

INTRODUCTION

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The eight papers included in this special issue represent a selection of extended contributions presented at the 10th International Conference on Soft Computing Models in Industrial and Environmental Applications (SOCO 2015) held in Burgos, Spain, in June 2015, and organized by the BISITE (University of Salamanca) and the GICAP (University of Burgos) research groups, together with the Technological Institute of Castilla y León.

This special issue is aimed at practitioners, researchers and postgraduate students who are engaged in developing and applying soft computing to solve real-world problems. The papers are organized as follows.

The first contribution, by Casteleiro-Roca *et al.*, address the problem of predicting the evolution of the muscular relaxation measured through Electromyogram (EMG), monitored during the period of anesthesia under surgery. In order to estimate the EMG signal, a hybrid intelligent model, combining clustering and regression techniques, is conceived and tested.

Wafega *et al.*, proposes a movement control system based on Qualitative Reasoning. More precisely, the paper describes an approach based on Propositional Dynamic Logic for obtaining stable qualitative representations which is particularly important when dealing with noisy data. The proposed framework is deployed in Robotic Operating System and tested with the computer simulator STAGE.

In the third contribution, the performance of different edge detectors for gray scale images is compared. More precisely, the comparison comprises edge detectors based on Mathematical Morphology, Fuzzy Mathematical Morphology, and a construction method to obtain Interval Valued Fuzzy Relations. A publicly available database of images is considered for the experiments.

The following paper, by González *et al.*, presents two different approaches, based on the time series representation called Symbolic Aggregation Approximation, for the detection of Apnea episodes. The first approach analyzes the

time series representation to detect respiratory events and their amplitude, while the second one proposes a dictionary of words that represents the normal sleeping conditions.

The research by Diering *et al.* is aimed at developing a methodology and a model for the analysis of industrial rating systems for qualitative characteristics, taking into account the different production conditions. As a result, an expert assessments supporting system based on fuzzy models is conceived. Authors proposal is validated with practitioners and quality engineers in the production process of diagnostic catheters.

In the sixth paper, by Górski *et al.*, Genetic and Finite Element Analysis algorithms are combined for the optimization of Fused Deposition Modeling (FDM) process parameters is presented, being FDM one of the most widespread 3D printing technologies. The paper addresses the requirements-driven planning of additive manufacturing process, taking into account parameters of the process and their influence on coefficients of obtained products.

Bankovic *et al.* present a general methodology for energy-efficient scheduling in multicore environments, which can be adapted to different features that the underlying environment exhibits and to different requirements of the task scheduling. To do that, an evolutionary algorithm is applied, considering two objectives to be minimised: the execution time and the total energy consumption.

Finally, a Genetic Fuzzy Model of the State of Health of a Li-Ion battery is proposed by Echevarría *et al.* developed where both outputs of the system and its first derivative with respect to the stored charge are approximated. Output of the system as well as its first derivative with respect to the stored charge are considered by fuzzy rule-based systems to detect cell degradation in this kind of battery technologies.

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