



Guest Editorial: Machine Learning Policies

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1. Introduction

We are glad to introduce to the readers of *Applied Intelligence*: The International Journal of Artificial Intelligence, Neural Networks, and Complex Problem-Solving, a selection of the best papers from the 3rd Congress of the Catalan Artificial Intelligence Association (CCIA'2000) [1]. This conference was held in Vilanova i la Geltrú, from the 5 to the 9 of October of 2000, at the premises of the Technical University of Catalonia [2]. Topics covered range from theoretical aspects (e.g., Machine Learning, Logics, Qualitative Reasoning, Fuzzy Sets Foundations, Neural Networks) to more practical matters (related with computer vision, electronic commerce, human tissue transplantation). This postpublication of the selected papers continues the trend initiated at the first Congress of the Catalan Artificial Intelligence Association (see [3, 4]).

For this special issue we had initially selected 11 papers from the 44 accepted for the conference that received more than 90 original papers. We asked the authors to substantially extend their works to be reviewed for publication at *Applied Intelligence*. The extended versions of the initially selected papers have been reviewed by two additional referees. This special issue contains the 5 papers finally accepted for publication. It is our understanding that these papers provide a limited but good display of some of the most recent research in AI in Catalonia.

The common trend among the selected papers is Machine Learning methods applied to learn policies or models of systems in order to control them.

Martin and Geffner in their paper show how *generalized policies* for a domain can be learned from a reduced set of examples generated by traditional plan-

ners on small size problems. Policies are represented as a set of prioritized rules where antecedent of the rules describe conditions over the arguments of the actions. This bias jointly with the expressive power of *Description Logics* seems responsible of the scaling up properties of the learned policies.

Gimeno and Béjar in their contribution present a nearest neighbor approach to predict time series. The framework presented explicitly takes into account process control features which is a first step for considering the creation of useful learning policies. The approach proposed works well on partially observable environments, as the test task proposed in their paper.

Morcego's work describes Miga, a software tool based on the evolution of neural networks for learning suitable models of non-linear systems. Two advantages of this approach (not always available in non-symbolic learning) are that the system allows the inclusion of *a priori* structural knowledge about the system and also Miga allows to extract symbolic knowledge about the learned model. Modelling of non-linear systems is in most cases a previous step to learn how to control them.

Bermejo and Cabestany's contribution presents a new approach for reducing variability and increase accuracy in learning using nearest neighbor classifiers based on prototypes. Specifically, they define an ensemble learning method, named *local averaging*, applied over Kohonen's LVQ algorithm, that experimentally has been proved successful in syntactic and real classification problems.

Cortés et al. paper introduces the use of multi-agent systems and electronic institutions to model the procurement and assignation of human tissues and organs for transplantation. The aim of this work is to model

and automate some of the complex tasks performed by a Transplant Coordination Unit (UCTx) inside a Hospital. One of the focus of this work is the learning of strategies to obtain the *best* tissue or organ for a given recipient. The other main goal is to specify the norms that rule these processes.

We very much appreciate and acknowledge Prof. Moonis Ali and *Applied Intelligence* for this opportunity to make better known some of the actual work in AI in Catalonia.

The Catalan AI Association (ACIA) [5] was founded in the summer of 1994 and has now more than 170 members that are very active in AI teaching and research.

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tive suggestions to enhance their papers for this special issue.

References

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