Special Issue on Recent Trend in Computational Method

Guest Editorial

This special issue is partly associated with the 2010 International Work Shop on Information Security and Applications (IWISA 2010) and 2010 Symposium on Cryptography, Data mining, E-commerce and Embedded systems (CDEE 2010), which was held in Yanshan University Qinhuangdao, China in October 2010. While some other manuscripts are solicited from the authors who are not participants of the conference. The purpose of this special issue is to provide a fast publication of high-quality conference papers on computer software or related to computer software and also the papers from authors with original high-quality contributions that have neither been published in nor submitted to any journals or refereed conferences. Papers are mainly interdisciplinary research in computer software related theory and computer software related techniques to unsolved problems.

We received 31 papers from around the world and selected 11 to be included in the special issue after a thorough and rigorous review process. The presented papers are mainly devoted to discussion on Algorithm, Knowledge Discovery, Data mining, Matlab Application, and Cloud Computing or using software related algorithms to solve problems in other area.

In "Incremental Learning Algorithm for Support Vector Data Description", Xiaopeng Hua et al. analyzes the possible changes of support vector set after new samples are added to training set according to the relationship between the Karush-Kuhn-Tucker (KKT) conditions of SVDD and the distribution of the training samples. Based on the analysis result, a novel algorithm for SVDD incremental learning is proposed. In this algorithm, the useless sample is discarded and useful information in training samples is accumulated. Experimental results indicate the effectiveness of the proposed algorithm.

In "A Super Data-sharing Model in Common Platform of Geographic Information", Xin Liu et al. put forward a data-sharing model in the common platform of geographic information. The data model architecture in the common platform is mainly compose of the entity-oriented vector data model in the three-dimensional space, the layer and tile pyramid grid data, the relationship table or WORD files and so on. The data model was realized in C/C++ development environment in Windows XP.

In "Modeling and Analysis of Electronic Commerce Protocols Using Colored Petri Nets", Yang Xu et al. propose a new method synthesizing ZQ logic and Colored Petri Nets to analyze electronic commerce protocols. The new method is shown to be suitable for analyzing both accountability and fairness. The new method needs not to establish a dispute settlement model. Moreover, the ISI protocol is chosen to illustrate how an electronic commerce protocol is analyzed using the new method.

In "Design and Implementation of Coastal Zone Remote Sensing Information Extraction Platform", Rui-fu Wang et al. analyze the requirements of coastal zone information extraction software, designs the coastal zone information extraction software. This paper showes that the function of the software includes management of the targets interpreting marks and displaying in extracting procession, management of target type codes and evaluation code value automatically, editing coastal zone vector data, shorelines extraction automatically, 3D terrain displaying and reference for the information etc. At last, this article builds coastal zone remote sensing information extraction platform based on .NET and ArcEngine development platform.

In "Analysis of the Aerosol Optical Depth and the Air Quality in Qingdao, China", Jinshan Zhu et al. discussed MODIS data for Qingdao, Shandong province. They adopted further software techniques to extract data that cover this area. The Air Pollution Index (API) which is obtained from China National Environmental Monitoring Centre is used to collect API in the same time range. The paper also discussed the relationship between AOD and API.

In "An Algorithm of Unsupervised Posture Clustering and Modeling Based on GMM and EM Estimation", Chuanxu Wang focuses on human posture clustering and modeling for human action recognition in the field of computer vision. Specifically he mainly talk about posture description with spatial temporal interesting point features rather than traditional posture segmentations; also he gives the comparisons of four kinds of unsupervised clustering methods and continue to carry out unsupervised posture classifications based on Weizmann database. In the following he uses GMMs based on EM algorithm to model each clustered posture type. Finally he tests his method with Weizmann and KTH Action database. These experiments show its effectiveness and robustness.

In "Face Segmentation Based on Skin Color in Complicated Background and Its Sex Recognition", Chuanxu Wang focuses face detection based on skin color feature in complicated background. He assumes that skin pixels in each frame are closed together as a "dot cloud" in a color space, its shape evolution from frame to frame is modeled as the mixture of translation, scaling and rotation. This paper introduces linear combination of forecasts to predict these parameters related to the above shape evolutions, so that skin distribution of next frame to be segmented can be predicted and skin segmentation for face detection can be improved against illumination variations.

In "On Formalism of Continuous Knowledge Discovery and Temporal Granularity", a continuous knowledge discovery process is introduced by Ding Pan for inducing the local first-order rules and global evolutional rules, to trace

dynamic evolution patterns firstly. The definitions of main notions (event, sequence pattern, temporal rule) are proposed in a formal way, based on first-order linear temporal logic and temporal granularity. The measures of support and confidence about ranged degree of truth of a formula are established. The formalism defines the valuation on a linear state structure with time granules. By defining transition operation between temporal types, it is proved that only the independent information for unspanned-granule may be transferred without loss among different granularities. Otherwise, an aggregation mechanism was proposed to state sequence.

In "Applications of Matlab in Mathematical Analysis", Gao Feng discussed the wide applications of Matlab in international academia. It is well known that Matlab has already been accepted as an accurate and reliable standard computational soft ware. It is widely applied in applied algebra, statistics processing, automation and digital communication. Matlab has also been incorporated into the study of calculus. In this paper, the author demonstrates Weierstrass function which has the property of being continuous everywhere but differentiable at no where, the graph of Weierstrass function is given by the use of Matlab. Besides, the author studied the numerical approximation of π by using Matlab and Romberg method.

With the rapid development of internet, cloud computing rapidly becomes the next round of growth wave in IT industry. In "The trend of cloud computing in China ", Chunmei Chi et al. introduce some recent trends in the cloud computing in China. They analyze the policy, the related companies, the advantages of this sector, the services and also some technological problems existed in this area.

RFID security and RFID anti-collision are research hotspots of RFID technology in the internet of things. Most of the existing studies take them as separated parts and study them independently. In "The design and realization of a Lightweight RFID Mechanism Integrating Security and Anti-collision", Yu Songsen et al. attempt to deal with them as a whole, with a strategy integrating lightweight random key double-authentication and dynamic slot-ALOHA protocol. The processing mechanism, performance comparison and algorithm realization are given in this paper. The new mechanism not only maintains the advantage of rapid tag identification, but also has the ability to resist re-transmission attack, tracking-attack, blocking-attack, tampering-attack and so on. It has high safety and practicality..

Hopefully, this Special Issue will contribute to enhancing knowledge in many diverse areas of the software and software related area. The author wishes to extend his thanks to Dr. Xijun Zhu who have done a lot of work in soliciting papers to this special issue, and to all those who kindly participated as peer reviewers. Their involvement was greatly appreciated.

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