

Editorial

Dear Colleague:

Welcome to volume 16(1) of Intelligent Data Analysis journal.

With this issue of the IDA journal, that consists of eight articles, we start our sixteenth year of success. As customary, this issue represents a variety of topics, all related to the applied and theoretical research in the field of Intelligent Data Analysis.

The first three articles are about algorithm development. Muelas *et al.* on the first article of this issue discuss the topic of dynamic or adaptive combination strategies and propose a new methodology for developing intelligent adaptive hybrid algorithms that use data mining techniques to analyze the results from previous executions. They evaluate their proposed methodology on a number of well known benchmark data sets where they demonstrate results that are significantly better than existing approaches. Jorge and Azevedo in the second article of this issue propose a framework for defining and discovering optimal association rules involving a numerical attribute in the consequent. The optimality that is considered here is with respect to leverage where the generated rules are called maximum leverage rules. The authors present different methods for generation of maximum leverage rules where they take into account both optimality and readability of the discovered rules. Their evaluation shows that their discovery process is scalable. Hernandez-Leon *et al.* in the third article propose a novel classifier that is based on class association rules. This classifier introduces a new strategy for computing class association rules using a measure of interest that allows exploring the particular search space for building specific rules with the highest value. The authors also introduce a new way for ordering the set of class association rules in which an ensemble strategy is applied.

The next two articles are about unsupervised learning. Al-Aghbari *et al.* discuss the importance of being able to properly identify clusters in data streams and propose a clustering technique to find clusters in multiple data streams. Their proposed algorithm applies a Discrete Fourier Transformation to reduce the dimensionality of data streams and present each stream by a point in a multidimensional grid. Their experiments on synthetic data streams show the superiority of their algorithm in terms of speed which makes it suitable for sensor network applications. Oliveira and Gama in the fifth article of this issue address the problem of monitoring the evolution of clusters over time and propose a framework to trace this evolution through the detection and categorization of cluster transitions. They evaluate their approach based on two objectives, which are: to determine general evolution trends and to detect abnormal behavior or rare events. Their approach is evaluated on economy and financial problems.

The last three articles of this issue are mainly focused on applied research. Moradi *et al.* discuss automatic skill acquisition in reinforcement learning and propose a new graph theoretic approach to automatically identify and evaluate subgoals which are related to skills in reinforcement learning. They propose a method that uses prior knowledge necessary for skill development. The method is based on two graph centrality measures which are node connection graph stability and co-betweenness centrality. Their method is evaluated using some benchmark data. The seventh article by Olasha *et al.* is on functional characterization of drug-protein interaction networks. The authors present their results of the study and analysis of the relationship between drugs and proteins that they target. Their aim is to

identify protein properties that might guide the drug discovery process using interaction networks. Their analysis involves using social network models where drugs and proteins are studied using rich matrices. The last article of this issue, by Martins *et al.* is mostly on data visualization where they present a methodology which enables the graphical representation of atmospheric pollutants in a bi-dimensional Euclidean Space. The approach presented in this article relies on the use of multidimensional unfolding which is an exploratory multivariate data analysis method. Evaluation of their proposed approach using simulated data is also presented in this article.

In conclusion, with this first issue of Volume 16 of the IDA journal, we continue our efforts on organizing and publishing one of the best journals in this community. Currently, there are a few special issues under development that are at different stages of completion. The IDA conference, that is usually held in Europe, this year was held in Porto, Portugal from October 29–31, 2011. As usual, this was a successful event that consisted of technical, poster and Ph.D. presentations. We look forward to receiving your feedback along with more and more quality articles in both applied and theoretical research related to the field of IDA.

With our best wishes,

Dr. A. Famili
Editor-in-Chief