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Guest-Editorial

Selected papers from CIMA'08

The combination of different intelligent methods is a very active research area in Artificial Intelligence (AI). The aim is to create integrated or hybrid methods that benefit from each of their components. It is generally believed that complex problems can be easier solved with such integrated or hybrid methods.

Some of the existing efforts combine what are called soft computing methods (fuzzy logic, neural networks and genetic algorithms) either among themselves or with more traditional AI methods such as logic and rules. Another stream of efforts integrates case-based reasoning or machine learning with soft-computing or traditional AI methods. Some of the combinations have been significant and more extensively used, like neuro-symbolic methods, neuro-fuzzy methods and methods combining rule-based and case-based reasoning. However, there are other combinations that are still under investigation.

Based on the above perspectives, the 1st International Workshop on Combinations of Intelligent Methods and Applications (CIMA-08) was organized in conjunction with the 18th European Conference on Artificial Intelligence (ECAI-08), held in Patras, Greece, in July 2008. The workshop was intended to become a forum for exchanging experience and ideas among researchers and practitioners who are dealing with combining intelligent methods either based on theoretical approaches or in the context of specific applications.

There were 20 papers submitted to the Workshop. Each paper was reviewed by at least two members of the PC. We finally accepted 12 papers (10 full and 2 short), presented in CIMA-08, which turned out to be quite successful. The authors of selected papers were called to submit extended versions of their papers, for possible inclusion in this special issue. After a second journal-level peer review round for the extended versions, finally four (4) papers were accepted for publication. A brief overview of the papers is given below.

Prentzas and Hatzilygeroudis in their paper entitled "Combinations of Case-Based Reasoning with Other Intelligent Methods" provide an extensive and comprehensive survey of the most important types of combinations between case-based reasoning (CBR) and other intelligent methods, like rule-based reasoning, neural networks, fuzzy methods, genetic algorithms and ontologies. An objective of their work, apart from a systematic survey presentation, is the exploration of future promising directions in combining CBR with other methods

In their paper, Cocea and Magoulas, under the title "Hybrid Model for Learner Modelling and Feedback Prioritisation in Exploratory Learning", present a conceptual model that employs a synergistic approach based on CBR and Multicriteria Decision Making (MDM) components for learner modelling and feedback generation during exploration in an ill-defined domain of mathematical generalisation. The CBR component is used to diagnose what students are doing on the basis of simple and composite cases. The MDM component is responsible for prioritising types of feedback depending on the context.

Spanoudakis et al, in their paper "Portfolio Construction Using Argumentation and Hybrid Evolutionary Forecasting Algorithms", apply an argumentation based decision making framework and a hybrid evolutionary forecasting algorithm, which combines Genetic Algorithms (GA), MultiModel Partitioning (MMP) theory and Extended Kalman Filters (EKF), to constructing mutual fund portfolios.

Finally, Illiadis and Anastasopoulos in their paper "Intelligent Hybrid modelling towards the Prognosis of Abdominal Pain" apply a hybrid method for developing an effective artificial neural networks (ANNs) based classification model for the abdominal pain disease. The model is configured using a novel fuzzy method for evaluating various alternatives. Results are very promising.

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Guest Editors