

Special Issue on Selected Papers of the 9th International Conference for Young Computer Scientists (ICYCS 2008)

Guest Editorial

The theme of the 9th International Conference for Young Computer Scientists (ICYCS 2008) is Computer and Communications Frontiers (CCF). The combination of computing technologies and communications services will benefit modern people with more convenient and better lives. Following the tradition and success of previous ICYCS conferences, ICYCS 2008 provides an international forum for scientists and engineers in academia and industry to exchange and discuss their experiences, new ideas, research results, and applications on all aspects of computer science and technology and its related disciplines. We selected 10 papers with extensive extensions from the conference for publication in this special issue.

In the first paper entitled "Measuring Software Component Reusability by Coupling and Cohesion Metrics", G. Gui and Paul. D. Scott proposed a set of new static metrics of coupling and cohesion developed to assess the reusability of Java components retrieved from the Internet by a software component search engine. These metrics differ from the majority of established metrics in three respects: they measure the degree to which entities are coupled or resemble each other, they quantitatively take account of indirect coupling and cohesion relationship, and they also reflect the functional complexity of classes and methods.

In the second paper entitled "A Method for Surface Reconstruction Based on Support Vector Machine", Lianwei Zhang, Wei Wang, Yan Li, Xiaolin Liu, Meiping Shi, and Hangen He proposed a method for reconstructing surface based on support vector machine (SVM). In order to overcome the inefficiency of SVM, a feature-preserved nonuniform simplification method is employed to simplify cloud points set, which is reduced while the feature is preserved after simplification. Then a reconstruction method based on segmented data is proposed to accelerate SVM regression process from cloud data.

In the third paper entitled "Distribution Network Reconfiguration Based on Particle Clonal Genetic Algorithm", Yemei Qin and Ji Wang proposed particle clonal genetic algorithm (PCGA) to build particle swarm algorithm (PSO) mutation operator in order to solve mutation probability and slow the convergence of clonal genetic algorithm (CGA) in the later stage. PCGA avoids the premature convergence of PSO and the blindness of CGA. The global optimal solution can be obtained with fewer generations and shorter searching time.

In the fourth paper entitled "Visually Lossless Accuracy of Motion Vector in Overcomplete Wavelet-based Scalable Video Coding", Chuan-Ming Song, Xiang-Hai Wang, and Fuyan Zhang proposed a visually lossless accuracy model for scalable coding of motion vectors in overcomplete wavelet-based scalable video codec. By exploiting theory of stationary random process, this paper first estimated motion compensation errors in spatial domain due to inaccurate motion vectors. This paper then extended the results to overcomplete wavelet domain, and further derived the errors caused by fraction-pixel motion vectors. Finally, by combining with a visibility model of wavelet coefficient errors, this paper proposed a novel algorithm to estimate the accuracy threshold of motion vectors with which motion compensation errors will be invisible.

In the fifth paper entitled "Modeling Complex System Using T-subnet based Hierarchical Petri Nets", Zhijian Wang and Dingguo Wei proposed a kind of transition subnet to model complex manufacturing system in order to provide the same service and interface after transformation as original module. The concept "standardized interface" is presented; transition subnets are classified into different types, and the idea of "normalized subnet" is presented; and engineering subnet is defined and a live and normalized subnet with finite live loopbacks is proved to be an engineering subnet. Because of live loopbacks owned by engineering subnets, the same interface and service as the original module are reserved after the transformation between an engineering subnet and the corresponding transition, mean while fewer preconditions are required for the engineering subnet compared with current researches.

In the sixth paper entitled "An Automated Mechanism for Secure Input Handling", Jin-Cherng Lin and Jan-Min Chen presented an integral sanitizing mechanism consisting of application-level security gateway, injection testing framework, and enhanced crawler to reduce the error rate of detection. To mitigate the defects, the hybrid analysis module can cooperate with testing framework to perform injection test to generate a vulnerable list. Only the Web pages that are in a list need to be checked so the system load and false positives can mitigate effectively. Moreover, the authors proposed a mechanism that can automatically create meta-programs and adjust the sanitizing rule of every vulnerable injection point.

In the seventh paper entitled "Data Management of Mobile Object Tracking Applications in Wireless Sensor Networks", Jin Zheng, Weijia Jia, and Guojun Wang proposed link-segment storage and query protocol to track mobile object in wireless sensor network dynamically. The main idea of the protocol is to combine advantages of local storage with data centric storage methods to support the query of object movement information efficiently. Object's movement information will be stored in node near detecting sensor and the relation of storage nodes is maintained using multiple access entry linked list along the moving path of the object. Index-store node (a designated node) stores the access entry

messages of linked list. Users can obtain tracking information of object from a part of linked list according to query request.

In the eighth paper entitled “SOBIE: A Novel Super-node P2P Overlay Based on Information Exchange”, Zhigang Chen, Jiaqi Liu, Deng Li, Hui Liu, and Athanasios Vasilakos proposed a novel super-node overlay based on information exchange called SOBIE in order to guarantee both the efficiency and robustness in the Peer-to-Peer (P2P) network. Differing from current structured and unstructured, or meshed and tree-like P2P overlay, the SOBIE is a whole new structure to improve the efficiency of searching in the P2P network.

In the ninth paper entitled “Trust-Based Constraint-Secure Interoperation for Dynamic Mediator-Free Collaboration”, Lingli Deng, Ziyao Xu, and Yeping He presented the requirements for constraint-secure interoperation, prohibiting implicit authorizations that break constraints from other member domains. The authors proposed a trust-based framework to implement constraint-secure interoperation with differential trust relations between member pairs in open collaborative scenarios. The authors also provide algorithms of a fully distributed implementation, security proofs and demonstrative usage cases for the proposed solution.

In the last paper entitled “Improved Resource Allocation Algorithms for Practical Image Encoding in a Ubiquitous Computing Environment”, Mianxiong Dong, Long Zheng, Kaoru Ota, Song Guo, Minyi Guo, and Li Li proposed UMP-PerComp, a Ubiquitous Multiprocessor-based pipeline processing architecture to support high performance pervasive application development. The authors studied resource allocation policies that can improve the overall performance of the system and considered those static and dynamic allocation approaches and then proposed four different allocation algorithms by exploring various cache policies which include disabled cache, unrestricted cache and restricted cache.

We would like to express our sincere gratitude to all the authors and reviewers who made this special issue possible. We hope you enjoy this issue.

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