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Proceedings

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Preface

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 quite important 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. In some cases, combinations are based on first principles, whereas in other cases they are created in the context of specific applications.

The Workshop is intended to become a forum for exchanging experience and ideas among researchers and practitioners who are dealing with combining intelligent methods either based on first principles or in the context of specific applications.

There were totally 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). Revised versions of the accepted papers (based on the comments of the reviewers) are included in these proceedings in alphabetic order (based on first author).

Five of the accepted papers deal with combinations of Genetic Programming or Genetic Algorithms with either non-symbolic methods, like Neural Networks (NNs) and/or Kalman Filters (Georgopoulos et al, Spanoudakis et al), or symbolic ones, like Decision Trees (Kalles et al) and Temporal Logic (Bennett and Magee). Another four papers deal with combinations of Case-Based Reasoning (CBR). One of them presents a short survey of CBR combinations (Prentzas and Hatzilygeroudis) and another one a combination with Agents (Teodorescu and Petridis). The rest two of them present CBR combinations with a Neuro-Fuzzy (Cocea and Magoulas) and a Neuro-Symbolic (Prentzas et al) approach respectively, leading to multi-combinations. Also, another two papers concern combinations of Fuzzy Logic with either NNs (Anastassopoulos and Iliadis) or Bayesian

Nets (Fogelberg et al). Finally, one of the papers combines a NN-based approach with a Natural Language Processing one (Foster et al).

Four of the above papers present combinations developed in the context of an application. Applications involve Medicine (Anastassopoulos and Iliadis), Education (Cocea and Magoulas, Kalles et al) and Economy (Spanoudakis et al).

We hope that this collection of papers will be useful to both researchers and developers.

Given the success of this first Workshop on combinations of intelligent methods, we intend to continue our effort in the coming years.

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