Editorial

Mouloud Ayad* and Kamel Saoudi

LPM3E Laboratory,
Department of Electrical Engineering,
Faculty of Sciences and Applied Sciences,
University of Bouira,
Rue Freres Boussendalah, 10000, Bouira, Algeria
Email: m.ayad@univ-bouira.dz
Email: k.saoudi@univ-bouira.dz
*Corresponding author

Biographical notes: Mouloud Ayad received his Engineering, Magister and PhD degrees in Electronics from the University of Setif1, Algeria in 2001, 2005 and 2015 respectively. He is currently an Assistant Professor of Electrical Engineering at the Department of Electrical Engineering, University of Bouira, Algeria. He is a member in LPM3E Laboratory, University of Bouira, Algeria. Her research interests cover signal processing, telecommunication systems and renewable energies.

Kamel Saoudi received his BS, MSc and PhD degrees all in Electrical Engineering from the University of Setif 1, in 2005, 2008 and 2014, respectively. He is currently an Assistant Professor at the Department of Electrical Engineering, Bouira University, Algeria. His research interests include robust nonlinear adaptive control, intelligent power systems control and renewable energy.

Introduction

This is the special issue composed of selected papers from the International Conference on Electronics and Electrical Engineering (IC3E'18). This conference was organised by the Department of Electrical Engineering, Faculty of Sciences and Applied Sciences, University of Bouira. It was held during 12–13 November 2018. In this special issue, the contents of the selected papers are briefly described as follows:

In the paper entitled 'Intelligent SVM technique of a multi-level inverter for a DFIG-based wind turbine system' the authors (Habib Benbouhenni, Zinelaabidine Boudjema and Abdelkader Belaidi) present a study based on simple and fuzzy space vector modulation (4L-FSVM) for the control of the four-level converter in order to reduce total harmonic distortion (THD) of rotor current and powers ripples. The obtained results show that the proposed control scheme reduces the THD value, electromagnetic torque ripples and powers ripples compared to conventional control under various operating conditions.

The paper entitled 'Effects of temperature on the electromagnetic shielding effectiveness under a plane wave excitation' by Tahar Merizgui, Abdechafik Hadjadj, Mecheri Kious and Bachir Gaoui, presents a study of shielding behaviour of NaCdVO4

in thermal applications and particularly the relationships between the shield parameters and how these parameters effect, the shielding effectiveness mechanisms of materials against the electromagnetic interference. The obtained results of the total SE show that the used composite NaCdVO4 has the advantages for being an efficient shielding at high temperature and lightweight.

Ammar Ramdani and Mohammed Traïche, in the paper 'PID controller compared with dynamic matrix control applied on disturbed complex system', present a PID control method for disturbed complex system. The methods used are Ziegler-Nichols method (step response, frequency response, and ZN improved method), IMC-PID method of Rivera and Tyreus-Luyben method. The performances are achieved using dynamic matrix control (DMC) controller in both cases without and with perturbation.

The authors Abdelghani Harrag and Yacine Daili, in the paper 'Novel voltage-based PV MPPT controller', present a controller for tracking the maximum power of PV generator system composed of solar MSX-60W PV panel. The proposed controller has been implemented and validated using Matlab/Simulink environment. The obtained results prove that the performances of the proposed single sensor MPPT are very close to those of the two sensors IC MPPT regarding dynamic, static and tracking accuracy performances. In addition, this controller can effectively track the maximum power using only one sensor compared to the classical MPPTs.

In the paper entitled 'Direct torque control of induction machine drive based on sliding mode controller and a stator resistance compensator with a new hybrid observer', by Mohamed Horch, Abdelmadjid Boumédiène and Lotfi Baghli, the direct torque control (DTC) is investigated. Based on sliding mode controller approach (SMC), the DTC is applied to an induction machine drive fed by a power voltage source without speed sensor. The sliding mode controller is designed based on flux error and torque error, to make the torque and flux fast and accurate adjustment. The tests are effectuated and validated by numerical simulations using Matlab/Simulink toolbox. The simulations results show the effectiveness of the proposed controller.

There are many techniques have been proposed to perform the monitoring and diagnosis induction machines faults. For this purpose, the authors Hamid Khelfi, Samir Hamdani and Youcef Chibani presented a paper entitled 'Diagnosis inverter-fed induction motor fault at low load conditions by using demodulation Teager-Kaiser energy operator based on stator current'. The proposed approach is based on the analysis in a frequency domain of the temporal signal extracted through Teager-Kaiser energy operator demodulation in a steady state of one phase stator current. The experiments motors were operated under three load conditions (low, medium and high) and supplied by the inverter at different frequencies. The main obtained results are performed under various operational situations show the robustness and effectiveness of the proposed technique even for the lightly load.

The authors Mounir Hadef, Mohamed Rachid Mekideche, Abdesslem Djerdir and Abdoul Osmane N'diyae, in the paper 'Pattern recognition-based fault detection of a PM synchronous motor under stator winding short circuit faults', present a new detection fault approach based on pattern recognition analysis for detecting the stator inter-turn fault in two phases. The obtained results prove the efficiency of the proposed approach for the detection of an inter-turn fault at different phase to phase percent and at different level load in steady and transient state. Rapid detection of these faults can give an indicator of when maintenance intended reducing the likelihood of system failure.

A new numerical method for acoustics microwaves detection of an acoustics microwaves signal during the propagation of acoustics microwaves in a piezoelectric substrate zinc oxide (ZnO) is proposed by Hichem Hafdaoui and Djamel Benatia in the paper 'Regrouping of acoustics microwaves in piezoelectric material (ZnO) by SVM classifier'. The approach used is SVM. This study is very interesting in modelling and realisation of acoustics microwaves devices (ultrasound, radiating structures, filter SAW, etc.).

Based on model reference adaptive system (MRAS), the authors Salim Issaouni, Abdesselem Boulkroune and Hachemi Chekireb present a sensorless adaptive neuro-fuzzy backstepping control scheme. This controller is developed for induction machines with unknown model, uncertain load-torque and nonlinear friction. The paper is entitled 'MRAS speed observer for sensorless adaptive intelligent backstepping controller of induction machines'. The proposed sensorless controller guarantees the tracking errors converge to a small neighbourhood of the origin and the boundedness of all closed-loop signals what demonstrate the effectiveness of the proposed approach.

In the paper entitled 'Optimal digital PID controller design for regulating blood glucose level of type-I diabetic patients' presented by Salah Benzian, Aissa Rebai and Aissa Ameur, an optimal PID controller is investigated. Based on Xilinx system generator for the regulation of blood glucose level, the model of Bergman is used as a plant. The PSO algorithm is used to determine the optimal values of controller parameters. The simulation results show that the proposed controller gives better performances compared to the classical PID controller.

The stability analysis of delayed systems has attracted the attention of many researchers in recent years. Based on parallel distributed compensation (PDC), the authors (Hadil Soltani, Rafika El Harabi, Saloua Bel Hadj Ali, Abdel Aitouche and Mohamed Naceur Abdelkrim) present a study entitled 'Delay dependent stability analysis of Takagi-Sugeno fuzzy time-delays system'. This study investigate Takagi-Sugeno fuzzy observer using PDC. The trailer-truck is considered to prove the effectiveness of the stability conditions of the proposed approach and can provide the maximal allowable delay compared to some existing methods.

The Guest Editors of this special issue would likes to thank the Editor-in-Chief of IJDSSS, Professor N. Derbel and all the authors for their contributions and wish that the readers can benefit from these papers. Finally, we would also like to appreciate the reviewers for their evaluation of the papers.