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Paper number	Title Authors	Abstract	Pages
001	Improvement of the integration of a grid-connected windphotovoltaic hybrid system  Rabeh Abbassi Manel Hammami Souad Chebbi	This paper presents control strategies for the integration of a grid-connected wind-photovoltaic hybrid system via adaptation converters connected to a common DC bus. For both wind and solar system, adequate control algorithms have been implemented for the maximum power extraction. The grid side converter has been connected to the point of common coupling (PPC) through an RL filter. The control of the grid side converter (GSC) was made in order to control the power quality and quantity of the feed power to the grid. At the DC bus, a PRegulation control was adopted to overcome the ripples caused by the power flow. Performances of the adopted control laws have been evaluated by MATLAB/Simulink simulations.	001-005
002	Supervisory Control Strategy for Optimal Integration of Direct Drive Wind Turbine to the Grid  Mohamed Abbas Jamel Belhadj	The main attention of this paper is to improve the integration of wind energy systems to the grid. Therefore, a new supervision scheme for a 2MW direct drive wind turbine is proposed. It aims to satisfy the new Grid Connection Requirements (GCR), where the lowest voltage dip that wind farms must withstand can reach 0% of nominal voltage. The power electronics interface of the investigated wind turbine consists of a back-to-back voltage source converter. The threelevel, Neutral Point Clamped topology is used since multi-level converters are suitable for high power applications. Power limitation is achieved by pitch control. Supervision algorithm adapts the control strategy according to the different operating conditions. Thus, wind turbine safety during faults is guaranteed and it can provide ancillary services, necessary for power system stability. Performances are evaluated in terms of accordance with GCR including, low voltage ridethrough capabilities, power limitation and reactive power control.	006-012
003	Texture defect detection with Combined local homogeneity analysis and discrete cosine transform  A. Rebhi S. Abid	In this paper a new technique for defect detection in gray-level textured images is proposed. The first step of the algorithm is devoted to compute the local homogeneity of each pixel to construct a new homogeneity image denoted as (Himage). The second step consists in dividing the H-image into squared blocks and applying the discrete cosine transform (DCT) and then representative energy features of each DCT block are extracted. The defect blocks can be determined by a multivariate statistical method. Finally, a simple thresholding method is applied to extract defective areas. Simulations on different textured images and different defect aspects show good promising results.	013-017

004	A novel neural network approach for image edge detection  Sabour Abid Farhat Fnaiech Ezzeddine Ben Braiek	In this work a new method for image edge detection based on multilayer perceptron (MLP) is proposed. The method is based on updating a MLP to learn a set of contours drawn on a 3x3 grid and then take advantage of the network generalization capacity to detect different edge details even for very noisy images. The method is applied first to Gray scale images and can be easily extended to color ones. Simulations on synthetic and real image show much promised results in term of precision and localization. Moreover the method works well even for very low contrast images for which other edge operators fail.	018-023
005	Identification of nonlinear systems by the new representation ARX Laguerre decoupled multimodel  Sameh Adaily Tarek Garna Abdelkader Mbarek Hassani Messaoud	This paper proposes a new alternative in the multimodel approach by expanding each ARX sub-model on independent orthonormal Laguerre bases by filtering the process input and output using Laguerre orthonormal functions. The resulting multimodel, entitled ARX-Laguerre decoupled multimodel, ensures the parameter number reduction with a recursive and easy representation. However, such reduction is still constrained by an optimal choice of Laguerre pole characterizing each basis. To do so, we develop a pole optimization algorithm which constitutes an extension of that proposed by Tanguy. The ARX-Laguerre decoupled multimodel as well as the proposed pole optimization algorithm are illustrated and validated on a numerical simulation.	024-029
006	A Neural Network System for Designing New Stretch Fabrics  Hamza ALIBI Faten FAYALA Abdelmajid JEMNI Xianyi ZENG	In this paper, an artificial neural network (ANN) aided system for designing knit stretch materials based on the virtual leave one out approach is presented. This system aims at modeling the relation between functional properties (outputs) and structural parameters (inputs) of knitted fabrics made from pure yarn cotton (cellulose) and viscose (regenerated cellulose) fibers and plated knitted with elasthane (Lycra) fibers. Knitted fabric structure type, yarn count, yarn composition, gauge, elasthane fiber proportion (%), elasthane yarn linear density, fabric thickness and fabric areal density, were used as inputs to ANN model. These models have been validated by a testing data. The developed neural model allows designers to optimize the structure of knit stretch materials according to the functional properties.	030-035
007	OCR independent and Segmentation free Word Spotting in Handwritten Arabic Archive Documents  Aouadi N. Kacem A.	In this paper, a word-spotting approach is presented that can help in reading handwritten Arabic Archive Documents. Because of the low quality of these documents, the proposed approach is free segmentation, independent of OCR, using a global transformation of word images. It is a based learning approach which employs Generalized Hough Transform (GHT) technique. It detects words, described by their models, in documents images by finding the model's position in the image. With the GHT, the problem of finding the model's position is transformed to a problem of finding the transformation's parameter that maps the model into the image. Parameters such as Hough threshold and distance between voting points are considered for a better location and recognition of words. We tested our system on registers from the 19th century onwards, held in the National Archives of Tunisia. Our first experiments reach an average of 94% of well-spotted words.	036-041

008	H <sup>∞</sup> control of nonlinear fuzzy descriptor system via LMI  Assil AYADI Amine TRABELSI Mohamed CHAABANE Driss MEHDI	This paper deals with the H <sup>∞</sup> control of nonlinear fuzzy descriptor system described by Takagi-Sugeno fuzzy models. In the first step, we present a stability analysis of nonlinear fuzzy descriptor system. The stability conditions are given in LMI form. In the second step, we have developed H <sup>∞</sup> PDC control law in order to reject the effects of external disturbances submitted to the system. Finally, a simulation example is presented to illustrate the main results.	042-047
009	Optimal Control Design for VSCHVDC Systems  Mohamed Ayari Mohamed Moez Belhaouane Naceur Benhadj Braiek Xavier Guillaud	This paper deals with modeling and optimal control design of VSC-HVDC transmission system in order to enhance system stability. The steady of the state mathematical model for GL (Generator-Load) VSC-HVDC system is developed and the decoupled relationship between the controlling variables is proposed. Furthermore, this work focuses on the design of optimal PI (proportional-integral) controller which aims to maintain DC link voltage and control the reactive power. The effectiveness of the proposed optimal control scheme is proved through digital simulation studies on a VSC-HVDC power system, using MATLAB/Simulink software. The simulation results shows that the proposed optimal PI controller is effective to enhance power system stability.	048-053
010	Effect of defects on the efficiency of a SiCH pin based solar cells  T. Azizi A. Torchani M. Ben Karoui R. Gharbi M. Fathallah E. Tresso	In amorphous hydrogenated silicon carbide (a-SiC:H) based p-i-n type solar cells, the device performance is limited by various factors. Most important of which is defects in the i-layer and particularly in the p/i interface. We performed I-V measurements on amorphous solar cells in the structure p(a-SiC :H)/i(a-SiC :H)/n(a-Si :H) at AM1.5. All parameters are determined such as efficiency and filling factor. In the dark, the static and dynamic parameters of diode are deduced. Defects in the intrinsic layer are evaluated by photothermal deflexion spectroscopy technique. All the measured parameters are used by the solar cell capacitance simulator (SCAPS 3.2). The structure of solar cells and the experimental conditions were introduced in simulator. The experimental I-V and spectral response characteristics were correlated to the simulated ones. The simulation shows that increase in defects density, reduces the electrical parameters of amorphous solar cells. The effect of the gap value is more important to define the efficiency of the solar cell made by a-SiC:H materials.	054-058
011	SOCENCLUSTER A New Rapid Clustering Technique  Farouk Baccari Mounir Sayadi	In this paper, we present a novel clustering technique for unindexed, randomized, multidimensional, datasets. The main advantage of the proposed technique is the time and space complexity that were reduced to linear cardinality dependency. The algorithmic implementation shown in this paper uses some heuristics to enhance the overall execution time and space required making them fully scalable. This particularity makes it easier for ASICs / FPGA architects to implement such a technique in a constrained environment.	059-064
012	Increasing the Capacity of OMIMO Systems using MGDGM Technique by Transfer Matrix Decomposition  Faycal Baklouti	Mode Group Diversity Multiplexing (MGDM) is an Optical Multiple-Input-Multiple-Output (O-MIMO) technique that provides larger robustness and capacity for data communication over MultiMode Fiber (MMF). The utility of a MGDM system in terms of capacity expansion gives a major interest in most applications of optical communication. In this paper, we propose a	065-070
	Rabah Attia	transfer matrix decomposition of O-MIMO systems using MGDM technique in order to increase the capacity of the system. This treatment can be divided into 3 stages: noise whitening, channel diagonalization and dimension reduction. Numerical Matlab simulations results of a 3 MGDM link are given to support the efficiency of this study.	
013	The first Tunisian fuel cell test station  M. Barbouche F. Krout M. Chiha K. Charradi A. Zakarya R. Chtourou	In this study, a design and realization of a fuel cell test station is described. The control of the stack temperature and the optimization of some parameters, such as the acquisition and equilibrium time for each value of the current density are necessary steps for an objective and trustworthy comparison of the performance data. Our test bench comprises two major parts hardware and software. The hardware part comprises an electrical cabinet, a power supply, an acquisition chain, an electronic load, mass flow controllers, temperature controller, solenoid valves, and solid state relay. The assemblies of the different parts of the test station are made considering our project objectives, such as, security, size (Length: 1000mm, Width: 800mm, Height: 1900mm), accessibility and mobility etc. The software part includes not only the development of the pipelines and instrumentations diagrams but also the design of the rack using solid-works software. An interface was developed in the LABVIEW environment to enable mass flow controller and the solenoid valves control. It also allows the automatic data acquisition (fuel cell power, temperature and pressure). Preliminary measurements are made with a PEMFC (25 cm <sup>2</sup> ) to make out the effect of temperature, relative humidity, back pressure and in the end the effect of cell number on the fuel cells power. The results may be used to find the best operating conditions.	071-076
014	Faults Detection and Isolation for energy management system in electric traction  Bejaoui. Fatah Yahoui. Hamed Mechmeche. Chokri Hadjbraeik. Naceur Hammouri. Hassan	This paper deals with the problem of diagnosis of faults in energy management for electric traction system .In fact, a bilinear model for the DC-DC (Boost and Buck/Boost) power converters is proposed. The analytical approach of residual generation using the observers with unknown inputs is reviewed, the computation of a bank of residual generators is exploited for fault detection and isolation, in the presence of disturbance. To illustrate the effectiveness of this method, simulations using Matlab/simulink are carried out.	077-082
015	Miniaturized patch Antennas with complementary splitting Resonators and reactive impedance surface.  S. BELDI A. FERCHICHI R. BEDIRA A. GHARSALLAH	The new design of patch antenna with complementary split-ring resonators (CSRRs) and reactive impedance surface (RIS) is presented in this paper. The meta-resonator (CSRRs) and the meta-surface are able to miniaturize the antenna size. This antenna is designed, including a circularly-polarized antenna. Key words: Microstrip antenna, split-ring resonator (SRR), miniaturized antenna reactive-impedance surface (RIS), circular polarization.	083-086

016	Robust Non Fragile Control of a Class of Nonlinear Uncertain Systems  H. BELKHIRIA AYADI M. REZGUI M. M. BELHAOUANE N. BENHADJ BRAIEK	This paper proposes a method to design a stabilizing Robust non-fragile control of uncertain polynomial systems. Based on a quadratic Lyapunov Function, a sufficient stabilization conditions are proposed. An LMI-based optimization problem is then derived for computing the state feedback gains of the closed-loop system with maximization of the stability robustness bound. The effectiveness of the proposed robust control scheme is illustrated through numerical simulations on a numerical example.	087-092
017	From an integrated optimal design to a systemic optimization of a stand alone passive wind turbine system with storage.  M. Belouda J. Belhadj A. Jaafar B. Sareni X. Roboam	In this paper, the authors report the development of a Systemic Optimization Process (SOP) devoted to a passive wind turbine system with electrochemical storage bank. Aim of the SOP is to find the optimal combination and sizing among sets of system components, that meets the desired system requirements; with the lowest system owning cost. The passive wind system associated to the storage bank interacts with wind and load cycles (deterministic data). Sets of passive wind turbines are obtained through an Integrated Optimal Design (IOD) process. The system cost model is inspired from constructor data for the wind turbines and related to the battery cycles for the storage bank. An optimization problem is developed and performed using an exhaustive research. The optimization results are finally exposed and discussed.	093-098
018	Analytic Hierarchy Process Selection for Batteries Storage Technologies.  Faouzi Ben Ammar Inès Hammami Hafsa Faten Hammami	The objective of this study is to select the most appropriate battery technology for photovoltaic application. However, the selection criteria and the diversity of technologies make choice difficult. So, we focus on the Analytic Hierarchy Process which is among the most widely used and has been applied in several multicriteria decision making domains.	099-104
019	Robust and Simultaneous Reconstruction of Actuator and Sensor Faults via Sliding Mode Observer  Ali Ben Brahim Slim Dhahri Fayçal Ben Hmida Anis Sellami	This paper proposes a method for robust and simultaneous actuator and sensor faults reconstruction of linear uncertain system based on sliding mode observer (SMO). In comparison with existing work, the observer contains two discontinuous terms to solve the problem of simultaneous faults. The idea is to introduce an appropriate filter on the systems output to transform the sensor faults in the fictitious actuator faults and hence the proposed SMO can be applied.	105-110
020	A Novel Control of a Reverse Osmosis Desalination System Powered by Photovoltaic Generator.  Abderrahmen BEN CHAABENE Anis SELLAMI	In Arid or semi-arid regions the ensoleillement is important while the water quality is bad. The coupling between Reverse Osmosis Desalination (ROD) processes and photovoltaic energy sources is a best solution to produce drinkable water from brackish water. However, the high intermittence of the photovoltaic energy level is the mean reason of membranes filling; therefore it makes these plants not optimally designed and operated because only a short number of constant operation points is considered and not a changeable control strategy. The present paper deals with a novel suitable control strategy approach based on the Variable	111-116
		Structure Model Reference Adaptive Control (VSMRAC) applied to ROD systems fed by photovoltaic sources. The control algorithm ensures minimal value of the following error between the plant and the reference model even in the presence of intermittent sources. The performances of the proposed control are shown by simulations and validated by experimental results.	
021	Predictive Sliding Mode Control for perturbed discrete delay time systems Robustness Analysis.  Ben Mansour Houda Abdennebi Nizar Nouri Ahmed Said	This paper presents a control strategy for perturbed discrete system with time delay, using Sliding Mode Control (SMC) and Model based Predictive Control (MPC). A predictive sliding mode control strategy is proposed and a discrete-time reaching law is improved. By applying a predictive sliding surface and a reference trajectory, combining with the state feedback correction and rolling optimization method in the predictive control strategy, a predictive sliding mode controller, for perturbed discrete system with time delay, is synthesized. The combination of SMC and MPC improves the performance of these two control laws. A robustness analysis proves that the designed control strategy has stronger robustness and chattering reduction property. Finally, a numerical example is given to illustrate the effectiveness of the proposed theory.	117-122
022	Interest of the Combination of Classifiers for Volumetric Textures Classification  Elmoez BEN OTHMEN Mohamed Ali CHERNI Mounir SAYADI	Nowadays, classification is applied in various fields such as pattern and writing recognition, prints checking, faces identification, medical images analysis, 2D textures characterization and volumetric textures characterization. Indeed, the three dimensional field is considered among one of the most important fields in image processing because of the great quantity of information that can be extracted. In this work, we try to improve the performances of classification for volumetric textures images by proposing a multiple classifier systems (MCS) based method combining three Euclidean classifiers: simple Euclidean classifier (ES), normal Euclidean classifier (EN) and balanced Euclidean classifier (EB). Thereafter, we compared the performance of the proposed method to the Euclidean methods (ES, EN and EB). The hybrid presented approach has proven to be more efficient in classification and mostly robust against Gaussian noise.	123-128
023	LowComplexity Approaches for Maximum Doppler Spread Estimation in Mobile Communication Systems  Nessrine BEN REJEB Ines BOUSNINA M. Bassem BEN SALAH Abdelaziz SAMET	In this paper, three different low-complexity maximum Doppler Spread (DS) estimators are compared. A single source transmitter through a Rayleigh channel scenario is considered. The first studied method is based on velocity estimation and correlation properties of narrow-band mobile communication channels. The second low-complexity considered approach is the robust Doppler Spread estimation in the presence of residual carrier frequency offset which exploits the covariance matrix of the received signal. The third one uses reduced interference timefrequency distribution of the received signals. Simulation results shows that the second approach offers lower estimation error with a good compromise between computational complexity and estimation accuracy.	129-134

024	Speed Sensorless Indirect Field Oriented of Induction Motor Using Two Type of Adaptive Observer  Chiheb Ben Regaya Abderrahmen Zaafour Abdelkader Chaari	In this paper, the indirect vector control speed sensorless is presented, two adaptive mechanisms have been proposed to estimate the rotor speed. The first adaptive observer based on sliding mode, a study was made to present the steps needed to design a sliding mode observer. The second has been developed from the backstepping technique to design an observer for the rotor speed. Finally, tests show the robust performance of the control law obtained by these two types of adaptive observers.	135-139
025	Induction motor mechanical fault identification using Park's vector approach  Samira Ben Salem Walid Touti Khmais Bacha Abdelkader Chaari	In this work we have shown that the extended Park's vector spectrum is rich in harmonics characteristics of mechanical defects (air-gap eccentricity and outer raceway bearing fault). About the use of Park's Lissajou's curves to identify mechanical defects, we have demonstrated that this type of index can only detect the occurrence of a fault, but it cannot identify.	140-145
026	Design and Dynamic Modeling of a Fuel Cell/Ultra Capacitor Hybrid Power System  Ben Slama Sami Ben Chaabene Abderrahmen Cherif Adnane	The aim of this paper is firstly to describe the design than to introduce a new approach of dynamic modeling and simulation results of a Fuel cell/Ultra capacitor (FC/ULC) hybrid power system. The developed model is represented in the state space, so it can be used to implement a suitable control strategy. The given design shows that the transient behavior, effect of the Fuel Cell, is eliminated by the use of the Ultra capacitor through the Flyback converter (FIBC). Thus, the output voltage from the source is maintained with a certain range and meets power demand of the load at high efficiency.	146-152
027	Dual Stator Induction Motor Operation from Two PWM Voltage Source Inverters  Ben Slimene Marwa Khilifi Mohamed Larbi Ben Fredj Mouldi Rehaoulia Habib	This paper presents a d-q model of dual stator induction machine supplied by a two identical PWM voltage source inverters suitable for analysis the dynamic steady under balanced operating condition. In the analytical model, the effects of common mutual leakage inductance between the two three-phase stator winding sets have been included. The model has been developed in general reference frame and it is suitable for analysis of the machine behavior with spatially shifted by 0, 30 and 60 electrical degrees between the two three-phase stator winding sets.	153-156
028	Unknown inputs observers for state and unknown inputs estimation in a class of discretetime Lipschitz nonlinear systems.  Ben Warrad Seifeddine Dahri Slim Ben Hmida Fayçal	In this paper, we propose a method for estimating of state and unknown inputs based in observers approach in a class of discrete-time Lipschitz nonlinear systems with unknown inputs both state and measurement. This method design is obtained using a particular Lyapunov function in order to guaranty the asymptotic stability of the error estimation. The observer gains are determined in terms of Linear Matrix inequalities (LMI). Performances of the proposed approach are illustrated through simulation results.	157-161
029	Animating signing avatar using descriptive sign language  Nour Ben Yahia Mohamed Jemni	This paper proposes an interactive manipulation of signing avatar (complex human's figures) by means of a descriptive sign language. The objective is to improve the human-computer communication, to generate precise signs for Deaf community, to control and animate the virtual character. This approach has been developed to manipulate robots through several analytic and numerical resolution methods. These methods have been applied to the virtual character for better monitoring and to ensure a realistic animation in real time.	162-166
030	Robust Sliding mode observer for fault estimation of uncertain system  Habib Ben Zina Slim Dahri Fayçal Ben Hmida	This paper describes a method of actuator fault estimation for linear uncertain systems. In this work, the upper bound of the unknown input is not required. To remove this requirement a modified sliding mode observer is presented. The novelty in this method lies in the structure of the mechanism introduced to calculate the sliding mode observer gain responsible to counteract uncertainty and actuator fault. In order to guarantee robustness to uncertainty, the developed observer use the $H^\infty$ principle. Then, based on Lyapunov method, asymptotic stability conditions are given to design the observer parameters. Also, the equivalent output error injection signal is used to estimate the fault. Finally, the validity of this approach is illustrated by a VTOL aircraft model.	167-171
031	Asymmetrical Cascaded Multilevel Converter Applied in Photovoltaic Systems  Oussama Bouaziz Imen Jaafar Faouzi Ben Ammar	The performance of photovoltaic system is affected by solar radiation, temperature, shading and cells configuration. This paper presents a suggested solution to cure the problems of the shade, by the use of the cascaded multilevel inverters adapted to the situation of non-identical continuous DC PV sources and commended by an appropriated PDPWM control.	172-177
032	Robust Stiffness Control for Constrained Robots Under Model Uncertainties.  Haifa Mehdi Olfa Boubaker	In this paper, we present an improved proof of global asymptotic stability of constrained robotic systems under model uncertainties. The control objective is to make the robotic manipulator's end effector to track the reference trajectories in the task space. The proposed approach is an enough straightforward method without force and position control separation. It's based on the Lyapunov Hamiltonian method and the stiffness control strategy. The robustness of the suggested robust controller is proved via simulation results.	178-182
033	Toward a mobile service for hard of hearing people to make information accessible anywhere.  Mehrez Boulares Mohamed Jemni	Deaf and hard of hearing people can find it difficult to follow the rapid pace of our daily life. This problem is due to the lack of services that increase access to information. Regarding hearing impairment there is no specific solutions to make information accessible anywhere. Although this community has very specific needs related to the learning and understanding process of any written language. However, hearing impairment is an invisible disability which is quite frequent: it is estimated that more than 8% of world's population suffers from hearing loss. According to many studies reading level of hearing impaired students is lower than reading level of hearing students. In fact many deaf people have difficulties with reading and writing; they cannot read and understand all the information found in a newspaper, in vending machine to take a conveyance, in instruction leaflet etc Mainly all visual textual information are	183-187

		not accessible for this category of people with disabilities. However, a number of obstacles still have to be removed to make the information really accessible for all and this is crucial for their personal development and their successful integration. In this paper we propose a solution to this problem by providing a mobile translation system using the great technological advances in smart phones to improve the information accessibility anywhere. We rely on text image processing, virtual reality 3D modeling and cloud computing to generate a real-time sign language interpretation by using high virtual character quality.	
034	A new Approach Combining speech Chaotic Encryption with fragile Image Watermarking For audio securing and intrusion detection  Bouslehi Hamdi Seddik Hassene	Digital watermarks have been created to be a protection technique of copy rights on digital audio, image, and video. A watermarking can be fragile and robust according to our needs. An attack in watermarking technology is any process that can impact the detection of the watermark. In this paper we studied the evaluating of extracted signal quality before and after attack with the SNR value calculated between extracted signals. This evaluation serves to present the fragility of our watermarking whose the mark is an audio sequence encrypted by a chaotic encryption algorithm method and tested by using various types of attacks. The fragility of watermarking is used as a tool to control intrusion.	188-193
035	New Condition of Stabilization for Continuous Takagi Sugeno Fuzzy System based on Fuzzy Lyapunov Function  Ali bouyahya Yassine Manai Joseph haggège	This paper tries to give a new stabilization condition of continuous Takagi-Sugeno fuzzy models. Using nonquadratic Lyapunov function, the new condition of stabilization are used in terms of linear matrix inequalities LMI. To verify the robustness of this new condition, a numeric example is used. Index Terms: Takagi-Sugeno fuzzy system, Fuzzy Lyapunov Function, Linear Matrix Inequalities LMI, Parallel Distributed Controller PDC.	194-200
036	New Allied Fuzzy CMeans algorithm for Takagi Sugeno Fuzzy model Identification  BOUZBIDA Mohamed TROUDI Ahmed HASSINE Lassad CHAARI Abdelkader	Takagi--Sugeno (TS) fuzzy model have received particular attention in the area of nonlinear identification due to their potentialities to approximate any nonlinear behavior [1]. In literature, several fuzzy clustering algorithms have been proposed to identify the parameters involved in the Takagi- Sugeno fuzzy model, as the Fuzzy C-Means algorithm (FCM) and the Allied Fuzzy C-Means algorithm (AFCM). This paper presents the New Allied Fuzzy C-Means algorithm (NAFCM) extension of the AFCM algorithm. Then an optimization method using the Particle Swarm Optimization method (PSO) combined with the NAFCM algorithm is presented in this paper (NAFCMPSO algorithm).The simulation's results on a nonlinear system shows that the New Allied Fuzzy C-Means algorithm combined with the PSO algorithm gives results more effective and robust than the Allied Fuzzy C-Means algorithm.	201-207
037	Neural Network Based Method for the Automatic Detection of the Stator Faults of the Induction Motor  Monia Ben Khader Bouzid Gérard Champenois	This paper proposes a neural network based method to achieve an automatic detection of different stator faults of the induction motor. The concerned stator faults are the inter turns short circuit, phase to phase and phase to ground faults. The inputs of the feedforward multi-layer neural network are the indicators of the stator faults while its outputs are the corresponding faults. Therefore, the used indicators of faults are extracted from the symmetrical components of the stator currents which are the magnitude and the angle phase	208-214
		of the negative and zero sequence current. The neural network is trained by the back-propagation algorithm. A faulty simplified multiple coupled circuit model of a 1.1 kW induction motor is used to simulate the different operating conditions of the machine useful to built the data base for the training and the test procedures. The good training and test results show the efficiency of the proposed method.	
038	An Animated Avatar to Interpret SignWriting Transcription.  Yosra Bouzid Mohamed Jemni	People with hearing disability often face multiple barriers when attempting to interact with hearing society. The lower proficiency in reading, writing and understanding the spoken language may be one of the most important reasons. Certainly, if there were a commonly accepted notation system for sign languages, signed information could be provided in written form, but such a system does not exist yet. SignWriting seems at present the best solution to the problem of SL representation as it was intended as a practical writing system for everyday communication, but requires mastery of a set of conventions different from those of the other transcriptions systems to become a proficient reader or writer. To provide additional support for deaf signers to learn and use such notation, we propose in this paper a new tool for displaying SW notation content, automatically, in visual-gestural modality by using a 3D signing avatar. The notation is provided as input in an XML based format called SWML (SignWriting Markup Language). Such tool can help the deaf to grasp and interact with the transcribing data through a more user-friendly environment.	215-219
039	Sliding Mode Control of Nonlinear Uncertain System Based on TakagiSugeno Fuzzy Model  Lotfi Chaouech Oussama Saadaoui Abdelkader Chaari	This paper proposes an approach to design sliding mode control for a class of uncertain nonlinear systems, where the uncertainty is a norm bounded type. Firstly, we choose the sliding surface which gives a good behaviour during sliding mode. It is formulated as an assignment of the poles of uncertain nonlinear system in a convex optimization area. Secondly, we design a nonlinear control law leading the state trajectory on the sliding surface in a finite time. A numerical application of inverted pendulum is given to validate the theoretical results of our approach.	220-225
040	Energy Estimation on Large Scale Time of Stand Alone Wind Turbine.  Habib Cherif Jamel Belhadj	In this paper, accurate energy production estimation of stand-alone wind turbine in southern Tunisia has been studied. Energy estimation by Weibull distribution and meteorological data is applied. The design of the wind turbine system architecture according to all the characteristics of the studied site was presented. Monthly average wind energy production is estimated with the integration of converters losses. Loss models of boost and rectifier converters are investigated. The obtained results show that the integration of converters losses and using the statistical distributions leads to a better energy estimation taking into account all the characteristics of the southern Tunisia site.	226-231
041	A Hybrid Method Based on Conjugate Gradient Trained Neural Network and Differential Evolution for Non Linear systems Identification	A hybrid method based on Differential Evolution and Neural Network training algorithms is presented in this paper for improving the performance of neural network in the non linear system identification. For this purpose, the local optimization algorithm of conjugate gradients (CG) is combined with the differential evolution algorithm (DE), which is a population-based stochastic global search method, to yield a computationally efficient algorithm for training	232-236



	Chiha Ibtissem Liouane Nouredine	multilayer perceptron networks for nonlinear system identification. After, a series of simulation studies of our method on the different nonlinear systems it has been confirmed that the proposed CG+DE algorithm has yielded better identification results in terms of time of convergence and less identification error.	
042	Incremental relaying effect on the outage probability of correlated sources Transmission.  Zina Chkribene Noureddine Hamdi	In this paper we investigate different relaying strategies for correlated source transmission in block Rayleigh fading channels. Outage probability close form expressions are derived for both the cases where incremental decode and forward and only simple decode and forward techniques are used in the relays. We show that when using incremental technique in the principal relay, not only we gain in terms of channel resource saving but we get also a significant outage performance improvement compared to simple decode and forward system. Another finding of this paper is that if incremental relaying technique is used in the principal relay, the system reaches a diversity order of 2 with a significant power gain compared to a two links maximum ratio combining system.	237-242
043	An Equilibrium Pricing Model for Large Scale Computational Markets  Lilia Chourou Mohamed Jemni Ahmed Elleuch	Load balancing is one of the most challenging problems facing large-scale computational systems. This paper introduces a competitive pricing model to achieve a general equilibrium between the global supply and demand in large scale computational commodity markets. Prices are adjusted according to a tâtonnement like process. A fully distributed pricing model is proposed based on an existing partially distributed version. While in this last version, the price of each commodity is computed by only one auctioneer, in our algorithm, a scalable number of auctioneers is used to support a massive number of suppliers and consumers.	243-248
044	Voltage Control of a Single Distributed Generation Unite in Autonomous Mode Operation Under Unbalance and Nonlinear Load Conditions.  Yacine DAILI Lazhar RAHMANI JeanPaul GAUBERT	This paper propose a voltage control of a single distributed generation (DG) unit powered local load. The DG system utilizes three phase four wire voltage source inverter VSI with split DC link as the medium interface and LC filter to attenuate the switching frequency harmonics. A dual loop scheme is employed. Dead beat current controller in inner loop, which achieve fast dynamic response. In the outer loop, Multigeneralized resonant filter with feedback state is employed to track reference voltage and eliminate the low order harmonics, and to make the dynamic of the system greatly adjustable via pole-placement strategy. The proposed controller provides a set balanced three phase voltage with low THD equal to 1.80% in worse case (non linear load) for a locale load, despite unbalanced and distorted current load, guarantee a robust stability, fast dynamic response to disturbance, zero steady state error. Effectiveness of the proposed control strategy is evaluated based on time domain simulation studies in Matlab/Simulink TM environment.	249-254
045	Photovoltaic properties of devices using fullerene and copper phthalocyanine doped with polyhexylthiophène..  H. DEROUICHE A.B. MOHAMED	We have fabricated organic solar cells, with an active layer of fullerene (C60) and Copper-phthalocyanine (CuPc) doped with poly(3-hexylthiophène) (P3HT) deposited by spincoating. This layer is sandwiched between the anode, an indium tin oxide film and the C60 layer. We have studied the effect of CuPc doping using P3HT in order to improve the efficiency of the photovoltaic devices. The thin films have been characterized by infrared absorption measurements (I-R), Atomic force microscope (AFM) and ultraviolet/visible spectroscopy in	255-257
		order to study the influence of P3HT doping on the properties of the solar cells. We have also compared the I-V characteristics of two different structures: ITO/PEDOT:PSS/ C60-CuPc/Al and ITO/PEDOT:PSS/ C60-CuPc-P3HT/Al. Both structures show weak but significant photovoltaic behaviour. Indeed, doping CuPc with P3HT improves the efficiencies of the solar cells. We have also seen that the diffusion of species from the indium tin oxide (ITO) anode into the active layer causes a decrease in overall photovoltaic characteristics of C60-CuPc-P3HT based solar cell.	
046	New LMI Formulation for Control Design of Discrete Linear Repetitive System.  Jamel Dridi Selma Ben Attia Salah Salhi Mekki Ksouri	This paper addresses the stability analysis along the pass and the synthesis problem of linear 2D/repetitive systems (i.e. information propagation in two independent directions). A new sufficient condition for the synthesis problem in the case of MIMO is also given for both discrete repetitive linear. A necessary and sufficient condition for analysis and synthesis for discrete repetitive linear MISO systems is presented. These new results are expressed in term of LMI (linear matrix inequalities). Numerical examples are provided to illustrate the effectiveness of the proposed formulations.	258-263
047	Expansion of MIMO ARX model on Laguerre orthonormal bases.  Amani El Anes Kais Bouzrara Tarek Garna Hassani Messaoud	In this paper, we propose a new dynamic linear MIMO system representation by using discrete-time MIMO Autoregressive with exogenous input (ARX) model. To provide a reduced complexity model, each polynomial function of the MIMO ARX model associated to the inputs and to the outputs is expanded on independent Laguerre orthonormal basis to develop a new black-box linear MIMO ARX-Laguerre model. This reduction is ensured once the poles characterising each Laguerre orthonormal basis are set to their optimal values. Simulation results show the effectiveness of the proposed modeling method.	264-269
048	Design of a Hybrid Linear Stepper Motor for Shunting the Railways Channels  Barhoumi El Manâa Hajji Mansour Ben Salah Boujemâa	This paper concerns the optimal design of hybrid linear stepper motor by evaluating the developed propulsive force for each position of the used permanent magnet. The new linear actuator is proposed for shunting the railways channels in aim to replace the currently used system which consists of a rotary actuator coupled with system for movement transformation (Rotary to Linear). Hence, three different structures with permanent magnet are analysed by finite element method in aim to evaluate the propulsive force versus the mobile displacement. The magnetic flux distribution and the force profile of each hybrid structure are presented and discussed. The analysis of different actuator structures allows the selection of the proper structure for the specific requested application.	270-273
049	New approach for noise cleaning on real time videos based lowpass filtering and mathematical morphology  Dhekra ESSAIDANI Hassene SEDDIK Ezzedine BEN BRAIEK	Video de-noising presents a necessary step in video processing. It improves its quality and permits a preview processing for other applications such as objects tracking, compression, feature extraction, edge detection, motion tracking etc. In this paper, we combined the mathematical morphology operations with low-pass filtering to improve real-time video de-noising corrupted by different noise types. Different kinds of morphologies and filters are proposed in order to define the best combination possible. This algorithm does not require any motion estimation. It isn't present a blur in de-noising video. Nevertheless, it can be a good reference for estimate motion in video.	274-279

050	<p>A Sensorless Speed Control of Induction Motor Based on Robust Rotor Flux Observer</p> <p>Fethi Farhani Abderrahmen Zaafouri Abdelkader Chaari</p>	<p>The induction motor is the principal source of the workhorse [1] in the industry. However, due to its high non linearity, a high-performance control of induction motor remains a challenge for the automation. In this paper, we present a robust solution for the observer and control of the induction machine taking into account the iron losses. The proposed technique is based on Lyapunov theory and application of the bilinear matrix inequalities framework. Thus, an adaptive mechanism is introduced to cover not only uncertainty parameters but also the rotor speed which is derived from the satisfaction of the first condition of the Lyapunov theory. The observer gain is calculated by solving the bilinear matrix inequality (BMI) to satisfy the second condition of Lyapunov. Some simulation results are given to demonstrate the robustness and performance of the proposed solution.</p>	280-285
051	<p>Activities' traces sharing for elearners using heterogeneous LMS</p> <p>Belhassen Guettat Ramzi Farhat Mohamed Jemni</p>	<p>Many Learning Management Systems (LMS) are available today and they are widely used. Many e-learners use two or more LMS simultaneously for different kinds of learning. The research question discussed in this paper is: how learners can benefit from their learning activities whatever the used LMS? We propose in this paper our approach to support the sharing of learners' activity traces when an elearner uses simultaneously heterogeneous LMS. Use cases demonstrating the advantage of using our approach are given. The state of the art is presented. Finally the elements of our approach are explained.</p>	286-289
052	<p>Ontology based semantic metadata extraction approach</p> <p>Baraa JEBALI Ramzi FARHAT</p>	<p>In this paper we describe our approach for automatic generation of learning objects' semantic metadata. The extraction process is based on the OBIE (Ontology Based Information Extraction) systems' principles. The input of our approach is a set of IEEE LOM metadata elements in conformance with two requirements. First, each data element must describe the educational content of the learning object. Second, it must be one of the data elements frequently filled by the learning objects' authors and required by most of the LOM application profiles. Concerning the outputs, each one is a couple of a domain concept (from domain ontology) and a degree of pertinence. Moreover we present the details concerning the integration of our approach to learning objects' repositories by taking the COLORS repository as example. In fact the ultimate goal behind our approach is the improvement of repositories' services by offering semantic metadata.</p>	290-294
053	<p>Miniaturized patch Antennas with complementary splitting Resonators and reactive impedance surface.</p> <p>S. BELDI A. FERCHICHI R.BEDIRA A. GHARSALLAH</p>	<p>The new design of patch antenna with complementary split-ring resonators (CSRRs) and reactive impedance surface (RIS) is presented in this paper. The meta-resonator (CSRRs) and the meta-surface are able to miniaturize the antenna size. This antenna is designed, including a circularly-polarized antenna. Key words: Microstrip antenna, split-ring resonator (SRR), miniaturized antenna reactive-impedance surface (RIS), circular polarization .</p>	295-298
054	<p>Ant Colony Algorithm Applied to Power Transformer Optimization</p> <p>Montasser Fouzaï Taoufik Zouaghi</p>	<p>This paper describes a new optimization method based on Ant colony Algorithm for the optimal choice of the number of turns in the primary winding, flux and current density in power transformers .The goal of the proposed Algorithm is to minimize the cost of the transformer. The advantage of this method for designers is to have quick results without having to deal with all possible combinations to get the optimal solution. The proposed optimization methodology has been implemented successfully to optimize the design of power transformers and results have been compared with conventional design techniques.</p>	299-303
055	<p>Robust fault and state space estimation for linear uncertain systems An RLS approach</p> <p>F. Gannouni F. Ben Hmida</p>	<p>This paper addresses the robust filtering problem of joint fault and state estimation for uncertain systems from the viewpoint of regularized least-square estimation. The method is based on the assumption that no prior knowledge about the dynamical evolution of the fault is available. Compared with earlier studies the robust criterion for least-square designs incorporate simultaneously both regularization and weighting and applies to a large class of uncertainties. The solution to the regularized least-square problem yields robust filter equations that perform regularization as opposed to de-regularization. The proposed filter is tested by an illustrative example.</p>	304-311
056	<p>Conducted Immunity Requirements Tests for Power Line Communication Coupling Interface Circuit</p> <p>Héla Gassara Fatma Rouissi Adel Ghazel Fabrice Duval</p>	<p>This paper presents the specifications and the measurement results of conducted immunity requirements tests applied to coupling circuits designed, by authors, for the narrowband Power Line Communication channel measurement. Obtained results showed that the proposed design provides a high safety level to users and measurement devices, and is in compliance with CENELEC immunity requirements in terms of surge tests in both common and differential modes and fast transients tests specifications.</p>	312-315
057	<p>Empirical Mode Decomposition for Usable Speech Detection.</p> <p>Wajdi Ghezaïel Amel Ben Slimane Ezzedine Ben Braïek</p>	<p>Usable speech criteria are proposed to extract minimally corrupted speech for speaker identification in cochannel speech. This paper deals with an empirical mode decomposition for usable speech segments detection of co-channel speech. Usable speech detected could be processed by a speaker identification system. Experiment and simulation of this method is performed on TIMIT database.</p>	316-320
058	<p>Current Sensors Faults Detection Isolation and Control Reconfiguration for PMSM Drives.</p> <p>F. Grouz L. Sbita M. Boussak</p>	<p>This paper deals with a new method current sensors faults detection isolation (FDI) and reconfiguration of the control loops of a permanent magnet synchronous motor (PMSM) drives. The stator currents are measured as well as observed. During fault free operation, the measured signals are used for the PMSM control. In the case of current sensors faults, the faulty measurements are detected and isolated using the new FDI algorithm. This algorithm uses an augmented PMSM model and a bank of adaptive observers to generate residuals. The resulting residuals are used for sensor fault detection. A logic algorithm is built in such a way to isolate and identify the faulty sensor for a stator phase current fault after detecting the fault occurrence. After sensor fault detection and isolation, the control is reconfigured using the healthy observer's outputs. The validity of the proposed method is verified by simulation tests.</p>	321-326



059	Activities' traces sharing for elearners using heterogeneous LMS  Belhassen Guettat Ramzi Farhat Mohamed.jemni	Many Learning Management Systems (LMS) are available today and they are widely used. Many e-learners use two or more LMS simultaneously for different kinds of learning. The research question discussed in this paper is: how learners can benefit from their learning activities whatever the used LMS? We propose in this paper our approach to support the sharing of learners' activity traces when an e-learner uses simultaneously heterogeneous LMS. Use cases demonstrating the advantage of using our approach are given. The state of the art is presented. Finally the elements of our approach are explained. Keywords—Learning activities traces; heterogeneous Learning Management Systems.	327-330
060	Active power measurement comparison between analog and digital methods.  A. Ayari H. Mehergui A. Haddouk	The measurement method used in this paper compares the power measurement on analog wattmeter and digital systems. One analyzes, in the first part, the metrological behavior of an electrodynamic wattmeter and in the second part one uses a multifunction measurement numerical method. This method uses two Hall sensors and an electronic analog multiplication process to adapt the network voltage and current and also the power measurement. Via an interface board of the type CIGAL M23, one acquires directly the normalized power using a statistical measurement method which increases the accuracy. Using an 8255 timer, one measures the phase angle between the voltage and the current load. The intelligent system allows us to measure the phase angle, the active, reactive and apparent power and to identify the load type (inductive or capacitive one). A comparison in the active power was made between the electrodynamic wattmeter and the smart system. The measurement ranges of this power systems are: An input voltage of 220V and a maximum load current of 5A. The accuracy is less than 0.2%. Keywords—Electrodynamic wattmeter behavior, numerical active power measurement, arithmetic mean value, metrological errors analysis, phase angle measurement.	331-336
061	Controller order reduction techniques for loop shaping procedure  Ali Ameur Haj Salah Kais Bouzrara Tarek Garna Hassani Messaoud	The main objective of loop shaping design methodology is to produce a controller that guarantees robust stability against normalized coprime factor uncertainty. This form of uncertainty was used by Glover and McFarlane [6-8] to obtain an exact solution to the robust stabilization problem. The order of loop shaping controller is typically as high as the model order. Such high order controllers are sometimes difficult to implement due to hardware limitations. In many cases, the higher order controller can be approximated by a reduced order controller with acceptable performance degradation. In this paper, the effectiveness of order reduction techniques is applied on an inverted pendulum.	337-341
062	From Desktop Grid to Cloud Computing Based on BonjourGrid Middleware.  Karim Hassan Heithem Abbes Mohamed Jemni	Desktop Grids provide computing and storage power, with a low economic cost, through the federation of free resources. Their performance relies strongly on the voluntary participation of users who make their machines available when these are unexploited. Several criteria such as number and volatility of resources make the execution of many applications in desktop grid, a great challenge. We attend today the emergence of a new concept: Cloud Computing. Similar to desktop grid, cloud computing provide resources for the execution of HPC (High Performance Computing) applications. In this context, we are interested in designing an approach, with an aim of having a hybrid execution's environment formed by BonjourGrid	342-347
		desktop grid middleware and a cloud computing, to overcome the constraint of lack of resources caused by the volatility of machines.	
063	Load Shedding Strategy Application Using Fuzzy Logic  Moez Ben Hessine Houda Jouini Souad Chebbi	As a perspective to ensure the voltage and frequency electrical network stability, the load shedding constitutes a desirable action to maintain the network service quality and to control its vulnerability. In this paper, we propose a new intelligent load shedding strategy applying fuzzy control algorithms. This strategy is based on the estimate, in real time, of the load quantity to shed. Calculation algorithms containing fuzzy controllers generate command vectors ensuring the load shedding of a pre calculated proportion loads in order to reestablish the power balance and to lead the electrical network to a new stable condition.	348-352
064	Joint Optimization of Switching Threshold and Power Allocation in One Way Incremental Amplify and Forward Cooperative Networks  Ines Hosni Noureddine Hamdi	Incremental adaptive relaying has shown an attractive compromise between robustness and spectral efficiency in cooperative networks. Relays are used to incrementally assist sources to transmit data to their destinations. In this paper, a joint optimization of switching thresholds and transmit power assignments is proposed. The relaying is used, if either the signal strength at the destination is lower than a given threshold and at the relay is respectively greater than another threshold. In the relaying phase, optimal transmit power assignment is considered at the source and at the relay. The proposed scheme permits to meet the best compromise among reliability, throughput and energy efficiency of cooperative source-relay-destination transmissions. We apply the proposed scheme to amplify and forward (AF) relaying systems. A selection of numerical results is illustrated for the performance analysis.	353-357
065	DTCSVM Control for Three Phase Induction Motors  Hosni Hiba Hmidet Ali Hasnaoui Othmen	By principle, Direct Torque Control (DTC) is used to adjust stator flux and electromagnetic torque. Simple structure and very good dynamic behavior are main features of DTC. However classical DTC has some disadvantages, the most important of them is the high ripple torque. In this paper we propose some variety of DTC combined with FOC structures. Hysteresis controllers and switching table are replaced by PI controllers and space vector modulator. Three algorithms work in fixed switching frequency are developed, can overcome the aforementioned drawback. The proposed schemes are described clearly. Simulation results prove the effectiveness, reliability and correctness of the proposed methods.	358-364
066	Nonlinear System Identification Using Extended Possibilitic C-Means algorithm EPCM And Particle Swarm Optimization PSO  HOUCINE Lassad BOUZBIDA Mohamed TROUDI Ahmed CHAARI Abdelkader	The Takagi-Sugeno fuzzy model is one of the best approaches for modeling and identifying of a nonlinear system. Several algorithms have been proposed in this framework; identify the premise parameters involved in the Takagi-Sugeno fuzzy model, as the fuzzy c-mean algorithm (FCM), the Gustafson Kessel algorithm (GK), PCM algorithm and EPCM algorithm. The implementation of these algorithms in the case of identification of nonlinear stochastic systems shows that this approach to several shortcomings, such as convergence to local optima and sensitivity to initialization (choice of number of clusters) and sensitivity to noise. In this paper, a combination of the EPCM algorithm and the PSO (particle swarm optimization) algorithm is used. However, the consequent parameters are therefore estimated by using the recursive weighted least squares (RWLS) method. The simulation results presented here illustrate the effectiveness of this algorithm.	365-370

067	Performance Evaluation of Wireless Sensor Networks Based On Zigbee Technology in Smart Home  Monaem IDOUDI Habib ELKHORCHANI Khaled GRAYAA	Wireless Sensor Networks (WSNs) has diverse application domains such as smart home, smart care, industrial, etc. In this paper, we present a WSN system based on the ZigBee technology (IEEE 802.15.4) in Smart Home. To have a good sensor networks communication implanted in a smart home, studies of operating performance on this network is important. In this work, we investigate the performance of our ZigBee sensor networks. The study of performance is based on measurements of the Received Signal Strength Indicator (RSSI) in different parts of the Home. We will also discuss the impact of electromagnetic noise on the communication performance of a ZigBee Sensor Network in the presence of a motor with variable speed drive.	371-374
068	Development of Communication Architecture for Intelligent Energy Networks  Habib ELKHORCHANI Monaem IDOUDI Khaled GRAYAA	Smart Grid is a network of transmission and distribution of electricity enjoying a complete integrated control and new capabilities of information technology and telecommunications. It provides bidirectional energy flow and informational in real time between all actors in the network. The Smart Grid is now the state of experimental design and there is no industrial sector itself. It reigns including greater uncertainty about the standard technology of tomorrow and it is difficult to have a universal model of Smart Grid frozen in time. The evolution of smart device and the news protocols open more research in this field in order to achieve a standard architecture of telecommunication in a smart grid. In addition to the currently wired standards and protocols used, new wireless approaches should be study. In order to address this issue, this paper proposes Network Architecture of Smart Grid Communication by deploying wireless protocols consisting of 802.15.4 ZigBee, 802.11, and the WiMAX standards. These are applied at different levels of the architecture as the Wide Area Network (WAN), Neighborhood Area Network (NAN) and the Home Area Network (HAN). For this architecture to be more robust, reliable and efficient, more characteristics of these protocols will be studied and simulated in this article.	375-380
069	Fuzzy c-regression models based on the BELS method for nonlinear system identification  Borhen Aissaoui Moëz Soltani Dorsaf Elleuch Abdelkader Chaari	A fuzzy c-regression model clustering algorithm based on Bias-Eliminated Least Squares method (BELS) is presented. This method is designed to develop an identification procedure for noisy nonlinear systems. The BELS method is used to identify consequent parameters and eliminate the bias. The proposed approach has been applied to benchmark modeling problem which proved a good performance.	381-386
070	Study and Modeling of Ferromagnetic Hysteresis  Monia Ferjani Jaafar	In this paper we are interested in the study and modeling of ferromagnetic hysteresis. We simulated the magnetic hysteresis based on the Jiles-Atherton (J-A) model that we have developed using Matlab-Simulink environment. The (J-A) model is based on physical considerations, it is characterized by five parameters and considered to our knowledge as the most accurate and complete one. It allows studying a wide range of ferromagnetic material hysteresis loops which justify in this work our choice for this model. In order to determine these five model parameters, we have to numerically analyze experimental data from the material hysteresis loop. For this purpose we applied the (J-A) model for the dynamic study of a magnetic circuit taking into account the phenomenon of hysteretic material.	387-392
071	Controller design techniques applied for a case of a linear fractional system.  Rim Jaouani Kaouther Laabidi	The purpose of this paper is to present tow methods to synthesize fractional order control for a given type of Fractional Order System FOS model. Two controllers are proposed for this class of FOS: Fractional Order Proportional Integrator (FO-PI) controller and Proportional Integrator PI. A practical and systematic tuning procedure has been developed for these controllers. In fact the paper presents an extension of some results developed in the simulation of integer order plants to FOS using the state representation; Computer simulation of the circuit model by Matlab was used to prove the relevance of our work and to show the effectiveness of the proposed controller design strategy and the robustness of the FO-PI controller compared to the classic PI under the same number of design parameters and the same specifications.	393-399
072	A comparative study between HSic and silicon power PiN diode having the same breakdown voltage KV.  Atef Jedidi Hatem Garrab Kamel Besbes	The exploitation of silicon carbide semiconductor devices in power electronic field have made exceptional improvements by their fast switching and low dissipated losses especially at high operating temperatures, However, physical performances of silicon power components have reached their limits. This paper presents a comparative study, through numerical simulation and using the finite element method modeling, between 4H-SiC and silicon power PiN diode having the same breakdown voltage "4KV". This comparative study highlights the benefits of silicon carbide.	400-405
073	HMMbased method to overcome spatiotemporal sign language recognition issues  Maher JEBALI Patrice DALLE Mohamed JEMNI	Sign languages (SL) are the most accomplished forms of gestural communication. Therefore, their automatic analysis is a real challenge which is interestingly implied to their lexical and syntactic organization levels. Statements dealing with sign language occupy a significant interest in the Automatic Natural Language Processing (ANLP) domain. In this work, we are dealing with sign language recognition, in particular of French Sign Language (FSL). FSL has its own specificities, such as the simultaneity of several parameters, the important role of the facial expression or movement and the use of space for the proper utterance organization. Our object is to develop a new method based in HMM in order to overcome spatio-temporal sign language recognition issues.	406-411
074	Ontology based semantic metadata extraction approach  Baraa JEBALI Ramzi FARHAT	In this paper we describe our approach for automatic generation of learning objects' semantic metadata. The extraction process is based on the OBIE (Ontology Based Information Extraction) systems' principles. The input of our approach is a set of IEEE LOM metadata elements in conformance with two requirements. First, each data element must describe the educational content of the learning object. Second, it must be one of the data elements frequently filled by the learning objects' authors and required by most of the LOM application profiles. Concerning the outputs, each one is a couple of a domain concept (from domain ontology) and a degree of pertinence. Moreover we present the details concerning the integration of our approach to learning objects' repositories by taking the COLORS repository as example. In fact the ultimate goal behind our approach is the improvement of repositories' services by offering semantic metadata.	412-416
075	A New Modeling and Simulation Methodology of a	In order to develop a new tool for modeling and simulation, more effective for multi-triangular	417-422

	Patch Antenna by Bond Graph Approach.  Sabri Jmal Hichem Taghouti Abdelkader Mami	patch antenna, we thought, in this paper, to use the Bond-Graph approach jointly with the Scattering formalism. Indeed, what we seek is a simple, effective, fast tool, allowing integrating our antenna with other components. This new technique is based on a physical interpretation of patch antennas that will lead to a conventional Bond-Graph model. The analytical procedure operating Scattering parameters, developed in our previous research, will be applied on the Bond-Graph model of patch antenna to validate the results.	
076	Modeling and Control for a DOF Platform Manipulator.  Marwa Jouini Mohamed Sassi Neji Amara Anis Sellami	This paper deals with the modeling and the control of a parallel robot with six degree of freedom (dof). The mathematical model of the 6-DOF parallel manipulator includes dynamics model which is on the Lagrange method. The model is built in generalized coordinate system. The kinematics model is based on the closed-form solutions. The latter has six electric actuators at six legs. The model-based controller is presented with feedback of platform positions. Two control laws of the actuators positions of the robot are proposed: PID control and Sliding Mode Control (SMC). Simulation results are given to show the comparison performance in term of robustness.	423-427
077	Toward the personalization of learning games according to learning styles  Mohamed Ali Khenissi Fathi Essalmi Mohamed Jemni	This paper aims to answer the following question: is it possible to personalize learning games according to learning styles? On one hand, there are several learning styles which could be used to personalize learning. For example, it is possible to personalize learning according to the learning styles active and reflective. On the second hand, learning games differ according to their genres. In fact, there are several games genres such as action and puzzle games. This paper presents two learning games having two different genres. In addition, this paper proposes, argues for and experiments relations which could serve for the personalization of games according to different learning styles.	428-433
078	Determination of the target speed corresponding to the optimum functioning of a photovoltaic system pumping and regulation of the water level  Abla KHIAREDDINE Chokri Ben SALAH Mohamed faouzi MIMOUNI	This paper deals with the problem of the water level regulation in the photovoltaic pumping system. To achieve this aim, a fuzzy logic controller has been developed in order to determine the reference speed needed for vector control of asynchronous motor taking into account the water level in the tank and the variation of solar irradiation. The mathematical model of the regulation of water level is built on the basis of Matlab-Simulink.	434-438
079	Rwave detection using EMD and Bionic wavelet transform.  Bochra Khiari Ezzedine Ben Braiek Mohamed Jemni	The most striking waveform in an electrocardiogram (ECG) is the QRS complex. The detection of the R wave is the first step in any automatic analysis of the ECG. In this paper, we propose a new method based on a preprocessing of ECG signal in order to restore and enhance it properly. For this purpose, we use the intrinsic components issues from the empirical modal decomposition. To emphasize and extract R waves, we proceed to a decomposition of ECG signal by bionic wavelet transform. Finally thresholding time/amplitude is applied to determine the position of the R-wave. The algorithm tests have been carried out on the signals QT database.	439-443
080	A Real Time Open Phase Faults Detection for	Permanent Magnet Synchronous Motors (PMSM) are many used to high performance	444-449
	IPMSM Drives Based on Discrete Fourier Transform Phase Analysis  A. Khlaief M. Boussak A. Châari	applications. Accurate faults detection can significantly improve system availability and reliability. This paper investigates the experimental implementation and detection of open phase faults in interior permanent magnet synchronous motor (IPMSM). The proposed method of open phase fault detection is based only on stator current measurement. The objective of this paper is to develop a new detection method for the open phase fault in IPMSM drives. The main idea consists in minimizing the number of sensors allowing the open stator phase fault of the system to study. This paper proposes the fault diagnosis for open-phase faults of IPMSM drives using a Discrete Fourier Transform phase. The current waveform patterns for various modes of open phase winding are investigated. Discrete Fourier Transform is used for the phases ( $f_{\dot{c}}$ , $f_{\dot{A}}$ ) calculation. Experimental results show that the method is able to detect the open-phase faults in IPMSM drive. The experimental implementation is carried out on powerful dSpace DS1103 controller board based on the digital signal processor (DSP) TMS320F240. Experimental results obtained confirm the aforementioned study.	
081	Arabic HMMbased Speech Synthesis  Krichi Mohamed Khalil Cherif Adnan	This paper describes the Arabic system synthesis on hidden Markov models (HTS). Our developed synthesis system uses phonemes as HMM synthesis unit, Arabic database was developed for the first test. The main objective is to maintain the consolidated text coherence which is interpreted by concatenating HMM phoneme. In our experiments, spectral properties were represented by Mel cepstrum coefficients. For the waveform synthesis, a noise or pulse excited corresponding MLSA filter was utilized. Besides that basic setup, a high-quality analysis/ synthesis system STRAIGHT was employed for more sophisticated speech representation. This method has several advantages. As it is parametric, it is possible to play on the HMM parameters, change the producer voice characteristics. The developed model improves the speech synthesis, naturalness and intelligibility quality in the Arabic language environment.	450-454
082	Facial emotion recognition with the hidden Markov model  Mouheb Lahbiri Ahmed Fnaiech Moez Bouchouicha Mounir Sayad Philippe Gorce	This paper presents a simple algorithm for an automatic recognition of facial expressions. First we extract feature points, and then we define distances using these features. The variation of these distances is used to characterize the transition from one emotion to another. Our approach is based on the use of a hidden Markov model whose states can recognize facial expressions.	455-460
083	Application of Structured Analysis Real Time Method on a Natural Gas Station  Z. SALAH M.N LAKHOJA	The aim of this paper is to present the application of the method of structured analysis and real time (SA-RT) on a control-command application using supervisory control and data acquisition systems (SCADA). Then, the concepts of the SCADA system and its architecture are presented. An example of a control-command application of the supervision of the natural gas in a thermal power plant in Tunisia is presented and analyzed using the SA-RT formalism. Finally, this analysis enables us to facilitate the different steps of the programming and the configuration of the tabular in a SCADA environment.	461-466
0841	Application of Functional Analysis and Supervision	After a presentation of the part of the automation and the supervision in the upgrading of the	467-472

	of a Weighing System of a Grain Silo. M.N LAKHOUA M. TOUMI M.TIBINI	process systems, we present the issues involved in the application of a Functional Analysis (FA) technique on a supervisory system of a weighing system of cereals. Our contribution consists on applying a FA technique SADT (Structured Analysis Design Technique). This technique allows a functional description of the weighing system of cereals. The paper briefly discusses the functionality of the weighing system and some advantages of the application of the FA for the design of a supervisory system. Then the basic principles of the application of the supervision of the weighing system are presented. Finally, the different results obtained from the application of supervision are discussed.	
085	Bar Faults Diagnosis of An Indirect Vector Control Squirrel Cage Induction Motor  Souad Saadi Laribi Gérard Champenois Azzedine Bendiabdellah Samir Meradi	In this paper, the performance study of the vector control method applied to a three phase squirrel cage induction motor with rotor broken bars faults as well as with both faults simultaneously is being presented. The fault diagnosis technique used in this work is based on the spectral analysis of electrical and mechanical quantities such as currents (id, iq), speed error (ew), direct current error (eld), quadratic current error (elq) and voltage. Simulation as well as experimental results are being carried and presented to illustrate the influence of vector control on a faulty squirrel cage induction motor.	473-478
086	Unsupervised system for Lexical Disambiguation of Arabic Language using a vote procedure.  Merhbene Laroussi Anis Zouaghi Mounir Zrigui	In this paper we propose an unsupervised method for Arabic word sense disambiguation. Using the corpus and the glosses of the ambiguous word, we define a method to generate automatically the context of use for each sense. Since that, we define a similarity measure based on collocation measures to find the most nearest context of use to the sentence containing the ambiguous word. The similarity measure may give more than one sense, for that we define a novel supervised approach called vote procedure. Our work was compared with other related works. We obtained a better rate of disambiguation in the average of 79%.	479-484
087	Dimensioning a hybrid electrification system PV / WT / DG + battery using a dynamic simulation  Layadi. TM Mostefai .M	The aim of this paper is to demonstrate that a dynamic simulator, taking into account temporal data of renewable sources and using energy on one year, is able to sizing each element composing the electric generation system and the storage system. The electrical system includes photovoltaic panels (PV), a wind turbine (WT), a diesel generator (DG) and a storage battery. To illustrate the sizing capability of the dynamic simulator, we have fixed the surfaces of the PV and wind turbine as well as the battery. We are looking to obtain 100% supply by whole generation system. The study is limited to the power minimization of the diesel generator and to elaboration a strategy of starting and stopping the DG according to the SOC of the battery. I.e. with minimum power of DG, minimize the number of start-up and minimize the amount of excess energy. The simulation results for several sizing of DG illustrate the possibility to choose the power DG and the SOC thresholds of the battery to starting or stopping the DG.	485-490
088	Spatial shape variability analysis of T-waves in the ECG signal	This work aims to study the shape variability of the T-waves using multi channel records. The classification between a group of subjects with Myocardial Infarction (MI) and a group of	491-494
	Rebh MABROUKI Balkine KHADDOUNI Mounir SAYADI	healthy subjects is obtained using a synthetic signal called Integral Shape Averaging (ISA). Our methodology is based on calculation of projection coefficients corresponding to each electrode for both groups of subjects. These coefficients represent a distance between each subject and one of the groups. This latter allows us to compare each subject to each population. These coefficients are obtained by a surface difference between the signal of each electrode in each column and the associated ISA signal. In addition, we seek for the electrode that represents the best separation between the two populations. In this study we improve previous studies and make a comparison with another approach which is a combination between the ISA technique and the calculation of shape difference.	
089	Ant Colony Optimization algorithm for breast cancer cells classification  Ahmed Nejmedine Machraoui Mohamed Ali Cherni Mounir Sayadi	Ant colony optimization (ACO) is a bio-inspired technique formalized into a meta-heuristic for combinatorial optimization problems. In this work, the ACO-Otsu segmentation method, based on ACO algorithm and Otsu's method as a fitness function, is applied in classification and detection of breast cancer cells. Subsequently, this method is compared with the Otsu's standard method. The experiments show the performance of this probabilistic search approach in such type of problems.	495-500
090	Active and reactive power compensation through a preventive defense strategy based on FACTS devices  Sahbi Marrouchi Souad Chebbi	The excessive increase in the number of subscribers in the electrical grid requires a flexible control of this electrical network and a better reliability of the offered power quality. Thus, several defense plans are omnipresent to ensure stability, continuity of service and to overcome some disturbances which can affect the electrical grid. In this context, we present in this paper the development of a new control strategy used a compensator UPFC based on fuzzy controllers. We simulated this strategy in the IEEE test 14 buses network and the results were promising.	501-505
091	Nonlinear Control of Three Phase Active Rectifiers Based L and LCL Filters  Amira Marzouki Mahmoud Hamouda Farhat Fnaiech	In this paper, a state-space modeling of three-phase voltage source type pwm rectifiers using L and LCL filters is proposed. Next, an input-output feedback linearization based control technique is developed with the aim to control the DC output voltage and the input displacement factor as well. The overall control strategy is tested using Matlab/simulink software wherein a two-level converter is modulated by comparing lowfrequency sine wave modulating signals to a 10 kHz triangular wave pulse. Finally, simulation results are investigated so as to make a comparative study between the performances of two topologies in terms of unity power factor operation capability, total harmonic distortion of line currents, and DC bus voltage regulation.	506-510
092	Optimal expansion of linear system using generalized orthogonal basis  Abdelkader Mbarek Kais Bouzrara Hassani Messaoud	This paper proposes a new method for determining the optimal pole of generalized orthonormal basis (GOB) which leads to an optimal system model developed on such basis. This optimal pole is obtained by solving a set of non linear equations. The proposed procedure is formulated for single-input/singleoutput (SISO) systems. The proposed algorithm is tested on simulations and good performances in term of approximation and calculus time are obtained.	511-516

093	Neural SKCS For Efficient Noise Reduction And Content Preserving.  Z. MBARKI E. BEN BRAIEK H. SEDDIK S.TEBINI A.SELMANI	Images are often corrupted by random variations in intensity ,illumination or have poor contrast and can't be used directly .Several studies have expressed the need to reduce noise and to improve the visual quality of the image . For this purpose, several mathematical tools have been developed such as image filtering by a convolution filter, such as the kernel with compact support (KCS) which has been recently proposed by Remaki and Cheriet [1] and it's version separable (SKCS) [10].The effectiveness of the SKCS filter in the smoothing operation depends on the value of the scale parameter. Moreover, if the scale parameter is increased, the image is blurred and details and borders are removed. This disadvantage is related to the static nature of the KCS kernel. In this paper we propose a dynamic and adaptive SKCS filter based on neural networks. The scale parameters involved in the filtering process are calculated in real time and supervised by the neural network. The filter scale varies continuously in order to detect and clean noisy areas of the image. To assess the developed theory, an application of filtering noisy images is presented, including a qualitative comparison between the result obtained by the static SKCS and the adaptive SKCS kernel proposed.	517-520
094	Robust Tracking Navigation of Aerial in Longitudinal Plane  H. MIBAR S. TLILI	In this paper, we address the problem of trajectory tracking in the longitudinal plane an unmanned aerial vehicle of blimp type with robust controller. In this plane, the dynamic behavior of the airship is quite complex. The problem of the tracking of the blimp's trimmed flight is described by a Linear Parameter Varying system (LPV). In this case, we use a LPV control by state output feedback to solve this problem. The approach used is based on finding a parameter dependent Lyapunov functions which ensures the robust stability of the LPV system. The theoretical results are tested by simulation in MATLAB which use the LMI control toolbox.	52' -529
095	A Supervised Segmentation Scheme Based on Multilayer Neural Network and Color Active Contour Model for Breast Cancer Nuclei Detection  Aymen Mouelhi Mounir Sayadi Farhat Fnaiech	Breast cancer nuclei detection is an impressive challenge in surgeries and medical treatments. In the microscopic image of immunohistologically stained breast tissue, cancer nuclei present a large variety in their characteristics that bring various difficulties for traditional segmentation algorithms. In this paper, we propose an efficient supervised segmentation method using a multilayer neural network (MNN) combined with a modified geometric active contour model based on Bayes error energy functional for nuclear stained breast tissue images. First, a discrimination function is constructed from color information of the desired nuclei using Fisher Linear Discriminant (FLD) analysis and a trained MNN in order to get a preliminary classification of cancer nuclei. This function is then included in the region term of the energy functional and the stopping function of the model to improve the segmentation accuracy of the detected cancer nuclei. Furthermore, the initial curve and the controlling parameters of the proposed model are estimated directly from the initial segmentation by the FLD-MNN method. The proposed segmentation scheme is tested on different microscopic breast tissue images recorded from real patients located in the Tunisian Salah Azaiez Cancer Center. The experimental results show the superiority of the proposed method when compared with other existing segmentation methods.	530-535
096	Modeling and control of a switched reluctance machine for wind generation	The rotational speed of a wind turbine is very low compared to that of classical generators, a speed multiplier is then necessary. To eliminate this last, research was directed towards the design of new structures of generators called direct drive (without a speed multiplier). The	536-540
	MOSBAHI Jamel Eddine MAHMOUD Imed FATHALLAH Mourad REHAOULIA Habib	synchronous and especially asynchronous machines still dominate the market of the wind applications. However, the Switched Reluctance Generator or SRG is regarded as a serious alternative to the traditional generators thanks to its multiple assets (robustness, simplicity of construction, low cost, high torque...). In this work, it is intended to model and simulate a switched reluctance generator 6/4 (SRG) (6 poles with the stator and 4 poles with the rotor) of a power of 30 kW. The design is carried out by finite element method (Software Mag.Net). The modeling and the simulation of this system are carried out under Matlab /Simulink environment	
097	Sensorless Direct Torque Control of Permanent Magnet Synchronous Motor Drive Using Extended Kalman Filter  Mongi Moujahed Hechmi Ben azza Mohamed Jemli Mohamed Boussak	This paper presents the control of the speed problem for a Sensor-less Direct Torque Control (DTC) of permanent magnet synchronous motor (PMSM), using the Extended Kalman Filter algorithm (EKF) by only measuring the phase voltages and motor currents. Also, due to an angle modification scheme with error tracking, the Sensor-less drive system is robust to parameter variations. Simulation result is provided to verify the proposed approach based on the EKF.	541-545
098	Expert system for the decision on the Ability to drive power wheelchair based on fuzzy logic  Iheb Soussi Makrem Mrabet Farhat Fnaiech Philippe Gorce *	This paper presents an expert system based on the fuzzy logic. The main idea is to study and realize a tool to help the ergo-therapist for the decision on the capacity of the disabled person to drive safely a power wheelchair. The decision will also concern the optimal number of sensors and the suitable type of assistance (light, sound ...) to integrate on this wheelchair in order to assist the handicapped during his navigation. In order to test the efficiency of this expert system, based on fuzzy logic, a 3D simulator for driving wheelchair was created.	546-551
099	Estimation of the parameters for a complex repairable system with preventive and corrective maintenance  Arwa Nasr Soufiane Gasmii Mounir Sayadi	Estimation of reliability and maintainability parameters is essential to modeling repairable systems and determining maintenance policies. However, this estimation becomes more difficult when system failure times are neither identically nor independently distributed. This is due to the aging of repairable systems under imperfect maintenance. In this paper, reliability and maintainability RAM parameters are estimated in the maximum likelihood sense based on historical RAM data and using the virtual age model of Kijima Type I and Type II. A Weibull distribution for the first system failure is assumed. Kijima Type I and II imperfect corrective and preventive maintenance are also considered. Using the maximum-likelihood approach, four parameters of this repairable system are estimated. The proposed method is illustrated with simulated data.	552-557
100	Open end Winding Induction Machine Supplied by Two Flying Capacitor Multilevel Inverters  Abdelmonoem Nayli Sami Guizani Faouzi Ben Ammar	In this paper the authors propose the open-end winding induction machine supplied by two multilevel inverters with flying-capacitor, two PWM strategies, phase-shifting PWM and phase-disposition-band are presented. A generalized mathematical model of the « n » levels inverters feeding the open-end stator winding induction machine is presented. An extended generalized multilevel PWM strategy is carried out to control the inverter.	558-563



1011	A Novel Approach for D Head Segmentation and Facial Feature Points Extraction  Achraf Othman Oussama El Ghoul	This work presents a novel approach for 3D head segmentation as well as for extraction of facial features vertices. These tasks are the preliminary task for retrieval, recognition, classification and tracking processes. 3D head regions are detected from a cloud of points using the ratio of geodesic to Euclidean distances between pairs of vertices that combine neighbor coordinates and position information of the point. In this paper, we propose a new algorithm to extract automatically feature points inside the facial region based on the topology of 3D face. Furthermore, in order to validate our approach, we have run experimentations on several types of full 3D head that differ in number of points and surfaces, gender and ethnic. Also, to approve its robustness, we apply our approach on a benchmark of scanned faces containing 67 models.	564-569
1022	A Rule Based Approach for Building an Artificial English ASL Corpus  Zouhour Tmar Achraf Othman Mohamed Jemni	A serious problem facing the Community for researchers in the field of sign language is the absence of a large parallel corpus for signs language. The ASLG-PC12 project proposes a rule-based approach for building big parallel corpus between English written texts and American Sign Language Gloss. We present a novel algorithm which transforms an English part-of-speech sentence to ASL gloss. This project was started in the beginning of 2010, a part of the project WebSign, and it offers today a corpus containing more than one hundred million pairs of sentences between English and ASL gloss. It is available online for free in order to develop and design new algorithms and theories for American Sign Language processing, for example statistical machine translation and any related fields. In this paper, we present tasks for generating ASL sentences from the corpus Gutenberg Project that contains only English written texts.	570-573
103	Compensation of harmonic disturbances in the Tunisian sahel railway supply system  Ouni Fatem Faouzi Ben Ammar	The Tunisian SAHEL railway supply system of 68 km length track is fed by one electrical substation (ESS) 150kV/25kV. The overhead line is modeled as distributed circuit which presents parallel and series resonances. In the drive system, the DC motors are fed by half bridges which generate current harmonics in the line. The major supply system problems caused by harmonic current in the line are presented, as overvoltage and psophometric current in telecommunication cable. Moreover, the leakage current into the earth and the long distance from substation which produces electromagnetic interference are analyzed. To reduce the disturbances in railway supply system, several solutions are studied. Indeed, the problems presented previously may be reduced by changing of drive converter or by changing of the topology of the line or by using filters.	574-578
104	Adaptive Immersion and Invariance Control for a Class of Electromechanical Systems  Tarek Rabaï Raoudha Ben Khaled	Abstract—This paper proposes a control approach for a class of electromechanical systems based on immersion and invariance method. Two cases are considered: full information system and unknown parameters existence. Thereafter, two controllers are, respectively, proposed: stabilization control and adaptive control. The effectiveness of the obtained control schemes is illustrated via simulation of an example.	579-584
105	Study of Photovoltaic Water Pumping System using Scalar DVC Based Control  NAJET REBEI BELGACEM BENGHANEM ALI HMIDET OTHMAN HASNAOUI.	This paper aims to achieve a control of a photovoltaic water pumping system. The study consists of a photovoltaic generator, an inverter, an induction motor and a centrifugal pump as mechanical load. The model used for global simulation is a closed loop model: the voltage output of PVG model is coupled with the voltage input of the inverter-induction motor model; the current output of this latter is coupled with the current entry of the PVG. The strategy control proposed in this study consist to i) pumping water with Solar energy, ii) drives the machine in constant flux and variable voltage for this subject a closed loop scalar based control law via a direct voltage control (DVC) inverter is used . The MPPT is given by the theory of conservation of energy ensures the control speed. The induction motor model is based on the classic dynamic model in the dq orthogonal Park reference frame. Simulations results confirm the working of the complete model and the effectiveness, feasibility and limits of such approach.	585-592
106	A Feedforward Neural Network Wheelchair Driving Joystick.  Yassine Rabhi Makrem Mrabet Farhat Fnaiech Philippe Gorce	People with disabilities such as those affected by IMC disease or Parkinson's disease have difficulties in operating standard joystick due to their different levels of tremors or difficulties encountered when moving their arms. The objective of this work is to design a new neural joystick suitable for each patient allowing overcoming these difficulties or incomplete or erroneous actions, in order to reach maximum security. The design of the neural network joystick system is based on training a neural network to model the inverse of the standard joystick. The trained resulting neural network is then connected to output of the joystick. The overall system is then used to control all the DC motors and devices of the wheelchair. Simulations and experimental real data recorded on disabled persons are then used to highlight the effectiveness of the designed system.	593-598
107	Input-Output Feedback Linearization Control of a Cascaded H-Bridge Multilevel Inverter  Abir Rehaouia Mahmoud Hamouda Farhat Fnaiech	This paper proposes a voltage controller for Cascaded H-bridge three-phase multilevel inverters operating in islanded mode with constant-amplitude constant-frequency output voltages. For this purpose, a non linear state-space model of the converter feeding a three-phase load via a second order LC filter is developed. Next, an input-output feedback linearization controller is designed so as to drive the output voltages to track the target references. Numerical simulations carried out on a 7 level inverter emphasize the effectiveness of the proposed model and control law. Based on feedback linearization strategy, the closed loop response of the system is stable even in case of disturbances. The transient state is extremely short and presents small overshoots.	599-605
108	A Sliding ModeMultimodel Control for Torque Evolution of a Double Feed Asynchronous Generator  Ahmed RHIF Zohra KARDOUS Naceur BEN HADJ BRAIEK	This paper proposes a robust control of doublefed induction generator of wind turbine to optimize its production: that means the energy quality and efficiency. The proposed control reposes in the sliding mode control using a multimodel approach which contributes on the minimization of the static error and the chattering phenomenon. This new approach is called sliding mode multimodel control (SMMC). Simulation results show good performances of this control.	606-611

109	Fingerprint images enhancement using diffusion tensor  Ferial Romdhane Faouzi Benzarti Hamid Amiri	Fingerprints are the oldest and most widely used form of biometric identification. However, their image contrast is poor due to skin conditions and application of incorrect finger pressure. Fingerprint enhancement is necessary to ensure the performance and robustness of the algorithms for fingerprint recognition. In this work, we present a fast fingerprint enhancement method based on the diffusion tensor which allows a better performance than a simple gradient. The performance and efficiency of the algorithm are estimated by calculating various quality metrics and compared with the advanced met.	612-617
110	Neural Evaluation of Texture Synthesis Results  Kais Rouis Mounir Sayadi Farhat Fnaiech	This paper introduces a new idea of using the Self-Organizing Map to compare the similarity between the synthesized textures and the original sample in accordance with human visual system. The approaches of texture synthesis do not provide convincing results for all types of textures, since it is difficult to produce a general definition of this term. So that, we propose to evaluate the quality of results provided by different approaches, based on features of comparison to capture information present in texture image.	618-621
111	Design of a recursive parametric estimation algorithm for nonlinear system described by a Hammerstein mathematical model  SALHI Houda KAMOUN Samira	In this communication, a recursive parametric estimation algorithm is developed for the parametric estimation of nonlinear systems which can be described by a Hammerstein mathematical model. The formulation of this parametric estimation problem is made by using the method of the adjustable model and the least squares techniques. The stability analysis of the parametric estimation algorithm is made by using the Lyapunov theory. The performance of the developed recursive parametric estimation algorithm is illustrated using data from an experimental acid-base neutralization process.	622-628
112	Experimental Technique for Estimation of Mechanical Load Unbalance Level Based on Time Analysis of Induction Machine Stator Current  Mohamed Salah Khmais Bacha Abdelkader Chaari	Traditional fault diagnostic techniques using motor current signature analysis is, generally, based on the assumption of a constant load torque. In fact, due to the design, construction, and ageing phenomenon of loads, torque imposed to the motor can not be strictly constant and, in most of cases, varies according to the machine rotor position. These variations of the load torque, which are not related to the health of the motor, involve amplitude modulation of machine stator current at rotational frequency. In this paper we propose a technique based on the introduction of a supplementary known mechanical unbalance on the motor rotor axis to estimate the unknown load unbalance level from time analysis of stator current signal. Simulation and experimental results show the effectiveness of the proposed method.	629-634
113	Detection of Brushless Exciter Rotating Diodes Failures by Spectral Analysis of Main Output Voltage  Mohamed Salah Khmais Bacha Abdelkader Chaari	Rotating rectifier is a basic part of synchronous generators. Inappropriate operation of this component can prove costly for the machine's owner. This paper presents theoretical analysis and experimental validation for detecting failure of brushless exciter rotating diodes that can fail either open circuit or short circuit. Harmonic analysis of the alternator output voltage waveform is performed when machine is unloaded as well as when it runs around its rated load. Apparition of characteristic frequencies can be useful to distinguish the rotating diodes state. By considering the relative amplitudes at specific harmonics, it is possible to discriminate short circuit diode failure case from open circuit diode breakdown.	635-640
114	Trajectory tracking of bilinear systems using high gain observer  Hajer Sayem Naceur Benhadj Braiek Laboratoire de Hassan Hammouri	This paper proposes a trajectory tracking approach for bilinear systems using high gain observer. The proposed technique is based on the use of orthogonal functions and especially the use of operational integration and product matrices. These operational tools allow the conversion of a bilinear differential state equation into an algebraic one. Arranging and solving the obtained algebraic equation lead to a feedback control law that allows the track of a system trajectory. High gain observer is applied to the controlled system in order to ensure the robust track of system trajectory. The adjusting high gain observer parameter permit to system to track its trajectory despite noise. The proposed method is applied to a cylindrical heat exchanger process that is considered, under some assumptions, as a bilinear system.	641-646
115	Single, Multiple and Simultaneous Current Sensors FDI based on an Adaptive Observer for PMSM Drives  L. Sbita F. Grouz M. Boussak	This paper deals with a new method single, multiple and simultaneous current sensors faults detection isolation (FDI) and identification for permanent magnet synchronous motor (PMSM) drives. A new state variable is introduced so that an augmented system can be constructed to treat PMSM sensor faults as actuator faults. This method uses the PMSM model and a bank of adaptive observers to generate residuals. The resulting residuals are used for sensor fault detection. A logic algorithm is built in such a way to isolate and identify the faulty sensor for a stator phase current fault after detecting the fault occurrence. The validity of the proposed method is verified by simulation tests.	647-652
116	Image securing based chaotic encryption coupled with DCT robust watermarking  Hassen Seddik Ezzdine Ben Braiek	Applying cryptographic techniques in the field of 2D signal processing is an attractive approach in the recent years. Different methods are proposed to ensure prior data protection. Symmetric block encryption schemes, designed on two-dimensional chaotic maps, are efficient and secure for real-time image encryption. In the case of numeric data, the encrypted signal can be easily viewed and then intercepted in order to be revealed. This creates a need to offer a posterior protection to improve protection for confidential data. In this paper a method combining chaotic encryption system with frequency watermarking is presented. The proposed technique is divided in two steps. The first step, consists in applying a modified Tao algorithm based chaotic map with higher complexity and applicable for all images sizes. To avoid revealing that the transmitted data is encrypted, this data is then hidden by coding it in the frequencies DCT coefficients of a transformed second image. The proposed approach presents more security and reliability for any kind of image data.	653-658
117	Efficient Speech Denoising Applied to Colored Noise Based Dynamic Lowpass Filter Supervised by Cascade Neural Networks  Selmani Anissa Seddik hassene Mbarki zohair	In this paper, we investigated the enhancement of speech by applying an optimal adaptive low-pass filter supervised by neural network. The corruption of speech due to the presence of additive noise causes its degradation in quality and intelligibility. To filter this distorted signal in its spatial representation is a hard task. This task is more difficult to realize if the distortion are caused by colored noise. In addition using a static filter is not efficient due to the speech signal variability. In the same sentence a phoneme can change in shape and amplitude. For these constraints, we propose to apply a low-pass filter with Gaussian core supervised by neural networks. Filtering strength changes continuously with the phoneme variation to generate a variable filter that change over the whole sentence.	659-663

118	A Simple Method for the Steady State Performances of Self Excited Induction Generators  M. SELMI H. REHAOULIA	Recently, the self-excited induction generators (SEIG) have been widely employed to operate as wind-turbine generators of an isolated power system. This paper proposes a simple method for the steady-state performance characteristics of a SEIG. Unlike the previous method, the proposed method avoids the tedious and erroneous manual work of segregating the real and imaginary components of the complex equation of the model. In this method, the model is formulated in a simple way and then solved using a numerical MATLAB function "fzero". The effectiveness of this method has been confirmed by comparing on a 0.8- kW induction generator the computed results obtained by the proposed method to those obtained by classical methods.	664-667
119	Structural and electrical characterization of the HSiC based Junction Field Effect Transistor JFET  K. Shili M. Ben Karoui R. Gharbi M. Fathallah	The main focus of our work is the characterization and structural study of 4H-silicon carbide (SiC) normally-off vertical junction field effect transistor (JFET). We will determine the experimental static $I_{ds}$ - $V_{ds}$ characteristics under temperature variation. In order to achieve a better description of SiC and metal interface properties, many interesting parameters related to the material and to the device performance have been obtained from these measurements. Simulation has been used to correlate obtained results to physical parameters. When the temperature increases to 300°C, the RDS (ON) increase to 700 mΩ and the saturation drain source current decreases up to 14A.	668-671
120	Fuzzy cregression models based on Euclidean particle swarm optimization  Moez Soltani Abdelkader Chaari	This paper proposes a modified fuzzy c-regression models clustering algorithm based on Euclidean particle swarm optimization. The Fuzzy C-Regression Models (FCRM) clustering algorithm has a considerable sensitive to initialization susceptible to converge to a local minimum of the objective function. In order to overcome this problem, Euclidean particle swarm optimization is employed to optimize the initial states of FCRM. The orthogonal least squares is used to identify the unknown parameters of local linear model. Finally, numerical example are given to verify the effectiveness of the proposed approach.	672-675
121	Comparative study of minimal value parameters and RKPCA in RKHS.  Nadia souilem Ilyes Elaissi Hassani Messaoud	This paper aims to compare two RKHS models used for describing nonlinear process behaviour. The first model is issued from the estimation of the minimal value of the learning set cardinal and the second results from the complexity reduction of an RKHS model built using arbitrary learning set cardinal. Both models have been tested on non linear dynamic system used as a benchmark and the results were successful.	676-681
122	A Particle Swarm Optimization Approach for Optimum Design of PID Controller for nonlinear systems  Taeib Adel Chaari Abdelkader	In this paper,a novel design method for determining the optimal proportional-integral-derivative (PID) controller parameters for Takagi-Sugeno fuzzy model using the particle swarm optimization (PSO) algorithm is presented. In order to assist estimating the performance of the proposed PSO-PID controller,a new timedomain performance criterion function has been used. The proposed approach yields better solution in term of rise time, settling time,maximum overshoot and steady state error condition of the system.the proposed method was indeed more efficient and robust in improving the step response.	682-685
123	Delaydependent stability criteria for neutral systems with a varying delay.  Taleb Hamdi Issam AMRI Dhaou SOUDANI	In this paper, we consider the problem of delay dependent stability of neutral system with time varying delays. By using an augmented Lyapunov functional, a new delay dependent sufficient stability criterion is obtained in terms of Linear Matrix Inequalities LMIs. The proposed approach involves neither free weighting matrices, nor any model transformation, and it is shown that these criteria can provide less conservative results than some existing ones. Numerical examples are considered to show the efficiency of the proposed stability approach.	686-690
124	A new Online Kernel method identification on RKHS Space  Okba Taouali Ines Zakraoui Ilyes Elaissi Hassani Messaoud	This paper proposes a new kernel method for online identification of nonlinear system. The proposed Support Vector Regression- Regularized Network (SVR-RN) method uses the technique SVR in an offline phase to reduce the parameters number of the RKHS. Then the RN method is used to update theses reduced parameters.	691-696
125	Adaptive observer approach for actuators multiplicative faults detection and isolation  Raouaa TAYARI Fayçal BEN HMIDA	In this paper we interest in the problem of multiplicative faults detection and isolation for linear systems. To solve this problem we use a bank of adaptive observers. The proposed algorithm is applied on a numerical example to conclude that the correct and robust detection and isolation in respect to the actuators multiplicative faults.	697-702
126	Flatnessbased trajectory generation for induction machine control  Hajer Thabe Mounir Ayadi	This article deals with the problem of trajectory generation and tracking for nonlinear systems. The principal problem considered concerns the generation of desired trajectories for differentially flat systems. In this work, two methods of trajectory generation are applied in case of induction machine control to solve the problem of trajectory tracking with good efficiencies. The first one is based on the polynomial functions and the second rests on the B-splines functions. The combined methods of PI controllers and trajectory planning give an improvement results in terms of trajectory tracking in the case of field- oriented control strategy.	703-708
127	RGB image denoising Using New Low-pass filter with variable Gaussian core Real time optimized by Neural networks  Tebini Sondes Seddik Hassene Mbarki Zouhair Ben Braiekh Ezzedine	Filtering consists in applying a non linear transformation on the image intensities by convolution to modify its characteristics. Gaussian filter is widely used in literature as a low pass filter for signal de-noising. It has some advantages and many inconvenient. It presents a static shape that convolves uniformly the entire image zones. Its smoothing efficiency depends on the value of its standard deviation. More its smoothing efficiency is increased more the image is blurred and the details and borders are removed. All these inconvenient are related to the static nature of Gaussian core of the filter. In this paper we propose a new approach for RGB images filtering, based on a smart dynamic filter with variable Gaussian core based neural network. The parameters that intervene in the filtering process are real time computed and supervised by a neural network. The filter is continuously varied to detect and clean noisy zones and avoid clean zones in the image. The experimental results demonstrate the efficiency of the proposed technique. The image is well filtered and the details and borders are	709-715

		more conserved.	
128	A new Internal MultiModel controller for a linear process with an uncertain time delay  Touzrl Mustapha Naceur Mongi Soudanl Dhaou	This document presents a new Internal Multi-Model Command controller design method for a linear system with a limited uncertain time delay. This design method is based on the use of a models collection to approximate the system functioning using Padé approximations; these models are inverted and multiplied by low pass filters in order to obtain a set of controllers to calculate the command value through a fusion procedure. These controllers are obtained by the multiplication of a low pass filters and Models inverses, in order to impose poles and zeros for the considered system and to control the robustness of the command through the filters parameters, which must confirm a compromise between stability and rapidity. In this paper the Multi-Model Command controller design method will be presented through five sections; the first one describes Internal Model Control concepts, the second one describes effects of presence of a time delay on systems dynamics, the third section describes briefly Multi-Model concepts, the fourth section presents the new Internal Multi-Model controller design Method and finally the fifth section presents the obtained results of the new controller design method application for a system with a limited uncertain time delay and the filters parameters variations effects.	716-721
129	Discrete time sliding mode control of PMSM  Hassene Trabelsi Adel Chbeb Anis Sellami	In this paper a discrete-time model for Permanent Magnet Synchronous Motor (PMSM) based on the Explicit Euler method is presented. Thus, an advanced application of the discrete variable structure control theory using a discrete time varying sliding surface is designed for the tracking of the rotor velocity. First, modeling and simulation of the PMSM supplied by an inverter is presented. Then, closed loop simulations of the RST control and the discrete time sliding mode control (DSMC) are realized. The obtained results from the two approaches are finally compared in terms of good performances.	722-727
130	Skin Disease Analysis and Tracking based on Image Segmentation  Olfa Trabelsi Lotfi Tlig Mounir Sayadi Farhat Fnaiech	Tracking of the skin disease is a necessary step of diagnostic as well the measure of the wound's surface is very useful in healing's document. To overcome the difficulties of the skin illness's estimation, encountered with the currently used measurement techniques, we propose a novel approach aiming to reduce the time-consuming and the error rate. The proposed method is based on two steps; the first step is a preprocessing one which consists in image segmentation to detect the edge of the infected skin region. In the second one, another proposed method is applied to measure the wound 'size' and control the illness evolution. In this work, a comparative study was realized to select the most suitable segmentation technique referred to a proposed criterion based on 'edge accuracy' EAC. The new criterion was compared with the 'surface accuracy' based on ROC1 space. The experiments show the performance of the proposed criterion and the efficacy of the measurement technique.	728-734
131	Phase AC Induction Motor Rotor Flux Oriented Control with Space Vector Modulation Technique.	The paper deals with the analysis of the rotor flux oriented control with space vector modulation technique for a five phase induction motor drive. The speed control using the rotor	735-746
	Hamdi Ben Echikhb Ramzi Trabelsia Mouhamed Faouzi Mimounib Faouzi M'sahlilb	flux oriented control (RFOC) with or without speed sensor uses proportional integral controlled technique which make it possible to achieve satisfactory goals on the torque dynamics and flux. Simulated results on a five phase induction motor drive are displayed to validate the feasibility and the effectiveness of the proposed strategy.	
132	Comparative study of the saturated sliding mode and antiwindup controllers  Chaker Zaafouri Anis Sellami Germain Garcia	The saturation problem is the one of the most common handicaps for applying linear control to real applications, especially the actuator saturation. This paper focus on a comparative study between the classical anti-windup regulator and robust saturated sliding mode control. In the first step, we present a design methodology of SMC of a class of linear saturated systems. We introduce the structure of the saturation, then we perform the design of the sliding surface as a problem of root clustering, which leads to the development of a smooth and non-linear control law that ensures to reach the sliding surface. The second step is devoted to present briefly the anti-windup controller technique. Finally, we use an example of a quarter of vehicle system to give simulation results.	747-752
133	Control of Linear Switched Reluctance Motor For biomedical application.  Zaafrane Wajdi MahmouD Imed Fathalah Mourad Rehaoulia Habib	The work developed in this paper deals with control of a linear switched reluctance motor (LSRM). The studied actuator is used to motorize a syringe pump in biomedical systems. A model of the actuator is performed neglecting magnetic saturation. Different control and command modes using standard controllers are detailed and tested in this paper. In order to make a constant flow of the liquid in the syringe pump, this paper reports a study of sensor less force and closed loop control of the LSRM with a classical PID and hysteresis controller.	753-759
134	DSP Full Implementation of Second Order Sliding Mode Control to Drive a SPIM  Noureddaher Zaidi Hechmi Ben Azza Mohamed Jemli Abdelkader Chaari	In this paper, the design and the real time implementation of a novel non linear control algorithm to drive a Single Phase Induction Motor (SPIM) are presented. The control schema is based on the field oriented control strategy and requires the development of three controllers. A super twisting algorithm (STA) associated with a partial feedback linearization is applied to control the currents of both main and auxiliary windings. The speed SPIM is driven via a first order proportional sliding mode controller. The stability is demonstrated using the Lyapunov approach and robustness is investigated under load conditions. To illustrate the effectiveness of the proposed controllers, experimental setup is developed and tests were carried out.	760-765
135	Identification of MIMO systems using MLP Networks Comparison between SVR and random initialization.  Hajer Zardoum Nawel Mensia Moufida Ksouri	Neural network (NN) modelling approach is often used for non-linear system identification. Building a NN for some identification problem starts by choosing its structure and initial weights. There is no exact method to determine the optimal initialisation for a NN, but some authors have used support vector regression (SVR) to initialise a RBFNN which could be considered as a systematic way. This paper presents a SVR initialisation method for Multi-Layer Perceptron (MLP) NN. The proposed method is based on the analogy between NN and SVR to determine the necessary number of hidden neurons and the initial weights for a given modelling precision. Simulation results for multiinput multi-output (MIMO) system show the	766-771

		feasibility and accuracy of the proposed method.	
136	GPC Multivariable Control Applied to Temperature and Humidity Neonate Incubators  M. A. Zermani E. Feki A. Mami	This paper presents a multivariable predictive control algorithm to resolve the coupling effect in closed loop systems. The desired decoupling is achieved by including an appropriate weighting factor on the objective function of predictive control. This weighting factor is tuned in synchronization to the error observation to eliminate the strong interaction. The proposed algorithm is applied to the control of humidity and temperature of a neonatal incubator. Simulation results are verified and compared with the others algorithm in the literature.	772-777
137	Implementation of Space Vector Modulation Using DSP  Zoghلامي Maha Bacha Faouzi	The progress of microelectronics allows the implementation of complex control algorithms while using embedded platforms such as FPGA cards and DSP cards. In this paper, we proposed to implement on a DSP digital control algorithms onboard a three-phase inverter voltage applications for variable speed electrical machines. This command is based on the use of the principle of Space Vector modulation technique PWM. The control platform is based on the DSP TMS320F240 from Texas Instruments Code Composer and Software. As further work, we developed the real time implementation of a Space Vector pulse Width Modulation (SVPWM) technique.	778-784
138	An Extended Sliding Mode Observer for a Class of Linear Uncertain Time Delay Systems Delay Dependent Design Method  Boulaabi Iskander Sellami Anis Ben Hmida Fayçal	For uncertain systems an extended Sliding Mode Observer (SMO) delay-dependent design method is presented in this paper. The considered uncertainty is bounded and the time delay is constant and affects simultaneously the input and state system. The basic design idea consists to combine the SMO concept with an adequate choice of a Lyapunov- Krasovský functional. This design method is numerically tractable via Linear Matrix Inequalities (LMI) optimization. Besides, the dynamic properties of the observer are also analyzed and the reachability condition is satisfied. An illustrative example is given to show the validity and the applicability of the proposed approach.	785-789
139	New Clustering Algorithm for Identification of a Nonlinear Stochastic Model  TROUDI Ahmed HOUCINE Lassad BOUZBIDA Mohamed CHAARI Abdelkader	Many clustering algorithms have been proposed in literature to identify the premise and consequence parameters involved in the TS fuzzy model. In this paper this parameters are estimated at the same time and this from the minimization of four optimization criteria. The proposed algorithm constitutes an extension of the algorithm proposed by J.Q.Chen in 1998. However, in this paper we introduced some modification on the optimization criteria and especially the last two criteria, thus we replaced the Euclidean distance by another non-Euclidean distance when calculating the fuzzy partition matrix. The purpose of these modifications is to introduce more robustness with the algorithm especially for highly nonlinear systems and those operating in a stochastic environment. The efficiency of the algorithm is tested on an electro-hydraulic system.	790-795
140	Toward A Data Desktop Grid Computing Based On Bonjour Grid Meta Middleware	Desktop Grid or Voluntary Computing systems forms one of the biggest computing platforms in using idles resources over Internet or over LAN's networks. Desktop Grids have been successfully used for solving scientific applications around the world at low cost. However, the	796-800

	Walid Saad Heithem Abbes Christophe Cérin Mohamed Jemni	data requirements of e-Science applications increase dramatically with the emergence of data-intensive applications. Hence data management becomes one of the major challenge of Desktop Grids. In this work, we describe important challenges that are needed to implementing scalable data-intensive solution in Desktop Grids systems. In addition, we explore the state-of-the art in tools and frameworks for Big Data handling. The proposal solution will be integrated in BonjourGrid Desktop Grid.	
141	Direct Power Control of GridConnected Converters Using Sliding Mode Controller  B.Bouaziz F.Bacha	This paper proposes a Direct Active and Reactive Power Regulation of Grid-Connected converters using Sliding Mode Control approach applied to three phase PWM converters. The DPC-SMC controller regulates the DC-link voltage, active and reactive power-flows of the grid-connected converter. The proposed DPC-SMC strategy scheme calculates directly the required converter's control voltage. So as to eliminate the instantaneous errors of active and reactive powers without involving any rotating coordinate transformations. Meanwhile, there are no extra current controls loops involved, which simplifies the system design and enhances the transient performance. Constant converter switching frequency is achieved by using space vector modulation, which eases the design of the ac harmonic filter. Simulation results of the improved direct power control (DPC-SMC) are compared to standard direct power control (DPC) strategies. The robustness of the proposed DPC to line inductance variations is also inspected during active and reactive power changes.	801-806
142	Simulation of a Tunisian Wind Farm of Sidi Daoud Using PSAT.  F.Bacha R. Karoui	This paper deals with the analysis and simulation of a Tunisian Wind farms in Sidi-Daoud, the most important wind farm in Tunisia. In this farm constant speed wind turbines are used. The first section devoted to the presentation of the wind farm of Sidi-Doud. In the second part, we present the aerodynamic model of the wind turbine and the transient model of the induction generator used in this wind park. Finally, we simulate the electrical behavior of the wind farm under the turbulent wind upstream of each rotor turbine and identify the main features based on simulation software PSAT.	807-813
143	Overview of Hybrid Excitation Synchronous Machines Technology  Sami Hlioui Yacine Amara Emmanuel Hoang Michel Lecrivai Mohamed Gabsi	This paper describes the state of the art of hybrid excitation synchronous machines. Different hybrid excited synchronous structures from scientific and technical literature are described and analysed. Advantages and drawbacks of the different structures are discussed. Different method of classification of these structures will also be discussed. The contribution of the hybrid excitation principle for motoring and generating mode is detailed and the different models for the design of these structures are presented.	814-823