Journal of Computational Methods in Sciences and Engineering 11 (2011) 159–160
DOI 10.3233/JCM-2011-0371
IOS Press

Editorial

Advances in Intelligent Systems

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This special issue is concerned with Advances in Intelligent Systems. The area of intelligent systems is rapidly developing and reaching in multiple directions. In this special issue we present seven papers that show some of the area that current intelligent systems enclose. Seven papers have been selected, after review, for this special issue. These cover two categories: the first set of papers focuses mainly on the machine learning domain and on topics belonging to the general concept of intelligent systems, while the second set of papers focuses mainly on approaches belonging to engineering applications of computational intelligent systems.

In the paper by S. Alvarez et al., neural expert networks for faster combined collaborative and content-based recommendation have been considered. The authors found that the recommendation quality achieved by a feed-forward multilayer perceptron network operating on combined collaborative and content-based information is statistically significantly better than that of a network that is provided with the collaborative data alone, assuming that dimensionality reduction is performed on the collaborative and content-based data components separately. The second paper by E.R. Hruschka Jr. et al., describes a Bayesian Imputation Method for a Clustering Genetic Algorithm. Missing values are a critical problem in data mining applications. The substitution of these values, also called imputation, can be performed by several methods. This paper describes the application of an optimized version of the Bayesian Algorithm K2 as an imputation tool for a clustering genetic algorithm. The resulting hybrid system was assessed by means of simulations in five benchmark datasets. The paper by Z He et al. is related to the clustering of categorical data streams. A new algorithm that utilises small memory footprints is presented and an empirical analysis on the performance of the algorithm in clustering both synthetic and real data streams is performed.

The last paper of the first part entitled "Temporal Conflict in Workflow Schemas" by Chountas et al. presents a temporal formalism for representing indeterminacy to workflow specifications. The authors further argue that integrating workflows with temporal databases can further enhance the workflow specification. The second part of this special issue is devoted to the application of novel computational intelligent methodologies in engineering. P. Jahankhani et al., describes a novel decision support system for EEG signals based on Adaptive Fuzzy Inference Neural Networks. Although, EEG signals are used widely in biomedicine, this research study describes a new approach based on a fuzzy logic system implemented in the framework of a neural network for classification of EEG signals. Decision making

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was performed in two stages: feature extraction using the wavelet transform and classification using the classifier trained on the extracted features. The proposed network constructs its initial rules by clustering, while the final fuzzy rule base is determined by competitive learning. Both error backpropagation and recursive least squares estimation, are applied to the learning scheme. The paper "Genetic Evolution of Controllers for Challenging Control Problems" by D. Dracopoulos, considers an alternative approach to the construction of controllers, especially in situations where traditional control theory and algorithms fail to provide adequate solutions. Genetic programming, a field under the "umbrella" of evolutionary computation, is capable of creating computer programs given a high level description of a problem. Any controller can be described in terms of a computer program and thus, at least in theory, genetic programming offers an ideal candidate for the automatic construction of controllers. This paper considers the application of genetic programming on two different problems: the aircraft auto-landing problem and the bioreactor control problem, both of which have been suggested in the literature as challenging benchmarks in the quest for building automatic controllers. The last paper in this special issue is related to short term load forecasting utilising a novel Extended Normalised Radial basis Function Network. Load forecasting is an important component for power system energy management system. Precise load forecasting helps the electric utility to make unit commitment decisions, reduce spinning reserve capacity and schedule device maintenance plan properly. In the proposed scheme, the Bayesian Ying Yang Expectation Maximisation algorithm has been used with novel splitting operations to determine a network size and parameter set. The results, utilising data from Eastern Slovakian Energy Board, are then compared with that of an MLP neural network.

The editors wish to thank the editor-in-chief of the journal for providing us with the opportunity to edit this special issue. We would also like to thank the referees for critically evaluating the papers in a short time span. Finally, we hope the reader will enjoy reading this special issue.