Editorial

Dear Colleague:

Welcome to volume 12(4) of *Intelligent Data Analysis* – An international Journal.

The fourth issue of volume 12 consists of seven articles. These articles represent various topics, all related to the field of intelligent data analysis from the theoretical (the first two articles) to the applied research (the last five).

In the first article of this issue Song, Yang and Xu propose a new algorithm for mining frequent closed itemsets. Their approach is based on three criterion, which are (i) an index array, (ii) a bit-mapped based computing index array, and (iii) a frequent set merged from the heuristics obtained from the index array. The efficiency of their algorithm, particularly in dense data sets is shown as part of this article's experimental results. Deshmeh and Rahmati, in the second article, address the problem of detecting anomalies in horizontally distributed data where only a limited number of instances at each remote site are allowed to be shared. In their approach, local predictors are trained and association rules are extracted using the difference between the predicted and actual values on a given data set. The proposed method is compared to some of the existing anomaly detection methods where the superiority of their approach is presented.

The next five articles are mostly on applied research, each is related to a particular topic. Alami and El Imrani, discussing the issue of multi-modal optimization, introduce a new model that is based on a cultural algorithm and a fuzzy clustering procedure. Their approach consists of first formation and maintenance of subpopulations and then an implementation of the concept of cultural exchanges among them. The validity of this approach is evaluated using some well known test function where an electromagnetic benchmark is used to demonstrate the usefulness of this approach in real world applications. Similarly, Wickramaratna and Kubat in the fourth article of this issue focus on discovering numeric laws in soft science and describe their attempt in predicting absorption rate of CO_2, something that ocean chemists can benefit from. The system introduced by these authors has been able to find questions that were beyond the ones suggested by the domain experts. Esameili *et al* in an interesting application paper report on their method where through integration of electroencephalogram data and use of fuzzy soft computing they can quantitatively estimate the depth of anesthesia. The approach which is based on a single channel EEG input (using frequency and time domain data) is applied to a data set of 22 patients with some interesting results that explain the status of these patients. The paper also includes additional experiments where the authors applied the same features to an adaptive network based fuzzy-inference system. The overall goal of this research was to simplify the natural language exchange between any computer and human being.

In the sixth article of this issue, Ollikainen and Juhola examine an identifier matching problem where the data for identifiers corresponds to information extracted from the DNA samples representing to various persons of interest. The data for individual objects is matched to the contents of a data base where the information is stored as integers of small intervals. The matching problem is solved through sorting the data and comparing it with a maximally reduced subset of the data. And finally, the last article of this issue by Saunders *et al* is in the area of music where the authors show an interesting application

of string kernels for recognizing music played by famous pianists. The data in this study is called performance worms, which comes from the changes in the beat-level tempo and beat-level loudness of playing the same pieces by different musicians. The authors show that when using the string kernel, both kernel partial least squares and support vector machines outperform the best available results. The authors also introduce a new method of obtaining feature directions which can deliver better performance than pervious methods.

In conclusion, this volume of the IDA journal includes three special issues that are from three events, either conferences or special workshops that were held recently. Ideas for publication of special issues are always welcome.

With our best wishes,

Dr. A. Famili
Editor-in-Chief