Editorial

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Biographical notes: Saad Motahhir has previous expertise acting in industry as an Embedded System Engineer at the Zodiac Aerospace, Morocco, from 2014 to 2019, and more recently became Professor at ENSA, SMBA University, Fez, Morocco, since 2019. He received his Engineer in Embedded System from the ENSA, Fez, in 2014. He received his PhD in Electrical Engineering from the SMBA University, in 2018. He has published a good number of papers in journals and conferences in the last few years, most of which are related to photovoltaic (PV) solar energy and embedded systems. He published a number of patents in Morocco the Patent Office.

This special issue is composed of selected papers from the International Meeting on Advanced Technologies in Energy and Electrical Engineering (IMAT3E'18). This meeting was organised at 'Ecole Supérieure de Technologie de Fès' belonging to Sidi Mohamed Ben Abdellah University, on November 22 and 23, 2018 at Fez, Morocco. This meeting provided an excellent opportunity for networking and for dissemination and exchanges of innovative research findings on advances in the state-of-the-art of renewable energy, electrical engineering, embedded systems and artificial/computational intelligence; both theoretical contributions (including new techniques, concepts and analyses) and practical contributions (including system experiments and prototypes and new applications). In this special issue, the contents of the selected papers are briefly described as follows.

In the first paper of this special issue, Naoufal El Youssfi et al. provide a method for estimating actuator faults and fault-tolerant control (FTC) technique based on fuzzy observers for Takagi-Sugeno (T-S) continuous fuzzy models, which are affected by actuator faults and disturbance modelling. The stability analysis is based on the Lyapunov quadratic function and the resolving of a convex set of linear matrix inequalities (LMIs). The objective is to ensure the asymptotic stability of the system states and to compensate for the impact of disturbances and actuator faults. Ultimately, numerical simulations on the lateral vehicle dynamics model illustrate the efficiency of the proposed control and the procedure for designing fuzzy observers.

In the second paper, Kaushalendra Kumar Dubey and R.S. Mishra present the study of different eco-friendly (low global warming potential and low ozone depletion potential) refrigerant materials for unused heat utilisation of captive industry like power generation, steel industry, etc. The obtained results show that the proposed solar thermal energy operated waste heat recovery system of vapour adsorption and ejector refrigeration systems have significant 50C–100C of cooling temperature. R134a and R717 both eco-friendly refrigerant materials consume low and medium grade heat source (1,000C–2,000C) with zero impact on environment. The employment of solar thermal

energy source enhances the generator heating, which is important for superheating of refrigerant and further small expander work output. The actual performance of the system is also evaluated in terms of exergetic efficiency. Ejector refrigeration is better than a vapour adsorption system with valuable cooling effect and power generation also. Overall, proposed systems have a considerable potential of dumped heat utilisation, capable of reducing carbon emission and map the decarbonise infrastructure for massive industry.

In the paper entitled 'Robust integral sliding mode controller design of a bidirectional DC charger in PV-EV charging station', Youssef Cheddadi et al. raise the problem of the current control in the charging systems of electric vehicles. The design of robust and nonlinear control of such a system becomes a complex task when the chargers are bidirectional that adopt the vehicle-to-grid feature. The authors designed an integral sliding mode controller to track and regulate the current, relying on the averaged current-mode control, which permits to handle and control both the charge and discharge current inside the electric vehicle charging system. Their simulation results confirm the robustness and excellent performance of the presented control technique in terms of tracking, stability and chattering cancellation.

In the paper entitled 'A summary study on handwritten documents word spotting', Manal Boualam et al. present the process and techniques used in each step of a handwritten word recognition system, this paper gives a summary of published research efforts in the field of handwritten documents word spotting focusing on the period between 2002 and 2020 to provide the most efficient techniques.

On the paper entitled 'Numerical approach for parameter extraction of a photovoltaic module based on datasheet and five parameters model', Fatima Cheddadi et al. present a numerical technique of extraction of the unknown parameters of a photovoltaic module based on one diode model which contain five unknown parameters. This method is based on the resolution of five nonlinear and independent equations. Then, it is validated with data given by the manufacturer on two types of photovoltaic technologies: the polycrystalline module SET230G and the monocrystalline module SET195C. The proposed technique presents an excellent performance for both photovoltaic technologies polycrystalline and monocrystalline under variable climatic conditions.

In the final paper, Khaoula Oulidi Omali et al. present a study based on sliding mode observers. The key idea is to generated residuals when sensor faults are presented by using this technique. Therefore, a proportional derivative (PD) controller is used to improve the system's stability. The PD controller is based on the Lyapunov equation. The observed results show the efficiency of the detection system. Thus, the residuals allow the detection and isolation of the sensor's faults. Finally, simulation results are given to demonstrate the effectiveness of the proposed approach on a robot manipulator.

The guest editor of this special issue would like 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.