Preface

This special section is based on collaborative research results accomplished by the two teams under the support by the International Partnership Programs for Creative Research Teams, funded by the Chinese Academy of Sciences and State Administration of Foreign Experts Affairs. The two teams are on Intelligence and Security Informatics and Advanced Computer Systems and Architectures, respectively. The papers selected for this special section are peer-reviewed through the normal review process of the JCST.

The first group consists of five contributions, which record recent progress in the representative growing fields of security informatics and social computing. The first paper, "Customer Activity Sequence Classification for Debt Prevention in Social Security", by Huaifeng Zhang *et al.*, proposes a novel hierarchical algorithm for sequence classification using discriminative sequential patterns. The algorithm first mines for the sequential patterns that are most strongly correlated to each target class, and then employs pattern pruning and coverage test to select the mined patterns. The patterns that pass the test in each loop are used to form sub-classifiers at different levels of the final classifier. The authors apply the proposed algorithm to the prediction of debt occurrences based on customer activity sequence data, and show the efficiency and effectiveness of the algorithm in real-world social security application.

Security informatics and social computing are faced with the same research challenge of analyzing huge amounts of data from various information sources. Machine learning methods play a critical role in such domains. "Performance Evaluation of Machine Learning Methods in Cultural Modeling", by Xiao-Chen Li *et al.*, investigates the performance of representative classification methods in cultural modeling and analyzes the empirical results as to group behavior forecasting using benchmark cultural data sets. Cultural modeling addresses important research issues such as the discovery of the correlation between cultural factors and organizations' behavior, efficient and effective identification of behavioral patterns of organizations from tons of cultural-related data, and the prediction of organizational behavior based on the cultural context.

Due to the data characteristics and information overload, data mining techniques have become popular in recent years. However, many information-intensive, knowledge-critical domains in security informatics and social computing require a pervasive data analysis platform so that decisions can be made rapidly under distributed and dynamic system environments. "Ubiquitous Mining with Interactive Data Mining Agents", by Xin-Dong Wu *et al.*, presents an interactive data mining agent — OIDM, which provides three categories (i.e., classification, association analysis and clustering) of data mining tools, and interacts with the user to facilitate the mining process. OIDM can help users find appropriate mining algorithms, refine and compare the mining process and finally achieve the best mining results, so that security informatics and social computing applications can benefit from it.

As a typical representation of social computing and Web 2.0 application, collaborative social annotation systems allow users to record and share their original keywords or tag attachments to Web resources. These annotations are a method for organizing and labeling information, however, there exist problems such as spam and synonymous annotations. "Exploring Social Annotations with the Application to Web Page Recommendation", by Hui-Qian Li *et al.*, discusses the advantage of organizing social annotations from semantic perspective and embedding them into algorithms for knowledge discovery. The authors propose four graphic models in which user, Web page and annotation clusters are associated based on real users' surfing and annotating activity patterns. The experimental results show that the graphic models outperform the classical methods and are robust for the real applications.

In recent years, the scope of social computing has expanded tremendously, with almost all branches of software research and practice strongly feeling its impact. The last paper in this group, "Innovative Batik Design with an Interactive Evolutionary Art System", by Yang Li *et al.*, explores the use of Interactive Evolutionary Algorithm (IEA) in an art system, with the goal of enhancing user's creativity to generate innovative Batik-like patterns. In the paper, first, a new representation is proposed to capture the features in Batik and create innovative patterns through evolutionary processes; second, an out-breeding mechanism is applied to the system, in order to sustain user's interests for a longer period. The authors develop the first Batik design system, and the experimental results show its effectiveness and potential in evolving novel Batik design.

The second group of this special section contains four research papers on advanced computer systems and architectures. They represent recent progress in system-level simulation, many-core architecture, design for reliable Network-on-Chip (NOC), and DRAM row buffer locality optimization.

The paper "SimK: A Large-Scale Parallel Simulation Engine" by Jian-Wei Xu *et al.* proposes a parallel simulator engine (SimK) towards the prevalent SMP/CMP platform, which aims at large-scale fine-grained computer system simulation. Based on SimK, large-scale parallel simulators HppSim and HppNetSim have been developed, which can simulate a full supercomputer system and its interconnection network respectively.

The paper "Godson-T: An Efficient Many-Core Architecture for Parallel Program Executions" by Dong-Rui Fan *et al.* proposes a many-core architecture, Godson-T. It features a region-based cache coherence protocol, asynchronous data transfer agents and hardware-supported synchronization mechanisms, to provide full potential for high efficiency of the on-chip resource utilization.

The paper "Selected Crosstalk Avoidance Code for Reliable Network-on-Chip" by Ying Zhang *et al.* proposes a reliable NOC design using a code with the capability of both crosstalk avoidance and single error correction. It can handle possible error caused by either crosstalk effects or single event upset (SEU). In comparison with previous crosstalk avoidance methods, the proposed method can reduce wire overhead, power dissipation and the total delay.

The paper "PARBLO: Page-Allocation-Based DRAM Row Buffer Locality Optimization " by Wei Mi *et al.* proposes a new page-allocation-based optimization that works seamlessly together with some existing hardware and software optimizations to eliminate significantly more row buffer conflicts. The proposed method can reduce row buffer miss rates by up to 76%, and translates into performance speedups by up to 15%.

The guest editors hope that the perspectives, technological developments, research findings and empirical findings as presented in this special section will help encourage exciting research on the related fields. We thank all contributing authors and reviewers for their hard work. In particular, we thank the Journal of Computer Science and Technology editorial staffs for their significant assistance in the process.

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