

Special Issue on Parallel Architecture, Algorithms and Programming

Guest Editorial

International Conferences on Computational Intelligence and Security (CIS conferences) are high quality annually international conferences originated from 2005, and most of CIS2005 to CIS2011 received more than 700 submissions, but the rate of accepted papers for almost CIS conferences was fewer than 20%. CIS'2011 was held in Sanya, Hainan Province, China on December 3-4, 2011. In recent years, there has been a growing interest in the field of computational intelligent and security as well as their applications. Many novel algorithms and their new applications have been developed. They are widely applied to our daily life to solve realistic problems in various fields including science, engineering, management and games. The aim of CIS2011 is to bring together researchers, engineers, developers and practitioners working in two crucial fields: computational intelligence (CI) and information security (IS), to share the experience, exchange and cross-fertilize ideas. In this special issue, we try to select a part of high quality extended and revised papers from CIS2011 on new computational algorithms and their new applications. The details of these selected papers are briefly introduced as follows:

1. In a synchronization problem on a class of supply chain complex networks authored by Xiaobing Gan and Jingyi Wang, a class of the supply chain problems was modeled as a complex network with nonlinearly coupled identical nodes. Then the global adaptive synchronization problem on this class of supply chain problems is studied, and a practical sufficient condition for the global synchronization is given. The computer simulations demonstrate the effectiveness of the theory.
2. In solving constrained optimization problems with a hybrid genetic algorithm Genetic algorithm authored by Dalian Liu, Xiao-hua Chen and Jin-ling Du, a new fitness function based hybrid genetic optimization algorithm for constrained optimization problems is proposed. In designing crossover operator, Union Design is employed; In designing new fitness function, the smooth function technique is adopted. Experiments on benchmark problems are made and the results indicate the proposed algorithm can not only quickly converge to optimal or near-optimal solutions, but also have a high performance.
3. In New Heuristic Algorithm of RNA Structure Prediction Including Pseudoknots authored by Zhendong Liu and Daming Zhu, an improved heuristic algorithm is presented to predict RNA pseudoknotted structure, and it can compute arbitrary pseudoknots. The algorithm requires $O(n^3)$ time and $O(n^2)$ space, and widens the maximum length of the RNA sequence. The preliminary experiment shows that the algorithm is more effective than the existing algorithms.
4. In A Hybrid Simplex Multi-Objective Evolutionary Algorithm Based on A New Fitness Assignment Strategy authored by Xiaofang Guo and Yuping Wang, a new algorithm is proposed for multi-objective optimization problems, which adopts a new fitness assignment strategy using the information of the individual preference order ranking and the individual density. In this way, it is helpful to guide the individuals to more sparse areas in the Pareto Front.
5. In Transactional Automaton-driven Web Services Selection authored by Weitao Ha, selection rules based on transactional properties of service is defined first. An automaton model to implement transactional-aware service selection is set up. Experimental results are also presented.
6. In An Adaptive Multiobjective Differential Evolution Algorithm authored by Fangqing Gu and Hailin Liu, An local and global mutation operator based subregion and external set strategies are proposed, and a novel crossover operator based subregion and external set strategy also is introduced. Based on these, an adaptive multiobjective differential evolution algorithm is proposed.
7. In A fuzzy portfolio model considering transaction costs authored by Jianhui Yang, Yuan Wang, the portfolio selection problem is tackled when the expected return rates and risks are fuzzy. Firstly, a fuzzy linear portfolio model is established, Then, the fuzzy linear programming problem is transformed into a multi-objective linear programming problem and its analytic solution is obtained. Finally, the experiments are made on actual Chinese stock market data to demonstrate the effectiveness of the proposed model.
8. In MOEA/D with Uniform Design for the Multiobjective 0/1 Knapsack Problem authored by Yanyan Tan and Yongchang Jiao, A new version of MOEA/D with uniform design is successfully applied to solve multiobjective 0/1 knapsack problem, and the experiments on some difficult test problems demonstrate the effectiveness of the proposed algorithm.
9. In The simulation of electromagnetic suspension system based on the finite element analysis authored by Zhengfeng Ming, Tao Wen and Tuo Chen, the large air gap electromagnetic suspension system model is accurately divided into the mesh by the method of the finite element analysis, then the electromagnetic force of the suspended matter in the system is calculated. Finally, the experiments are conducted.
10. In The Effect of the Number of Features to Supervised Chinese Word Sense Disambiguation authored by Pengyuan Liu, the effect of the number of features to supervised Chinese word sense disambiguation is studied through thousands of experiments on Semeval 2007 Multilingual Chinese-English Lexical Sample task dataset. It shows that local basic feature provides adequate information to do disambiguation and the influence of data sparseness is not so

important as we thought before.

11. In An IPsec Accelerator Design for a 10Gbps In-Line Security Network Processor authored by Yun Niu, Liji Wu and Xiangmin Zhang, a high performance IPsec accelerator used in a 10Gbps in-line network security processor (NSP) is presented. The design integrates the protocol processing and the cryptographic processing; the transport/tunnel mode of the AH, ESP security protocols and the AES, HMAC-SHA-1 cryptographic algorithms is realized by hardware.

12. In Multi-Agents Model and Simulation for the Evolution of Industrial Clusters authored by Yajuan Yang and Wenxue Niu, a multi-agent system model is constructed, and industrial clusters are formed as a conceptual system which corresponds a virtual multi-agent system. Moreover, the basic genetic algorithm is employed as an agent's intelligent learning algorithm.

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