

Preface

The combination of different intelligent methods is an 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. Yet another integrates agent-based approaches with logic and also non-symbolic approaches. 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, such as those related to the Semantic Web. In some cases, combinations are based on first principles, whereas in other cases they are created in the context of specific applications.

The 4th Workshop on “Combinations of Intelligent Methods and Applications” (CIMA 2014) was intended to become a forum for exchanging experience and ideas among researchers and practitioners dealing with combining intelligent methods either based on first principles or in the context of specific applications.

Important issues of the Workshop were (but not limited to) the following:

- Case-Based Reasoning Integrations
- Genetic Algorithms Integrations
- Combinations for the Semantic Web
- Combinations and Web Intelligence
- Combinations and Web Mining
- Fuzzy-Evolutionary Systems
- Hybrid deterministic and stochastic optimisation methods
- Hybrid Knowledge Representation Approaches/Systems
- Hybrid and Distributed Ontologies
- Information Fusion Techniques for Hybrid Intelligent Systems

- Integrations of Neural Networks
- Intelligent Agents Integrations
- Machine Learning Combinations
- Neuro-Fuzzy Approaches/Systems
- Applications of Combinations of Intelligent Methods to
 - Biology and Bioinformatics
 - Education and Distance Learning
 - Medicine and Health Care

CIMA 2014 was held in conjunction with the 26th IEEE International Conference on Tools with Artificial Intelligence (ICTAI 2014).

This volume includes extended and revised versions of the papers presented in CIMA 2014.

We would like to express our appreciation to all authors who submitted papers as well as to the members of the CIMA-14 program committee for their excellent work. We would also like to thank the ICTAI 2014 PC Chair for accepting to host CIMA 2014.

We hope that this proceedings will be of benefit to both researchers and developers. Given the success of the first four Workshops on combinations of intelligent methods, we intend to continue our effort in the coming years.

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