

Introduction to the Special Issue on Intelligent Agent and Knowledge Mining

The intersection between Computational Intelligence and Agent technology opens new significant scenarios in many application fields. In the formulation of Agent-based systems, the role of uncertainty is crucial for an efficient and coherent resolution of complex problems. In recent years there has been a growing awareness that Computational Intelligence handling of uncertainty in agents is equally important as other features of agent paradigm. In addition, the knowledge mining plays an important role in the intelligent agents. Knowledge mining is to extract desirable knowledge or interesting patterns from data with different formats for specific purposes. It has become a process of considerable interest in recent years, as the amounts of data in many databases have grown tremendously large. Many types of knowledge and technology have been proposed for knowledge mining.

This issue collects fully revised and extended versions of three contributions initially presented at the special session on (1) Intelligent Agent, held in Taiwan, on September 16-17, 2007, in the 12th Conference on Artificial Intelligence and Applications (TAAI 2007), (2) Ontology Application and Knowledge Management, held in Taiwan, on December 20-21, 2007, in 2007 National Computer Symposium, and (3) Intelligent Agent and Knowledge Mining, held in Singapore, on October 12-15, 2008, in the 2008 IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC 2008). It covers various facets of recent research at the intelligent agent, ontology, and knowledge mining.

This volume contains eleven papers that consider different aspects of perception based intelligent agent, ontology, and knowledge mining. The first three papers deal with ontology to apply to different research fields such as investment knowledge management, semantic web, and Capability Maturity Model Integration (CMMI). Applying Fuzzy Candlestick Pattern Ontology to Investment Knowledge Management by Chiung-Hon Leon Lee and Alan Liu proposes a fuzzy candlestick pattern based on ontology to assist in the candlestick pattern representation, storage, and reuse. Adaptable Distributed Ontology Alignment System by Chih-Hao Liu, Meng-Shium Tzou, Yong-Feng Lin, and Jason Jen-Yen Chen proposes an ontology alignment system with adjustable matching strategy and distributed processing to share the different ontologies across platforms and languages. The third paper A Novel Fuzzy CMMI Ontology and Its Application to Project Estimation by Mei-Hui Wang, Chang-Shing Lee, Zhi-Rong Yan, Hao-Han Chuang, Chi-Fang Lo, and Yi-Chen Lin proposes a novel fuzzy ontology for project planning and an ontology-based fuzzy agent, including a project planning ontology and a Takagi-Sugeno-Kang (TSK)-based project cost estimation, to estimate the total project cost.

The next five papers describe the application about the agent. In the fourth paper Single-Occupancy Simulator for Ambient Intelligent Environment by M. Javad Akhlaghinia, Ahmad Lotfi, Caroline Langensiepen, and Nasser Sherkat addresses the simulation of an occupant's behavior in a single-occupant ambient intelligent environment. The fifth paper Applying a Case-based Reasoning System Development Tool in the Design of BDI Agents by Ken Yen-Ru Cheng, Chiung-Hon Leon Lee, and Alan Liu, designs a Java Case-Based Reasoning Development Tools (JCBRDT) to make the system developers use CBR to export a Belief-Desire-Intention (BDI) agent, create a CBR system easily, and save the time on designing and maintaining the CBR system. The sixth paper Designing of an Autonomous Reinforcement Learning Agent for Dynamic Power Management in Embedded System by Cheng-Ting Liu and Roy Chaoming Hsu, describes a dynamic power management mechanism based on reinforcement learning agent to adaptively manage power consumption and service

achievability of an embedded system device. In Customized Advertising in E-Commerce Services Provision, Vincenzo Loia, Sabrina Senatore, Maria I. Sessa, and Mario Veniero introduce a web-centric system to provide a straightforward support to e-commerce market mediation through an agent-based architecture and fuzzy techniques. The paper Sentiment Classification for the Italian Language: a Case Study on Movie Reviews of Paolo Casoto, Antonina Dattolo, and Carlo Tasso evaluates the performance obtained by a set of high performance opinion polarity classifiers for the Italian language and a multi-agent is exploited to offer graph-centric views and navigation of the results.

The last three papers deal with the genetic algorithm and knowledge mining. In A GA-based Document Clustering Method for Search Engines Chun-Wei Tsai, Ming-Chao Chiang, and Chu-Sing Yang present a multiple search genetic algorithm to cluster the web pages returned by a search engine and provide a taxonomy of those web pages to the user. In the tenth paper A Modified Three-Phased Object-Oriented Mining Approach for Association Rules by Tzung-Pei Hong, Jun-Song Dong, and Wen-Yang Lin proposes a modified mining algorithm to derive association rules from object-oriented data with more pruning effects. In the last paper The Step Similarity Comparisons on Method Patents, Cheng-Yen Chen and Von-Wun Soo establish the technologies of automatic similarity analysis and comparison of two method patents in order to reduce the cost and human efforts.

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