

Computational Intelligence in Knowledge Engineering

Guest Editors: Tianrui Li and Yang Xu

This special issue is dedicated to the 2007 International Conference on Intelligent Systems and Knowledge Engineering (ISKE2007) held on October 15-16, 2007 in Chengdu, China. ISKE has become a major forum of contacts between research scientists, engineers and practitioners in the area of intelligent systems for knowledge engineering. ISKE2007 is the 2nd in a series of conferences on Intelligent Systems and Knowledge Engineering held in China. It contains 284 final accepted papers from 797 online submissions for ISKE2007.

The present special issue includes seven revised and peer-reviewed extended papers selected from ISKE2007 to reflect the current development of computational intelligence in knowledge engineering. The first paper by Zhang et al. is entitled "An extended k th-best approach for referential-uncooperative bilevel multi-follower decision making". The authors present a model for the referential-uncooperative bilevel multi-follower (BLMF) decision problem. As the k th-best approach is one of the most successful approaches in dealing with normal bilevel decision problems, an extended k th-best approach is proposed to solve the referential-uncooperative BLMF problem with an illustrated example of logistics planning.

The second paper by Kolaczek and Juszczyszyn is entitled "Attack pattern analysis framework for multiagent intrusion detection system". The authors introduce the use of attack pattern ontology and formal framework for network traffic anomalies detection within a distributed multiagent intrusion detection system architecture. The proposed framework assumes an ontology-based attack definition and distributed processing scheme with exchange of communicates between agents. They present the role of traffic anomalies detection and discuss how some specific values characterizing network communication can be used to detect network anomalies caused by security incidents (worm attack, virus spreading).

The third paper by Martínez et al. is entitled "A knowledge based recommender system with multigranular linguistic information". The authors present a knowledge based recommender system that uses the fuzzy linguistic approach to define a flexible framework to capture the uncertainty of the user's preferences. The proposed framework allows users to express their necessities in scales closer to their own knowledge and different from the scale utilized to describe the items.

The fourth paper by Augusto et al. is entitled "Situation assessment in disaster management". The authors bring forward a framework for decision-making in relation to disaster management with a focus on situation assessment during disaster management monitoring. Further, they present a decision procedure to decide on those conflicting situations which not only provides a framework for the assistance of one decision-maker but also how to handle opinions from a hierarchy of decision makers.

The fifth paper by Vroman et al. is entitled "Using parametric functions to solve systems of linear fuzzy equations with a symmetric matrix". The proposed method solves linear fuzzy equations with a symmetric matrix. Ignoring the symmetry leads to an overestimation of the solution. Their method to find the solution of a system of linear fuzzy equations takes the symmetry of the matrix into account and is based on parametric functions. It is a practical algorithm using parametric functions in which the variables are given by elements of the support of the fuzzy coefficients of the system.

The sixth paper by Chen and Chen is entitled "Building an associative classifier based on fuzzy association rules". The authors extend the notions of support and confidence, along with the notion of compact set in dealing with rule redundancy and conflict. An associative classification approach, in line with classification with Fuzzy Association Rules (CFAR), is proposed to generate fuzzy association rules for classification. The experimental results revealed that CFAR

generated better understandability in terms of fewer rules and smother boundaries than the traditional CBA approach while maintaining satisfactory accuracy.

The seventh paper by Li et al. is entitled “A linguistic-valued weighted aggregation operator to multiple attribute group decision making with quantitative and qualitative information”. The authors propose a lattice-based linguistic-valued weighted aggregation (LVWA) operator for multiple attribute group decision making with non-totally ordered linguistic-valued information. Then they review and summarize some transformation functions for unifying different formats of preference information. An example is presented to illustrate how to use the LVWA operator and transformation functions for multiple attribute group decision making.

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Guangquan Zhang, Chenggen Shi, Jie Lu, An Extended k th-best Approach for Referential-Uncooperative Bilevel Multi-follower Decision Making

Grzegorz Kolaczek, Krzysztof Juszczyszyn, Attack Pattern Analysis Framework for Multiagent Intrusion Detection System

Luis Martínez López, Manuel J. Barranco, Luis G. Pérez, Macarena Espinilla, A Knowledge based Recommender System with Multigranular Linguistic Information

Juan Carlos Augusto, Hui Wang, Jun Liu, Situation Assessment in Disaster Management

Annelies Vroman, Glad Deschrijver, Etienne E. Kerre, Using Parametric Functions to Solve Systems of Linear Fuzzy Equations with a Symmetric Matrix

Zuoliang Chen, Guoqing Chen, An Efficient Approach to Classification Based on Fuzzy Association Rules

Xiaobing Li, Da Ruan, Jun Liu, Yang Xu, A Linguistic-valued Weighted Aggregation Operator to Multiple Attribute Group Decision Making with Quantitative and Qualitative Information