-Input DCDC Converters	IEEE EXPLORER	M. Pushpavalli; P. Abirami; P. Sivagami; V. Geetha; M. Kavitha	2021		Research paper publication
9	Forecasting the Cloud Cover for Agronomical function Based on Real Time Valuation	IEEE EXPLORER	M.Pushpavalli , V.Geetha, Krithika K , S.D.Sundar Singh Jebaseelan , P.Sivagami , Abirami M and P. Abirami	2021		Research paper publication
10	Consumer Friendly Energy Meter for Home Application	-ACCAI 2022 CONFERENCE	Radhika, S., Chandrasekar, A., Jothi, S., Vijayakumar, K	2021		Research paper publication
11	Engineering Virtual Plan of the Domestic	Advancement in Materials,	V. Geetha, M. Pushpavalli, P. Abirami, P. Sivagami, R. Harikrishnan	2021		Research paper

	Enlistment Warming Framework to Reproduce Electromagnetic Boundaries	Manufacturing and Energy Engineering, Vol. I				publication
12	Auto Supply to Load from Four Different Sources Using IoT	IEEE EXPLORER	P. Abirami ¹ , C.N.Ravi ³ , M.Pushpavalli ² , V.Geetha ² , P.Sivagami ² , M.Chandraleka ² and S.Deepa ²	2021		Research paper publication
13	An Efficient Employee Retention Prediction Model for Manufacturing Industries Using Machine Learning Approach	Smart Innovation, Systems and Technologies,	Radhika, S., Umamaheswari, S., Ranjith, R., Chandrasekar, A.	2021		Research paper publication
14	Kurtosis-based, data-selective affine projection adaptive filtering algorithm for speech processing application Applied Speech Processing: Algorithms and Case Studies	Applied Speech Processing: Algorithms and Case Studies	Radhika, S., Chandrasekar, A	2021		Research paper publication
15	Zero attraction data selective adaptive filtering algorithm for big data applications	Handbook of Big Data Analytics: Applications in ICT, security and business analytics,	Radhika, S., Chandrasekar, A	2021		Research paper publication
16	Simulation and Analysis of Hybrid Energy Resources in Chennai Using Homer Software	Advancement in Materials, Manufacturing and Energy Engineering, Vol. II	P. Abirami, M. Pushpavalli, V. Geetha, P. Sivagami, and R. Harikrishnan	2021		Research paper publication

17	Investigating the influence of nanoparticle disbanded phase changing material (NDPCM) on the working of solar PV	Material Today Proceedings,Elsevier	Ramya.D,KrishnakumariA.b,P.T.Dineshkumar,Mudit Prakash,Srivastavad,L.Vadivel ,KannaneG.Puthilibaif,P.Manoj Kumar	2021		Research paper publication
18	Performance Enhancement of Three phase boost casacaded fifteen level inverter using PI controller	Computational Intelligence Techniques for Realization of Power Electronic Converters for Next Generation Grids	Sathish Kumar. S,Ramkumar. R,Sivarajeswari.S,Martin Sankoh,Ramya.D,Subburaj.T,	2021		Research paper publication
19	High Efficiency bridgeless single power conversion battery charger for electric vehicle	MATERIAL TODAY PROCEEDINS	RAMYA.D,RAMKUMAR.R,Tamilselvan.A,Jagadesh.V.S	2021		Research paper publication
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21	Artificial intelligence based quality of transmission predictive model for cognitive optical networks material Today proceedings	INTERNATIONAL JOURNAL OF LIGHT AND ELECTRON OPTICS	HARINDER SINGH,RAMYA.D, R.SARAVANA KUMAR,NAYANI SATEESH,ROHIT ANAND,SWARNJIT SINGH	2021		Research paper publication
22	Effect of Tool Profile Influence in Dissimilar Friction Stir Welding of Aluminium Alloys (AA5083 and AA7068)	Advances in Materials Science and Engineering	S. Jayaprakash , S. Siva Chandran, T. Sathish , Bhiksha Gugulothu , R. Ramesh , M. Sudhakar, and Ram Subbiah	2021		Research paper publication

23	3-Phase multi-inverter with cascaded H-bridge inverter designing and implementation for renewable system	Sustainable Energy Technologies and Assessments	S. Jayaprakash . R. Balamurugan , S. Gopinath , T. Kokilavani , S. Maheswaran	2021		Research paper publication
24	Machine Learning-Based Optimization Technique for Forecasting the Solar Radiation	Journal of Physics: Conference Series	S Jayaprakash1*, S Soundara Bala, G MadhusudhanaRao, and R Murugesan	2021		Research paper publication
25	Sliding Mode Control and Fuzzy With MPPT Control Based PV Integrated Grid System	Journal of Physics: Conference Series	G MadhusudhanaRao, S Jayaprakash, R Murugesan, and S Soundara Bala	2021		Research paper publication
26	Distinguished DC-DC Converter for an Electric Vehicle	Proceedings of the Sixth International Conference on Computing Methodologies and Communication (ICCMC 2022) IEEE Xplore	Saravanan A.,Dr.L.Chitra. Siva Chandran,B. Sai AravindJ. Naveen Kumar,S. Jayaprakash,	2021		Research paper publication
27	Analysis of Converters for Photovoltaic System	2022 International Conference on Electronics and Renewable Systems (ICEARS)	A. Kumar, S. P, P. M. M, M. Mehta, A. P and S. P, "Analysis of Converters for Photovoltaic System	2021		Research paper publication
28	Implementation of Tilt angle computing in IoT Based PV System	2022 International Conference on Advances in Computing, Communication and Applied Informatics (ACCAI), 2022	P. Sivagami, M. Mehta, A. Kumar, R. Harikrishnan, M. Pushpavalli and P. Abirami	2021		Research paper publication

29	Review on IoT Based Remote Monitoring for Solar Photovoltaic System	2021 International Conference on Communication information and Computing Technology (ICCICT), 2021	Sivagami P; Jamunarani D; Abirami P; Pushpavalli M; Geetha V; Harikrishnan R	2021		Research paper publication
30	Review on Soiling Implications and Cleaning Methodology for Photovoltaic Panels	Proceedings of the 2021 IEEE International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems, ICSES 2021	P. Sivagami, D. Jamunarani, P. Abirami, R. Harikrishnan, M. Pushpavalli and V. Geetha	2021		Research paper publication
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33	A Novel Optimization Algorithm for Modifying the Parameter Unit of Solar PV Cell	International Journal of Photo energy	V. Senthil Nayagam, S. Sanal Kumar, V. Thiagarajan, Neel Kamal, N. Nisha, J. Samson Isaac, and Adane Kassa	2021		Research paper publication
34	Periodic and nonperiodic amplifications of attosecond solitons in	Optik	Sana Ben Khalifa ,*, Saleh Chebaane , V. Senthil Nayagam , Saravana Veni , M. S. Mani Rajan	2021		Research paper publication

	an inhomogeneous lossy optical fiber					
35	Grid Interfaced Windfarm Using Dynamic Voltage Restorer for Power Compensation with Pv Fed Sepic Converter	Conference	V Senthil Nayagam, Balachandra Pattanaik, K Sekar, S Manikandan	2021		Research paper publication
36	Investigation on Wear Characteristics of AZ91D/Nanoalumina Composites	journal of Nanoscience	Bharathi.M.L	2021		Research paper publication
37	Performance Analysis of IPT with DC to DC Converter for E-Vehicle Application	Conference	V. Senthil Nayagam, L. Premalatha	2021		Research paper publication
38	An integrated CRITIC-TOPSIS- and Entropy-TOPSIS-based informative weighting and ranking approach for evaluating green energy sources and its experimental analysis on pyrolysis	Environmental Science and Pollution Research	Bharathi.M.L	2021		Research paper publication
39	Extraction of maximum power from solar with BLDC motor driven electric vehicles based HHO algorithm	Advances in Engineering Software, Elsevier	Malli sthaya krishna, Bharathi.M.L	2021		Research paper publication
40	Artificial Neural Network based Automatic Prediction Unit for COVID 19 in Asymptomatic Patient	2022 International Conference on Advances in Computing, Communication and	Bharathi.M.L	2021		Research paper publication

		Applied Informatics (ACCAI)				
41	Hybrid Multicarrier Random Space Vector PWM for the Mitigation of Acoustic Noise	Electronics 2021, 10, 1483.	P. Madasamy , Rajesh Verma , C. Bharatiraja , Barnabas Paul Gladys J. , T. Srihari , Josiah Lange Munda and Lucian Mihet-Popa	2021		Research paper publication
42	Synthesis and study on optical properties of CeO ₂ -Mg(OH) ₂ and inverted Mg(OH) ₂ -CeO ₂ nanocomposites	Synthesis and study on optical properties of CeO ₂ -Mg(OH) ₂ and inverted Mg(OH) ₂ -CeO ₂ nanocomposites	G. Murugadoss, M. Rajesh Kumar, R. Jothi Ramalingam, Hamad Al-Lohedan, A. Ramesh Babu, A. Kathalingam, Ahmed M. Tawfeek	2021		Research paper publication
44	MPPT Based Solar PV and Class IV Powered Brushless DC Motor for Water Pump System	2021 International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICSES)	Rameshbabu A, Sundarrajan G T, Godwin Immanuel D, Barnabas Paul Gladys, Sundar Singh Jeebaseelan S D and Muthukumar C	2021		Research paper publication
45	Improved Dynamic Response of Boost LLC AC– DC Converter with Voltage Regulation	2021 International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICSES)	Rameshbabu A, Sundarrajan G T, Sundarsingh Jebaseelan S D, Dilleswararao A, Barnabas Paul Gladys J and J V Sunil kumar	2021		Research paper publication
46	Potential Applications of 6G-Enabling Technologies and Challenges	IGI global Handbook of Research on Design, Deployment, Automation, and Testing Strategies for 6G Mobile Core Network	Zhang Yiming, Zhu Yunfeng, Yang Qiu, Sujatha Krishnamoorthy, China SatishKumar, Rameshbabu A.	2021		Research paper publication
47	Acoustic Feedback Noise Cancellation in Hearing	International Journal of Integrated Engineering	D N S Ravi Kumar	2021		Research paper

	Aids using adaptive filtering					publication
48	Biometric and IOT Technology Based Safety Transactions in ATM	7th International Conference on Advanced Computing and Communication Systems, ICACCS 2021	Bhuvaneswari, C., Malini, T., Giri, A., Mahato, S.	2021		Research paper publication
49	Automatic Speed Controller of Vehicles Using Arduino Board	ICSES conference	V.Meenakshi ¹ , D.Godwin Immanuel ¹ , M. Kavitha ¹ , V.Vijeya kaveri ² and C.R. Edwin Selva Rex ³	2021		Research paper publication
50	Energy Forecasting of Grid Connected Roof Mounted Solar PV Using PV*SOL	ICSES	M. Kavitha ¹ , D.Godwin Immanuel ¹ , C.R. Edwin Selva Rex ² , V. Meenakshi ¹ , M. Pushpavalli ¹ , Supriya Singari ¹ and Vinoba Baskaran ¹	2021		Research paper publication
51	Modeling of Filters For Grid Connected Voltage Source Inverter used in Renewable energy resources	conference	V.Meenakshi, M.Kavitha, V.Vijeyakaveri	2021		Research paper publication
52	Solving constrained economic electrical energy generation and CO ₂ emission dispatch using hybrid algorithm	”, Environmental Technology & Innovation, Elsevier	1. S.D. Sundarsingh Jebaseelan , N.B. Muthu Selvan , C. Kumar , A. Kalaimurugan , A. Srujana , and C.N. Ravi	2021		Research paper publication
53	Performance of multifunctional smart PV-based domestic distributed generator in dual-mode operation’	Machines	2. Kumar Chandrasekaran , Jasper John Sahayam, Sundarsingh Jebaseelan Somasundaram David Thanasingh, Sripriya Ramalingam, Hady H. Fayek, Nagananthini Ravichandran and Eugen Rusu	2021		Research paper publication
54	Constraint estimation in three-diode solar photovoltaic model using Gaussian and Cauchy mutation-based	IET Renewable Power Generation	Manoharan Premkumar ¹ Pradeep Jangir ² Chandrasekaran Kumar ³ Somasundaram David Thanasingh Sundarsingh Jebaseelan ⁴ Hassan Haes Alhelou ⁵ Rajvikram Madurai Elavarasan ⁶ Huiling Chen	2021		Research paper publication

	hunger games search optimizer and enhanced Newton–Raphson method					
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Review

Electric Vehicles Charging Stations' Architectures, Criteria, Power Converters, and Control Strategies in Microgrids

Dominic Savio Abraham ¹, Rajesh Verma ², Lakshmikhandan Kanagaraj ³, Sundar Rajan Giri Thulasi Raman ⁴, Narayanamoorthi Rajamanickam ¹, Bharatiraja Chokkalingam ^{1,*}, Kamalesh Marimuthu Sekar ⁵ and Lucian Mihet-Popa ⁶

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Citation: Savio Abraham, D.; Verma, R.; Kanagaraj, L.; Giri Thulasi Raman, S.R.; Rajamanickam, N.; Chokkalingam, B.; Marimuthu Sekar, K.; Mihet-Popa, L. Electric Vehicles Charging Stations' Architectures, Criteria, Power Converters, and Control Strategies in Microgrids. *Electronics* **2021**, *10*, 1895. <https://doi.org/10.3390/electronics10161895>

Abstract: The usage of electric vehicles (EV) has been increasing over the last few years due to a rise in fossil fuel prices and the rate of increasing carbon dioxide (CO₂) emissions. EV-charging stations are powered by existing utility power grid systems, increasing the stress on the utility grid and the load demand at the distribution side. DC grid-based EV charging is more efficient than AC distribution because of its higher reliability, power conversion efficiency, simple interfacing with renewable energy sources (RESs), and integration of energy storage units (ESU). RES-generated power storage in local ESU is an alternative solution for managing the utility grid demand. In addition, to maintain the EV charging demand at the microgrid levels, energy management and control strategies must carefully power the EV battery charging unit. In addition, charging stations require dedicated converter topologies, control strategies, and need to follow set levels and standards. Based on EV, ESU, and

A Novel Design on Non-isolated High-Gain Interleaved KY- Converter with Enhanced Dynamic Performance

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Abstract :- KY converter a boost converter which consists of power switches, one energy transferring elements and inductor. The circuit involves of two stages inter leaved KY converter to acquire a high voltage conversion ratio. This converter normally has greater voltage gain than the conventional interleaved converters. Voltage strain of the power switches and diode are slow. Efficiency can also be increased to a greater level. It can be used in photo voltaic where input current ripple is a significant concern..

Keywords- DC- DC converter, Interleaved, PIC Microcontroller, MOSFET switches, High voltage stress, High voltage gain, Step- up

I. INTRODUCTION

Many concerns like temperature transformation and universal microwaving have been a major problem in the past eras with the massive production of green-house gas. There have been promising options such as renewable energy tools, photovoltaic, wind power, and fuel cells (FCs) [1]. Still, the mentioned sources have truncated grid output voltage. The aforesaid problem is solved by high-speed converters.

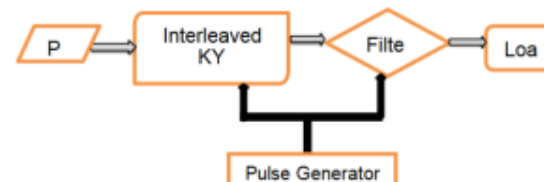
boosting are suggested.

This article introduces a new high-phase interlocking DCDC converter composed by two interlocking modified KY step up converters.

II. OPERATIONPRINCIPLE OFINTERLEAVED KY CONVERTER

The converter as depicted in Fig 1 and 2 named as a non-isolated high gain interleaved KY converter. Some assumptions are made for the continuous study of the topology, as set out in the following:

1. The condenser voltage is presumed to be constant since the scale of such is sufficientlyhigh.
2. All semiconductor systems are deemed suitableand not all parasites are taken intoaccount.



Optimization of Energy and Security in Mobile Sensor Network Using Classification Based Signal Processing in Heterogeneous Network

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Received: 23 June 2021 / Revised: 16 July 2021 / Accepted: 29 July 2021

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Abstract

The use of mobile devices has been growing rapidly and at the same time mobile applications has attained increasing popularity. Moreover, mobile services have introduced unexpected demands on the infrastructure of mobile and wireless networking. Recently, Mobile Sensor Networks (MSNs) has developed a class of popular sensor network where mobility has the major responsibility in executing the application. Since the deployment of a sensor network is not completely static, the mobility factor has plenty of challenges which have to be solved including coverage, connectivity, and energy consumption. The aim of this article is to design a robust procedure to handle the challenges of mobile sensors network by providing a secure and energy-efficient communication. In this article swarms of sensors are able to move while maintaining the optimal distance among sensor nodes. The security and energy of the signal transmission has been enhanced using multi-path link routing protocol (MLRP) and a hybrid-based TEEN (H-TEEN) protocol. Transmitted signals have been classified via a recurrent neural networks (RNN). The simulation results show that this proposed model is able to effectively detect malicious nodes and balance the energy so that the lifespan of MSN can be prolonged.

Keywords MSNs · Secure · Energy-efficient · MLRP · H-TEEN · RNN

Proportionate Maximum Versoria Criterion-Based Adaptive Algorithm for Sparse System Identification

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Abstract—Proportionate Maximum Versoria Criterion (P-MVC) based adaptive algorithms for unknown sparse system identification problem are proposed in this brief. The conventional proportionate type algorithms used for sparse system identification can work well only under Gaussian assumption due to the dependency on the least mean square error. However, in many real cases, the algorithms have to be also robust in impulsive noise environments. The Maximum Versoria Criteria based adaptive algorithms were found to have good robustness against impulsive noise while the proportionate term in the adaptive algorithm exploits the sparse nature to improve the convergence speed. Hence, to simultaneously have robustness under impulsive environment and improved convergence speed, the P-MVC algorithm and an improved tracking P-MVC version are proposed. The performance analysis indicates that the Excess Mean Square Error (EMSE) is the same as that of MVC adaptive algorithm. Furthermore, simulations in the context of sparse system identification scenario reveal that the proposed algorithms have both robustness and improved performance in impulsive noise environment.

Index Terms—Adaptive filters, system identification, steady-state, convergence, mean square error methods, finite impulse response filters.

towards zero. In proportionate type adaptive algorithm, the convergence is accelerated by varying the gain factor which is proportional to the filter weights, i.e., it is higher for active filter coefficients and smaller for inactive coefficients. Due to the difficulty in selection of the regularization term in sparsity norm-based algorithms and the inability to work with systems which are not strictly sparse but possess a relatively sparse (non-uniform) structure [2] the proportionate type is preferred and used in this work.

Many proportionate adaptive filters have been developed so far (e.g., [2]–[6]). Most of the traditional algorithms are based on Mean Square Error (MSE) and they depend on the Gaussian assumption. However, in real time, the noise is often an impulsive noise, and the traditional algorithms perform poorly in this case. Several information theory-based proportionate variants were developed too. In [7] the Proportionate Minimum Error Entropy (MEE) algorithm is developed and in [8] the proportionate adaptive filtering algorithms based on Maximum Correntropy Criteria (MCC) is proposed. The main problems associated with these approaches are the high computational complexity due to the presence of double sum operation and exponential terms respectively. In [9]–[12] the

Research Article

Parameters Optimization of Dissimilar Friction Stir Welding for AA7079 and AA8050 through RSM

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Received 23 June 2021; Accepted 12 July 2021; Published 17 July 2021

Academic Editor: Samson Jerold Samuel Chelladurai

Energy Forecasting of Grid Connected Roof Mounted Solar PV Using PV*SOL

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Abstract : Solar energy is renewable energy source which can be easily converted into electrical energy. This paper presents the selection of proper PV system, battery and inverter for a particular application for any location based on its climatic condition before implementing in real time. So before implementing the experimental set up, the entire system is simulated using any PV*SOL simulation software and the obtained results used to decide and modify the design of planned system. In this paper, a Grid coupled PV system along with electrical battery, electrical vehicle and consumption load is analyzed. Four PV module is used and each PV module uses different tracking systems. Production forecast with consumption, usage of PV energy, coverage of consumption of electric vehicle, battery, grid and other electrical appliances are analyzed by using PV*Sol.

Keywords— Energy forecast, Grid connected PV, Inverter, Battery, Electric vehicle, PV* SOL.

helps us to decide which technique is more suitable to any particular tracking system. There are many methods being improvising and already developed, that enhances and increase the lifetime of the solar panels as well as cooling systems suitable to the kind of system designed [4]. Multi-method concepts are also discussed while studying the design and tracking algorithms of PV systems. There is a need to design solar photovoltaic system that can obtain maximum energy from the sun and track the sun throughout the day to produce continuous energy [5]. The sun position and optimum inclination angles of solar panel can vary time to time. Hence to avoid complexity in solar tracking, a simple accurate sun position measuring system is needed to provide better results [6]. Various sun position tracking algorithms are needed to be studied in order to understand the trajectory movements of sun and to



Contents lists available at [ScienceDirect](#)

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr



Analysis of novel multi-input KY boost converter

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ARTICLE INFO

Article history:

Available online xxxx

Keywords:

Multi-input

KY boost converter

Stability

Pole-zero

Transfer function

ABSTRACT

The KY converter gets its name from a paper titled "KY converter and its derivatives" by the author K.I. Hwu and Y.T. Yau (KY converter). The literature survey of various KY converters analysed from 2007 to 2017. From the research study, it is apparent that KY converters have so many advantages than conventional converters. This KY boost converters are mainly used for boosting the voltage from lower value to higher value. This converter also possesses the advantages of low ripples, high Power applications and stable converter. By analysing the performance, the most suitable KY boost converter is developed by Hwu, K.I. This KY boost converter single-stage converter. The same converter is taken for the multi-input analysis. This paper analysis about Multi-Input (MI) converter systems rather than individual converters. The individual converter results in a large volume of the device in the system and high expenditure. The other multi-input converters have at least one zero in the right hand of the $j\omega$ plane, which leads to instability in the converters. This multi-input KY boost converter transfer function proves that all the poles and zeros are present in the left hand of the $j\omega$ plane. So, the stability of the converter is good. Multi-input Converters in which Multi-input KY boost converter is superior to other converters. Copyright © 2022 Elsevier Ltd. All rights reserved. Selection and peer-review under responsibility of the scientific committee of the International Conference on Artificial Intelligence & Energy Systems.

Stability Analysis of Multi-input DC-DC Converters

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Abstract :- This analyst for the most part centers around the steadiness examination of the multi-input DC converter framework. This MI contains two sources where wind and sun oriented can connect to the system. The performance of Multi-input DC Converters designed by the boost type with different converters configurations is Multi-input Boost, Buck-Boost, Sepic, Cuk, Zeta and KY Boost DC Converter. The Performance of the above converters analyzed in the closed-loop. Among this Multi-input KY boost, DC converter behaviour is superior to other MI DC Converters. MI KY boost DC converter is the most acceptable converter in terms of stability, time-domain analysis, and ripples. By comparing this, multi-input KY boost converter consumes less rise time, fall time and overshoot in percentage. Similarly, steady-state error (ESS) shows very low compared to other converters. Bode plot of a MI converter, measured gain margin in decibel and phase margin in degrees. Bode determines transfer function and pole-zero plot used to determine the balance of the plot. Dynamic conduct is tried and check with the assistance of MATLAB reproduction..

Keywords— Multi-input (MI) DC Converters, Bode plot, Stability

This Multi-input converter applies flux addition topology. It Combines the electrical sources inform of magnetic form and electrically separated. Phase shifted PWM pulses generated for switches. It Combines two different level of DC source. It Achieved soft switching technique also [1]. One is drawn the supply from PV and another one from Utility line. PWM control for switches[2]. It receives the input from PV/Wind. The P&O MPPT proposed for the hybrid energy. Power can be supplied to grid from PV/Wind simultaneously or individually. Real time variables like insolation and wind speed are taken into account. The Results verified for various weather condition with desired features [3]. It Works in four modes of operation to deliver the power to load. Full mode of operation mode ,all the sources deliver the power simultaneously. UPS mode of operation battery delivers the load. Highly Concentrated PV mode only PV source deliver the power. Power Factor Correction Mode inverter supplies to battery to charge the DC bus. Supervisory control and energy management for this hybrid system [4]. PV, Fuel cell and battery delivers the supply by adjusting their duty ratios. Fourth duty ratio is controlled

Forecasting the Cloud Cover for Agronomical function Based on Real Time Valuation

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Abstract :- There's an assortment of advancement which has been made with respect to computerized picture preparing and ML calculations which likewise incorporate its different applications. Presently we are living in a period where the issue with respect to agribusiness is a significant issue these days. The serious issue in crop development is we need to deal with the soundness of the plants and yields In this venture we fundamentally centered around characterization of different leafs as various sorts of illnesses. For this we use HSI shading model and bunching calculation .We likewise utilize MATLAB for our task. Less yield, greater expense of creation because of work shortage and compost cost are the significant difficulties prior the farmers. In current situations it's difficult to supply water to the farmlands manually and is consuming more time and manual power. For that We also included an automatic irrigation system to water the plants automatically. Real time monitoring of the data is there using the cloud platform.

Keywords—image processing, agriculture, disease, clustering.

corruption

So there is a need for quick development in farming areas for confidence, yet additionally to achieve impartial appropriation of pay and abundance in rustic zones just as to lessen destitution and improve personal satisfaction.

This paper depicts the methodology starts with a catch of leafing the pictures from the horticultural field. Gabor channel is utilized to fragment the info picture previously including extraction. At that point division of information picture is done to extricate the surface data and shading highlights .Appropriate determination of the component esteems to prepare fake neural organization to precisely recognize the sound and ailing examples leaf effectively. ANN based classifier has precision of 91%.[1-2]. This paper proposed plan affirmation systems for the distinguishing proof and course of action of cotton leaf

Consumer Friendly Energy Meter for Home Application

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Abstract- The power demand is increasing at an exponential rate every day, but the conventional method for power generation, transmission and distribution does not meet the requirement. One avenue to solve this crisis is to reduce and manage the energy usage in the house hold. Thus more emphasis has to be given for accurate and economic method for power measurement at home. This works fills the gap between consumers and energy usage by proposing a smart energy meter for automation of power consumption on an hourly basis. In the proposed method, the entire house hold is classified low, medium and high loads and a preset value of energy and cost associated with them is set. Sensors at each load conditions enable efficient data collection. The proposed energy meter enables circuit cutoff facility through relays when the consumed energy crosses the preset values. Additionally buzzer and SMS facility is also provided for alerting the user if the power consumption exceeds the preset value. Simulations and hardware results proved that the proposed smart energy meter has more reliability, flexibility and improved performance over conventional ones. In addition our proposed system can help the consumers to know their daily usage so that they can take necessary steps to meet their energy usage and the electricity bill.

Keywords—smart energy meter; energy; consumer; cost; energy.

The traditional energy meter provides monthly energy usage which prevents the consumers from knowing their daily usage and it may result in more energy consumptions. Also the consumers will not be aware of the energy consumption of the different appliances and it is not possible to plan for reduction in the usage of an appliance which consumes more power. In the traditional energy meter, the electricity bill generated can only be known after a month or two through the authorized person which usually involves human judgment and work.

Several literatures has discussed about the usage of smart meters in a smart grid system. In [1] the role of smart meter to measure electricity in the context of smart grid system is discussed. The pros and cons of usage of smart meter in a smart grid system in USA context is discussed [2].The importance of advanced sensing system for future electric grid is discussed in [3]. In the proposed energy meter in [3], the voltage and current are analyzed using IEEE standard 1459-2010. The power quality and consumption are monitoring in a remote location in the proposed

Virtual Plan of the Domestic Enlistment Warming Framework to Reproduce Electromagnetic Boundaries



V. Geetha, M. Pushpavalli, P. Abirami, P. Sivagami,
and R. Harikrishnan

1 Introduction

In the heating process, the electromagnetic field and the thermal field are strongly coupled. Induction heating process of the working material leads to rapid rise up in temperature due to the changes in the magnetic parameters like magnetic flux density (B), magnetic field intensity (H), permeability (μ), and electrical conductivity which leads to the changes in the electrical properties, which is harmful for the heating system and also affects the efficiency of the heating system. The measurement of these varied electrical and magnetic parameters with respect to temperature changes needs a computing resource. There are only few resources available for the computation of the electromagnetic parameters of the IH system. They are JMAG, COMSOL, CENOS, MULTIPHYSICS, EMS, etc., and survey on the simulation platform availability for the transient analysis of the heating system was made and the review states the usage of the EMS to compute the magnetic and thermal properties of the IH system developed for the domestic application. The state of the art of the review proves that the MULTIPHYSICS simulation of the

Auto Supply to Load from Four Different Sources Using IoT

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Abstract :- The economic growth of any country is decided based on the per capita consumption of energy. In our busy life style, we have to carry over our essential services without any interruption. The prime objective of this work is to supply the essential loads continuously using hybrid resources such as solar, wind, main supply and battery backup. These four sources are automatically simulated to supply all essential services like banking sector, schools and colleges, medical and domestic appliances and for industrial automation. To fulfill the needs of human, all crucial loads should get continuous power supply. This is achieved by controlling all the sources using Arduino microcontroller and relay driver circuit. If any one of the sources fail to supply the load, then the next source is activated through relay driver IC and supply the load without any disruption.

Keywords: PV System; Wind Turbines; Internet of Things (IoT); Power Shortages.

I. INTRODUCTION

two ways. Either by using embedded system or by using Arduino microcontroller. The later methodology is accommodated in this work. The main cause for power failure is the sudden maintenance of electrical line. The other problems like power shut down, black out for long period especially more than one day during cyclones or due to environmental constraints. All these problems affect the continuous supply to the load. So, by using IOT based microcontroller, four sources such as solar, wind, battery and main are supplying the load whenever its service is essential. In today's scenario, renewable sources are playing major role to reduce the emission of poisonous gas to the atmosphere. Since our fossil fuels are exhausting and at a point of time, we will be in search of our resources to satisfy our needs. Solar and wind resources are abundance in nature and it may not get exhausted throughout our lifetime. Solar source depends on the irradiance level of sun and wind source depends on the speed of wind. Also, battery bank can store energy

An Efficient Employee Retention Prediction Model for Manufacturing Industries Using Machine Learning Approach

[S. Radhika](#), [S. Umamaheswari](#), [R. Ranjith](#) & [A. Chandrasekar](#)

Conference paper | [First Online: 10 February 2022](#)

129 Accesses

Part of the [Smart Innovation, Systems and Technologies](#) book series (SIST, volume 269)

Abstract

This paper explores the advantage of machine learning algorithm in the prediction of employee retention in manufacturing industries in India. The effect of different work-related and personal features on the retention of employees is discussed in detail. Further the main features that contribute to the retention of employees are also found. Using the best

CHAPTER 1

Kurtosis-based, data-selective affine projection adaptive filtering algorithm for speech processing application

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1.1 Introduction

Speech is an important mode of communication that is produced naturally without any electronic devices. Some of the major applications of the speech signal include vehicle automation, gaming, communication systems, new language acquisition, correct pronunciation, online teaching, and so on. In addition, speech signals also find applications in medicine for developing assistive devices, identifying cognitive disorders, and so on. In the military field, speech signals are used for the development of high-end fighter jets, immersive audio flights, and more [1–4]. Nowadays, speech signal processing is inevitable for the development of smart cities. Generally, these speech

Chapter 2

Zero attraction data selective adaptive filtering algorithm for big data applications

Sivashanmugam Radhika¹ and Arumugam Chandrasekar²

Big data sets are characterized by raw data with large dimension, noise accumulation, spurious correlation and heavy-tailed behavior along with measurement outliers. Therefore, a unified approach is inevitable to preprocess the raw data in order to improve the prediction accuracy. In this paper, we present updated data preprocessing framework based on adaptive filtering algorithm with data selection capability together with removal of outliers and noise. The l_1 norm minimization along with a new update rule based on higher order statistics of error enables dimension reduction without any sacrifice in accuracy. Thus, the proposed zero attraction data selective least mean square (ZA-DS-LMS) algorithm can claim for the reduction in the computational cost with the improvement in convergence speed and steady-state mean square error (MSE) without any compromise in the accuracy. Simulations were performed in real and simulated big data to validate the performance improvement of the proposed algorithm in the context of preprocessing for big data analysis.

Simulation and Analysis of Hybrid Energy Resources in Chennai Using Homer Software



P. Abirami, M. Pushpavalli, V. Geetha, P. Sivagami, and R. Harikrishnan

1 Introduction

Our globe gets polluted due to industrialization and automation. The emission of gases from conventional energy sources is also a cause for polluting nature. The nature can be saved by using renewable sources in power generation. Though, many renewable sources are available solar power is one of the most widely used powers to supply a specific load. If a single PV source is supplying a load, then it is required to increase the size of system. To avoid complexities solar, wind, and battery storage systems are connected together to form hybrid energy sources. The resources are interconnected in order to track maximum energy from them. HRES can be able to supply the load continuously in both standalone and grid connected modes. The main



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Outline

[Abstract](#)[Keywords](#)[1. Introduction](#)[2. Synthesizing NDPCM](#)[3. Experimental](#)[4. Results and discussion](#)[5. Conclusions and future works](#)[Declaration of Competing Interest](#)[References](#)[Show full outline](#)

Figures (8)

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Volume 56, Part 3, 2022, Pages 1341-1346



Investigating the influence of nanoparticle disbanded phase changing material (NDPCM) on the working of solar PV

Ramya, D. ^{a,*}, Krishnakumari, A. ^b, P.T. Dineshkumar ^c, Mudit Prakash Srivastava ^d, L. Vadivel Kannan ^e, G. Puthilibai ^f, P. Manoj Kumar ^{g,h} [Show more](#) [+ Add to Mendeley](#) [Share](#) [Cite](#)<https://doi.org/10.1016/j.matpr.2021.11.419>[Get rights and content](#)

Abstract

Research Article

Performance Enhancement of a Three Phase Boost-Cascaded Fifteen Level Inverter Using the PI Controller

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Received 24 March 2022; Revised 17 April 2022; Accepted 20 April 2022; Published 19 May 2022

Academic Editor: Dragan Z. Marinkovic

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Photovoltaic power generation is a potential alternative energy source that offers several benefits over other alternative energy sources such as wind, sun, ocean, biomass, geothermal, and so on. Multilevel inverters are essential for power conversion in solar power generation. These multilevel inverters employ three distinct topologies: diode-clamped (neutral-point clamped) inverter, capacitor-clamped (flying capacitor) inverter, and cascaded H-bridge multilevel inverter. The cascaded H-bridge multilevel



High efficiency bridgeless single power conversion battery charger for electric vehicle

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ARTICLE INFO

Article history:
Available online xxx

Keywords:
- Bridgeless converter
Zeta converter
Flyback converter
Charging
Ac-Dc conversions
PF regulation

ABSTRACT

High efficiency chargers having high power are required to charge the batteries of light electric vehicles. This work proposes a single-power-conversion battery charger without a bridge made up of a boost AC-DC converter that is isolated and with a circuit having resonance in series to suit this need. The circuit with a series resonance decreases by offering zero current switching, you may reduce output diode recovery losses, while conduction losses associated with the input diode rectifier are reduced by using a bridgeless arrangement. Furthermore, injection of current by direct and series-resonance allows the transformer to excite the core in both directions, providing for high power capabilities (Lakshmi and Hemamalini (2019) and Haghbin et al. (2013) [1,2]). In conversion of power using single stage, the feed-back linearization-derived control algorithm is also built, allowing the suggested charger for power factor correction and output power regulation. This straightforward circuit construction results in good efficiency and a large power factor. The proposed charger's ideas that are theoretical are tested in an actual setting with a 1.7 kW prototype.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Thermal Analysis and Energy Systems 2021.

IoT Based Disease Prediction Using Mapreduce and LSQN³ Techniques

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Received: 05 December 2021; Accepted: 19 January 2022

Abstract: In this modern era, the transformation of conventional objects into smart ones via internet vitality, data management, together with many more are the main aim of the Internet of Things (IoT) centered Big Data (BD) analysis. In the past few years, significant augmentation in the IoT-centered Healthcare (HC) monitoring can be seen. Nevertheless, the merging of health-specific parameters along with IoT-centric Health Monitoring (HM) systems with BD handling ability is turned out to be a complicated research scope. With the aid of Map-Reduce and LSQN³ techniques, this paper proposed IoT devices in Wireless Sensors Networks (WSN) centered BD Mining (BDM) approach. Initially, the heart disease prediction dataset is acquired from publicly available sources in the proposed approach. Following that, the dataset is mitigated by reducing redundant data using Map-Reduce and making it useful for the upcoming examination. During the mapping step, the Linear Log induced K-Means Algorithm (LL-KMA) clustering algorithm is used. The LF-CSO technique is used in the reduction phase to select the optimal Cluster Centroids (CC). The features are extracted from the reduced data. After that, utilizing the Pearson Correlation Coefficient



Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/ijleo



Artificial intelligence based quality of transmission predictive model for cognitive optical networks

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ARTICLE INFO

Keywords:

Artificial intelligence
Optical networks
Quality of Transmission
Predictive model
Machine learning
Transmission equation

ABSTRACT

Due to the advancements in 5 G technologies, high-definition, and the internet of things (IoT), the capacity demand of optical networks has been exponentially increased. Optical communication networks offer several metrics such as high transmission capacity, low transmission loss, better anti-interference, robustness, etc which offers new opportunities to the communication field. To satisfy the increasing demands of optical networks, effective network resource utilization become essential. So, it is needed to design proper planning tools with superior accuracy for quality of transmission (QoT) in optical networks. Recently, artificial intelligence (AI) techniques pose new opportunities for resolving these issues and machine learning (ML) algorithms offer better performance over the analytical approaches. With this motivation, this paper presents a novel AI based cognitive QoT prediction (AI-CQoT) model for optical communication networks. The proposed AI-CQoT model aims to predict the QoT for the quality of service (QoS) link setup using AI techniques with the transmission equation based synthetic data generation. The proposed model uses the Label weighting extreme learning machine (LW-ELM) model for the prediction process which includes a link and signal characteristics as input features. Besides, the LW-ELM

Research Article

Effect of Tool Profile Influence in Dissimilar Friction Stir Welding of Aluminium Alloys (AA5083 and AA7068)

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Received 23 June 2021; Revised 5 July 2021; Accepted 14 July 2021; Published 22 July 2021

Academic Editor: Samson Jerold Samuel Chelladurai

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Friction stir welding is an innovative welding process for similar and dissimilar joining of the materials effectively. FSW simply modified the grain structure and also improved the strength of the joints for any type of alloying elements. This experimental study planned to carry out the joining process for dissimilar materials such as aluminium alloys 5083 and 7068. Three different types of



3-Phase multi-inverter with cascaded H-bridge inverter designing and implementation for renewable system

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ARTICLE INFO

Keywords:

Multilevel inverter
Photo volatile systems
Renewable energy
Modulation
Solar panel
H-bridge

ABSTRACT

Several applications of Distributed Generation networks uses Multilevel inverters, specifically photo voltaic systems. Few major benefits of the Multilevel inverters are its power quality and the output voltages generated from the small PV voltage sources are high. Furthermore, AC output voltage is low for these inverters and it is nearly 400 V (phase to phase voltage). This research developed a compact three-phase modular multilevel inverter with symmetrical decomposition and asymmetrical of input multi-terminal for various PV system's ratings. The 3-phase inverter proposed uses lower number of components. The design incorporates multiple carrier PWM for reduction of THD. The PV panels are related at every 3 phase VSI (Voltage Source inverter's) DC side. The 3-phase isolation transformer with primary open-end windings, connects 3-phase VSIs AC sides in which multilevel operation are ensured. Three half-bridge cells for each phase for 7-level output voltage generation are combined. Proposed inverter is evaluated by comparing with existing methods such as Neutral-Point-Clamped three-phase Multi Level Inverter (NPC-MLI), Multi Level Inverter with Linear Discriminate Notation Reactor (MLI with LDNR) and Cascaded H-bridge Multi Level Inverter (CHBMLI). Hence the proposed TPM-CHI achieves 2.1 V and 2.2amps of THD under symmetric disposition, 2.2 V and 2.4amps of THD under asymmetric disposition.

Machine Learning-Based Optimization Technique for Forecasting the Solar Radiation

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Abstract. Solar radiation measurement determines how often electricity a given area absorbs from the sun. This light is the key source of energy for conversion into solar thermal and photovoltaic plants. The radiation incident is not stable and relies on the temperature records, contributing to intermittent activity and electricity supply changes. This justifies designing a method to forecast and estimate incident radiation to predict improvements in photovoltaic systems' performance. In this paper, the support vector machine (SVM) based machine learning is proposed to improve solar radiation prediction accuracy. The designed system results are compared with existing models that predicted the radiation and the global solar radiation is predicted accurately with efficient.

Keywords: Machine learning, an optimization technique, solar radiation, forecasting.

Sliding Mode Control and Fuzzy With MPPT Control Based PV Integrated Grid System

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Abstract: In this paper, the photovoltaic (PV) system based energy generation with grid integration of inverter and DC-DC boost converter. To enhance the system transient response and track the PV voltage in the load perturbations, the sliding mode controller (SMC) is implemented. The power conversion of DC-DC is accomplished using the converter controlled using the fuzzy logic controller with the MPPT control system. The proposed system increases the grid system stability, and it is achieving the quick settling time in power converter output, which means DC link voltage improvement. The results are achieved using the MATLAB/Simulink, and the obtained results are verified successfully.

Keywords: Inverter, SMC, Fuzzy with MPPT controller, PV system, DC-DC converter.

Distinguished DC-DC Converter for an Electric Vehicle

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Abstract— Due to rising environmental challenges and complicated emission regulations, electric vehicles have been seen as an alternative to traditional transportation. Modern electric vehicles use electronic circuits powered by electrical energy (PECs). DC to DC converters and DC to AC inverters are both classed as PECs. DC to AC inverter: It delivers utility power while also driving electric motors; the DC to DC converter serves as a source of low voltage utility electricity. DC to DC converters are categorised according to application requirements. In order to charge a high-power electric load, an increase in output is needed. It is because of this that it uses the SEPIC converter. DC-DC converter designates the single-ended primary-inductor converter (SEPIC). The electrical potential may be any value, such as less than, equal to, or greater than the input voltage. Duty cycle of the control transistor governs the SEPIC output. In SEPIC, voltage conversion is accomplished by transferring energy between inductors and capacitors. SEPIC boost converter relates to

I. INTRODUCTION

The development of DC-to-DC converters with higher voltage gain has occurred as a result of low DC output voltage power sources in applications. The DC-to-DC converter in this review has a high voltage gain and is often used in applications such as UPS, hybrid vehicles, energy storage systems, DC distribution networks, fuel cells, solar systems, and low-power wind turbines. A significant advantage of renewable energy sources like FCs and PVs is that their DC output voltage is low. Voltage regulation was performed using high step-up DC to DC converters to regulate and raise voltage levels. The ideal input current for the converter is a continuous current with minimum ripple. The operation of FCs is dependent on output power control. As a result, DC to DC converters with constant input current are utilised. This improves the dynamic performance of the

Analysis of Converters for Photovoltaic System

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Abstract— Country's economic progress rely on the energy which acts as key for development. The energy consumption is on a large scale because of expeditive growth of industries, increased vehicular usage and domestic consumers. The energy produced by fossil fuel causes air pollution which increase the global temperature. To reduce the carbon footprint is a challenging task to conserve the environment. Therefore, people look out for alternative energy sources for power production. In spite of COVID pandemic the energy source which has a rapid growth in last few years is renewable energy sources. The developing countries are trying to overwhelm issues relating to generation of power using these conventional energy sources. Solar and wind meet the demand desideratum with the help of converters and controllers. Among these renewable resources most feasible is solar photovoltaic power, because of its unique features such as no rotating parts, doesn't expel any harmful gases, mobility, noiseless that is eco-friendly in nature. Since PV depends on unalterable factors such as irradiance, temperature it suffers from stability, conversion efficiency etc. For extracting maximum power from PV DC-DC converters play a vital role. The converters must have the capability to boost the voltage, reduce ripples and must be stable to meet the needs of Photo Voltaic array - PV Array. Its performance can be further improved by integrating converter with Maximum power point

beautiful. PV installation in GW from 2014-2020 shows a rapid shift in demand and it is always a raising curve and there is no sign of fall. The installation capacity also shows an elevation for the year 2019 when compared to previous years. The installed value is about 36 GW more in countries like China, India, USA. It is more when compared to the period of 2009-2018. The increase in percentage of annual installation in countries like India, China, USA is shown in figure 1. In 2019 the amount invested to harness power from renewable energy system is 3 times more than the amount invested for fossil fuels. Among the amount invested for harnessing power major part were contributed to wind and solar when compared to other inexhaustible energy sources. It is found that about 282.2 billion USD were invested for the improvement of renewable energy systems to enhance the power production. Among the countries in the world India and Brazil are emerging economies and they have started increasing their funds to develop clean energy technology. The total power harnessed from solar in the world is about 627 Gigawatts for the year 2019. The annual increase is about 100 gigawatts. It is a rising curve and each country contribution towards power production using Solar is shown in figure 2. Among many countries in the world China, USA, Japan, Germany and India will be the major power

Implementation of Tilt angle computing in IoT Based PV System

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Abstract- Because of depleting energy resources, to increase the reliability as well to reduce the capital expenses innovation has to be made to increase the power output from renewable energy. In order to meet the energy demand in future among the energy sources one of the propitious energy source is solar energy. The energy from the sun is abundant and is radiated on the earth surface in the form of heat and light. Some of the alterable factors which influence the production of electric power from solar energy are PV installation factors namely the angle of incidence of light from the sun, orientation, area of exposure etc. The factors that cannot be altered are ambient temperature, wind movements, solar insolation etc. Since the earth and the sun position differs for the month and season. Due to this PV panel tilt angle as well as absorption of sunlight vary. Thus, the energy generation can be increased by determining the optimum angle for PV panel to collect maximum amount of solar energy to increase the electrical energy generation. Thus, tilt angle decides the PV panel surface area exposed to the solar radiations. If the yearly average fixed tilt angle is used the loss of energy is around 8-10% for each month. In order to increase the efficiency, the tilt angle should be varied. This paper confers about the

The cost of energy produced using fossil fuel is expensive when compared to energy produced using solar. In conventional fossil fuel forecast fossil fuel energy consumption increases till 2020 after that its consumption decreases. The power produced using fossil fuel cost around .05\$/kwh whereas solar cost around 0.029\$/kwh. The implementation of solar photovoltaic system helps in producing electric power. The electric power produced can be sold that is it provides an income for the investor or owner of the solar plant. Since it helps in earning it is important in economic point of view. Thus, solar photovoltaic system gains importance in this era not only because of energy point of view but also economic point of view. The figure 1 represents the conventional fossil fuel rise and fall for the period of 1900-2100. The figure 2 delineates the contribution of fossil fuel for the year 2018-2020. It becomes essential to harness maximum yield from solar.

Review on IoT Based Remote Monitoring for Solar Photovoltaic System

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Abstract—Global meliorism of technologies brings down the equipment cost of renewable energy system especially solar photovoltaic system. Depleting resources as well as increasing energy demand make the people to look out for alternative energy sources. So, it becomes essential to increase the energy conversion efficiency of the panels. Technology that helps in increasing the energy efficiency is Internet of Things-IoT. In this digital era IoT evolved as a powerful enabler for it transforms the use of internet to provide solution to improve the living standards of the people. IoT with embedded technology allows sensing and communication devices to interact with each other in all ways to respond to the individual needs of the people, thus it merges digital and physical world. In monitoring and controlling the parameters of PV panel human intervention is replaced by machine-machine communication by IoT. IoT performs A3 that is at any time from any place collect data using sensors in the world and also analyze the data at any time and then process the data to make decisions and perform actions. IoT finds its application in all sectors such as health, industry, agriculture, energy etc. This

Solar, and wind will be the main contributors for replacing fossil fuel which will exhaust by the year 2080. Photovoltaic system may be standalone or grid connected. In some places even wind and solar are integrated to meet the growing power demand. Government of many countries are giving subsidies to encourage the installation of solar and wind.

Covid-19 is a disease which affect the respiratory system and is caused by Severe Acute Respiratory Syndrome. It is a contagious disease if not given proper attention it leads to death. Everything on the earth has wreaked after Covid-19. In spite, of this havoc some of the countries have seen a bloom in the renewable energy sector. In US due to Covid-19 in the second quarter residential installations dropped to 20% but at the end of the year 19 gigawatts of power generated by solar shared the contribution with other resources and is found to be greater than that of solar power produced by Columbia in the year 2019.

In China during this pandemic Covid-19

Review on Soiling Implications and Cleaning Methodology for Photovoltaic Panels

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Abstract :- In power generation the main source which disports a key role is the fossil fuel. The preeminent composition of it is carbon. It requires millions of years to form and it cannot form in short duration. That is, they are non-renewable, once exhausted it cannot be retrieved back. In order to supplant the place of conventional energy sources the world looks for other resources such as renewable energy. Renewable energy sources help in meeting the energy requirement of the growing population along with depleting sources. There are numerous inexhaustible resources available. Among them PV, Wind is gaining importance and its yield helps in satisfying the needs of energy requirement of growing population and industries. Renewable energy power production relies on the substantial factor such as temperature, wind speed, intensity of light etc. These factors affect the performance of energy conversion in renewable energy sources. In Solar photovoltaic panel, soiling decreases the quantum rays reaching the panel. It affects the power yield from PV. Soiling- the accumulation of dust over the PV panels influenced by factors such as orientation, tilt angle, wind velocity, ambient temperature, site characteristics, the texture of the PV panel surface. This paper deliberates about soiling factor influencing performance of the Photovoltaic

The different power production contributors are Solar, Wind, Hydro, Geothermal, Biomass, nuclear power plant etc. Hydro power plant does not emit greenhouse gases, but the cost required for installation and maintenance is high. Apart from these it can be constructed where the water available is abundant and it cannot be constructed near the load centers as a result long transmission lines has to be installed. Geothermal energy releases harmful gases during power generation and it is not easily transportable. Biomass though neutralizes the carbon emitted it expels out methane gas during electrical power generation which affects the ozone layer. Apart from this it requires more space and abundant water.

Nuclear power plant uses uranium to extract energy. Nuclear power plant polluting the atmosphere is less compared to many fossil fuels. But managing the radioactive waste as a result of power production is major challenge. It is because nuclear waste cannot be destroyed, it has to be sealed in a container and must be stored deep under the earth. It also contaminates the environment.

Wireless Power Transfer For Electric Vehicle

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In this technical era some of the reasons which made the researchers to look out for the replacement of Internal Combustion Engine (ICE) are shortage of fossil-fuels, global warming due to emission of green house gases caused by petroleum, gasoline technologies. Electric Vehicles-EVs are substantial alternative for ICE. Electric vehicle on the road can save about an average of 1.5 million of grams of carbon monoxide. Thus, EVs become an enticing solution as it improves the health of the residents, quality of life and air. EVs driven by electric energy depends on the energy stored in the battery. The infrastructure for battery charging may be wired or wireless power transmission. EV is limited by the distance it can travel. In order to overcome the range anxiety, it is necessary to propose a Wireless Power Transfer (WPT)-a technology capable of making the charging mechanism automated This, wireless charging process is more convenient because of absence of wires and is more flexible and reduces the human intervention. This paper discusses about the WPT mechanisms integrated with IoT- Internet of Things to make aware of the user whether the charging carried out by the receiver

Research Article

Liquid Crystal Display (LCD) and Organic Light Emitting Diode (OLED) Applications on Natural Fibre Reinforced Polymer Matrix Composites

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Received 8 September 2021; Accepted 28 October 2021; Published 26 November 2021

Academic Editor: P. Ganeshan

Research Article

A Novel Optimization Algorithm for Modifying the Parameter Unit of Solar PV Cell

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Received 18 January 2022; Accepted 17 March 2022; Published 15 April 2022

Academic Editor: V. Mohanavel

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Periodic and nonperiodic amplifications of attosecond solitons in an inhomogeneous lossy optical fiber

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ARTICLE INFO

Keywords:

Generalized NLS equation

Lax Pair

Darboux Transformation

Attosecond soliton

Amplifications of solitons

Symbolic computation

ABSTRACT

We investigate the variable-coefficient generalized higher order nonlinear Schrödinger equation which governing the attosecond optical soliton propagation in an inhomogeneous fiber system. Three-soliton solutions are attained through Darboux transformation based on the Lax pair. Using three soliton solutions, we investigate the periodic and nonperiodic amplification of three solitons by adopting certain functions to variable coefficients. Various amplification schemes are demonstrated graphically via symbolic computation. Especially, periodic and nonperiodic amplifications are attained under dispersion and nonlinearity management. In order to realize the soliton amplifications, two different set of variable coefficients profiles are employed. The results obtained in this work will be helpful for designing the optical amplification devices by soliton control technology.

Grid Interfaced Windfarm Using Dynamic Voltage Restorer for Power Compensation with Pv Fed Sepic Converter

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Abstract: In this paper, the wind energy generation farm is connected with the grid system. The dynamic voltage restorer (DVR) is installed to control the grid side's under and overvoltage. The photovoltaic (PV) system is installed in the DVR system, and the voltage of the grid over and under voltages is also addressed to achieve the proposed system's high efficiency. The grid voltage compensation is harvested from PV and injected through the DVR. The boost converter is used in the existing systems to improve the available power from PV. In this system, the SEPIC converter is used to achieve high voltage gain from the PV plant to improve DC link capacitor voltage which is the inverter input source. The DVR based wind energy farm using PV with SEPIC system results are achieved in MATLAB/Simulink.

Keywords: PV array, DVR, SEPIC, Wind farm, and Grid system.

Research Article

Investigation on Wear Characteristics of AZ91D/ Nanoalumina Composites

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Performance Analysis of IPT with DC to DC Converter for E-Vehicle Application

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Abstract. This work proposes the utilization of Inductive Power Transmission (IPT), for charging the E-Vehicle's battery with the help of an efficient DC TO DC converter. In this IPT method, the DC TO DC converter is operated with the inclusion of transmitting and receiving coils. The required power for transmitting coil from the input source (AC Source or solar energy) is controlled and supplied by the DC TO DC converter 1. Meanwhile from the receiving coil side of IPT system, the obtained power supply will be controlled by DC TO DC converter 2 for charging the battery. In order to identify the efficient DC TO DC converter, two types of converters namely VMC (Voltage multiplier cell) based DC TO DC converter and LUO converters are taken into account for comparison.

Keywords: DC-DC Converter, LUO, IPT, E-Vehicle, Battery

1 INTRODUCTION

1.1,EXISTING SYSTEM METHODOLOGY

Most of us in this modern world use a traditional vehicle that uses fossil fuel, which is the primary factor that causes harmful damage to the ozone layer. It is therefore, proposed traditional vehicles will be replaced by electric vehicles (EV) [1] to maintain the quality of the air around us. This solution of using battery-operated vehicles [2-3] leads the automobile industries to manufacture various cars and two wheelers which are more luxurious thus replacing the engines of the conventional vehicles by motors. This is named as the E-Vehicle [4] and it is popular in the market but not affordable for all consumers due to its heavy initial cost. All these luxurious



An integrated CRITIC-TOPSIS- and Entropy-TOPSIS-based informative weighting and ranking approach for evaluating green energy sources and its experimental analysis on pyrolysis

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Received: 24 October 2021 / Accepted: 8 April 2022

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Abstract

Selection of the most suitable biomass material for bio-fuel generation is a complex and multi-criteria decision problem as it engages many conflicting criteria which have to be assessed simultaneously. In the past, researchers have used subjective weighing techniques, which question the reliability of the approach. In this study, two objective weighing methods such as Criteria Importance Through Intercriteria Correlation (CRITIC) and Entropy are used to calculate the weights of evaluating criteria and Technique for Order of Preference by Similarity to an Ideal Solution (TOPSIS) is applied to select the suitable biomass material. This study considered six biomass alternatives such as lemongrass (A1), hard wood (A2), rice husk (A3), wheat straw (A4), rice straw (A5), and switch grass (A6), and seven important criteria such as volatile matter, fixed carbon, moisture and ash content, lignin, cellulose, and hemicellulose have been evaluated. Both the approaches show that switch grass has been the best alternative for yielding more bio-oil while rice straw is seen as the worst preferred option among the selected biomass materials. These approaches are systematic having simple computational procedure for determination of complete ranking of biomass materials. At the end of the study, the prediction is also validated by conducting pyrolysis experiments and characterization study. The experimental findings are identical and indicating a strong correlation between MCDM approach and real-time study.

Keywords Biomass material selection · MCDM · Entropy · CRITIC · TOPSIS · Pyrolysis



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Outline

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Volume 170, August 2022, 103137



Review

Extraction of maximum power from solar with BLDC motor driven electric vehicles based HHO algorithm

Mali Satya Naga Krishna konijeti , M.L. Bharathi

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Figures (31)



Highlight

- Harris Hawks Optimization (HHO) is used to offer a Maximum Power Point Tracking Technique (MPPT) for Photovoltaic (PV) Powered e-Vehicles.

Artificial Neural Network based Automatic Prediction Unit for COVID 19 in Asymptomatic Patient

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Abstract- In this pandemic situation of COVID 19 virus attack in human race for the last few months the disease occurrence prediction and patient's condition monitoring is being a major thrust area in the global medical field by the researchers. The major problem of this disease is that the asymptomatic patient are acting as a carrier without knowledge. Which leads to a major threat in spreading the disease which even cause death in other people even after maintaining the social distancing. More over according to the research, rate of death is more in heart related disease affected patients. There is a vital need to detect cases at the early stages to minimize mortality especially in heart patients. In our work, we have designed and developed a trained Artificial Neural Network which can predict COVID 19 in asymptomatic patients and also can used for conditioning monitoring in COVID affected patients. Here we have used 2500 patients' details as training and testing data for the ANN network and 50 Symptoms as input variables. The Patients data are collected in Government Sivagangai Medical College and Hospital, Thirupathur village, Sivagangai district, Tamilnadu, India.

Keywords: COVID-19; Coronavirus; ANN prediction tool; ANN condition monitoring tool.

I. INTRODUCTION

nature of virus, COVID 19 has become a critical topic for the medical society. To flatten the curve a strong comprehensive strategy for surveillance and testing is required. So, if this disease is predicted in earlier stage many lives can be saved [1-4]. An optimization technique in order to predict the transmission style across the countries. [5]. Literature Survey on the Artificial intelligence and Machine learning techniques application for solving various factor of COVID 19 and to fight against outbreak of coronavirus [6]. Based on the countries and the affected cases the lockdown strategies are mitigated [7, 8]

II. ARTIFICIAL NEURAL NETWORK FOR COVID PREDICTION

Since the coronavirus attack involves multiple factors and spreads from unknown source our problem of prediction in early stages became nonlinear in nature. The disease source depends on various factors right from age, occupation, H/O

Article

Hybrid Multicarrier Random Space Vector PWM for the Mitigation of Acoustic Noise

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Citation: Madasamy, P.; Verma, R.; Bharatiraja, C.; J., B.P.G.; Srihari, T.; Munda, J.L.; Mihet-Popa, L. Hybrid Multicarrier Random Space Vector PWM for the Mitigation of Acoustic Noise. *Electronics* **2021**, *10*, 1483. <https://doi.org/10.3390/electronics>

Abstract: The pulse width modulation (PWM) inverter is an obvious choice for any industrial and power sector application. Particularly, industrial drives benefit from the higher DC-link utilization, acoustic noise, and vibration industrial standards. Many PWM techniques have been proposed to meet the drives' demand for higher DC-link utilization and lower harmonics suppression and noise reductions. Still, random PWM (RPWM) is the best candidate for reducing the acoustic noises. Few RPWM (RPWM) methods have been developed and investigated for the AC drive's PWM inverter. However, due to the lower randomness of the multiple frequency harmonics spectrum, reducing the drive noise is still challenging. These PWMs dealt with the spreading harmonics, thereby decreasing the harmonic effects on the system. However, these techniques are unsuccessful at maintaining

Synthesis and study on optical properties of $\text{CeO}_2\text{-Mg(OH)}_2$ and inverted $\text{Mg(OH)}_2\text{-CeO}_2$ nanocomposites

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Well-crystalline $\text{CeO}_2\text{-Mg(OH)}_2$ and inverted $\text{Mg(OH)}_2\text{-CeO}_2$ nanocomposites were successfully synthesized by a facile 'one-pot' chemical precipitation method at low temperature. The crystal structure, morphology and optical properties of the $\text{CeO}_2\text{-Mg(OH)}_2$ and inverted $\text{Mg(OH)}_2\text{-CeO}_2$ nanocomposites were investigated using X-ray diffraction, TEM, FTIR, UV-vis absorption and PL spectrometer. The photoluminescence study revealed visible light emission for the nanocomposite. Interestingly, significant red shift observed for $\text{Mg(OH)}_2\text{-CeO}_2$ nanocomposites. The optical tuning nanocomposites can be used for the optoelectronic applications.

(Received July 3, 2021; Accepted November 4, 2021)

Keywords: Nanocomposites, TEM, X-ray techniques

MPPT Based Solar PV and Class IV Powered Brushless DC Motor for Water Pump System

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Abstract :- In this work the PV (Photo Voltaic) panel is used for primary energy supply of the complete arrangement. However, class IV power supply is proposed as a backup power source. The PV output power is fed to zeta converter and class IV source is fed to boost converter with the same input power. In this proposed system the P&O algorithmic method of MPPT is implemented. The P&O algorithm regulates the duty cycles given to zeta converter, that will continue DC link voltage. The motor speed is regulated by correcting the voltage of the DC link in the inverter which is given to motor. When the PV power absent, class IV power and boost converter maintain the voltage constant across DC link. The effectiveness of proposed work can be verified using MATLAB simulation and developed prototype model..

Keywords— VSI, Solar PV Array, MPPT, ZETA Converter, BLDC Motor, Class IV Source, Boost Converters.

I. INTRODUCTION

The continuous lessening cost of solar panels and semiconductor devices has fortified the pupils and companies to exploit the PV array produced power for diverse

[8]. The merits of zeta converters are more advantageous in the proposed PV system to BLDC Motor drive. In the prevailing cases PV inverters used in small PV units categorized for large variety of input voltage appropriate to receive different conformations in PV field [9]. The ability is guaranteed by accepting inverters depends on double stage system. In the first phase, normally DC to DC converter, used to adjust the Photo Voltaic system voltage so as to achieve the necessities of DC to AC level, that is used for an AC load or insert the generated power to the grid [10]-[11]. In this arrangement the effectiveness and also in relation of controllability. The first phase is given as the pathway for maximum power in PV array. In second stage it is used to yield ac current with a minimal Total Harmonic Distortion (THD). Another control structure creates more cost and difficulty, that is necessary to regulate the speed. In addition, the voltage source inverter can be operated with switching loss so that the efficiency also reduced [12]. In Z source inverter exchanges dc to dc converter in another representation remains unaffected, ad gives high efficiency with low cost

Improved Dynamic Response of Boost LLC AC–DC Converter with Voltage Regulation

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Abstract :- This paper shows a high gain idea for Industrial application to straight forwardly incorporate Boost LLC converter. Here the simulation was developed for FOPID for Boost LLC converter in DC loads system with Power Factor Correction (PFC). This work recommends FOPID to control and improve time domain response in voltage Regulation. The output of Boost LLC converter is measured by using closed loop arrangement. The locked PI & FOPID configured Boost LLC converter arrangements are simulated and outcomes are compared. The outcome of signifies of Boost LLC-FOPID provides a better answer than the Boost LLC-PI controller arrangement. The Boost LLC-FOPID controlled high gain arrangement has better result parameter like reduced steady-state error, rise time, peak time, settling time.

Keywords—Boost LLC; PI controller; FOPID Controller; Control loop, Stability-Analysis; Time domain characteristics

I. INTRODUCTION

In the revolutionized modern world the awareness toward the harmonic pollution increased the interest to design an advanced power quality (PQ) for high gain voltage ratio

output voltages of various applicable grades. Boosting and decreasing charge of uncontrolled capacitor effect in an exceptionally distorted output, higher crest factor [3] moreover sometimes the higher input current disrupts the limitations of “International PQ(Power Quality) standards” such as IEC 610003-2. Further, the current in neutral line in the distribution system surges if these (Personal Computer) PC’s are used in an enormous quantity that produces severe problems like Heating and overloading the of neutral conductor, input supply noise, reduction of the transformer rating, voltage disturbance etc. Finding a solution for this problem can be attempted through increasing the power quality on the non-linear loads that are working along with unity power factor at any type of load are extensively being developed.

Switched Mode Power Supplies (SMPS) for PC’s are commonly utilized with PI controllers that give a very bad power quality [4]. The poor quality of power exhibits that the utility interlinks such as total harmonic distortion (THD) of input power supply current being higher than 80% if the power factor being lesser than 0.5 and voltage

Chapter 6

Potential Applications of 6G–Enabling Technologies and Challenges

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ABSTRACT

Through specific technical approaches, 6G will provide people with high quality of service (QoS) and high quality of experience (QoE), so as to make human life better. The author predicts the huge potential and development trend of 6G wireless communication technology combined with the healthcare field. 6G is a promising communication technology, and it is expected to revolutionize many sectors, including healthcare. Currently, time and space are the primary barriers to healthcare, and 6G has the potential to break these barriers down. The authors first introduce the background and related obstacles of the current healthcare development field and then prove the huge potential of 6G in its development field. Further, they reveal how 6G technology can be utilized for remote surgery, epidemics, and pandemics. Finally, there are related challenges. Similarly, the cell free communication in AR/VR helps in 360 video scenes.

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Biometric And IOT Technology Based Safety Transactions In ATM

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Abstract—The ATM Fraudulence occurring in the society has become very common nowadays. Even though technology has boomed in various aspects it is being misused in different ways for stealing money through ATM'S. Skimming and Trapping of the ATM devices have been designed by many Burglars. Recognition based Verification system as been implemented for many ATM's for safety purposes. This work deals with Biometric recognition like fingerprints, face recognition to identify person. In addition, Internet of things has been used to enhance the security of the Money and to give timely updates. Also, one time password will be sent to user to verify identity. Simulation of the work is done in Proteus and the results are verified by implementing the same with a hardware setup.

Keywords—component; ATM Transactions; Face Recognition System; Internet of Things; Machine to Machine Communication

technique which cannot be same for any two individuals. This property is used to recognize each person and secure his own materials [5]. The Biometric feature is continued without which authorization is denied [6].

A new concept called the GAMMA Concept has been illustrated by which many security levels have been established in local level, national level and international level for different stake holders [7]. Multibanking transaction system has been implemented with high security and verification at different stages [8]. Also, Iris Recognition sensors is used for capturing the movements and coding is done by Python for Safe transactions in ATM [9]. The Objective is to make a secured and advanced cash transaction machine based on multifactor authentication. Provide restriction of access on lost or stolen card to avoid misuse and

Automatic Speed Controller of Vehicles Using Arduino Board

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Abstract :- As a ways as vehicles are involved, safety may be very critical to reduce the occurrence of accidents in velocity confined zones. It lessens the lack of belongings and lifestyles. According to the modern-day surveys, within the past few years, an coincidence close to the school zones, hospital zones and sharp turnings have accelerated quite, because of their rush to get the centered area fast. Therefore calculating automobile velocity has been a important trouble to be taken into consideration. This paper goals to offer a realistic, packed in and easy propose to develop an automated automobile speed manipulate gadget, which desires to be quick get achieved in college, university, hospital, sharp turning zones to reduce the various accidents. This computerized speed controlling machine is constructed using the microcontroller- primarily based definitely platform of the Arduino Uno board. Here programming the Arduino inside the sort of way that, the prescribed speed restrict became integrated within the transmitter unit. The transmitter sends the signal through the receiver inside the vehicle using wi-fi communication era and the speed of the automobile modified into mechanically controlled with the aid of the input alerts by way of the usage of the receiver, with the assist of velocity encoder sensor..

Keywords—Arduino uno board, encoder, microcontroller, receiver, transmitter.

I. INTRODUCTION

on both sides of the road. The speed restrict set through the tool is kept on the very area relying upon the visitors. The travelling time taken by the car during journey from one place to other is designed via a microcontroller application. Based on that time it then calculates the velocity and displays that on an LCD and additionally transmits the equal. Moreover if the automobile crosses the speed restrict, a buzzer sounds alerting the police both on the place and wirelessly on the manipulate room[1]. The accident are prevented by gadget absolutely works on the basis of a non-stop video processing device, a digital camera is placed on the bottom of a rear view replicate which is positioned within the front windshield of the automobile which works like a belief system accumulating all of the modifications in the environment and gives it to an PIC controller which does processing and senses any obstacles gift on street and if the size of the impede is minimal and doesn't motive any damage that it's far properly underneath the automobile. The vehicle doesn't sluggish down and can be capable of circulate constantly with the equal pace, but if there is any obstacle that hinders the progress of the automobile the processor will test whether or not the auto is slowing down or not. If it doesn't sluggish down the automatic machine applies brakes and slows down the auto before getting collided with the obstruction. Initially our concept became to offer

Energy Forecasting of Grid Connected Roof Mounted Solar PV Using PV*SOL

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Abstract : Solar energy is renewable energy source which can be easily converted into electrical energy. This paper presents the selection of proper PV system, battery and inverter for a particular application for any location based on its climatic condition before implementing in real time. So before implementing the experimental set up, the entire system is simulated using any PV*SOL simulation software and the obtained results used to decide and modify the design of planned system. In this paper, a Grid coupled PV system along with electrical battery, electrical vehicle and consumption load is analyzed. Four PV module is used and each PV module uses different tracking systems. Production forecast with consumption, usage of PV energy, coverage of consumption of electric vehicle, battery, grid and other electrical appliances are analyzed by using PV*Sol.

Keywords— Energy forecast, Grid connected PV, Inverter, Battery, Electric vehicle, PV* SOL.

I. INTRODUCTION

The sun is the most important source of energy which is natural and abundant among all the available resources of

helps us to decide which technique is more suitable to any particular tracking system. There are many methods being improvising and already developed, that enhances and increase the lifetime of the solar panels as well as cooling systems suitable to the kind of system designed [4]. Multi-method concepts are also discussed while studying the design and tracking algorithms of PV systems. There is a need to design solar photovoltaic system that can obtain maximum energy from the sun and track the sun throughout the day to produce continuous energy [5]. The sun position and optimum inclination angles of solar panel can vary time to time. Hence to avoid complexity in solar tracking, a simple accurate sun position measuring system is needed to provide better results [6]. Various sun position tracking algorithms are needed to be studied in order to understand the trajectory movements of sun and to calculate accurate positions of the sun and analyze the climatic conditions even on an unusual day. The power output of PV systems depends on solar irradiation of sun's energy. Henceforth the panels are arranged right angles to the sun's irradiation [7]. In recent years a new approach of solar tracking which includes vision with attached camera

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Modeling of Filters For Grid Connected Voltage Source Inverter used in Renewable energy resources

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Solving constrained economic electrical energy generation and CO2 emission dispatch using hybrid algorithm



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ARTICLE INFO

Article history:

Received 8 June 2021

Received in revised form 14 September 2021

Accepted 29 September 2021

Available online 6 October 2021

Keywords:

Economic dispatch

Emission dispatch

Intelligent algorithm

Hybrid algorithm

Firefly algorithm

Differential evaluation

Constraint optimization

ABSTRACT

Carbon foot print is latest hot discussion and all the countries are started the initiation to minimize it. One of the main carbon emission industries is thermal electrical power generating company. For the social welfare the emission has to minimize to maximum extend. The electrical power generation company as well needs to minimize the generation cost for the better operation. Minimizing carbon foot print and minimal power generation cost are opposite to each other. When the optimization focused to minimize the generation cost it lead to increase the carbon foot print and vice versa. This paper addresses the constraint the optimization problem which needs the objective of reducing both emission and generation cost. Electrical power generating cost of thermal power plant is nonlinear and non-convex in nature. Likewise the emission produced by the thermal power plant is complex mathematical problem. Intelligent algorithms are best suitable to solve these types of practical problems. In this paper hybrid of firefly algorithm and differential evolution technique is adopted to find the constrained emission minimization and cost minimization. Firefly algorithm works based on brightness, attractiveness and movement and there is no mutation process.

Article

Performance of Multifunctional Smart PV-Based Domestic Distributed Generator in Dual-Mode Operation

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Citation: Chandrasekaran, K.; Sahayam, J.J.; Thanasingh, S.J.S.D.; Ramalingam, S.; Fayek, H.H.; Ravichandran, N.; Rusu, E. Performance of Multifunctional Smart PV-Based Domestic Distributed Generator in Dual-Mode Operation. *Machines* **2021**, *9*, 356. <https://doi.org/10.3390/machines9120356>

Abstract: This article briefs about a smart multifunctional single-phase inverter control for a domestic solar photo voltaic (PV)-based distributed generation that can work in both a grid-connected mode and an islanded mode by making the inverter mimic the operation of a synchronous generator. The control objectives were threefold: to provide the required active and reactive power for normal operating conditions and under varying operating conditions, to maintain the rated voltage and the rated frequency for the islanded mode, and to switch between the two modes of operation with the least amount of disturbance for the system while behaving as a virtual synchronous generator (VSG). The control structure is divided into three major loops: the outermost loop responsible for power control, the middle loop responsible for voltage control, and the innermost loop responsible for current control. The proposed control methodology incorporates the functionalities of the

Constraint estimation in three-diode solar photovoltaic model using Gaussian and Cauchy mutation-based hunger games search optimizer and enhanced Newton–Raphson method

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Abstract

The reliability of the photovoltaic models is strongly reliant on their parameters, which are primarily determined by the optimization algorithm and the objective function. As a result, obtaining the parameters under different environmental conditions is critical for increasing their performance, reliability and significantly lowering cost. Many optimization techniques are reported to address this problem based on the complexity. As a result, an enhanced version of the recently reported Hunger Games Search Optimizer (HGSO) method called Gaussian and Cauchy Mutation-based HGSO (GCMHGSO) algorithm for defining the requirements of the Three-Diode equivalent Model (TDeM) by utilizing multiple representations in the algorithm along with an efficient objective function. The Cauchy mutation increases the exploration ability, and Gaussian mutation increases the exploitation ability of the basic HGSO. Furthermore, an Enhanced Newton–Raphson Method (ENRM) is presented to effectively solve the behaviour of the *current–voltage* relation of the TDeM. The robust optimization is also considered to demonstrate the impact of the measurement error. Comparing the GCMHGSO-ENRM to other competitors reveals that the proposed GCMHGSO-ENRM can accurately find the best solution, and its effectiveness is verified in many statistical parameters. It is found that the GCMHGSO-ENRM algorithm is stable and robust compared to other competitors.