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Transactions on Computational Collective Intelligence VIII



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Preface

Welcome to the eighth volume of *Transactions on Computational Collective Intelligence* (TCCI). This is the third issue in 2012. This TCCI volume includes 10 interesting and original papers selected after a peer-review process.

The first, entitled “Introduction to Active Sets and Unification” by Germano Resconi and Chris Hinde, presents an original framework for an active set which is a unifying space being able to act as a “bridge” for transferring information, ideas and results between distinct types of uncertainties and different types of applications. Active sets can be considered as a very useful tool for collective intelligence.

In the second paper, “*Modeling a Teacher in a Tutorial-Like System Using Learning Automata*,” the authors B. John Oommen and M. Khaled Hashem present a novel approach to modeling the behavior of a teacher in a tutorial-like system. The interesting aspect of this model is that the teacher is capable of presenting teaching material from a Socratic-type domain model via multiple-choice questions.

The next paper, “*Power Network Reliability Computations Using Multi-Agent Simulation*” by Ales Horak, Miroslav Prymek, and Tadeusz Sikora, presents a multi-agent simulation system designed for modeling several aspects of power network elements and power network processes. Owing to this it is able to predict the weak points of a simulated power network over an extended time span. The authors have shown that the prediction takes into account the network topology, meaning that each element is modeled in a context that is close to the real one.

In the fourth paper entitled “*Sequence Automata for Researching Consensus Levels*,” the author, Henryk Piech, addresses the problem of building sequence automata and using them to process inconsistency. The author proposes a unified form of complex criteria to work out the tools for consistency estimation.

In the paper “*An Analysis of the Influence of Fundamental Indexing on Financial Markets Through Agent-Based Modeling: The Fundamentalist and Fundamental Indexing*” by Hiroshi Takahashi, an analysis of the influence of indices that are employed in the asset management business on financial markets through agent-based modeling is presented. The author has focused on a fundamental index being proposed as a new benchmark for investments. On the basis of this analysis, the author has achieved very interesting results.

The next paper entitled “*Agent-Driven Integration Architecture for Component-Based Software Development*,” by Sodany Kiv, Yves Wautelet, and Manuel Kolp, presents an architectural pattern for components integration, which has been used in a multi-agent system realizing an abstraction layer over the components. This multi-agent system allows one to functionally decompose and coordinate user requests with respect to available components.

In the seventh paper with title “*Adaptive Tutoring in an Intelligent Conversational Agent System*,” Annabel Latham, Keeley Crockett, David McLean, and Bruce Edmonds present an adaptive online conversational intelligent tutoring system called Oscar that delivers a personalized natural language tutorial. Owing to the intelligent algorithms, Oscar can dynamically predict and adapt to a student’s learning style during the tutoring conversation.

In the eighth paper entitled “*Biological and Computational Perspectives on the Emergence of Social Phenomena: Shared Understanding and Collective Power*,” Jan Treur presents an approach for building computational mechanisms to obtain human-like social agent models based on neurological concepts. The author has analyzed how these social agent models are indeed an adequate basis for the emergence of shared understanding and collective power in groups of agents.

The ninth paper entitled “*Egress Modeling Through Cellular Automata-Based Multi-Agent Systems*,” Olivier Szymanczyk, Tom Duckett, and Patrick Dickinson present a framework for building a spatial database approach and extending it by augmenting the social and environmental data. The authors then use this model to compute the navigational force acting on agents. They have also evaluated and validated the feasibility of the approach.

In the last paper, “*Approximate Algorithms for Solving O_1 Consensus Problems Using Complex Tree Structure*,” Marcin Maleszka and Ngoc Thanh Nguyen present a method for determining the integration of a set of data in complex and hierarchical structures. They have worked out an algorithm for calculating the consensus satisfying criterion O_1 , meaning that the sum of distances from the consensus to the given data elements should be minimal.

TCCI is a peer-reviewed and authoritative journal dealing with the working potential of CCI methodologies and applications as well as with emerging issues of interest to academics and practitioners. The research area of CCI has been growing significantly in recent years and we are very grateful to everyone within the CCI research community who has supported the *Transactions on Computational Collective Intelligence* and its affiliated events including the *International Conferences on Computational Collective Intelligence* (ICCCI). ICCCI 2012 was held in Ho Chi Minh City, Vietnam, in November 2012. After each event of ICCI, we invite authors of selected papers to extend them and submit them for publication in TCCI.

We would like to thank all the authors, the Editorial Board members, and the reviewers for their contributions to TCCI. We would also like to express our cordial thanks to the LNCS editorial staff of Springer and Alfred Hofmann for their support of the TCCI journal.

Transactions on Computational Collective Intelligence

This Springer journal focuses on research in applications of the computer-based methods of computational collective intelligence (CCI) and their applications in a wide range of fields such as the Semantic Web, social networks, and multi-agent systems. It aims to provide a forum for the presentation of scientific research and technological achievements accomplished by the international community.

The topics addressed by this journal include all solutions of real-life problems for which it is necessary to use CCI technologies to achieve effective results. The emphasis of the papers published is on novel and original research and technological advancements. Special features on specific topics are welcome.

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