

Preface

It is my pleasure to present the 14th volume of LNCS Transactions on Computational Collective Intelligence. This volume includes nine interesting and original papers that have been selected via the peer-review process.

The first paper, “A Two-Armed Bandit Collective for Hierarchical Exemplar Based Mining of Frequent Itemsets with Applications to Intrusion Detection” by Vegard Haugland, Marius Kjølberg, Svein-Erik Larsen, and Ole-Christoffer Granmo, is devoted to the problem of frequent itemset mining as a collection of interrelated two-armed bandit problems. The authors propose a method to find itemsets that frequently appear as subsets in a stream of itemsets, with the frequency being constrained to support granularity requirements. A novel reinforcement scheme allows the bandit players to learn this in a decentralized and on-line manner by observing one itemset at a time.

The second paper entitled “Semantic Compression for Text Document Processing” by Dariusz Ceglarek describes the technique that allows for correct generalization of terms in some given context. Thanks to this generalization a common thought can be detected. Semantic compression can be applied in a variety of scenarios, e.g., in detection of plagiarism.

In the third paper, “On Stigmergically Controlling a Population of Heterogeneous Mobile Agents Using Cloning Resource,” W. Wilfred Godfrey, Shashi Shekhar Jha, and Shivashankar B. Nair present an on-demand population control mechanism for a heterogeneous set of mobile agents along with an underlying application for their deployment as service providers in a networked robotic system. They focus on a novel concept called the cloning resource which controls the cloning behavior of agents. The results obtained in the simulation and emulation environment are described.

The fourth paper, “On the Existence and Heuristic Computation of the Solution for the *Commons Game*” by Rokhsareh Sakhravi, Masoud T. Omran, and B. John Oommen, discusses the existence of an optimal solution to *Commons Game*, and demonstrates a heuristic computation for this solution. To do this, the authors consider the cases when, with some probability, the user is aware of the approach (color) which the other players will use in the exploitation of the commons. The problem of determining the best probability value with which a specific player can play each color in order to maximize his ultimate score is investigated.

The fifth paper entitled “Method of Constructing the Cognitive State for Context-Dependent Utterances in the Form of Conditionals” by Grzegorz Skorupa proposes an exemplary method for the grounding of context-dependent utterances and a method for constructing a context-dependent model of a cognitive state. An agent’s knowledge is partitioned into a few disjoint subsets. This division is the result of a classification of past environmental observations.

In the sixth paper, “Conflict Compensation, Redundancy and Similarity in Data-Bases Federation,” Germano Resconi gives the algorithm to discover the weak

redundant databases and also how to create the local compensation in a way to transform all the different databases in only one prototype. This is a useful method to solve conflicts among agents as databases.

The next paper, “Extended Learning Method for Designation of Co-operation” by Edyta Kucharska and Ewa Dudek-Dyduch, presents a new machine learning method for determining intelligent cooperation at project realization. The method uses local optimization task of a special form and is based on learning idea. Additionally, the information gathered during a searching process is used to prune non-perspective solutions.

In the eighth paper entitled “Methods of Prediction Improvement in Efficient MPC Algorithms Based on Fuzzy Hammerstein Models,” Piotr M. Marusak proposes two methods of prediction improvement in model predictive control (MPC) algorithms utilizing fuzzy Hammerstein models. Efficiency of the MPC algorithms based on the prediction utilizing the proposed methods of improvement is demonstrated in the example control system of a nonlinear control plant with significant time delay.

In the last paper, “Visualization of Semantic Data Based on Selected Predicates,” Gábor Rácz, Gergő Gombos, and Attila Kiss develop a method that aims to help to understand the structure of semantic datasets. It can reduce the size and complexity of a dataset while preserving the selected parts. The result of the method can be visualized as a labelled directed graph that is suitable to give an overview of the structure of the dataset.

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