Editor's Introduction to the Special Issue

Intelligent Systems

The area of intelligent systems is rapidly developing and reaching in multiple directions. In this mini-special issue we present four papers that show some of the area that current intelligent systems enclose.

The first paper, entitled "The Cross-Entropy Method for policy search in Decentralized POMDPs," was written by Frans A. Oliehoek, Julian F.P. Kooij, and Nikos Vlassis. It concerns possible approaches to multiagent planning under uncertainty. One of possible methods is utilization of Decentralized Partially Observable Markov Decision Processes (Dec-POMDPs). Unfortunately, solving a Dec-POMDP exactly is an intractable combinatorial optimization problem. In the paper, a new Cross-Entropy-based method is applied to the problem. It operates by sampling pure policies from an appropriately parameterized stochastic policy, and then evaluates them to define the next stochastic policy to sample from. This process is repeated until convergence is reached. Experimental results demonstrate that the proposed method can efficiently search large solution spaces.

In the second paper, "On the Compilation of Programs into their Equivalent Constraint Representation," Franz Wotawa and Mihai Nica present a novel approach to program analyzing and debugging. They convert programs into their loop-free equivalents and, next, into the static single assignment form. This allows them to derive a corresponding constraint satisfaction problem, which can be used directly for debugging. Specifically, they utilize the hyper-tree representation of the constraint satisfaction problem for debugging, while the width of the hyper-tree is an indicator of the debugging complexity.

The next paper, "Automatic Streaming Processing of XSLT Transformations Based on Tree Transducers," written by Jana Dvorakova, recognizes the fact that XML streaming has become an ubiquitous mode for information exchange over the Internet, and deals with an important issue of transforming large XML documents or XML data streams. Specifically, an automatic streaming processor for XSLT transformations, which guarantees bounds on resource usage, is presented. In the proposed approach, resource bounding is achieved by employing tree transducers associated with a set of streaming algorithms. The input XSLT stylesheet is analyzed in order to identify its transformation type, which in turn allows application of the lowest resource-consuming streaming algorithm.

Finally, Oana Nicolae, Adrian Giurca and Gerd Wagner, in their paper "On Interchange between Drools and Jess," approach IT and business solutions based on business rules and consider challenges related to the target Platform Specific Implementation Model. The paper discusses an example of the business rules translation from a particular object oriented rule-system (Drools), to another rule-system coming from the AI area (Jess), using the R2ML as the interchange language. The proposed transformation preserves the semantic equivalence for a given rule set, taking also into account the rules vocabulary.

Papers presented here are based on those that were presented at the first edition of the International Symposium on Intelligent and Distributed Computing (IDC'2007), which took place on October 18-20, 2007 in Craiova, Romania. Overall, out of 33 full papers published in Symposium Proceedings we have selected six. However, after further refereeing we have eliminated two of them and left four best contributions.

Finally, we would like to thank all of our colleagues, who acted as referees of the papers and made sure that material presented here is of highest quality.

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