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Organized by

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INDEX

S.NO	PAPER ID	TITLE	AUTHOR(S)	PAGE No.
1	EE-301	COORDINATED POWER CONTROL SCHEME IN SOLAR PV SYSTEM USING MPPT TECHNIQUE AND MULTILEVEL INVERTER	S.P.RAGHAVEL , H.SAI SIDHARTHA, A.SHANMUGASUNDARAM, DR.J.PRAKASH	6
2	EE303	POWER ELECTRONIC CONVERTERS CONTROLLED SHIP PROPULSION ELECTRIC MOTORS	M JAQULIN SIMRAN	7
3	EE304	A QUASI IMPEDANCE SOURCE INVERTER BASED PV SYSTEM	MR.JAVID AHAMED.S	8
4	EE306	ARM AND HAND DESIGN OF THE HUMANOID ROBOT AND FACIAL EXPRESSIONS AND GUESTURES	S.V.DHARANIKUMAR C.NARENDRAN D.DINESH	9
5	EE307	IMPLEMENTATION OF RENEWABLE ENERGY BAILEVEL INVERTER USING MINIMUM NUMBER OF TRANSISTOR	MR.A.SARAVANAN	10
6	EE309	AUTOMATIC FILLING MANAGEMENT USING ARDUINO	M.MANI KANNAN MOHAMMED BASURUDEEN M MOHAMMED FAZIL	11
7	EE310	HOME AUTOMATION USING IOT FOR OPTIMUM UTILIZATION OF HYBRID RENEWABLE ENERGY	MOHAMMED SHABEER TAJ S MOHAMMED SHAIKE FARID MOHAMMED SHAMEER I GOKUL.K	12
8	EE311	PLC BASED RAILWAY SAFETY SYSTEM	MOHAMED SULAIMAN.A BASHEER AHMED THASVEER ALI A	13
9	EE313	DESIGN OF T-SHAPED LINEAR INDUCTION MOTOR	ARAVINDH H.A FARHAN SHAREEF MOHAMMED ZAHIR HUSSAIN RASOOL GANI	14
10	EE314	INNOVATIVE TRENDS IN RECENT TECHNOLOGIES COCONUT HARVESTING MACHINES	NAUSHAD SAHEB K	15
11	EE315	APPLICATION DEPENDENT TESTING OF FPGAs	MRS. P SAIPRIYA	16
12	EE316	SOLAR POWERED AIR CONDITIONER USING BLDC MOTOR	ARTHIHA.J.S, MAGESHWARI.M NAVEEN KUMAR CHANDRU S MOHAMMED	17
13	EE317	EXERGY ANALYSIS OF SOLID OXIDE FUEL CELL	MRS. S THILAGAVATHI	18
14	EE318	SECURING RFID WITH ULTRAWIDEBAND RADIATION	MR.J.MOHAMMED ILIYAS,	19
15	EE319	THERMAL PROFIT BASED UNIT COMMITMENT INTEGRATED WITH RENEWABLE ENERGY USING IPPD AND MMA	MR. S.F SYED VASIYULLAH	20
16	EE320	IMPLEMENTATION OF DIFFERENTIAL EVOLUTION ALGORITHM FOR MPPT OF PV FOR MODULAR MULTILEVEL CASCADED INVERTER	MR. M S RAJAN	21

17	EE325	FUZZY LOGIC CONTROLLED BUCK-BOOST DC-DC CONVERTER FOR SOLAR ENERGY BATTERY SYSTEM	RAVINDHAR.J MANOJ M MANIKANDAN J TAMIL SELVAN S	22
18	EE326	MICROCONTROLLER BASED DRIP IRRIGATION SYSTEM	PARAMESH A ZUBAIR I VIGNESHWARAN C MOHAMMED AHAMED SHARKHAN J A	23
19	EE328	DESIGN AND IMPLEMENTATION OF A MODULAR MULTILEVEL CASCADED INVERTER WITH PHASE SHIFTED CARRIER PWM USING FPGA	MR. M S RAJAN	24
20	EE334	SOLAR POWER FED PARALLEL IN SERIAL OUT THREE WINDING COUPLED INDUCTOR FOR BOOST CONVERTER	D.SIVAMANI	25
21	EE335	ANALYSIS AND DESIGN OF PV POWER FED GENETIC ALGORITHM BASED PI CONTROLLER FOR BUCK- BOOST CONVERTER	D.SIVAMANI	26
22	EE337	INTERLEAVED SEPIC CONVERTER USING SLIDING MODE CONTROLLER IN DISCONTINUOUS CONDUCTION MODE WITH HIGH GAIN.	MANIMEGALAI VISHNUPRIYA, LAVANYA, PARKAVI	27
23	EE-339	OPTIMAL ROTOR TIP CONTROL FOR WIND TURBINE BY USING NOVEL CAPRA ALGORITHM	AUGUSTEEN W A DEVI M DR. R. RENGARAJ	28
24	EE341	DESIGN AND IMPLEMENTATION OF DSM TOOL TO STUDY THE IMPACT OF FOSSIL FUEL FIXED AND VARIABLE COST EFFECT ON DIFFERENT CONSUMERS IN MATLAB/SIMULINK ENVIRONMENT	MR.A MOHANA SUNDRAM	29
25	EE342	ANALYSIS AND DESIGN OF INTERLEAVED BOOST CONVERTER AND MULTIDEVICE IBC CONNECTED TO PMDC MOTOR AND VARIABLE LOAD RESISTANCE	D. SIVAMANI	30
26	EE343	OPTIMAL PLANNING OF TRANSMISSION SYSTEM USING PARTICLE SWARM OPTIMIZATION	HARIPRIYA R AUGUSTEEN W R KALAIVANI.S	31
27	EE348	A CLOSED LOOP CONTROL STRATEGY OF TRANSFORMERLESS BUCK-BOOST CONVERTER WITH PID CONTROLLER	KARUPPIAH M, ARAVIND R, SARANRAJ K, DIWAKAR S	32
28	EE349	A SINGLE-STAGE SINGLE-SWITCH MULTIPLE OUTPUT LED DRIVER CIRCUIT	MARYSARANYA.T, ILAKIYA.K, SUJITHA.G, RAMYA.S	33
29	EE351	A LOW DEGREE OF FREEDOM BASED	MEENA.S	34

		PROSTHETIC HAND WITH HIGH GRASP ABILITY FOR PEOPLE WITH PARTIAL HAND DISABILITY	PONMANI.T , IVARANJANI.B , SARUGA.E	
30	EE352	IMPROVEMENT OF POWER QUALITY USING MULTILEVEL STATCOM FOR PV BASED APPLICATIONS	VIJAYAKUMAR S.C, KANNAN M, PRASANNA SRIRAMAN P, KIRUBAHARAN M	35
31	EE353	HIGH GAIN DC- DC CONVERTER USING LPPT TECHNIQUE FOR PV APPLICATION	AJITH RAJA P, KESAVAMOORTHY M, MOHAMAD THAHEER T KARUPPIAH M	36
32	EE354	IMPLEMENTATION OF SINGLE PHASE SEVEN LEVEL INVERTER FOR UTILITY SUPPLIES APPLICATION	BHARANI.V, SAKTHIVEL.R, MANI.P	37
33	EE355	A RAILWAY TRACTION POWER CONDITIONER USING STATCOM BASED MULTILEVEL CONVERTER FOR HIGH-SPEED RAILWAY SYSTEM	VINODINI D, ISHWARYA K, RAGAVI R, MEENAKSHI R	38
34	EE356	CLOSED LOOP CONTROL STATREGY OF BDLC MOTOR FOR POWER FACTOR CORRECTION	GOPINATH.P , KALAISELVAN.G, THENNARASU.R	39
35	EE357	A NEW BDC TOPOLOGY FOR FLYWHEEL ENERGY STORAGE	NATRAJAN S, MANJU P ARUN KUMAR A, ADHITHIYAN	40
36	EE358	A NON-ISOLATED BIDIRECTIONAL SOFT SWITCHING CURRENT FED LCL RESONANT DC/DC CONVERTER TO INTERFACE ENERGY STORAGE IN DC MICROGRID	OVIYA.D , SHALINI.N , SANDHIYA.S , SUNDARIA	41
37	EE359	TRANSFORMERLESS GRID-CONNECTED PHOTOVOLTAIC SYSTEM USING SPWM	DR.R.SATHISH KUMAR DR.K.UMA DEVI, N.NEBINA I INFANT FELCIVA	42
38	EE-360	MATERIAL SEGREGATION USING ARDUINO	ASKAR ALI.D ASSEM M MOHAMMED THOWEEK M NAVEEN KUMAR A	43
39	EE361	CONTROL OF REDUCED-RATING DYNAMIC VOLTAGE RESTORER WITH A BATTERY ENERGY STORAGE SYSTEM	FATHIMA K , KARTHIKHA R, SUSMITHA K,SWATHY N,	44
40	EE362	A NEW TRANSFORMERLESS CASCADED H5 INVERTER WITH DC-DC CONVERTER FOR PHOTOVOLTAIC SYSTEM	KARTHIKUMAR.K, KARUPPIAH.M, BASITH ALI.A, GOWTHAM.C, PARANTHAMAN.R	45
41	EE-363	SOLAR POWER EMPLOYING SEPIC CONVERTER DRIVEN BLDC MOTOR	MOHAMED AJMAL.M MOHAMMED NIJAR H THAWFIK KAREM	46
42	EE364	IMPROVED TRANSFORMERLESS PHOTOVOLTAIC INVERTERS TOPOLOGY WITH SPACE VECTOR	KARTHIKUMAR M, ELAYAVAN M, DAVID LIVINGSTON K	47

		<u>MODULATION TECHNIQUE</u>	JEYASURIYA M	
43	EE365	<u>SOLAR PV ARRAY EMPLOYING Z SOURCE CONVERTER</u>	MURALIDHARAN.M, GOKUL RAMESH.D, THOMAS.M.S	48
44	EE367	<u>A MODIFIED SINGLE PHASE MULTILEVEL INVERTER WITH REDUCED SWITCHES AND HARMONICS FOR RENEWABLE APPLICATIONS</u>	MANIMEGALAI D, VAISHNAVI R, DIVYA A, SENBAGAVALLI,	49
45	EE368	<u>EYE GAZE CONTROLLED WHEELCHAIR BASED ON ELECTROOCULOGRAPHY FOR THE PARALYZED PATIENTS</u>	VARADARAJAN.P ABUBAKER.S MOHAMMED ATHIQ.K KALAIVANAN.T JEBA CHRISTLA, A/P EEE	50
46	EE369	<u>IMPLEMENTATION OF ANTI-BRAKING SYSTEM USING CAN PROTOCOL BY INTERFACING CONTROLLERS</u>	KRISHNAKUMAR.S, DINESH.K, VEERAVIJAYAN.M, MUTHURAJ.D	51
47	EE372	<u>SINGLE STAGE BOOSTING INVERTER FOR HIGH GAIN APPLICATION</u>	DINESH KUMAR P, ARAVAZHI S, CHANDRU V, DINESH KUMAR M	52
48	EE374	<u>STABILIZATION OF DC MICRO GRID BY ACTIVE DAMPING METHOD</u>	VIGNESH.V SATHYA GIRIDHAR.G PRASANTH.N	53
49	EE376	<u>ENERGY MANAGEMENT SYSTEM IN INTERNET OF THINGS PLATFORM</u>	SASWATIKUMARI BEHERA DR.NALINKANTMOHANTY DR.PROMODKUMAR GOUDA	53
50	EE378	<u>TEXT TO VOICE ADAPTION USING PORTABLE CAMERA</u>	MR.S.BASKARAN S.AJITH KUMAR S.ARAVINDASWAMY R.ARUN PRASAD YADHAV	54
51	EE383	<u>HIGH STEP-UP CONVERTER WITH THREE-WINDING COUPLED INDUCTOR FOR FUEL CELL APPLICATION</u>	SARANYA DEVI.S, NIRMALA.S, SYAMALA MANI.A	55
52	EE383A	<u>DESIGN OF CONTROL METHOD TO PREVENT COLLAPSE OF MICROGRID</u>	R.PRASANNA VENKATESH, D.Y.VIGNESH, S.VEDAGIRI, MR.K.DILAVAR BASHA	56
53	EE384/EE 359A	<u>MULTI OUTPUT RESONANT BOOST RECTIFIER FOR INDUCTION HEATING APPLICATION</u>	PREETHI.K.C , RAMYA.P, RANJITHA.M	57
54	EC493	<u>INDEPENDENT INTERFACE FOR A GESTURE WHEEL CHAIR</u>	SHEIK ABDULLAH.A SURESH.G, VINOTH.D, JENIN PRABHU.R	58
55	CS627	<u>RECOGNITION AND CONVERSION OF TEXT TO SPEECH UNDER DIFFERENT LIGHTING CONDITION FOR VISUALY IMPAIRED PEOPLE</u>	SUSHILKUMAR.U RANJITH KUMAR, VIJAY.A.V.R, KARTHIKEYAN.M	59

EE-301 CO ORDINATED POWER CONTROL SCHEME IN SOLAR PV SYSTEM USING MPPT TECHNIQUE AND MULTILEVEL INVERTER

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Abstract—In recent days the requirement of continuous power is increasing abruptly and to meet out the current demand, use of renewable resources for power generation has received the most attention. This proposed system is dealt with coordinated control strategy for solar PV applications using Improved P&O algorithm and Multilevel inverter so as to obtain maximum power at all the time with reduced power oscillation. The voltage from the PV array is very less ,which is boosted using DC-DC boost converter circuit and further fed to the inverter unit. In this system the boost converter and MPPT control unit is formed into a closed loop so that the output of the boost converter depends on the power obtained from the PV array . The modified Multilevel inverter circuit is designed in such a way that reduces the switching losses and harmonics. the Proposed system is designed using MATLAB Simulink software to validate the operation of different units associated in this and the Total Harmonic Distortion(THD) is available by using MATLAB simulation. Hence the carried out simulation studies shows that proposed system provides high output voltage with very low THD using less Switching devices.

Key Words — Multilevel inverter, Total Harmonic Distortion (THD), DC-DC boost converter.

EE-303 POWER ELECTRONIC CONVERTERS CONTROLLED SHIP PROPULSION ELECTRIC MOTORS

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Abstract—The main essence of this paper is the electric ship propulsion system. Mainly how different types of converters are used for propellers that contributes for harmonics. Here we simulate different kinds of converters such as Rectifiers, VSI's ,CSI's and Cycloconverter and analyze the harmonics of each converter and finally by proving Cycloconverter as the best converter for ship propulsion systems by doing FFT Analysis in MATLAB. A hardware setup consisting of a Cycloconverter with a Single Phase Induction Motor and Single Phase Synchronous Motor with a Propeller connected to it with the help of a shaft. The complete simulation is done with the help of the MATLAB software .The simulation of 3 Phase induction Motor and Three Phase Synchronous Motor are also done with the help of MATLAB since there are some problems which differ in 1ϕ and 3ϕ circuits producing harmonics.

Key Words — Voltage Source Inverter, Current Source Inverter, Cycloconverter.

EE-304 A QUASI IMPEDANCE SOURCE INVERTER BASED PV SYSTEMS

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Abstract— This paper shows the clear understanding of the control of the output voltage by varying the modulation index and the boost factor independently. A comparative analysis between impedance source inverter and the quasi impedance source inverter (QZSI) were made and the best suitable inverter for PV generation system is found. The closed loop strategy in the QZSI were implemented successfully with good power conversion. The unique gate pulse pattern is designed to cope up with the shoot through and non-shoot through states in MATLAB Simulink and the gate pulse pattern is generated using the PIC 16F877A..

Key words—Boost factor, MATLAB Simulink, Modulation Index, PV systems, Quasi Impedance Source Inverter,

EE-306 ARM AND HAND DESIGN OF THE HUMANOID ROBOT AND FACIAL EXPRESSIONS AND GESTURES

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Abstract—The advancement in the field of assistance robots is growing. Therefore robots need sophisticated interaction abilities. Non-verbal communication and gesture realization seems to be an appropriate way to increase the quality of communication. Psychologist point that our human communication is mostly nonverbally. For that reason, researchers try to enable humanoid robots to realize that sort of communication. This paper presents a light weight , compact , low cost arm and hand design of humanoid robot for the generation of gesture as nonverbal interaction signals. Human range of motion and size have been investigated and they have been used as guiding principle for the construction of the arms and hands.This paper also present the facial expression system of the robots.

Key words— Non-verbal communication, humanoid robots

EE-307 IMPLEMENTATION OF RENEWABLE ENERGYBASED MULTILEVEL INVERTER USING MINIMUM NUMBER OF TRANSISTOR

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Abstract— An asymmetrical multilevel inverter for photovoltaic power supply to develop a reliable and efficient photovoltaic power supply unit for agriculture and domestic applications is presented in this paper. A seven level asymmetrical cascaded H-Bridge configuration using low voltage MOSFETs as switching devices is used. This configuration results in multiple stepped square wave output voltages with voltage level based modulation technique. Multilevel inverters with a large number of steps can generate high quality voltage waveforms, good enough to be considered as suitable voltage template generators. This project is focused on minimizing the switching stress with lesser THD and minimizing the number of power supplies, semiconductors for a given number of levels and to develop a low cost, reliable and efficient photovoltaic power supply unit for domestic applications. The simulation is done using MATLAB 7.3 under Simulink. This project shows the curves of single phase and three phase waveforms of asymmetrical multilevel inverter with cascaded topology.

Key words—Photovoltaic power supply, Boost converter, Asymmetrical Cascaded H- Bridge.

EE-309 AUTOMATIC FILLING MANAGEMENT USING ARDUINO

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Abstract— Filling a task carried out by a machine that packages liquid products such as cold drinks, medicine or water. Traditional methods of bottle filling involved, filling only one bottle at a time. This method is time consuming and expensive. The issue of automation is spreading widely in almost all industries such as beverages, medicine etc. This project mainly deals with the design of a prototype to control and monitor AUTOMATIC FILLING MANAGEMENT SYSTEM USING ARDUINO. This prototype can fill different mixtures of various proportions with greater accuracy and speed. As a test model, this prototype is used to fill two different solutions at a specified quantity.

Key words— Programmable Logic Controller, Arduino, Automation

EE-310 HOME AUTOMATION USING IOT FOR OPTIMUM UTILIZATION OF HYBRID RENEWABLE ENERGY

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AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING

Abstract— The main essence of this paper is the home automation system. Mainly in this paper we use renewable energy as a source for the automated appliances. We use Cascaded Vertical Axis turbine and solar panel for generation with the help of converters we store energy in the battery. Further on we use Arduino boards to control the source to the appliances using SCR switching board. A hardware setup vertical axis turbine with three blades with low speed rotor blade profile. This entire paper deals with the efficient automation of home appliances with internet control device of hybrid renewable energy stored using battery. Home appliances used are Alternating current converted us DC – AC Converters.

Key words— Cascaded vertical axis turbine, Internet control device, Hybrid renewable energy

EE-311 PLC BASED RAILWAY SAFETY SYSTEM

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A.MOHANASUNDARAM**

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Abstract—This paper is focus on railway safety system using PLC. Which works on the basics of PLC technology. If loco pilot haven't noticed the red signal and continuous beyond the red signal, the Infra Red sensor which is placed near the railway signal post sense the train movement and give that signal to PLC.

Key words— Programmable Logic Controller, Railway safety.

EE-313 DESIGN OF T-SHAPED LINEAR INDUCTION MOTOR

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ZAHIR HUSSAIN, A.MOHANASUNDARAM

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Abstract—Linear induction motor has been widely used for high speed ground transportation, conveyors baggage handling system. T-section finds application in material dislocation path showing sudden change in the horizontal plane and in the vertical plane. The rotor of the T-shaped linear induction motor acts as primary and the stator of T-shaped linear induction motor acts as secondary. This stator is built with steel laminations and rotor is built with aluminum sheet over the secondary iron. In this paper, T-shaped linear induction motor 2 pole, 3 phase, star(Y) connected winding prototype has been designed and constructed to study these two different machines. A Linear Induction Motor is a special type of induction motor which gives linear motion instead of rotational motion, as in the case of conventional induction motor. It operates on the principle of which a conventional induction motor operates. The primary of the T-shaped LIM is a Ferro magnetic plate and the secondary is normal conducting plate made of copper or aluminum in which interaction currents are induced. The speed of the LIM is determined by winding design and supply frequency. T-shaped LIM can have various configurations, the air gap can be flat and the flux can be longitudinal or transverse. The motor can be either single sided or double sided. Our paper is concerned with designing of short primary, transverse flux and a double sided motor.

Key words— Linear induction motor, T-shaped linear induction motor, Transverse flux.

EE-314 INNOVATIVE TRENDS IN RECENT TECHNOLOGIES COCONUT HARVESTING MACHINE

NAUSHAD SAHEB K

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Abstract—The objective of the paper is to develop a wired or wireless robot that is capable of climbing trees and pole like structures. The vital motivating force behind this project was to design a small man-portable robot which can be operated by an individual and perform various applications. The coconut harvester will be having qualities like maneuverability and adaptability on an irregular and varying diameter of a tree. The whole setup consists of a climbing base portion which can cling and climb on columns of a range of 30-40cm diameter. It has an arm which consists of a gripper and a cutter. The Gripper is used to plug the coconut from the tree and cutter is used to cut the branch of the tree. The entire motion of the coconut harvesting robot is controlled by using a DPDT switch.

Key words— Wireless robot, Small man-portable robot, DPDT switch.

EE-315 APPLICATION DEPENDENT TESTING OF FPGAS

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Abstract— The objective of this paper is to develop testing techniques for interconnect and logic resources of an arbitrary design implemented into a field-programmable gate array (FPGA). The target fault list includes all stuck-at, open, and pair-wise bridging faults in the mapped design. For interconnect testing, only the configuration of the used logic blocks is changed, and the structure of the design remains unchanged. For logic block testing, the configuration of used logic resources remains unchanged, while the interconnect configuration and unused logic resources are modified. Logic testing is performed in only one test configuration whereas interconnect testing is done in a logarithmic number of test configurations. This approach is able to achieve 100% fault coverage.

Key words— Field-programmable gate array (FPGA), Testing techniques.

EE-316 SOLAR POWERED AIR CONDITIONER USING BLDC MOTOR

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Abstract— The purpose of this paper to develop a “solar powered Air conditioner using BLDC motor”. During summer, the electricity bill increases due to power consumed by air conditioner. To reduce the power consumed by air conditioner, we are going to use Photovoltaic cell. The reciprocating motion in open type compressor is done by single phase capacitor start capacitor run motor instead of this motor we are going to use BLDC motor. Since, it has higher efficiency than capacitor start capacitor run motor. During load condition also the speed and torque remains constant and it has noiseless working. The output power of BLDC motor is high.

Key words— Air conditioner, BLDC motor, Photovoltaic cell.

EE-317 EXERGY ANALYSIS OF SOLID OXIDE FUEL CELL

S THILAGAVATHI

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Abstract—Fuel cells are one of the cleanest and most efficient technologies for generating electricity. Since there is no combustion, there are none of the pollutants commonly produced by boilers and furnaces. For systems designed to consume hydrogen directly, the only products are electricity, water and heat. Fuel cells are an important technology for a potentially wide variety of applications including on-site electric power for households and commercial buildings, supplemental or auxiliary power to support car, truck and aircraft systems, power for personal, mass and commercial transportation, and the modular addition by utilities of new power generation closely tailored to meet growth in power consumption. Exergy analysis of SOFC is based on second law of thermodynamics and the concept of irreversible entropy production. The exergy consumption during a process is proportional to the entropy production due to irreversibilities. It is a useful tool for furthering the goal of more efficient energy use, as it enables the determination of the location, type and true magnitude of energy wastes and losses in a SOFC system thus results in the improvement of the design and more efficient use of energy resources. An analysis of an integrated solid oxide fuel cell power system fed with hydrogen (H_2) is carried out based on second law of thermodynamics. Efficiencies of fuel cell power system are increased when the heat produced by the SOFC stack is used to preheat the air and fuel instead of rejecting it to the environment.

Key words— Thermodynamics, Exergy analysis, SOFC

EE-318 SECURING RFID WITH ULTRAWIDEBAND RADIATION

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Abstract—Current implementations of secure RFID rely on digital cryptographic primitives in the form of hashes and block ciphers. The presence of these blocks is motivated by privacy requirements, but they increase the overall processing latency, the power consumption, and the silicon area budget of the RFID tag. In addition, existing passive RFID systems rely on simple coding and modulation schemes using narrowband radio frequencies, which can be easily eavesdropped or jammed. We propose to implement the link from RFID to reader using ultra-wideband (UWB) communications. We show that the use of an advanced modulation scheme offers a new approach to the secure RFID problem. By using the modulation spreading code as a secret parameter of the communications link, we can make eavesdropping extremely difficult and increase the communication reliability. We also show that it decreases the latency and the risk for side-channel attacks. We present the digital baseband architecture of a passive UWB-RFID that uses time-hopped pulse-position modulation (TH-PPM), and present area- and power estimates that are competitive to solutions using digital cryptography

Key words— Ultra-wideband (UWB) communications, Time-hopped pulse-position modulation (TH-PPM).

EE-319 THERMAL PROFIT BASED UNIT COMMITMENT INTEGRATED WITH RENEWABLE ENERGY USING IPPD AND MMA

S.F SYED VASIYULLAH

AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING

Dr. M.GOPALAKRISHNAN

SRI VENTESHWARA COLLEGE OF ENGINEERING

Abstract—This paper presents a methodology that solve Profit Based Unit Commitment problem for thermal unit integrated with solar and wind energy systems. The solar-wind energy is included due to low electricity cost and environment issues. The generation scheduling of solar- wind energy minimize the total thermal fuel cost and maximize their generators profit. In the competitive environment, GENCO's run their units based on forecasted demand, reserve and price where the objective is to maximize individual GENCO's profit rather than to satisfy power demand. This paper utilizes Improved Pre-prepared Power Demand (IPPD) table for Unit Commitment and Memory management Algorithm for Economic Dispatch. The proposed approach has been tested on ten generating units in conjunction with solar-wind energy generators.

Key words— Improved Pre-Prepared Power demand (IPPD) table, Generation Company (GENCO), Memory Management Algorithm (MMA), Profit Based Unit Commitment (PBUC).

EE-320 IMPLEMENTATION OF DIFFERENTIAL EVOLUTION ALGORITHM FOR MPPT OF PV FOR MODULAR MULTILEVEL CASCADED INVERTER

M.S.RAJAN

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Dr.R.SEYEZHAI

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Abstract—Characteristics of PV systems consists of multiple local maxima, the conventional maximum power point tracking (MPPT) methods such as perturb-and-observe (P&O) method can only track the first local maximum point and stop progressing to the next maximum point and hence it fails to track global maxima. The problem with meta-heuristic algorithms such as Genetic Algorithm (GA), Ant System (AS) and Particle Swarm Optimization (PSO) is that the time required for convergence may be long if the range of the search space is large. This paper proposes a MPPT based on Differential evolution (DE) optimization algorithm for tracking the global maximum power point (GMPP). Since the direction of mutation in the DE algorithm is modified to ensure that the mutation always converges to the best solution among all the particles in the generation and thus ensures the rapid convergence of the algorithm. The proposed method is implemented for five-level modular multilevel cascaded inverter using MATLAB and effectiveness of the proposed technique is verified by comparing with algorithms using simulation results.

Key words— Maximum power point tracking (MPPT), Differential evolution (DE), Meta-heuristic algorithms.

EE-325 FUZZY LOGIC CONTROLLED BUCK-BOOST DC-DC CONVERTER FOR SOLAR ENERGY-BATTERY SYSTEM

RAVINDHAR.J, MANOJ.M, MANIKANDAN.J, TAMILSELVAN.S

M.S.RAJAN

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Abstract—In this paper, a Fuzzy Logic Controlled (FLC) buck-boost DC-DC converter for solar energy-battery System is presented. General design of a Fuzzy Logic Controller, based on Matlab/Simulink is performed. This design is compared with Proportional Integrated (PI) controller. The complete control system has been developed, analysed, and validated by simulation study. Then performances have been evaluated in detail for the different study conditions.

Key words— Fuzzy Logic Controller, Buck-boost DC-DC converter, Proportional Integrated (PI) controller

EE-326 MICROCONTROLLER BASED DRIP IRRIGATION SYSTEM

PARAMESH, ZUBAIR, VIGNESWARAN, J.MOHAMMED ILIYAS

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Abstract—In the field of agriculture, use of proper method of irrigation is important and it is well known that irrigation by drip is very economical and efficient. In the conventional drip irrigation system, the farmer has to keep watch on irrigation timetable, which is different for different crops. The project makes the irrigation automated. With the use of low cost sensors and the simple circuitry makes this project a low cost product, which can be bought even by a poor farmer. This project is best suited for places where water is scarce and has to be used in limited quantity. Also, third world countries can afford this simple and low cost solution for irrigation and obtain good yield on Crops. The heart of the project is the Intel 89c51 microcontroller. UART controller that will be used in this project. A 16×2 LCD is connected to the microcontroller, which displays the humidity level and ambient temperature. Three pushbuttons are provided to set the limits of humidity for switching the individual solenoid valves controlling the water flow to the field. The humidity and temperature levels are transmitted at regular time interval to the PC through the RS232 serial port for data logging and analysis. The humidity sensors are constructed using aluminum sheets and housed in easily available materials. The aim is to use the readily available material to construct low cost sensors. Five relays are controlled by the microcontroller through the high current driver IC, ULN2003. Four relays are provided for controlling four solenoid valves, which controls the flow of water to four different parts of the field. One relay is used to shut-off the main motor which is used to pump the water to the field.

Key words— Microcontroller, Conventional drip irrigation system, High current driver.

EE-328 DESIGN AND IMPLEMENTATION OF A MODULAR MULTILEVEL CASCADED INVERTER WITH PHASE SHIFTED CARRIER PWM USING FPGA

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Abstract—The Modular Multilevel Cascaded inverter (MMCI) is one of the latest and most promising topology of multilevel inverters for high power applications such as HVDC and High power AC Drives. This paper proposes a design and implementation of a Five-Level Modular Multilevel Cascaded inverter based on Double Star Chopper Cells (DSCC) with phase shifted carrier pulse width modulation (PS-PWM) using Field Programmable Gate Array (FPGA). This paper focuses on the comparative study of multicarrier techniques such as phase disposition pulse width modulation (PD-PWM), phase opposition disposition pulse width modulation (POD-PWM), alternative phase opposition disposition pulse width modulation (APOD-PWM) and phase shifted pulse width modulation (PS-PWM) using MATLAB/SIMULINK. Since phase shifted PWM technique has an inherent advantage of providing balanced output voltage and low total harmonic distortion (THD) it is considered for hardware implementation. This paper presents the design of arm inductance, sub module capacitance and capacitor voltage balancing technique involving averaging and balancing for modular multilevel cascaded inverter (MMCI). The simulation and experimental results on a MMCI based on phase shifted PWM using FPGA shows the effectiveness of the proposed method.

Key words— Multilevel Cascaded inverter, phase shifted carrier pulse width modulation (PS-PWM), Total harmonic distortion (THD)

EE-334 SOLAR POWER FED PARALLEL IN SERIAL OUT THREE WINDING COUPLED INDUCTOR FOR BOOST CONVERTER

D.SIVAMANI

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Abstract—This paper presents a Solar power fed three winding coupled inductor based boost converter .The proposed circuit modeled PISO (parallel input with serial output) boost converter .The design is aimed for reducing the voltage stress for achieving the ZVS and to reduce the leakage current by using soft switching method..The output side connects the T-filter to reduce the output ripple voltage. The high step-up voltage gain is achieved by the converter with appropriate duty ratio and low voltage stress on the power switch. To achieve a high conversion ratio with less duty cycle, converters that are based on transformers or coupled inductors are used and the secondary winding of the coupled inductor is inserted with a voltage multiplier for further extending the voltage gain dramatically. By varying the turn's ratio of coupled inductor high step up gain can be achieved, additionally the leakage inductor energy will be recycled to the output capacitor for improving efficiency. Low rated switch reduces conduction losses with low RDS-ON. The proposed converter's steady-state operational principles, circuit performance analysis, dc analysis (losses neglected) is performed to get the static voltage gain and voltage stress on power devices. Software results of existing and proposed converters are compared. Converter is designed for higher frequency ranges of 20 kHz, the same is simulated using MATLAB/SIMULINK

Key words —Three winding coupled inductor, PV array, high step up converter, T-Filter, Low voltage stress, ZVS

EE-335 ANALYSIS AND DESIGN OF PV POWER FED GENETIC ALGORITHM BASED PI CONTROLLER FOR BUCK- BOOST CONVERTER

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RAJALAKSHMI ENGINEERING COLLEGE

Abstract—This paper presents a framework for tuning Genetic Algorithm based PI(proportional Integral) feedback controller for DC -DC converter (Buck -Boost Converter) which is applied to PV panel. Due to non linear characteristic of the converter, a controller with better performance is required. Pulse Width Modulation technique is used for the converter gating pulses. PI controller is choose because large values tend to instabilities in the system response and to reduce steady state error. PI Controller is used for better gain and accuracy. GENETIC ALGORITHM is an adaptive method to solve search and optimization problems, The controller parameters are optimized to produce reasonable transient response without affecting the stable operation. Output voltage magnitude of DC – DC converter is constant either greater than or lesser than the input voltage magnitude. Proposed methodology is modelled by using MATLAB/SIMULINK results and proto type hardware model are verified.

Key words—PV panel, Buck-Boost converter, PWM technology, PI controller, Genetic Algorithm

EE-337 INTERLEAVED SEPIC CONVERTER USING SLIDING MODE CONTROLLER IN DISCONTINUOUS CONDUCTION MODE WITH HIGH GAIN

MANIMEGALAI, VISHNUPRIYA, LAVANYA, PARKAVI

VELTECH

Abstract—The converter is designed to operate in discontinuous conduction mode (DCM) in order to achieve soft switching for switches and diodes. The directly coupled inductors are utilized to reduce the number of magnetic components and decrease the input current ripple. A 500W interleaved SEPIC PFP prototype is designed to verify the benefits of this converter. The experimental results show that the converter can maintain high efficiency over a wide range of DC-link voltage.

Key words—Power factor pre-regulator (PFP), single ended primary inductor converter (SEPIC), discontinuous conduction mode (DCM), coupled inductors, interleaved converter.

EE-339 OPTIMAL ROTOR TIP CONTROL FOR WIND TURBINE BY USING NOVEL CAPRA ALGORITHM

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Indira Institute of Engineering and Technology, SSN College of Engineering

Abstract—The greatest deal with the wind power generation is the unpredictable character of the wind. The optimal rotor tip speed ratio for increasing efficiency and improves the maximum power generation. Wind energy is a lowest-priced renewable energy accessible today which depends upon the wind resource and setup revenue of the project. The purpose of this paper is to maximize the power generation and covers the operation of variable speed wind turbines with pitch control. In medium wind speeds, the power converter controls the wind turbine to capture maximum energy from the wind. In high speed region, the wind turbine is controlled to maintain the aerodynamic power produced by the wind turbine. The fundamental initiative to control dynamics is that the speed change is relatively slow because of the large involvement of inertia. This creates difficult in power converter to control the speed in highly variable wind applications. Pitch control is relatively fast and can be superior to regulate power flow especially when near the high speed limit. The optimal tip speed ratios depend on the number of rotor blades of the wind turbine. The smaller the number of blade will extract maximum power from the wind. The proposed paper is implemented with the new algorithm namely Novel Capra Optimization Algorithm (NCOA). NCOA utilizes only one turbine for getting maximum power generation. The numerical result shows the maximum capturing of power generation by NCOA of tip speed ratio when compare to other existing algorithms in the literature.

Keywords—Power coefficient, Power generation, Optimization, Tip Speed Ratio, Novel Capra Optimization.

EE-341 DESIGN AND IMPLEMENTATION OF DSM TOOL TO STUDY THE IMPACT OF FOSSIL FUEL FIXED AND VARIABLE COST EFFECT ON DIFFERENT CONSUMERS IN MATLAB/SIMULINK ENVIRONMENT

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COLLEGE OF ENGINEERING GUINDY (CEG)

Abstract— Solar and Wind are the two important sustainable open energy resources can meet world energy requirement when it is effectively utilized in its incidence with the smart grid enabled power system. Demand Side Management (DSM) is a tool to take Action on the customer side to change the amount or/and time of energy consumption through various methods such as financial incentives. The goal of demand side management here is to encourage the consumer to use renewable energy during its availability and reduce their peak load using an autonomous system. In this work, based on the most reliable hour-ahead forecasted solar and wind real time data feed through Home Energy Management (HEM) simulation tool designed with Matlab/Simulink produces the signals to activate smart appliances designed with Matlab State flow Toolbox.

Keywords — Demand Side Management (DSM), Home Energy Management (HEM). State flow Toolbox.

EE-342 ANALYSIS AND DESIGN OF INTERLEAVED BOOST CONVERTER AND MULTIDEVICE IBC CONNECTED TO PMDC MOTOR AND VARIABLE LOAD RESISTANCE

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RAJALAKSHMI ENGINEERING COLLEGE

Abstract—This paper presents the analysis and design of interleaved boost converter (IBC) and multidevice IBC (MDIBC) connected to PMDC motor and variable load resistance. Interleaved Boost converter (IBC) has better performance characteristics when compared to a conventional boost converter due to its increased efficiency, reduction in size and greater reliability. This paper focuses on the design aspects of two phase interleaved boost converter. The various parameters of the IBC AND MDIBC are compared to a conventional boost converter. Simulation results show that the current ripple in the input and output circuits is less and also minimizes the size of input filter and output power is more for IBC. Motor performance is compared when it is connected to open loop and closed loop connections. The entire system has to be constructed as a prototype and performance of the proposed converter has analyzed by using PI controller.

Keywords— IBC, MDIBC, PI controller, PMDC motor, Interleaved Boost converter (IBC).

EE-343-OPTIMAL PLANNING OF TRANSMISSION SYSTEM USING PARTICLE SWARM OPTIMIZATION

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INDIRA INSTITUTE OF ENGINEERING AND TECHNOLOGY

Abstract—In the current scenario, Electrical energy is one of substantial elements in our modern societies; Reduction of power utilization is directly affecting the day to day life of the customer. Growth of transmission network has brought more uncertainties necessities in Transmission Expansion Planning (TEP) for power system operational planners. Hence, planners have to adding and full-fill the insufficiency of old transmission network. Moreover, by locating the schedule number of new transmission amenities along to extend horizon of planning to minimize the operational and investment cost this makes the optimization problem is very complex and nonlinear. The paper intends to the algorithm of PSO is for TEP. This paper describes a hybrid tool to solve TEP problem, those problem based on improved algorithm of PSO for the final planning. Moreover, the paper successfully applied with standard test case of IEEE 6 bus system of 5 transmission path and adding a single line to existing 6 bus 5 line system. The simulation is carried out using PSO algorithm to analyses the TEP in terms of parameter selection, operating cost with and without line.

Keywords—Transmission Planning, Particle Swarm Optimization, Operating Cost.

EE-348-A CLOSED LOOP CONTROL STRATEGY OF TRANSFORMERLESS BUCK-BOOST CONVERTER WITH PID CONTROLLER

KARUPPIAH M, ARAVIND R, SARANRAJ K, DIWAKAR S

VELTECH

Abstract— A new technique of buck-boost converter with PID controller and its closed loop control technique are proposed in this study. The lower voltage gain in the existing converter is overcome by the newly proposed converter. The controller has better response compared to others. High voltage gain and positive output voltage are the main objective of this paper. The required duty cycle is achieved by the PID controller. This paper involves two strategy, as these switches conducts, the inductor is charged and as the diodes are forward biased, the capacitor is energized. Switches are excited using PWM technique. The modes of operation, simulation results, various analyses and experiments are presented in detail.

Keywords— Positive output voltage, Voltage gain, PID controller, Closed loop control, Voltage stress

EE-349-A SINGLE-STAGE SINGLE-SWITCH MULTIPLE OUTPUT LED DRIVER CIRCUIT

MARYSARANYA.T, ILAKIYA.K, SUJITHA.G, RAMYA.S

VELTECH

Abstract— A resonant single-stage single-switch eight-output LED driver has increased power factor. The output current of eight LEDs are controlled by controlling one output current which is said to be the passive current balancing technique. When it operates in the critical conduction mode unity power factor can be achieved. The proposed LED driver uses only one active switch and one magnetic component. The proposed system has following benefits low cost, small volume and light weight. Single-stage power conversion is highly efficient. This makes proposed LED driver more suitable than conventional ones.

Keywords— power factor, Passive current balancing technique, Single-stage power conversion

EE-351-A LOW DEGREE OF FREEDOM BASED PROSTHETIC HAND WITH HIGH GRASP ABILITY FOR PEOPLE WITH PARTIAL HAND DISABILITY

**MARY SARANYA.T, MEENA.S, PONMANI.T, SIVARANJANI.B,
SARUGA.E
VELTECH**

Abstract— To develop a prosthetic hand for people who although have mobility and sensitivity in their hand, but they are not strong enough to hold even some simple things in their daily life. To design a prosthetic hand that is basically constitutes sensors with high degree of repeatability, precision, and reliability. Sensor and servomotor plays an important role in the prosthetic hand. Flex sensor is such a device, which accomplish the above task with high degree of accuracy and Low Degree of Freedom(LDOF). This hand can perform various operations and can replace the prosthetic limbs of the patient with the help of a microcontroller programming and servomotors. Here flex sensors are used to sense the signal from human hand and human hand signals are transmitted to servomotor which are used to drive the prosthetic hand depends upon the movements sensed from the human hand. This designed work is a concept of robotic control. It is an exciting and high challenging research work in the recent years. In the development of robotic hands, different goals for the research can be distinguished. These goals depend on the type of application that the hand is used for. This prosthetic hand provides significant improvement in the grasp ability, especially for patients with partial hand disability. The main function of this hand is usually to displace objects in a 3D-space and in a flexible way, so that different objects and displacements can be made.

Key words — LDOF, Grasp ability, Flex sensor, Prosthetic limbs.

EE-352-IMPROVEMENT OF POWER QUALITY USING MULTILEVEL STATCOM FOR PV BASED APPLICATIONS

VIJAYAKUMAR S.C, KANNAN M, PRASANNA SRIRAMAN P,
KIRUBAHARAN M

VELTECH

Abstract— A simple static var balance system by means of cascaded two-level inverter-based multilevel inverter is projected. This topology has power generated from renewable energy system (PV) with two standard two-level inverters associated in cascade all over open-end windings of a three-phase transformer for the power quality improvement. The dc-link voltages of the inverters are keeping pace at diverse levels to get hold of four-level operation. A novel control technique for cascaded coupled inverter-based statcom. These converters comprise classically been commutated at fundamental line frequencies, but the evolution of power semiconductors has authorized the raise of switching frequencies and power ratings of these devices, permitting the use of PWM techniques. Judge against to the conventional multilevel inverter, the number of dc voltage sources, switches and converter cost is extensively reduced as the number of voltage steps increases. The method is talented to stable line-to-line output voltages as well as to construct the most of the linear modulation range less than the unbalanced dc-link conditions.

Key words — PWM techniques, renewable energy system (PV), Inverter-based statcom.

EE-353-HIGH GAIN DC- DC CONVERTER USING LPPT TECHNIQUE FOR PV APPLICATION

**AJITH RAJA P, KESAVAMOORTHY M, MOHAMAD THAHEER T,
KARUPPIAH M**

VELTECH

Abstract— Differential power processing (DPP) systems are an effective architecture for future photovoltaic (PV) power systems that achieve high system efficiency through processing a fraction of the full PV power. It achieves distributed local maximum power point tracking (MPPT). The power processed through the DPP converters depends on the string current in the PV-to-bus DPP architecture. The string current must be controlled to minimize the power processed through the DPP converters. A real-time least power point tracking (LPPT) method is proposed to minimize power stress on PV DPP converters. Mathematical analysis shows the unique of the least power point for the total power processed through the system. The perturb-and-observe LPPT method is presented. The method enables the DPP converters to maintain optimal operating conditions. The method helps in reducing the total power loss and converter stress. This work validates through simulation and experimentation that LPPT in the string-level converter successfully operates with MPPT in the DPP converters to maximize output power for the PV-to-bus architecture. Hardware prototypes were developed and tested at 140 and 300 W, and the LPPT control algorithm showed effective operation under steady-state operation and an irradiance step change

Key words — Differential power processing, least power point tracking, photovoltaic (PV) systems, perturb-and-observe (P&O), PV-to-bus (PV–bus) architecture

EE-354-IMPLEMENTATION OF SINGLE PHASE SEVEN LEVEL INVERTER FOR UTILITY SUPPLIES APPLICATION

BARANI, SAKTHIVEL, MANI

VELTECH

Abstract— This paper proposes a solar power generation system is composed of a dc–dc power converter and a seven level inverter. The seven-level inverter contains only six power electronic switches, which simplifies the circuit configuration. Only one power electronic switch is switched at high frequency at any time to generate the seven-level output voltage. This reduces the switching power loss and improves the power efficiency and also reduces the Total Harmonic Distortion (THD). The voltages of the two dc capacitors in the proposed seven-level inverter are balanced automatically, so the control circuit is simplified. The proposed solar power generation system generates a seven-level output voltage and outputs a sinusoidal current that is in phase with the utility voltage, yielding a power factor of unity.

Key words — Total Harmonic Distortion (THD), solar power generation, dc–dc power converter.

EE-355-A RAILWAY TRACTION POWER CONDITIONER USING STATCOM BASED MULTILEVEL CONVERTER FOR HIGH SPEED RAIL WAY SYSTEM

VINODINI D, ISHWARYA K, RAGAVI R, MEENAKSHI R

VELTECH

Abstract— Now a day, with advancement of high speed and high power electrified railway, the power quality has become the major problem hence to reduce the harmonics a modular multilevel convertor (MMC) based railway traction power conditioner (RTPC) is used. The RTPC consist of STATCOM cluster which are connected to the traction feeders in co-phase supply system. A Scott-traction system is used to increase the stability of the system. There is no dc- active power offset in clusters, so that cluster group voltage control can be omitted to reduce the complexity of control system. At last the experiment and simulation is conducted effectively.

Key words — Power quality, RTPC, MMC, STATCOM Voltage balance

EE-356-CLOSED LOOP CONTROL STRATEGY OF BLDC MOTOR FOR POWER FACTOR CORRECTION

GOPINATH.P, KALAISELVI.G, THENNARASU.R

VELTECH

Abstract— This paper deals with a power factor correction (PFC)-based Cuk converter-fed brushless dc motor (BLDC) drive as a cost-effective solution for low-power applications. The speed of the BLDC motor is controlled by varying the dc-bus voltage of a voltage source inverter (VSI) which uses a low frequency switching of VSI (electronic commutation of the BLDC motor) for low switching losses. A diode bridge rectifier followed by a Cuk converter working in a discontinuous conduction mode (DCM) is used for control of dc-link voltage with unity power factor at ac mains. Performance of the PFC Cuk converter is evaluated under four different operating conditions of discontinuous and continuous conduction modes (CCM) and a comparison is made to select a best suited mode of operation. The performance of the proposed system is simulated in a MATLAB/Simulink environment and a hardware prototype of the proposed drive is developed to validate its performance over a wide range of speed with unity power factor at ac mains.

Key words — power factor correction (PFC), Cuk converter, Continuous conduction modes, voltage source inverter

EE-357-A NEW BDC TOPOLOGY FOR FLYWHEEL ENERGY STORAGE

NATRAJAN S, MANJU P, ARUN KUMAR A, ADHITHIYAN S

VELTECH

Abstract— A bidirectional converter (BDC) is essential in applications where energy storage devices are involved. Such applications include transportation, battery less uninterruptible power system, flywheel energy storage systems, etc. Bidirectional power flow through buck and boost modes of operation along with high power density and efficiency is important requirement of such systems. This paper presents a new BDC topology using a combination offset turn-off SCR and insulated-gate bipolar transistor with a novel control logic implementation to achieve zero switching losses through zero voltage transition and zero current transition techniques. The proposed scheme ensures zero switching power loss (ZSPL) for both buck and boost modes of operation of the BDC. The scheme is simple and achieves ZSPL during both turn-on and turn-off of the devices resulting in improved efficiency and reduced electromagnetic interference problems. The basic principle of operation, analysis, and design procedure are presented for both voltage buck and boost modes of operation of the proposed BDC topology.

Key words — Bidirectional converter (BDC), energy storage, fast turn-off SCR, flywheel, zero current transition (ZCT), zero voltage transition (ZVT).

EE-358-A NON-ISOLATED BIDIRECTIONAL SOFT SWITCHING CURRENT FED LCL RESONANT DC/DC CONVERTER TO INTERFACE ENERGY STORAGE IN DC MICROGRID

OVIYA.D, SHALINI.N, SANDHIYA.S, SUNDARLA

VELTECH

Abstract— This paper proposes a non-isolated soft-switching bidirectional dc/dc converter for interfacing energy storage in DC microgrid. The proposed converter employs a half-bridge boost converter at input port followed by a LCL resonant circuit to assist in soft-switching of switches and diodes, and finally a voltage doubler circuit at output port to enhance the voltage gain by 2x. The LCL resonant circuit may also add a suitable voltage gain to the converter. Therefore, overall high voltage gain of the converter is obtained without transformer or large number of multiplier circuit. For buck operation, the high side voltage is first divided by half with capacitive divider to gain higher step down ratio. Converter is operated at high frequency to obtain low output voltage ripple and reduced magnetics and filters. Zero voltage turn-on is achieved for all switches and zero current turn on and turn-off is achieved for all diodes for both buck/boost operation. Voltage stress across switches and diode is clamped naturally without external snubber circuit. An experimental prototype rated at 350 W has been designed, built and tested in the laboratory to verify the analysis, design and demonstrate the performance of proposed converter

Key words — DC microgrid, LCL resonant circuit, Snubber circuit, non-isolated soft-switching bidirectional dc/dc converter

EE-359-TRANSFORMERLESS GRID-CONNECTED PHOTOVOLTAIC SYSTEM USING SPWM

**DR.R.SATISH KUMAR1, DR.K.UMA DEVI, N.NEBINA,
I.INFANT FELCIYA.**

SENGUNTHAR COLLEGE OF ENGINEERING.

Abstract— The traditional grid-connected PV inverter includes both a line frequency or a high frequency transformer among the inverter and grid. The transformer affords galvanic isolation between the grid and the PV panels. so one can increase the performance, to reduce the dimensions and price, the effective solution is to cast off the isolation transformer. It ends in look of commonplace mode (CM) floor leakage present day due to parasitic capacitance among the PV panels and the ground. The commonplace mode modern reduces the performance of electricity conversion level, affects the best of grid contemporary, become worse the electric magnetic compatibility and provide rise to the protection threats. so that you can get rid of the not unusual mode leakage modern-day in transformer much less PV device, the concept of virtual DC bus is proposed in this project. through connecting the grid impartial line at once to the poor pole of the DC bus, the stray capacitance between the PV panels and the ground is bypassed. The CM floor leakage cutting-edge may be suppressed completely. virtual DC bus is created to provide the terrible voltage level for the poor AC grid contemporary era. The virtual DC bus is realized with the switched capacitor generation that uses much less number of factors. therefore, the electricity digital value may be decreased. This topology can be modulated with the unipolar SPWM to lessen the output current ripple. A smaller clear out inductor can be used to lessen the size and magnetic losses. The simulation result of the proposed topology the use of MATLAB/SIMULINK is supplied.

Key words — Photo voltaic system, Grid connection, Transformer, Opto coupler.

EE-360-MATERIAL SEGREGATION USING ARDUINO

A.SARAVANAN, ASKAR ALI.D, MOHAMED THAWFEEK. M, ASEEM.M

AALIM MUHAMMED SALEGHCOLLEGE OF ENGINEERING

Abstract— The aim of the paper is to segregate recyclable waste material like (glass, plastic, metal and wood) into their proper bins by using ARDUINO. In this project we can separate the wastages based on their physical properties like dielectric strength, reflective, absorption and inductive properties by corresponding sensor. The object is moved forward on a conveyor belt which is driven by a geared dc motor(24 v 200 rpm) and sensed by a respective sensor based on physical properties and segregated into their respective bins by ARDUINO used(ARDUINO UNO R3).

Key words — Dielectric strength, conveyor belt, ARDUINO

EE-361-CONTROL OF REDUCED-RATING DYNAMIC VOLTAGE RESTORER WITH A BATTERY ENERGY STORAGE SYSTEM

FATHIMA K, KARTHIKHA R, SUSMITHA K, SWATHY N

VELTECH

Abstract— In this paper, different voltage injection schemes for dynamic voltage restorers (DVRs) are analyzed with particular focus on a new method used to minimize the rating of the voltage source converter (VSC) used in DVR. A new control technique is proposed to control the capacitor-supported DVR. The compensation of the voltage sag, swell, and harmonics is demonstrated using a reduced-rating DVR. The simulation of this project can be implemented by using simulink in Matlab.

Key words — Dynamic voltage restorer (DVR), power quality, unit vector, voltage harmonics, voltage sag, voltage swell. Harmonics.

EE-362-A NEW TRANSFORMERLESS CASCADED H5 INVERTER WITH DC-DC CONVERTER FOR PHOTOVOLTAIC SYSTEM

KARTHIKUMAR.K, KARUPPIAH.M,BASITH ALI.A,
GOWTHAM.C,PARANTHAMAN.R

VELTECH

Abstract— Leakage current reduction is one of the important issues for the transformer less PV systems. In this paper, the transformer less single-phase cascaded H-bridge PV inverter is investigated. The common mode model for the cascaded H4 inverter is analyzed. And the reason why the conventional cascade H4 inverter fails to reduce the leakage current is clarified. In order to solve the problem, a new cascaded H5 inverter is proposed to solve the leakage current issue. Finally, the experimental results are presented to verify the effectiveness of the proposed topology with the leakage current reduction for the single phase transformer less PV systems. The multilevel inverters can decrease the voltage stress of dv/dt on switches and increase the output waveform quality. However, few papers have been reported regarding eliminating the leakage current for the single phase cascaded multilevel inverters. A significant contribution by Zhou and Li is the filter-based leakage current suppression solution for the single-phase cascaded multilevel PV inverter.

Key words — Inverters, Leakage currents, Phase transformers, Photovoltaic system, Capacitors

EE-363-SOLAR POWER EMPLOYING SEPIC CONVERTER DRIVEN BLDC MOTOR

**A.SARAVANAN, MOHAMED AJMAL.M, MOHAMED NIJAR.H,
THAWFIKKAREEM.Z**

AALIM MUHAMMED SALEGHCOLLEGE OF ENGINEERING

Abstract— Solar photovoltaic (spv) array based energy generation is receiving wide attention nowadays to supply the various loads. Solar photovoltaics are low voltage DC energy sources. In this we present a SEPIC converter for maximum power point tracking in solar photovoltaic array based elevator system driven by a permanent magnet brushless dc (BLDC) motor. The primary function of a DC-DC SEPIC converter is to optimise the power output of SPV array and it also provides the safe and soft starting of the BLDC motor with an appropriate control. The speed is controlled through a variable DC link voltage of VSI. An appropriate control of sepic converter through the incremental conductance maximum power point tracking (MPPT) algorithm offers control of the BLDC motor. This system is designed using the MATLAB software.

Key words — Solar photovoltaic array, SEPIC converter BLDC motor, Maximum power point tracking (MPPT)

EE-364-IMPROVED TRANSFORMERLESS PHOTOVOLTAIC INVERTERS TOPOLOGY WITH SPACE VECTOR MODULATION TECHNIQUE

**KARTHIKUMAR M, ELAYAVAN M, DAVID LIVINGSTON K,
JEYASURIYA M**

VELTECH

Abstract— The three-phase grid-connected converter is widely used in renewable and electric power system applications. The two power conversion stages are required when low voltage unregulated PV output is conditioned to generate AC power. A space vector algorithm for a 3 level diode clamped multilevel inverter for operation in over modulation range. The inverter has several advantages over standard two level voltage source inverter, such as greater number of levels in output voltage waveforms, lower dv/dt, less harmonic distortion in voltage and current waveforms and lower switching frequencies. The operation of multilevel inverter in grid connected mode is discussed. The stand-alone mode multilevel inverter is controlled to provide voltage of desired magnitude and frequency to local loads. In grid connected mode multilevel inverter operates in current controlled mode to supply pre-defined active power to the grid. This report presents a SVPWM algorithm with over modulation for three level based on standard two level SVPWM.

Key words — Inverters, Vectors, Modulation, Voltage control, Trajectory, Switches, Arrays

EE-365-SOLAR PV ARRAY EMPLOYING Z-SOURCE CONVERTER

MURALIDHARAN.M, GOKUL RAMESH.D, THOMAS.M.S

VEL TECH

Abstract— This paper proposes a solar photovoltaic (SPV) array fed water pumping system utilizing a zeta converter as an intermediate DC-DC converter in order to extract the maximum available power from the SPV array. Controlling the zeta converter in an intelligent manner through the incremental conductance maximum power point tracking (INC-MPPT) algorithm offers the soft starting of the brushless DC (BLDC) motor employed to drive a centrifugal water pump coupled to its shaft. Soft starting i.e. the reduced current starting inhibits the harmful effect of the high starting current on the windings of the BLDC motor. A fundamental frequency switching of the voltage source inverter (VSI) is accomplished by the electronic commutation of the BLDC motor, thereby avoiding the VSI losses occurred owing to the high frequency switching. A new design approach for the low valued DC link capacitor of VSI is proposed. The SPV array generates the electrical power demanded by the motor-pump system. This electrical power is fed to the motor-pump system via the zeta converter and the VSI. SPV array appears as the power source for the zeta converter. Ideally, the same amount of power is transferred at the output of zeta converter which appears as the input source for the VSI. In practice, due to the various losses associated with a DC-DC converter, slightly less amount of the power is transferred to feed the VSI. The pulse generator generates, through INC-MPPT algorithm, the switching pulse for the IGBT (Insulated Gate Bipolar Transistor) switch of the zeta converter. The INC-MPPT algorithm takes the voltage and current variables as feedback from SPV array and returns an optimum value of duty cycle. Further, the pulse generator generates actual switching pulse by comparing the duty cycle with the high frequency carrier wave. In this way, the maximum power extraction and hence the efficiency optimization of the SPV array is accomplished.

Key words — Maximum power point tracking, IGBT (Insulated Gate Bipolar Transistor), DC-DC converter

EE-367 A MODIFIED SINGLE PHASE MULTILEVEL INVERTER WITH REDUCED SWITCHES AND HARMONICS FOR RENEWABLE APPLICATIONS

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VELTECH

Abstract— New Multilevel inverters are chosen over conventional inverters as the superiority of the output voltage get better with the number of voltage pace at the output. A new single phase cascaded multilevel inverter topology slot in a new basic unit is proposed in this paper. Besides, seven different methods are proposed to decide the magnitude of the dc sources. The proposed topology make use of fewer power electronic components to produce a specific number of output voltage levels in comparison with the traditional cascaded multilevel inverters resulting in compacted and cost effective design. The effectiveness of the proposed inverter is effectively authenticated by both MATLAB based simulation and experimental results. Further, assessment of the proposed topology with the freshly proposed topologies demonstrates the efficiency of the proposed topology. To propose a bridged CMV switching operation a New Single Phase Multilevel Inverter Topology with Reduced Number of Switches.

Key words — Topology, Inverters, Generators, Bridge circuits, Switches, Capacitors, Semiconductor diodes.

EE-368 EYE GAZE CONTROLLED WHEELCHAIR BASED ON ELECTROOCULOGRAPHY FOR THE PARALYZED PATIENTS

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Abstract—The ultimate aim of this paper is to capture the eye movement of the human to control the wheelchair for paralyzed patients. In order to help the patients who cannot speak (or) dump and diseases like Quadriplegia, Gullian-barre syndrome, Amyotrophic lateral sclerosis and Heniiparesis. The design and application are based on the electrooculography with Human Machine Interface. The bio-potential of the human are made to generate commands to work with the Human Machine Interface[HMI] to communicate with the environment. The classification of the eye ball movement to realise the interface between the human and the machine are made successfully. where the eye is used as mouse for computer in multiple application such as mobility and communication for the paralyzed patients as paralyzed assisting device The electrooculography by capturing the ocular movement based on the voltage changes that would occur due to some medication on the orientation with graphical user interface and eye dipole movement.

Key words— Human Machine Interface [HMI], Electrooculography, Gullian-barre syndrome.

EE-369 IMPLEMENTATION OF ANTI-BRAKING SYSTEM USING CAN PROTOCOL BY INTERFACING CONTROLLERS

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VELTECH

Abstract— Nowadays, automobiles are developed with many modern technologies. But their data transfer scheme is very complex. Hence a simple data transfer scheme for monitoring of vehicles is proposed in this paper. By employing a CAN network the connection topology is made simple and reliable. CAN network is used to collect the data from various parameters of the vehicle such as speed, RPM and distance using a device called tachograph. The information from the tachograph are collected and processed by microcontroller LPC2129 and the processed data is sent serial communication tracker for the monitoring purpose. The various operation, simulation, and results of the proposed system are presented in detail.

Key words— Real time system , CAN, LPC2129 , LM35, Ultrasonic sensor

EE-372 SINGLE STAGE BOOSTING INVERTER FOR HIGH GAIN APPLICATION

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VELTECH

Abstract— A new technique of single stage boosting inverter (SSBI) for high gain application by using photovoltaic. As compare to the existing two stage approach, the SSBI has a simpler topology and a lower component count. The lower voltage gain in the existing system is overcomes by newly proposed system. High voltage gain is the main objective from the photovoltaic. One cycle control was employed to generate ac voltage output. In Single-stage topology the input low DC voltage is step up by means of tapped inductor and achieve good dc–ac power conversion, good quality of ac output waveform, good conversion efficiency.

Key words—: High voltage gain, One cycle control (occ), Tapped inductor (TI)

EE-374 STABILIZATION OF DC MICRO GRID BY ACTIVE DAMPING METHOD

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VELTECH

Abstract—This paper proposes a new control strategy for damping of power oscillations in a multi-source dc microgrid. A parallel combination of a fuel cell (FC), a photovoltaic (PV) system and a super capacitor(SC) are used as a hybrid power conversion system (HPCS). The SC compensates for the slow transient response of the FC stack. The HPCS controller comprises a multi-loop voltage controller and a virtual impedance loop for power management. The virtual impedance loop uses a dynamic droop gain to actively damp the low-frequency oscillations of the power sharing control unit. The gain of virtual impedance loop is determined using small signal analysis and pole placement method. The Mesh analysis is employed to further study the stability of low-frequency modes of the overall dc microgrid. Moreover, based on the guardian map theorem, a robust stability analysis is carried out to determine a robustness margin for the closed-loop system. The main advantage of the proposed method is its robustness against uncertainties imposed by microgrid parameters. This feature provides DG units with plug-and-play capability without needing the exact values of microgrid parameters. The performance of the proposed control scheme is verified using hardware-in-the-loop(HIL) simulations carried out in OPAL-RT technologies.

Key words— DC microgrid, droop control,dynamicresponse, smallsignalanalysis, virtual impedance loop.

EE-376 ENERGY MANAGEMENT SYSTEM IN INTERNET OF THINGS PLATFORM

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Abstract—Rural areas are suffering from heavy power cut due to generation problems. This kind of generation problems is satisfied only to some extent. Due to the mismatch in power consumption the villages are facing power cut problems. To solve this problem we propose a system employing smart meter on customer premises embedded in internet of things platform. Our approach has the following advantages- smart meters are versatile with intelligent capabilities in order to meet the consumer demand, measure and communicate real time electrical usage, Facilitates remote real time monitoring, consumers are provided with real time pricing and analyses usage information which is the technical data to be transmitted to the grid. The entire system works on Internet of things platform.

Key words- Demand side management, Internet Of Things (IOT), smart meter, Independent System Operator (ISO)

EE-378 TEXT TO VOICE ADAPTION USING PORTABLE CAMERA

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Abstract—Since decades, real time hardware implementation of Text-To-Speech system has been drawing attention of the research community due to its various real time applications. These include reading aids for the blind persons and products label reading using portable camera. This application demand the real time embedded platform to meet the real time specifications such as speed, power, space requirements etc.In this context the embedded processor Raspberry pi, has been chosen as hardware platform to implement Text-To-Voice conversion. We are using the portable camera for capturing the text, and the image has been processed in Raspberry pi board by identifying the text in the image. This conversion needs algorithms to perform various operations like parts of speech tagging, phrase marking, word to phoneme conversion and open CV library. These algorithms are coded and developed in Python programming language using Raspbian OS and finally implemented on commercially available ARM 11 microcontroller consists of ARM1136J(F)-S, ARM1156T2(F)-S, ARM1176JZ(F)-S, ARM11MPCore.This system is capable of capturing images, automatically detecting and recognizing the text and translating the text into English. The translation can be displayed on a monitor or an LCD TV using GTA to VGA converter cable in the raspberry pi board.

Key words— Raspberry pi, camera, speaker, Raspbian OS and python software

EE-383 HIGH STEP-UP CONVERTER WITH THREE-WINDING COUPLED INDUCTOR FOR FUEL CELL APPLICATION

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Abstract—With the shortage of the energy and ever growing oil price, research on the renewable and green energy sources, especially the solar arrays and the fuel cells, becomes more and more important, so that high-efficiency dc–dc converters with high-voltage gain have been researched due to increasing demands. How to achieve high-step-up, low-cost, and high-efficiency dc/dc exchange is the major concern due to the low PV output voltage with the parallel-connected structure. The proposed high step-up dc–dc converter is devised for boosting the voltage generated from renewable source to 400V dc bus voltage. Through the three-winding coupled inductor and voltage doubler circuit, the proposed converter achieves high step-up voltage gain without large duty cycle. Furthermore, the switch voltage stress and the diode peak current are also minimized. The advantages and disadvantages of these converters are discussed in this paper. The circuit is simulated using MATLAB Simulink. The circuit is implemented using embedded controller. Both Simulation and Hardware results are verified.

Keywords—Fuel Cell, Switched-Capacitor, Zero-Voltage Switching, Zero-Current Switching, Stepup Converters, Coupled Inductor

EE-383A DESIGN OF CONTROL METHOD TO PREVENT COLLAPSE OF MICROGRID

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Abstract—In this proposed system, it is dealt with major challenges on the survivability of a microgrid with a mix of Distributed Energy Resources(DERs).A sudden loss of generation or fluctuating load will force the microgrid to operate near its capacity range, which may cause a cascading collapse in the same. A low inertia system which supports load changes initially is known to be the faster responding DER in the corresponding microgrid. If the faster responding DER does not have adequate reserve margin , then the microgrid gets easily affected. Thus an effective control method has been designed for safeguarding the DERs and to prevent the system collapse.

Keywords— Distributed Energy Resources (DER), Reserve Margin, Power Conditioning System (PCS), Synchronous Generator, Engine, PV Array, Wind resource.

EE-384 MULTI-OUTPUT RESONANT BOOST RECTIFIER CIRCUIT FOR INDUCTION HEATING APPLICATIONS

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VELTECH

Abstract-- Induction heating (IH) technology is commonly used in domestic applications because of its cleanliness, faster heating process and high efficiency. Induction heating is a key technology in modern household appliances and industries. Modern design trends require the design of high efficiency and multiple output power converters. This paper proposes a tri-output boost resonant full-bridge topology to provide a multiple-output rectifier with improved and cost-effective performance. In resonant converters, higher output power occurs at resonant frequency yielding high efficiency. The conventional series half-bridge resonant inverter is used for the IH application where the switching frequency is higher than the resonant frequency. Thus with the increased switching frequency, the losses are increased for the low output power range. To overcome this limitation, a boost resonant converter is proposed. In this converter, the resonance frequency is higher than the switching frequency, yielding to the maximum efficiency at the maximum output power. The proper operation and performance of the proposed topology is detailed and verified using simulation and the expected output is obtained.

Key words— Induction heating (IH), multiple-output converter, efficiency, resonant power conversion, boost rectification.

EC-493 INDEPENDENT INTERFACE FOR A GESTURE WHEELCHAIR

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VELTECH

Abstract—People use wheelchairs if they cannot able to walk due to physiological or physical illness, injury or any disability. The main aim of the project is to provide a solution for a people who are suffering from pressure sores . Recent growth shows a broad scope in developing smart wheelchairs. The current article presents a gesture based wheelchair which controls the wheelchair using hand movements. The scheme is divided into two main units: Mems Sensor and wheelchair control. The Mems sensor, which is linked to hand, is an 3-axis accelerometer that provides hand gesture detection. The wheelchair control unit is a wireless unit which is developed using other ARM controller. A Vibrator is provided beneath the seat of the Wheelchair which will be activated at predefined intervals by using software delay inorder to reduce the pressure sores.

Key words— Mems sensor, ARM controller. 3-axis accelerometer

CS-627 RECONGITION AND CONVERSION OF TEXT TO SPEECH UNDER DIFFERENT LIGHTING CONDITION FOR VISUALLY IMPAIRED PEOPLE

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KARTHIKEYAN.M**

VEL TECH

Abstract— This project introduces a new portable camera based method for helping blind people to detect obstacles and recognize the characters that are present in it. Thus converting them in to an audio output that can be used as a wearable for the visually impaired people and also partially blind people. The benefit of this method is to increase the awareness and to create a better living environment for the blind people .The methodological coarse description is addressed using two image processing strategies .The first one makes use of K-Nearest Neighbors Algorithm (K-NN) with Euclidean distance measure ,while the Second strategy implies on the Neural Network algorithm to be used for character recognition. The proposed system was assessed in indoor datasets representing different indoor environments under different lighting condition.

Key words— K-Nearest Neighbors Algorithm (K-NN), Euclidean distance measure