

Guest-editorial

Special issue: Data mining and hybrid intelligent systems

Fatos Xhafa^a, Francisco Herrera^b and Mario Köppen^c

^a*Department of Languages and Informatics Systems, Technical University of Catalonia, Barcelona, Spain*
E-mail: fatos@lsi.upc.edu

^b*Department of Computer Science and Artificial Intelligence, University of Granada, 18071 Granada, Spain*

^c*Network Design and Research Center, Kyushu Institute of Technology, 680-4, Kawazu, Iizuka, Fukuoka 820-8502, Japan*

This special issue encompasses four papers devoted to the recent developments in the field of Data Mining. The issue originated from presentations at the “8th International Conference on Hybrid Intelligent Systems” held at Technical University of Catalonia, in Barcelona (Spain), September 10–12th, 2008. Seven selected papers were submitted to the special issue, every paper was revised by at least three referees and finally four of them were accepted according to the referees’ evaluations.

This special issue is focused on data mining and the use of hybrid intelligent systems. The submissions embrace theoretical models dealing with classification problems as well as applications.

The first paper, “AD-SVMs: A Light Extension of SVMs for Multicategory Classification”, is devoted to the support vector machines and their use for multicategory classification. Nanculef et al. generalize the geometrical formulation, obtaining a method that preserves the form and complexity of the binary case optimizing a single convex quadratic program where each new class introduces just one additional constraint.

The second paper, “Analysis and Improvement of the Genetic Discovery Component of XCS”, is devoted to the analysis of the well known evolutionary learning algorithm XCS that uses genetic algorithms to evolve a population of classifiers online. Morales-Ortigosa et al. conduct a systematic experimental analysis of the

effect of the different genetic operators. The overall analysis enables them to provide important insights into the behavior of different operators and to improve the learning of interval-based rules in real-world domains on average.

Two other papers are related to the application of case-based reasoning systems to two medical problems.

The first one, “Case-based reasoning as a decision support system for cancer diagnosis: A case study”, is devoted to automatic classification of leukemia patients from microarray data. De Paz et al. present a case-based reasoning system for automatic classification. The system incorporates novel algorithms for data mining that allow filtering, classification, and knowledge extraction.

The second one, “Diagnosing Patients with a Combination of Principal Component Analysis and Case Based Reasoning” is focused on diagnosing patients. Pous et al. address the application of a principal component analysis of categorical data prior to diagnosing a patients dataset using a case-based reasoning system. They propose the hybridization of a regular simplex principal component analysis and a simple case based reasoning systems.

Finally, as Guest Editors of this special issue, we would like to thank all the authors for their contributions and the referees for their outstanding cooperation and constructive feedback.