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Guest editorial

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This special issue of *the Journal of Intelligent & Fuzzy Systems* consists of four papers inspired by *the Workshop on multi-agent systems, ontologies and conflict resolution* (*MASOCR*) that was held at KES'2004 Conference, 20–24 September 2004 in Wellington, New Zealand. The *MASOCR Workshop* was dedicated to conflict resolution methods and their application to distributed knowledge engineering, knowledge and ontology management, negotiation strategies, and semantic communication in multi-agent systems. Four detailed research problems discussed at the workshop and related to various aspects of processing of fuzzy and inconsistent knowledge have been chosen for this issue.

The first paper titled *Institutions in the opal multiagent system* has been written by a group of researchers from Otago University, New Zealand. Their names are Mariusz Nowostawski, Martin Purvis, Marcos De Oliveira and Stephen Cranfield and their paper extends substantially a brief presentation titled *A distributed model for institutions in open multi-agent systems* given at the *MASOCR Workshop*. In their work the authors argue that ontologies are primarily of practical use only within the domain of agent institutions and they outline how institutions are modeled and used in the OPAL agent platform that the authors are developing. As they write their work is dedicated to provide a general and robust framework for agent-oriented software engineering. Commitments and ontologies are important concepts and are treated in the paper as mechanisms implemented within institutions and multiagent systems to support coordinated activities and effective semantic communication. One section of this paper titled *Agent coordination, institutions, and ontologies* presents interesting references to philosophical background of their approach.

The next paper *On some properties of grounding uniform sets of modal conjunctions* has been written by one of the editors, Radoslaw Katarzyniak from Wroclaw University of Technology, Poland, and extends this author's brief communication titled *Soft implementations of epistemic satisfaction relations in communicative cognitive agents*. Comparing to the previous paper it discusses another social dimension underlying implementation mechanisms of semantic communication originated and accepted in the natural language discourse. The main practical result presented in this paper is that certain commonsense requirements related to simultaneous generation of sets of messages can be ensured in the technical sense or permanently prohibited in artificial communicative agents.

The third paper titled *Methods for achieving susceptibility to consensus for conflict profiles* has been written by the other guest editor Ngoc Thanh Nguyen from Wroclaw University of Technology, Poland. The author concentrates on his own approach to measuring the degree with which the content of knowledge pieces included into a certain profile of objects can influence the possibility of determining good consensus structures. This paper extends the presentation included into the *MASOCR Workshop* under the title *Deriving consensus for conflict situations with respect to its susceptibility* and prepared by Ngoc Thanh Nguyen and Michal Malowiecki from Wroclaw University of Technology, Poland. The main research and technical problem discussed in this paper covers possible criteria and methods for efficient rejections or transformation of objects from conflicting sets (consensus profiles) in order to transform these sets into the form ensuring actual possibility to derive socially acceptable consensus. Two strategies for achieving this target are presented and thoroughly discussed. The whole paper touches a subtle issue of what should be rejected from or at least modified in a given consensus profile to obtain the

quality of the resulting consensus. This paper is complementary to previous papers in this sense that another social dimensions of distributed knowledge processing is modeled and studied in precise formal way.

The fourth paper titled *An approach to resolving semantic inconsistency of multiple prepositional attitudes* by Radoslaw Katarzyniak and Agnieszka Pieczynska-Kuchtiak from Wroclaw University of Technology, Poland, has been devoted to the phenomenon of semantic inconsistency experienced by cognitive agents when sets of messages incoming from other sources of knowledge are internally interpreted. This type of inconsistency is naturally exhibited by sets of socially produced content and requires the strong reference to consensus methods. The originality of the presented approach follows from the assumptions that all messages uttered by members of considered multiagent systems are external representations of strictly subjective content stored in each actor of communication. In order to be resolved this type of inconsistency needs a previous translation of incoming external messages into their lower level representations, similarly to the approach known from the concept of linguistic variable and the idea of computing by words. The internal representations of messages are fuzzy sets corresponding to the idea of mental models.

The Guest Editors,
Ngoc Thanh Nguyen and
Radoslaw Piotr Katarzyniak
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