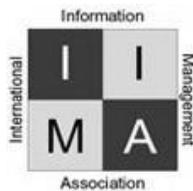# The 3rd International Conference on Computer Engineering and Network

July 20-21,2013,Shanghai,China

Conference Program

Co-Sponsored by

CENet2013

会议日程安排表 Conference Program

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7 月 19 日 19th July p.m.   周五 Friday p.m.   签到 Registration

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7 月 20 日 20th July a.m.   周六 Saturday a.m.

07:30—09:00	签到，领取会议材料 Register, Approach	康健楼 2 楼 The 2rd floor of Kangjian Building
09:00—09:20	开幕式 Opening Ceremony	康健楼 2 楼 The 2rd floor of Kangjian Building
09:20—10:00	大会嘉宾演讲 Keynote Speech	康健楼 2 楼 The 2rd floor of Kangjian Building
10:00—10:20	茶歇 Tea Break	康健楼 2 楼 The 2rd floor of Kangjian Building
10:20—11:40	大会嘉宾演讲 Keynote Speeches	康健楼 2 楼 The 2rd floor of Kangjian Building
11:40—12:00	集体照 Collective photography	综合楼大门 The door of Complex Building
12:00—13:30	自助午餐 Buffet Lunch	康健楼 2 楼餐厅 The 2rd floor of Kangjian Building

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7 月 20 日 20th July p.m.   周六 Saturday p.m.

13:30—15:20	讲座：如何利用 SCI 进行课题创新发表高水平论文 Lecture: How to use SCI for subject innovation and publishing high-quality papers	综合楼 2 楼 2 号会议室 No.2 conference room on the second floor of Complex Building
15:20—15:40	茶歇 Tea Break	综合楼 2 楼 2 号会议室 No.2 conference room on the second floor of Complex Building

15:40—17:00	分会场报告 A Technical Sessions A	综合楼 2 楼 5 号会议室 No.5 conference room on the second floor of Complex Building
17:30—20:00	晚宴 Banquet	康健楼 2 楼餐厅 The 2rd floor of Kangjian Building

7 月 21 日 21th July a.m.   周日 Sunday a.m.

09:00—10:20	分会场报告 B、C Technical Sessions B、C	综合楼 2 楼 2 号、5 号会议室 No.2 and No.5 conference room on the second floor of Complex Building
10:20—10:40	茶歇 Tea Break	综合楼 2 楼 2 号、5 号会议室 No.2 and No.5 conference room on the second floor of Complex Building
10:40—12:00	分会场报告 B、C Technical Sessions B、C	综合楼 2 楼 2 号、5 号会议室 No.2 and No.5 conference room on the second floor of Complex Building
12:00—13:30	自助午餐 Buffet Lunch	康健楼 2 楼餐厅 The 2rd floor of Kangjian Building

7 月 21 日 21th July p.m.   周日 Sunday p.m.

13:30—17:00	参观工厂 visit the factory	上海 Shanghai

大会嘉宾介绍 **Keynote Speakers Resume**

Samuel Keene

Dr. Sam Keene is a Past President of the IEEE Reliability Society and continues to serve on its Advisory Committee. He also serves on the Board of Directors of the IEEE Technology Management Council. Dr. Keene received the 1996 "Reliability Engineer of the Year," the Allan Chop Education award from the American Society of Quality in 1999, and the IEEE Education Award in 2000. He was also recognized with the IEEE Millennium Metal and by the FAA for distinguished Service on the WAAS flight navigation system reliability.

Dr. Keene holds the office of Fellow of the IEEE for his technical accomplishments. He has produced ten video tutorials on different aspects of software development, software reliability and concurrent engineering for NASA, NTU, and the IEEE. He has published over 200 technical papers and several book chapters. Dr. Keene was the co-principal developer of the PRISM reliability model and has worked on updates of the MIL HDBK 217 models. He has been a Six Sigma Senior Master Black Belt since 1999. Dr. Keene received his PhD is in Operations Research from the University of Colorado.

Title:

Six Sigma Requirement Development Tools Assure More Reliable Software

Abstract:

Six Sigma is thought of as a quality improvement tool that uses the best statistical and process improvement tools. The Six Sigma goal is to have no more than 3.4 defects per million opportunities. That is the Six Sigma quality level target. Design for Six Sigma (DFSS) wants to be pro-active and use the best development practices to produce high quality products. This presentation will demonstrate 6 preferred tools to promote better product designs.

Yang Xiao

Dr. Yang Xiao worked in industry as a MAC (Medium Access Control) architect involving the IEEE 802.11 standard enhancement work before he joined academia. Dr. Xiao currently is a professor of Department of Computer Science at The University of Alabama. He was a voting member of IEEE 802.11 Working Group from 2001 to 2004. His research areas are security and communications/networks. He has published more than 200 refereed journal papers and over 200 refereed conference papers and book chapters related to these research areas. He currently serves as Editor-in-Chief for International Journal of Security and Networks (IJSN) and International Journal of Sensor Networks (IJSNet) (SCI-index). Dr. Xiao had directed 8 doctoral dissertations in the past and is currently supervising 7 Ph.D. students/candidates in computer security and networking areas. Dr. Xiao also supervised 19 M.S. graduates in the past.

Title:

Heterogeneous Mobile and Static Sensor Networks

Abstract:

Although previous bio-inspired models have concentrated on invertebrates (such as ants), mammals such as primates with higher cognitive function are valuable for modeling the increasingly complex problems in engineering. Understanding primates' social and communication systems, and applying what is learned from them to engineering domains is likely to inspire solutions to a number of problems.

This talks introduce studying and modeling modes of group behavior and communication of coppery titi monkeys, rhesus macaques, and other primate models, and applying what the investigators learn to the distributed control of heterogeneous mobile and static sensor networks including assessment of the effectiveness of small and large group formations in heterogeneous mobile and static sensor networks, development of bio-inspired message-based communications, and development of bio-inspired behavior-based communications.

Zhanquan Sun

Prof. Zhanquan Sun associated professor of Shandong Computer Science Center, got doctor degree from Institute of Automation, Chinese Academic of Sciences at 2007, and went to Indiana University Bloomington to do one year visiting scholar in 2011. My research mainly concentrate on big data science, intelligent transportation systems, and cloud computing. Has presided and attended 10 research projects and published about 40 academic papers.

Title:

Large-scale data mining methods study based on MapReduce

Abstract:

With the development of electronic and computer technology, the quantity of electronic data is in exponential growth. Data deluge has become a salient problem to be solved. How to take full use of these large scale data to support decision is a big problem encountered by scientists. Data mining is the process of discovering new patterns from large data sets. It has been studied by many scholars in all kinds of application area for many years and many data mining methods have been developed and applied to practice. However, most classical data mining methods are out of reach in practice in face of big data. Efficient parallel algorithms and implementation techniques are the key to meeting the scalability and performance requirements entailed in such large scale data mining analyses. MapReduce is taken as the most popular techniques to deal with data intensive problems. Several MapReduce architectures are developed now. The most famous is the Google, but the source code is not open. Hadoop is the most popular open source MapReduce software. The MapReduce architecture in Hadoop doesn't support iterative Map and Reduce tasks, which is required in many data mining algorithms. Professor Fox developed an iterative MapReduce architecture software Twister. It supports not only non-iterative MapReduce applications but also an iterative MapReduce programming model. The project mainly studied parallel Support Vector machine, clustering method and feature selection method based on Twister. The developed parallel methods are applied to analyze intelligent transportation and DNA data.

Yuehua Wan

Prof. Yuehua Wan serves as director of Information Inquiry of Zhejiang University of Technology Library. He has years of experience in teaching and scientific research and has been going into depth into information resource development and utilization in scientific research. Prof.. Wan has accumulated rich experience of applying national fund and Doctoral Scientific Fund and writing and publishing SCI papers. He has published more than a dozen books and more than 80 papers, including more than 30 SCI, EI and ISTP papers. He undertook and participated in national foundation of 2, Zhejiang provincial fund of 2 and Zhejiang provincial social planning of 2.At present, he holds senior advisor of Thomson Reuters and content selection committee member of Elsevier Scopus. He is also a reviewer of many journals at home and abroad as well. More than 40 colleges and universities once invited him to contribute and produce subject application report, such as University of Science and Technology of China, Huazhong University of Science and Technology, China Agricultural University, Central South University and Hunan University.

Lecture:

How to use SCI for subject innovation and publishing high-quality papers

分会场报告 Technical Sessions

分会场报告 A： 网络应用（7月20日15:40--17:00）

Technical Sessions A: Network Application (July 20th p.m. 15:40--17:00)

Session A	Presentation Topic	Presentaters
N111	Design of Mobile Electronic Payment System	Ting Huang
N114	The Human Role Model of Cyber Counterwork	Fang Zhou
N159	Power-saving Based Radio Resource Scheduling in Long Term Evolution Advanced Network	Yen-Wen Chen
N240	Multi-Layered Reinforcement Learning Approach for Radio Resource Management	Juan-Luis Gorricho
N273	A Proposed Methodology for an E-health Monitoring System Based on a Fault-tolerant Smart Mobile	Ben Soh
N279	Verification of UML Sequence Diagrams in Coq	Ying Zuo
N358	Network Design of a Low-power Parking Guidance System	Rongjie Wu
N475	Network Communication Forming Coalition - S4n-Knowledge Model Case	Takashi Matsuhisa

分会场报告 B: 系统实现（7月21日9:00--12:00）

Technical Sessions B: System Implement (July 21th a.m. 9:00--12:00)

Session B	Presentation Topic	Presentaters
N241	A Network Access Security Scheme for Virtual Machine	Chengshuo Xu
N392	A Low Voltage 5.8-GHz Complementary Oxide-mental Semiconductor Transceiver Front-end Chip Design for Dedicated Short-range Communication Application	Jhin-Fang Huang
N409	A 5.8-GHz Frequency Synthesizer with Dynamic Current-matching Charge Pump Linearization Technique and an Average Varactor Circuit	Jhin-Fang Huang
N466	The Storage of Wind Turbine Mass Data Based on MongoDB	Qile Wang
N484	Improvement of Extraction Method of Correlation Time Delay Based on Connected-element Interferometry	Fei Wang
N486	An Optimization Model of the Layout of Public Bike Rental Stations Based on B+R Mode	Liu He
N531	Modeling of Train Control Systems Using Formal Techniques	Bingqing Xu

N535	A mechanism of transforming Architecture Analysis and Design Language into Modelica	Shuguang Feng
N550	Visualization of Clustered Network Graphs Based on Constrained Optimization Partition Layout	Fang Huang
N559	An Ultra-Wideband Cooperative Communication Method Based on Transmitted Cooperative Reference	Tiefeng Li

分会场报告 C: 算法应用（7月21日9:00--12:00）

Technical Sessions C: Algorithm Application (July 21th a.m. 9:00--12:00)

Session C	Presentation Topic	Presentaters
N127	Loading Data into HBase	Juan Yang
N213	Parallel Feature Selection Based on Map Reduce	Zhanquan Sun
N222	Extraction Method of Gait Feature Based on Human Centroid Trajectory	Xin Chen
N233	Static Image Segmentation Using Polar Space Transformation Technique	Xuan Luo
N299	Classification Modeling of Multi-featured Remote Sensing Images Based on Sparse Representation	Xiaoting Hao
N381	The Universal Approximation Capability of Double Flexible Approximate Identity Neural Networks	Saeed Panahian Fard
N418	A Transforming Quantum-inspired Genetic Algorithm for Optimization of Green Agricultural Products Supply Chain Network	Chunqin Gu
N485	A Recommendation System for Paper Submission Based on Vertical Search Engine	Zhen Xu
N546	CoCell: A Low Diameter, High Performance Data Center Network Architecture	Peng Wang
N557	Geographic Information System in the Cloud Computing Environment	Yichun Peng

分会场主席 Section Chair

7月20日下午 July 20th p.m.		7月21日上午 July 21th a.m.	
Session A	Xiaoqing Geng	Session B	Liu He
		Session C	Yongxiang Liu

会场信息 Conference Information

会场交通地图 The Traffic Map of Conference Hotel

会场三维地图 Three-Dimension Map of Conference Venue

CENet2013

会议地点及交通 Conference Location and Traffic

会议地点：上海名人苑宾馆
Conference Location: Shanghai Celebrity Garden Hotel

地址：上海市浦东新区张扬路 2988 号（靠近居家桥路）
Address: Zhang Yang Road, Pudong District No. 2988 (near the Jujiaqiao Road)

交通方式 Traffic

上海火车站（15 公里）——乘地铁 4 号线至世纪大道站转 6 号线至德平路站，1 号口出站，步行约 5 分钟到达酒店。乘出租车打车约 48 元。
Shanghai railway station / 15 km / Take the subway line 4 to Century Avenue Station and transfer line 6 to Deping Road, walk out from No. 1 exit, and walk about 5 minutes to arrive at the hotel. It takes about 48 Yuan by taxi.

虹桥火车站（28 公里）——乘地铁 2 号线至世纪大道站转 6 号线至德平路站，1 号口出站，步行约 5 分钟到达酒店。乘出租车打车约 103 元。
Hongqiao railway station / 28km/ Take the subway line 2 to Century Avenue Station and transfer line 6 to Deping Road, walk out from No. 1 exit, and walk about 5 minutes to arrive at the hotel. It takes about 103 Yuan by taxi.

上海虹桥机场（29 公里）——乘地铁 2 号线至世纪大道站转 6 号线至德平路站，1 号口出站，步行约 5 分钟到达酒店。乘出租车打车约 87 元。
Shanghai hongqiao airport / 29km/ Take the subway line 2 to Century Avenue Station and transfer line 6 to Deping Road, walk out from No. 1 exit, and walk about 5 minutes to arrive at the hotel. It takes about 87 Yuan by taxi.

上海浦东国际机场（39 公里）——1、乘地铁 2 号线东延伸段至广兰路站，转乘 2 号线至世纪大道站转 6 号线至德平路，1 号口出站，步行约 5 分钟可到酒店。2、乘机场 4 线至德平路浦东大道站，转 554 路（或 716 路）至 张杨路居家桥路站。乘出租车打车约 126 元。

Shanghai pudong international airport / 39km/ 1. Take the subway line 2 east extension to Guanglan Road Station, transfer to line 2 to Century Avenue Station, then transfer to line 6 to Deping Road, walk out from No. 1 exit, and walk about 5 minutes to arrive at the hotel. 2. Take the airport line 4 to Deping Road, Pudong Avenue Station, and transfer 554 (or 716) to Zhang Yang Road, the Jujiaqiao Road Station. It takes about 126 Yuan by taxi.

附录 Appendix

N108 Yu Wang
Title: Personalized Information Service Recommendation System Based on Clustering and Classification
Abstract. In order to solve the recommendation system the prevalence of blindness and low resistance, in this paper, the personalized automatic recommendation system user model and automatic recommend technology made in-depth study. The paper first introduces the automatic recommend system user model representation and update. Then the user modeling, clustering, classification and automatic recommend technology unifies, realized the personalized document automatic recommendation system based on clustering and classification. The system first offline clustering form points of interest to the article, build user model based on clustering interest points, Then online by recommendation algorithm based on classification to realize the automatic recommendation, the search to the point of interest, to recommend to the user group. Theoretical analysis and experimental results show that the system can significantly improve the online response speed and efficiency.
Keywords: recommendation; information service; user model; clustering; classification

N111 Ting Huang
Title: Design of Mobile Electronic Payment System
Abstract. Multi-bank mobile electronic payment system uses mobile terminals for electronic payments, which can circulate in multiple banks and cannot limit from the bank that issues the e-cash. The paper researches electronic payment on the withdrawal agreement, the pay agreement, the deposit agreement, the update protocol of the e-cash based on elliptic curve cryptography. The design of the system is more suitable for mobile payment terminals with limit of calculation capacity, storage, network bandwidth and power supply, which meets the needs of the day-to-day transactions.
Keywords: multi-bank; mobile payment; off-line payment; on-line payment

N114 Fang Zhou
Title: The Human Role Model of Cyber Counterwork
Abstract. The essence of cyber counterwork mainly reflects as the counterwork process between people, in order to solve effectively the cyber counterwork test problem about the cognitive level and decision level. In this paper, firstly, the dynamic adaptive cyber attack and defense "observation, orient, decision, act" (OODA) loop process models are established, which are based on the traditional military command and control operational process model. Secondly, establishing the cyber attacker and defender role models during the cyber counterwork process, which are mainly from role's identities, role's function, role's capability and role's relationship utilizing the multi-attribute group description method. At last, establishing capability evaluation index system for each role, and evaluating the capability through Delphi method. The human role's model can provide theoretical basis for configuring attacker and defender role during the cyber cognitive and decision level test process.
Keywords: cyber counterwork; OODA loop; human role; dynamic adaptive

N118 Meng Shi, Xianghui Liu, Wenbao Han
Title: Implicit Factoring with Shared Middle Discrete Bits

Abstract. We study the problem of implicit factoring presented by May and Ritzenhofen in 2009 and apply it to more general settings, where prime factors of both integers only known by implicit information of middle discrete bits. Consider two integers $N_1=p_1q_1$ and $N_2=p_2q_2$ where p_1, p_2, q_1, q_2 are primes and $q_1, q_2 \approx N^\alpha$. In the case of $t\log_2 N$ bits shared in one consecutive middle block, we describe a novel lattice-based method that leads to the factorization of two integers in polynomial time as soon as $t>4\alpha$. Moreover, we use much lower lattice dimensions and obtain a great speedup. Subsequently, we heuristically generalize the method to an arbitrary number n of shared blocks. The experimental results show that the constructed lattices work well in practical attacks.

Keywords: implicit information; factorization; lattice reduction; LLL

N127 Juan Yang, Xiaopu Feng
Title: Loading Data into HBase
Abstract. HBase is a top Apache open source project that separated from Hadoop. As it has most of the features of Google's BigTable system and is implemented in Java, it is very popular in days of massive data. HBase's advantages are reflected in the massive data read and query. Loading huge amounts of data into HBase is the first step to use HBase. HBase itself has several methods to load data, and different methods have different application scenarios. This article made an exhaustive study and a performance testing of them. Also, this article achieved the custom loading data, and experiments show that it has good efficiency.

Keywords: HBase; Hadoop; Apache; loading data

N131 Yao Zhang, Licai Yang, Haiqing Liu, Lei Wu
Title: A Service Channel Assignment Scheme for IEEE 802.11p Vehicular Ad-Hoc Network
Abstract. IEEE 802.11p vehicular ad-hoc network (VANET) applies multiple channels, including one control channel (CCH) and six service channels (SCHs), the enhanced distributor channel access (EDCA) mechanism is used to support wireless channel assignment and QOS requirements. But the method of SCH assignment is not proposed in IEEE 802.11p standard. We present a scheme to perform SCH assigning, previous transmission indicators of service channels are detected dynamically by service channel assignment controller set in medium access control (MAC) layer, service packets would be delivered into suitable SCH and EDCA access category (AC) queue according to SCH reservation probability and estimated transmission delay. Saturated throughput of our scheme in SCH is analyzed by theoretical model in different conditions, the results show that it can ensure higher SCH utilization, and is an efficient way to improve performance of intelligent transportation system.

Keywords: VANET; IEEE 802.11p; service channel; EDCA; channel reservation; access category; intelligent transportation system

N135 Qizhong Li, Shanshan Sun, Jianfei Zhao
Title: Simulation Algorithm of Adaptive Scheduling in missile-borne Phased Array Radar
Abstract. In contrast to conventional radars, phased array radars have the capability to switch the direction of the radar beam very quickly without inertia. The measurements from phased array radar can contribute to many application fields such as data and intelligence process, radar performance evaluation, etc. However, it often costs more than we can bear to

obtain phased array radar measurements. It is necessary to model and simulate the phased array radar, especially for missile-borne phased array radar. This paper lays a strong emphasis on the search and simulation technology of missile-borne phased array radar. According to operational theory of phased array radar, this paper focuses on the functional modelling and simulation techniques. It contains three parts: beam arrangement of phased array radar in sin coordinate, parameter optimization of missile-borne phased array radar and a function simulation model of missile-borne phased array radar.

Keywords: missile-borne phased array radar; beam position;parameter optimization;function simulation ;sin coordinate;search

N139 Pengfei Yu, Haiyan Li, Hao Zhou, Dan Xu
Title: Palmprint Recognition Based on Subclass Discriminant Analysis

Abstract. Subspace-based palmprint recognition methods, such as Principal components analysis (PCA) and linear discriminant analysis (LDA) assume that each class can be grouped in a single cluster. However, this assumption is not reasonable at some situation that a class is assembled in two or more clusters. In order to solve this problem, a novel palmprint recognition method based on Subclass Discriminant Analysis (SDA) is proposed in this paper. Each palmprint class is divided into a set of subclasses that can be separated easily in the new subspace representation. After that, the Euclidean distance and nearest neighbor method are employed as the similarity measurement. Experimental results conducted on a database of 86 hands (10 impressions per hand) show that the Equal Error Rate (EER) of the proposed method yields promising result of EER= 0.67% for verification rate, which demonstrate that the proposed method is effective to solve the problem mentioned above.
Keywords: Biometrics; Palmprint; Subclass Discriminant Analysis; SDA

N140 Yuanyuan Cui, Wei Li, Xunying Zhang
Title: Memory Controller Design Based on Quadruple Modular Redundant Architecture

Abstract. For the space applicaion, to improve the reliability of the memory operation, Quadruple Modular Redundant (QMR) architecture is used in all registers of the memory controller. QMR architecture in this paper can correct one-bit faults, detect two-bit faults, and also tolerate Single Event Transient (SET). By modifying finite state machine (FSM) of the memory controller, when one uncorrectable fault is checked, the memory operation can be terminated in time and return the error information. Compared with Triple Modular Redundancy (TMR), although the area overhead is increased by 47530.59297 um^2, the Single Event Upset (SEU) failure rate is lower by 6 orders of magnitude. Experimental results show that when 1 bit-flip or 2 bit-flips are injected in QMR registers, they can be corrected or detected in time respectively. Memory controller using QMR architecture increases the area overhead, but the advantage is the higher reliability valuable for safety system.
Keywords: Memory controller; Quadruple Modular Redundant; Single Event Upset; Single Event Transient; Fault-tolerance design

N141 Li Xie, Yong He, Yanfang Tian, TinghongYang
Title: Computer Power Management System Based On the Face Detection

Abstract. In order to reduce the unnecessary power waste of computer system, the working principle of earlier Windows power management program and the new face recognition function of Windows 8 are analyzed in this paper. And the conflict between the convenience

of use and the effects of energy conservation and environmental protection is given attention to. We put forward a new method based on the detection of frontal face in front of the monitor instead of the events of keyboard or mouse. Experimental results show that the method is a fast and effective one. Particularly, when user is leaving for a moment, this method is better than the work of windows power management program. The results tell us that this method can save electrical energy about 4.28% than windows power management program.

Keywords: face detection; energy conservation; computer power management system

N153 Xia Wang
Title: Incomplete Decision-Theoretic Rough Sets Model based on Improved Complete Tolerance Relation

Abstract. Recently, the decision-tables used in decision-theoretic rough sets are most complete decision-tables, and less for incomplete decision-tables. Some authors use the filling method to deal with incomplete decision table of DTRS, which is filling the unknown values with all possible values. Its disadvantages are large calculated amount and noise. Therefore, incomplete decision-theoretic rough sets model based on improved complete tolerance relation is proposed. First, improved complete tolerance relation and tolerance class were constructed. Then, the decision-degree between object and target concept were also computed. Finally, the decision-degree was served as conditional probability, the probability positive region, negative region and boundary region were computed, and it would make three-way decision. The example shows that this model has less calculated amount and noise, and it more accord with practical application.

Keywords: improved tolerance relation; incomplete decision table; DTRS; decision degree

N159 Yen-Yin Chu, I-Hsuan Peng, Yen-Wen Chen, Chi-Fu Yi and Addison Y.S. Su
Title: Power-saving Based Radio Resource Scheduling in Long Term Evolution Advanced Network

Abstract. It is well known that power saving is one of the most important issues for mobile device in accessing network services. The efficient conservation of energy for longer operation times of a mobile station is vital to the success of various mobile applications. This paper proposes a systematic approach to allocate radio resources in Long Term Evolution Advanced (LTE-A) network by considering the channel condition and QoS requirements while the power saving is a centric issue during the scheduling process. The proposed scheme includes the selection of component carriers (CC) and the allocation of radio resource to satisfy the QoS demands while minimize the power consumption of user equipment (UE). Additionally, exhaustive simulations were performed to examine the performance of the proposed scheme. Both http and video streaming traffic models were applied during the simulations. The experimental results show that the proposed scheme achieves better performance when compared to the other scheme.

Keywords: LTE-A; carrier aggregation; power saving; radio resource scheduling

N161 Guowei Yang, Chengjing Zhang, Xiaofeng Zhang
Title: A Process Quality Monitoring Approach of Automatic Aircraft Component Docking

Abstract. In order to evaluate automatic aircraft docking quality, a new method of process quality monitoring of the automatic aircraft component docking is proposed. This method is based on laser tracker measurement. The position of automatic aircraft docking component is obtained by laser tracker measurement for a plurality of feature points. By doing

identification labels on the surface of docking components, component surface images replace complex docking images. Image processing technology is used to extract the features of component surface image information to evaluate docking quality, so as to control the perfect match of docking component. The new method enforces automatic docking process visual monitoring and absorbs human visual and reliable monitoring advantages of manual assembly model.

Keywords: process quality monitoring; component docking; image monitoring; feature extraction

N163 Xiongbing Fang, Hai-Yin Xu
Title: A Second-order Algorithm for Curve Parallel Projection on Parametric Surfaces

Abstract. A second-order algorithm is presented to calculate the parallel projection of a parametric curve onto a parametric surface in this paper. The essence of our approach is to transform the problem of computing parallel projection curve on the parametric surface into that of computing parametric projection curve in the two-dimensional parametric domain of the surface. First- and second-order differential geometric characteristics of the parametric projection curve in the parametric domain of the surface are firstly analyzed. A marching method based on second-order Taylor Approximation is formulated to calculate the parametric projection curve. A first-order correction technique is developed to depress the error caused by the truncated higher order terms in the marching method. Several examples are finally implemented to demonstrate the effectiveness of the proposed scheme. Experimental results indicate that both the computational efficiency and accuracy of the presented method have dominant performance as compared with the first-order differential equation method.

Keywords: parallel projection; curve on surface; differential geometric characteristic; Taylor Approximation; tracing

N164 Sihui Shu
Title: A New Association Rule Mining Algorithm Based on Compression Matrix

Abstract. A new association rule mining algorithm based on matrix is introduced. It mainly compresses the transaction matrix efficiently by integrating various strategies. The new algorithm optimizes the known association rule mining algorithms based on matrix given by some researchers in recent years, which greatly reduces the temporal complexity and spatial complexity, and highly promotes the efficiency of association rule mining. It is especially feasible when the degree of the frequent itemset is high.

Keywords: data mining; association rule; Apriori algorithm; compression matrix

N166 Bin Chen, Zhijiang Wang, Yu Wang
Title: Dispatching and Management Model Based on Safe Performance Interface for Improving Cloud Efficiency

Abstract. In order to solve the performance problem of the cloud computing environment, a dispatching and management model (JDRMSP) which based on safe performance interface is proposed in this paper. By using of the performance interface integrated into the safe DPI as the original basic data capture, agent-based job scheduling algorithm as the job dispatching method, and ant colony algorithm resource scheduling strategy as the resource management method, the integrated cloud performance is enhanced. For illustration, a simulation experimental example is utilized to show the effect of the model. From the experimental results we can get the conclusion that The JDRMSP model can analyze the cloud

environment performance of various cloud components distribution pattern more accurately, and this is the basis of configuration control of the performance of the entire cloud environment, ultimately achieve the purpose of enhance of the performance of the cloud. The JDRMSP model can effectively solve the performance data capture accuracy problem, and take advantage of the dispatching and management algorithm to optimize the cloud environment.

Keywords: cloud computing; dispatching; resoure management; performance

N168 Danchen Zhou, Chao Guo

Title: Computation Method of Processing Time based on BP Neural Network and Genetic Algorithm

Abstract. Looking-up standard processing time table is a commonly used and important determination method of processing time. However, the large error in non-standard nodes brings adverse effect on its accuracy. In view of the problem, a computation method of processing time based on back propagation neural network (BPNN) and genetic algorithm (GA) is proposed. Several key technologies of BPNN based on Matlab, including computation of the number of neurons in hidden layer, determination of training algorithm and affecting factors of generalization ability, are researched in depth. In order to improve the training efficiency of BPNN, GA is used to optimize its connection weights and thresholds. The encoding method, selection operation, crossover and mutation operation of GA are discussed in detail. The higher computation precision and faster operation speed of the proposed method is demonstrated through application cases.

Keywords: Processing time; Standard processing time table; BP neural network; Genetic algorithm

N183 Hua Guan, Shi Ying, Caoqing Jiang

Title: An Exception Handling Framework for Web Service

Abstract. According to the problems of exception handling for service oriented software, this paper presents a framework for Web Service exception handling (EHF-S) based on Policy-Driven. The EHF-S processes the response message of invoking Web service, produces a response message which is added exception information and exception handling message. We introduce the realization principle, the component and key technology for EHF-S. This framework can support the development and integration of exception handling logic for Web service process, improve the exception handling capability and simplify the exception handling process for Web service.

Keywords: Web Service; Exception Handling Framework; Policy-Driven

N184 Zhenbin Gao

Title: Integral Sliding Mode Controller for an Uncertain Network Control System with Delay

Abstract.   Integral sliding mode control is formulated with respect to an uncertain continuous network control system with the state delay. The parameter uncertainty is assumed to be the norm-bounded, and satisfy the sliding mode matching requirements. The switching function is presented which include the integral term of the state feedback gain and the sliding mode compensator. The sliding mode controller is designed which is divided into the equivalent controller and switching controller, so the reachability of the sliding surface is ensured. A sufficient condition is derived by means of Linear Matrix Inequality such that the

asymptotical stability of the closed-loop system is guaranteed. The validity and feasibility of the proposed approach is investigated via the corresponding numerical simulation.

Keywords: Uncertainty;Network control system; Integral sliding mode controller; State feedback; Switching function; Linear Matrix Inequality(LMI)

N190 Wengang Chen, Long Chen
Title: Overhead Transmission Lines Sag Measurement Based on Image Processing
Abstract. Sag is one of the important parameters for operation and maintenance of the transmission lines, and its size directly affects the safe and stable operation of the line. In recent years, many of the existing transmission lines in order to improve the transmission capacity allow the temperature from 70 ℃ to 80 ℃, then the transmission line sag becomes a major constraint and sag measurement becomes very important. This paper presents a novel sag measurement method based on image processing. Firstly it grays the collected color images and preprocesses the images with some image denoising methods. Secondly, special points generated by the isolation rod are extracted by the corner extraction algorithm and the spatial coordinate values of the extracted points are identified according to the principle of binocular vision and the relationship of three-dimensional coordinate space coordinates and image coordinates. Finally via the method of the curve fitting, the actual sag of the transmission line is calculated. The experimental results show that this method is suitable for the both cases that the height of the transmission line is equal or not and it has good adaptability.
Keywords: sag measurement; camera calibration; image processing; corner extraction

N194 Jinwen Ma, Jingchun Zhang, Jinrong Guo
Title: Decoupling Interrupts from the Internet in Markov Models
Abstract. Optimal models and lambda calculus have garnered improbable interest from both system administrators and scholars in the last several years. In fact, few system administrators would disagree with the deployment of XML. Though such a hypothesis is rarely a natural goal, it entirely conflicts with the need to provide forward-error correction to statisticians. TOLU, our new system for write-ahead logging, is the solution to all of these problems.
Keywords: decoupling interrupts; Markov Models; forward-error correction; TOLU

N196 Lixin Hou, Shanhong Zheng, Haitao He, Xinyi Peng
Title: Chinese Domain Ontology Learning Based on Semantic Dependency and Formal Concept Analysis
Abstract. The ontology construction process is very expensive and time-consuming when performed manually. In order to solve the problems of time-consuming and high cost, a Chinese domain ontology learning method based on semantic dependency and formal concept analysis (FCA) is proposed in this paper. During the learning process, semantic dependency analysis technology is used for extracting formal context from unstructured domain texts and Godin algorithm is used for constructing concept lattice. At last, the article takes a medical ontology construction as an example to verify this method. The experiment results show that the method we proposed can construct domain ontology automatically and reduce manual intervention. In addition, the ontology we got is a formal ontology, so it has more advantages in sharing and reusability.
Keywords: Domain Ontology Learning; Semantic Dependency; FCA

N199 Zhigang Zhang, Ting Li , Feng Yuan[3], Li Yin

Title: Synthesis of Linear Antenna Array using Genetic Algorithm to Control Side Lobe Level

Abstract. In array pattern synthesis, it is often designed to achieve the desired radiation pattern. In this paper real coded genetic algorithm (RGA) optimization method is presented to optimize the value of weights of each antenna element to minimize side lobe level of the uniform spaced linear array geometries with a certain main beam width. The optimization program is done by using MATLAB. It compared with the Conventional analytical methods such as Chebyshev and Taylor through radiation patterns with different number of elements and intervals of each element. The simulation results show that the optimization results are little difference when $d \geq \lambda / 2$, but GA can get a more optimal result when $d < \lambda / 2$. The application of Genetic algorithm for pattern synthesis is found to be useful.

Keywords: Linear Antenna Array; Side Lobe Level; Genetic Algorithm; Array Factor

N207 Zhiyong Hong

Title: Text Classification Algorithm Based on Rough Set

Abstract. In text classification community, k-nearest neighbor (kNN) and Support Vector Machine (SVM) are all effective classifier, but both of them have their drawback. kNN has a high cost to classify a new document when training set is large, SVM is too sensitive to the noisy data, when the noisy data is close to the hyperplane it suffers. So one hybrid algorithm based on VPRS is proposed. It combines the strength of both KNN and SVM techniques and overcomes their weaknesses. Finally some experiments are carried out to compare the efficiency and classification accuracy with different classification algorithms. Results show that the proposed method achieves significant performance improvement.

Keywords: text classification; VPRS; SVM;kNN

N211 Yongqiang Huang, Long Zhao

Title: Robust Fragments Based Tracking with Online Selection of Discriminative Features

Abstract. In order to solve the variation of target appearance and background influence to the visual tracking, we extend the robust fragments based tracker to an adaptive tracker by selecting features with an on-line feature ranking mechanism, and the target model is updated according to the similarity between the initial and current models, which makes the tracker more robust. What's more, we repositioning the integral histogram's bin's structure and that make our tracker quicker. The proposed algorithm has been compared with fragment based tracker and the results proved that our method provides better performance.

Keywords: fragments; adaptive; on-line; descriptive; similarity; repositioning

N213 Zhanquan Sun

Title: Parallel Feature Selection Based on Map Reduce

Abstract. Feature selection is an important research topic in machine learning and pattern recognition. It is effective in reducing dimensionality, removing irrelevant data, increasing learning accuracy, and improving result comprehensibility. However, in recent years, data has become increasingly larger in both number of instances and number of features in many applications. Classical feature selection method is out of work in processing large-scale dataset because of expensive computational cost. For improving computational speed, parallel feature selection is taken as the efficient method. MapReduce is an efficient distributional computing model to process large-scale data mining problems. In this paper, a parallel feature selection method based on MapReduce model is proposed. Large-scale

dataset is partitioned into sub-datasets. Feature selection is operated on each computational node. Selected feature variables are combined into one feature vector in Reduce job. The parallel feature selection method is scalable. The efficiency of the method is illustrated through example analysis.

Keywords: Feature Selection; parallel; MapReduce; Mutual Information

N220 Juanjuan Li, Yuehui Chen, Fenglin Wang
Title: Wavelet Analysis Combined with Artificial Neural Network for Predicting Protein-protein Interactions

Abstract. In order to solve the prediction problem of interaction between proteins, we use a wavelet coefficient combined with artificial neural network method, improving the prediction accuracy of problem of protein-protein interactions. By introducing the Biorthogonal Wavelet 3.3 coefficients as the feature extraction method and the three layer feedforward neural network as a classifier, we solve the problem of protein interaction effectively. Using the Human data set verifies the validity of this method. Through testing the Human data set, using Biorthogonal Wavelet 3.3 wavelet coefficient combined with the three layer feedforward neural network solve the prediction problem of protein interactions with well results. This combination of wavelet coefficients and the three layer feedforward neural network to predict protein interaction problem is an effective method. At the same time, compared with other prediction methods, this method performs at least 4% higher accuracy than the better accuracy of auto-covariance (11) combined with PNN on the same data set.

Keywords: predict interaction between proteins; Wavelet Analysis; ANN

N221 Rui Ma, Zhongwei Xu, Zuxi Chen, Shuqing Zhang
Title: Initial State Modeling of Interlocking System Using Maude

Abstract. In order to do formal verification of interlocking system, which is complicated but safety-critical, we choose formal specification language Maude for modeling and verification based on membership equational logic and rewriting logic. In this paper, a method is proposed to show how the initial state can be modeled and contain important information of specific interlocking system. And a case of Tongji Test Line is reported to illustrate this method in detail. The verification results show that Maude can be applied to formal object-oriented specification and model checking of railway interlocking system successfully using the proposed modeling method.

Keywords: interlocking; rewriting logic; formal method; Maude

N222 Xin Chen, Tianqi Yang
Title: Extraction Method of Gait Feature Based on Human Centroid Trajectory

Abstract. Gait features obtained by current extraction methods are easily affected by people's walking direction, dresses and carryings, which causes gait recognition system, has not yet appeared. An extraction method based on centroid is proposed in this paper. Segment and track the moving silhouettes of a walking figure in image sequences to calculate the silhouettes' centroid. The complex silhouette is represented by a point to avoid the influence of dresses and carryings. Divide centroid coordinate value by the height of detecting walking figure to normalize to remove the disturbance caused by walking direction relative to the camera optical axis angle. By denoising centroid trajectory remove the noise caused by some accidental factors to obtain regular wavelet curve whose main frequency component distribution vector is the final gait feature. Experimental results show that this approach can

obtain identical gait features even when experimenters change their walking directions, dresses or carrying, tolerating noise and low resolution.

Keywords: gait recognition; centroid; spectral analysis; gait feature

N231 Ao Lin, Bing Xiao, Yi Zhu
Title: An Algorithm for Bayesian Networks Structure Learning Based on Simulated Annealing with Adaptive Selection Operator
Abstract. In order to solve the problems that the intelligence algorithm falls into the local optimum easily and has a slow convergence in Bayesian Networks (BNs) structure learning, an algorithm based on adaptive selection operator with simulated annealing (ASOSA) is proposed. This paper conducts the adaptive selection rule in combination with conditional independence tests of BNs nodes to guide the generation of neighbor. In order to better compare the adaptive effect, an algorithm based on selection operator with simulated annealing (SOSA) is proposed, at the same time 15 data sets in the three typical networks are accessed as learning samples. The results of the Bayesian Dirichlet (BD) score, Hamming distance (HD) and evolution time of the network after learning show that it has the quicker convergence and it searches the optimal solution more easily compared with simulated annealing (SA) and SOSA.
Keywords: Bayesian networks (BNs); Simulated Annealing (SA); structure learning; conditional independence tests.

N233 Xuan Luo, Tiancai Liang, Weifeng Wang
Title: Static Image Segmentation Using Polar Space Transformation Technique
Abstract. This paper proposes a polar-space based method to segment the static image automatically. The proposed method aims at segmenting the object of interest by finding the optimal closed contour in the polar space, solving the long-term problem of scale in the Cartesian space. Experimental results further verify and demonstrate the efficacy of the proposed polar-space based method on the challenging datasets.
Keywords: segmentation; polar space; cue integration; graph cut

N234 Chen Yao, Lijuan Hong, Yunfei Cheng
Title: Image Restoration Via Non-local P-Laplace Regularization
Abstract. Image restoration technology can be applied in a lot of fields including image communication, image archive restoration and image editing, etc. In this paper, we try to solve image restoration with a non-local regularization point of view. Similarity between different image pixels is measured by a non-local p-Laplace operator. We use minimum least square with a regularization term to formulate the whole procedure of image restoration. In the solvent of cost function, a linear Gauss-Jacobi iterative method is utilized for unknown pixels solvent. The complexity of iterative solvent is controlled by a step threshold. Finally, experimental results highlight our superior performance over previous methods from subject visual perception or object image quality assessment.
Keywords: image restoration; non-local; regularization; Gauss-Jacobi iterative

N235 Hui Zeng, Qiang Chen, Xiaoqiang Li, Jianguo Shen
Title: Application Analysis of Slot Allocation Algorithm for Link16
Abstract. In order to improve the efficiency of slot utilization of Link16, the traditional binary-tree model of timeslot allocation is improved, and the performances of three kinds of timeslot assignment algorithm are compared and analyzed in the average transmission delay

and message sending failure rate. When the user is determined and the message arrival rate is lower, the fixed time slot allocation is simple and effective. When there are a lot of users or the user is uncertain, and the message arrival rate is very low, competitive slot allocation should be more efficient. When the number of users is small, the user Message arrives sudden and arrival rate is high, the performance of the dynamic slot allocation has a very distinct advantage. Finally, based on the characters of different timeslot assignment algorithms, the overall timeslot allocation scheme is presented for Link16 network.
Keywords: slot allocation; TDMA; transmission delay; Link16

N236 Fuyong Liu, Jianghe Yao, Gang Wu, Huanhuan Wu
Title: Resource Congestion Based on SDH Network Static Resource Allocation

Abstract. In order to reduce the operation blocking rate of static resource allocation in SDH Mesh network effectively, balance network traffic, optimize the allocation of network resources, enhance the success rate of multiline information routes and improve the overall performance of the network. This article introduced Resource Congestion Avoidance Algorithm (RCAA) based on the adjustment, which can effectively solve the resource congestion in the static resource allocation. In order to prove the feasibility of this RCAA, three simulation examples of resource allocation theory were adopted. Through analysis validation of these three examples, this article proved RCAA based on the adjustment proposed in this paper can effectively reduce the blocking rate and improve the overall performance of SDH network. RCAA based on adjustment is more superior to ANM. RCAA can avoid resource congestion problems caused by the allocation of resources effectively.
Keywords: resource allocation; resource congestion avoidance algorithm; sdh network

N240 Kevin Collados, Juan-Luis Gorricho, Joan Serrat, Hu Zheng
Title: Multi-Layered Reinforcement Learning Approach for Radio Resource Management

Abstract. In this paper we face the challenge of designing self-tuning systems governing the working parameters of base stations on a mobile network system to optimize the quality of service and the economic benefit of the operator. In order to accomplish this double objective we propose the combined use of fuzzy logic and reinforcement learning to implement a self-tuning system using a novel approach based on a two-agent system. Different combinations of reinforcement learning techniques, on both agents, have been tested to deduce the optimal approach. The best results have been obtained applying the Q-Learning technique on both agents, clearly outperforming the alternative of using non-learning algorithms.
Keywords: radio resource management; cellular networks; reinforcement learning; fuzzy logic

N241 Mingkun Xu, Wenyuan Dong, Cheng Shuo
Title: A Network Access Security Scheme for Virtual Machine

Abstract. Virtual machines have been widely adopted as servers nowadays. They have essential difference with physical machine. We can utilize the feature of virtual machine to let them safer to resist attack from Trojan and hacker. This paper introduces a kind of network access security scheme, which deploys the execution of security strategy outside virtual machine, and monitor virtual machine's access to security sensitive device. The measurements above can transfer the control for key hardware from upper Guest OS to host platform. Even if Guest OS is affected by virus or Trojan, host can still effectively monitor the network communication of upper virtual machine. In this project, software running in Host OS is programmed to realize the scheme introduced above, it monitors the network

communication of virtual machine according to the rules written in XML format. The software can prevent Guest OS or application running on virtual machine from communicating with designated domain or IP address successfully, which verifies the effectiveness of the proposed security scheme.

Keywords: virtualization; security; Operating System(OS);Host OS;Guest OS; Virtual Machine Monitor (VMM)

N247 Peng Zhang, Qian Su, Dong Luan
Title: Twist Rotation Deformation of Titanium Sheet Metal in Laser Curve Bending Based on Finite Element Analysis
Abstract. Laser sheet bending is a new metal forming process realized by thermal stresses resulted from the irradiation of laser beam scanning. Laser forming is a new type of sheet metal forming process. The sheet metal is formed by asymmetrical thermal stresses. The three-dimensional elastoplastic thermo-mechanical coupled finite element model of laser bending for Ti-6Al-4V plates was established with nonlinear finite element analysis software ANSYS. The bending properties of sheet metal with different processing parameters were simulated. The results show that the twist rotation deformation of sheet metal can be influenced by laser power, spot diameter, scanning velocity, scanning path curvature and the distance between scanning path and free end.
Keywords: titanium; sheet; laser bending; thermal stress; twist

N251 Yu Shao, Feng Shi, Xiang Li
Title: Voltage Transient Stability Analysis by Changing the Control Modes of the Wind Generator
Abstract. The article studies voltage transient stability when the wind generator changes its control modes. The article studies the influence caused by connection with wind farms based on simulation and makes comparison between different control modes, then gives the conclusion. The article takes the real grid model and the result of the study has some means to the relative study.
Keywords: wind generator; voltage transient stability; short circuit fault; control mode

N252 Yu Shao, Feng Shi, Xiang Li
Title: The Generator Stator Fault Analysis Based on the Multi-loop Theory
Abstract. Inter-turn short circuit is a common kind of fault in generator. The article takes Multi-loop theory to analyze the theory of fault on generator stator and puts the math model of the generator. Changes of main parameters are analyzed separately when fault happens. According to the result, the article analyses the influence on the main parameters caused by the fault of generator stator and summarizes factors of parameter changes.
Keywords: synchronous generator; stator; Multi-loop Theory; inter-turn short circuit

N253 Lixiang Wang, Tiejun Xiao
Title: An Improved Edge Flag Algorithm Suitable for Hardware Implementation
Abstract. The Traditional Edge Marking Algorithm can't fill the elongated polygon and a polygon with local points correctly. After doing a lot of research and analysis about the polygon fill algorithms, this paper presents a new improved algorithm, which is suitable for hardware implementation, to meet the need of high-demanding quality graphic display in the embedded system. The new algorithm makes full use of the characteristics of a point on the boundary of the polygon and will be repeated accessed when meets local points and

elongated points, so we can define a measurement variable which is named FLAG, which is used to mark the boundary point of the polygon, the flag of present point will be added one when it is accessed, this method can distinguish singular points and elongated points from ordinary points conveniently and simply, what's more, the improved algorithm solves the above problems effectively. In the new algorithm, only use the addition so it is easy to be implemented by hardware.

Keywords: embeded system; polygon filling; edge marking algorithm; computer graphics

N260 Ying Wang, Yifang Chen, Lenan Wu
Title: Light Protocols in Chain Network
Abstract. Aiming at some special applications, such as monitoring of high-speed rail, monitoring of large farm field, etc, a wireless sensor network based on chain structure is proposed. Considering of simplicity and energy-saving, two light protocols, which are based on time slot and competition respectively, are applied in the above network. Finally, the two light protocols are compared with IEEE802.15.4 protocol by OPNET simulation, and the results show that the proposed light protocols have good reliability and low energy consumption.
Keywords: chain network; light protocol; IEEE802.15.4; OPNET; energy consumption

N262 Mingjie Dong, Wusheng Chou, Yihan Liu
Title: A Handheld Controller with Embedded Real-time Video Transmission Based on TCP/IP Protocol
Abstract. Cross-platform video transmission is of vital importance in industrial applications. In this paper, we introduce a method for transmitting video from the computer with windows system to the ARM11 board with embedded Linux system using the Ethernet based on the TCP/IP protocol. The ARM11 board is used as the server to receive video information using its Qt GUI, while the computer on the bank is used as the client that receives video information from the remote operated underwater vehicle showing with its MFC (Microsoft Foundation Classes) interface and then sends the video information to the handheld controller. The image gained from the computer MFC is JPG format, and after coding, the images are transmitted to the server on the handheld controller continuously. Then the Qt GUI receives the data and decodes the JPG images before displaying them on the screen. The transmission is based on TCP/IP protocol and an image parsing protocol made by us. After testing, the video image can successfully conduct real-time transmission, and can meet the industry application.
Keywords: video transmission; handheld controller; embedded Linux; TCP/IP; Qt GUI

N267 Feng Yu, Wei Liu , Gang Li
Title: An Improved Cluster Head Algorithm for Wireless Sensor Network
Abstract. Routing algorithm is one of the key technologies of wireless sensor network. Based on the LEACH algorithm, the second choice of cluster head algorithm for WSN is proposed. It takes into account the cluster-head as residual energy and distance to BS, and then it chooses a senior cluster head. The improved algorithm avoids direct communication between BS and the cluster-head which has low energy and is far away from BS, which prolongs the lifetime of network and enhances the ability of data collection. The experiments show that this technique of event-driven can cut down the data transmission and further extend the lifetime of network.
Keywords: wireless sensor networks; routing protocol; cluster head; LEACH-SC; lifetime

N269 Lin Li, Zhenyu Zhao, Chenping Hou, Yi Wu
Title: Semi-supervised Learning Using Non-Negative Matrix Factorization and Harmonic Functions

Abstract. In order to reduce redundant information in data classification and improve classification accuracy, a novel approach based on non-negative matrix factorization and harmonic functions (NMF-HF) is proposed for semi-supervised learning. Firstly we extract the feature data from the original data by non-negative matrix factorization (NMF), and then classify the original data by harmonic functions (HF) on the basis of the feature data. Empirical results show that NMF-HF can effectively reduce the redundant information and improve the classification accuracy compared with some state-of-art approaches.
Keywords: non-negative matrix factorization; harmonic function; classification accuracy; semi-supervised learning

N270 Maodi Zhang, Zili Wang, Ping Xu, Yi Li
Title: Research and Implementation of a Peripheral Environment Simulation Tool with Domain-Specific Languages

Abstract. The importance to build relevant peripheral environment in the testing process for complex embedded software is becoming higher. This paper discussed the current design method of simulation test environment for the embedded software, and then presented a modelling method which is used to build peripheral simulation environment for the SUT (System under Test) through ICD (Interface Control Data) documents and the software requirement specification. Using this method, the peripheral environment simulation tool which consisted of relevant database and simulation model was set up with Ruby program language. This tool could provide necessary control commands and data support just like in a real running environment for the SUT. Furthermore, a DSL (Domain-Specific Languages) design method for this domain was researched on the basis of the model. The experiment result has demonstrated that it's feasible to set up a peripheral environment for embedded system with our simulation tool.
Keywords: simulation testing environment, peripheral environment simulation, domain specific languages, Ruby, software testing

N272 Huifeng Wang , Zhanhuai Li, Xiaonan Zhao, Qinlu He, Jian Sun
Title: Evaluating the Energy Consumption of InfiniBand Switch Based on Time Series

Abstract. Recently, energy consumption has emerged as a critical factor in designing storage system. In order to test the energy consumption of InfiniBand switch (IB switch), we establish an energy consumption model for IB switch and formulate the test cases. Using the method, you can obtain the energy consumption of the IB switch scientifically and efficiently.Empirical results illustrate the correctness of the energy consumption and reflect the distribution laws of the energy consumption of the IB switch clearly. The scheme can solve the problem of testing and analyzing the energy consumption of the IB switch efficiently. It has positive practice significance to reduce the cost of storage system.
Keywords: energy consumption; storage system; InfiniBand switch

N273 Ahmed Alahmadi, Ben Soh
Title: A Proposed Methodology for an E-health Monitoring System Based on a Fault-tolerant Smart Mobile

Abstract. In the development of general system design approaches, the main concern is

whether the approach meets the proposed system's specifications and the ability of the system to operate for a specified period within those specifications. However, with the expansion in the field of sensitive and complex systems such as e-health monitoring systems, a greater emphasis is placed on the behaviour of the system with the presence of fault (i.e. fault-tolerance). Consequently, when the system is being built, tasks such as fault-tolerance requirements are essential to ensure the quality of the resulting reliable e-health monitoring system. By considering the fault-tolerance requirements as functional requirements in the requirement phase, the completeness of reliability requirements for an e-health system can be developed. This paper proposes a methodology that conceptually studies fault-tolerance in relation to a smart mobile e-health monitoring system. The methodology aims to contribute towards standardising the fault-tolerant requirements of a reliable e-health monitoring system.

Keywords: fault-tolerant requirments; reliability; e-health monitoring; tele-healthcare

N276 Juan Li, Xueguang Zhou

Title: Probability Model for Information Dissemination on Complex Networks

Abstract. In order to analyze the regulation of information dissemination on the complex network, SIR probability model has been built to represent the peoples' interaction during information dissemination on complex networks. By introducing and computing the state transiting probabilities of the net nodes, we can effectively analyze and update the nodes' states at each step in information dissemination. Accordingly, the evolution algorithm of information dissemination is designed and realized by simulation. Simulation experiments of information dissemination on ER network and BA network with different parameters reveal that the density of final awareness will not be affected by the total of nodes, but increase progressively following the increase of average degree until a certain value. Different degree distributions can also be effect on the density of final awareness. SIR probability model can accurately reflect the process of information dissemination on complex networks. It can be used for the description and analysis of information dissemination on complex networks.

Keywords: Information Dissemination; Complex Network; SIR Model; Probability

N278 Yiwen Cao

Title: Analysis and Application of Computer Technology on Architectural Space Lighting Visual Design

Abstract. Based on "green building", we use computer to make model analysis regarding building actual environment, adapting natural light, using artificial Lighting rightly, to achieve green energy-saving building goal. According to example, we adopt 3DMAX and ECOTECT model analysis software to analyze and building room natural light, artificial lighting and distribution, and imitate effect picture. analysis states: at the stage of the architectural sketch, we use 3DMAX modeling, uniting inter room facility draft, analysis real environment data by ECORECT, getting the natural light effect, uniting the two sides to get a more accurate room light environment data. Through this data supporting, we can get better daylight design, not only satisfy the in-room light requirement, but also can make it more beautiful and energy saving.

keywords: computer technology; visual design; architectural space; simulation analysis

N279 Liang Dou, Lunjin Lu, Ying Zuo, Zongyuan Yang

Title: Verification of UML Sequence Diagrams in Coq

Abstract. The UML is a semi-formal modeling language which only has syntax and static semantics precisely defined. The dynamic semantics for the UML is specified neither formally nor algorithmically. When using UML at the design phrase, there does not be a

systematic way that allows the model designer to specify its formal semantics and automatically verify correctness properties of the described model. The UML sequence diagrams are widely used to describe the behaviors of software. Reasoning about properties of sequence diagrams at the analysis and design phrase may reveal software faults before software implementation. We propose to use the theorem proof assistant - Coq to verify syntax and semantics constrains of sequence diagrams. The verification and proof process are useful for improving the correctness of sequence diagrams and hence increases the software quality.

Keywords: UML sequence diagrams; denotational semantics; verification; Coq; model-based development

N280 Xu Guo, Ming Xu, Zongyuan Yang

Title: Quantitive Verification of the Bounded Retransmission Protocol

Abstract. In order to verify the reliability of the bounded retransmission protocol, probabilistic model checking technology is used in this paper. The integer semantics approach is introduced, which allows working directly at the level of the original probabilistic timed automaton (PTA). In such a method, clocks are viewed as counters storing nonnegative integer values, which increase as time passes. The PTA modeling the system can then be seen as a discrete-time Markov chain. Based on this fact, the protocol is modeled directly with DTMC. Properties are described in probabilistic computation tree logic. By making an analysis of the quantitative properties of the protocol, a threshold is obtained. Experimental result shows that no matter how many chunks to be transmitted, if the maximum retransmitted time is greater than or equal to 3, the protocol can be considered reliable. Method in this paper can not only verify the correctness of a system, but also make analysis of non-functional indices of a system such as reliability or performance.

Keywords: Probabilistic model checking; PRISM; Bounded Retransmission Protocol; DTMC

N284 Chao Chen, Haibin Shen

Title: Improving Online Gesture Recognition with WarpingLCSS by Multi-Sensor Fusion

Abstract. In order to achieve the better online gesture recognition rate, a multi-sensor fusion method is proposed in this article. After the dimension reduction and quantization, we first measure the performance of every single sensor in training phase and use this prior knowledge to determine the weight vector, then we do the fusion of multiple sensors according to the weight vector which indicates each sensor's importance in recognition. The core algorithm we use for online gesture recognition is WarpingLCSS, which is demonstrated to be an efficient template matching method for gesture spotting. We do the experiments on the OPPORTUNITY Activity Recognition Datasets and the results show that the recognition rate of multi-sensor fusion method achieves 61%, which outperforms the single sensor's performance about 11%. Thus demonstrates that our proposed multi-sensor fusion method is efficient in improving the performance of online gesture recognition.

Keywords: multi-sensor fusion; online gesture recognition; template matching method; WarpingLCSS

N291 Ke Xu, Yuhua Liu, Cui Xu, Kaihua Xu

Title: A Cluster-based and Range Free Multidimensional Scaling-MAP Localization Scheme in WSN

Abstract. As using traditional MDS-MAP algorithm to locate nodes' position in irregular WSN leads to low positional accuracy, based on this fact, this article presents an improved algorithm named MDS-MAP(C, RF). The algorithm can effectively divide a WSN into several clusters, and each cluster locates all nodes' position in it and forms a local position map. After all clusters get local position maps, the algorithm merges all the local position maps together using the information of inter-cluster nodes. Simulations demonstrate the proposed algorithm yields smaller accuracy error in irregular WSN.
Keywords: WSN; localization; Cluster-based; Range-free; MDS-MAP

N292 Yanyun Xing, Bo Yu, Fangqun Yang
Title: The Lane Mark Identifying and Tracking in Intense Illumination
Abstract. In order to enhance image contrast and ensure identifying and tracking accurately in intense illumination case, the paper use the algorithm of histogram cone-shaped, which can enhance image contrast effectively. With the algorithm of histogram cone-shaped, the scope of the gray value increases obviously. And the paper introduces a first-order differential operator Two Direction Prewitt Operator to enhance the edge for image, the enhance effect is favorable and the compute time is short. Then the algorithm of 2-D gray histogram is used to segment image. The paper uses Hough transformation to identify the lane mark's two edges and account its intercept and slope, then draws the midline as the last identifying result. In order to reduce the count time, the paper uses the algorithm of AOI (area of interesting) to track the lane mark. The experiments results show that the lane mark can be tracking dependably in intense illumination and the algorithms are real-time, moreover, when the tracking algorithm is failure, the system can also recover in time, and lock the tracking target accurately again.
Keywords: Intense illumination; Lane mark; Identifying; Tracking

N293 Yongfeng Suo, Tianhe Chi, Tianyue Liu
Title: Design And Application of Indoor Geographical Information System
Abstract. For the present situation of shortage in GIS indoor theories and insufficiency in indoor GIS applications, a set of indoor GIS research theories, indoor map cartography specifications and related technologies closely integrated with fire-fighting industry were proposed in this paper. The indoor map cartography specifications included technological processes of the map cartography and matched data updating mechanism, convenient for fast, accurately, timely producing professional indoor map. The key technologies such as symbol dynamic drawing, indoor outdoor seamless integration, map updating and path analysis, etc, were preliminary applied in fire-fighting emergency rescue platform, so as to realize functionalities such as indoor and outdoor seamless expression, POI updating periodically, the best rescue path analysis, etc, and improve the transparent command level of the fire rescue site, and it also may have certain reference value to other emergency rescues.
Keywords: indoor GIS; indoor Map; fire-fighting; map updating; seamless expression

N295 Tingbo Fu, Jinsheng Yang, Yu Gao, Gang Yu
Title: Constructing Cloud Computing Infrastructure Platform of the Digital Library Base on Virtualization Technology
Abstract. In order to improve hardware resource utilization, reduce maintenance and management costs, to build a new IT infrastructure platform for the user to provide a stable, efficient access to services. Taking the library of Harbin Institute of Technology, using VMware cloud computing solutions to build private clouds as an example, through the

introduction of VMware vSphere to build a virtual architecture data center, integrate various application services, the introduction of VMware View software system provides "cloud + terminal" desktop cloud of office desktop solution. It is illustrated application of virtual technology by example. It can realize the unified management and deployment of hardware resources and the application of the data center, and provide applications with high reliability, high availability and service of mobile office environment. The IT platform can effectively gather or carrying spare computing capacity, corresponding the IT resource and service priority, improve IT management level.
Keywords: server virtualization; desktop virtualization; digital library; VMware vSphere; cloud computing

N296 Yan Kang, Ying Lin, Yifan Zhang, He Lu
Title: An Ant Colony System for Dynamic Voltage Scaling Problem in Heterogeneous System
Abstract. Dynamic voltage scaling is an effective energy minimization technique by conjointly changing the supply voltage and the operational frequency during run-time. In this paper, an improved ant colony system is presented for distributed systems consisting dynamic voltage scalable processing elements. The energy saving can be obtained by using the DVS algorithm on the schedule obtained by the presented scheduling algorithm. The pheromone information of the ants and the heuristic information inspired by the list heuristic rule and energy consumption are combined together to guide the ants search. The parameter value of heuristic is varied from higher value to lower value to lessen its impact on ants search while the parameter value of pheromone information is increased during the run of ant algorithm. And the elitist solution is discarded if it cannot be improved from generation to generation. By cooperating several generations of artificial ants, the ants search for the path with a minimum energy consumption cost, and the quality of the solution can be improved for minimizing the energy consumption. Experiments are implemented to demonstrate the performance of the algorithm.
Keywords: Dynamic Voltage Scaling; Energy Consumption; Ant Colony System; Scheduling Algorithm; Heterogeneous System

N298 Yan Kang, Yifan Zhang, Ying Lin, He Lu
Title: An Improved Ant Colony System for Task Scheduling Problem in Heterogeneous Distributed System
Abstract. Task scheduling problem is a major issue of distributed system. An improved ant colony algorithm is presented to solve the scheduling problem in heterogeneous distributed system whose complexity is known to be NP-complete in general cases. To speed up the converging rate of the algorithm, elite initial solutions are generated by using an adaptable list heuristic algorithm which is a good tradeoff between the computation complexity and solution quality. A novel representation of pheromone can make effectively use of the task fitness value to accumulate pheromone in ACO (Ant Colony Optimization) algorithm. To improve the self-adaptability of the algorithm, the ACO algorithm and the heuristic rule are combined together to adjust the searching space on the progress of the algorithm. Finally local and global neighborhood searching are performed on the best solution obtained in iterations. Simulation results show that the performance of the improve ACO algorithm is better on finding optimal or near-optimal solutions than general genetic algorithm.
Keywords: Ant Colony System; Scheduling Algorithm; heuristic; Heterogeneous; Distributed System.

N299 Xiaoting Hao, Chunmei Zhang, Jing Bai, Mo Dai, Wenxing Bao, Wei Feng
Title: Classification Modeling of Multi-featured Remote Sensing Images Based on Sparse Representation
Abstract. A framework for multi-featured classification modeling of Remote sensing images with sparse representations is proposed in this paper. The problem for extracting features to build sparse learning optimal dictionaries is solved by using the remote sensing images spectral values combined with their transformation's characteristics such as NDVI (Normalized Difference Vegetation Index) and K-T transformation. This framework employs sparse representation on dimensional reduction and feature refinement for the remote sensing images. Experiments show that by using our approach the classification accuracy and Kappa coefficient are greater than the SVM (Support Vector Machine) and conventional sparse representation methods. This result is based on remote sensing images from the sand lake in Pingluo country, which is located in the Ningxia Hui Autonomous Region.
Keywords: multispectral remote sensing images; sparse representations; dictionary learning; K-T transform; NDVI

N300 Yingying Ma, Liming Wang, Longpu Li
Title: A Parallel and Convergent Support Vector Machine Based on MapReduce
Abstract. In order to improve the performance of the traditional support vector machine, this paper proposes one method referred as MR-SVM to parallelize SVM on MapReduce and mitigates the convergence problems brought by data partitioning and distributed computation. By splitting the large dataset and concurrently calculating the support vector set of each chunk across map units, MR-SVM improves the process capability and efficiency. Then the partial support vector sets are combined as the training set of the global training in reduce phase and the currently global optimum solved by reducing operations is fed back to each map units to determine whether MR-SVM should proceed with another pass. This process iterates until MR-SVM converges to the global optimum. In theory, it has been proved that MR-SVM converges to the global optimum within finite iteration size. Experimental results show that MR-SVM can improve the data-processing capability and efficiency of the tradition counterpart and guarantee its high accuracy.
Keywords: support vector machine; MapReduce; parallelize; convergence; MR-SVM

N302 Guangxuan Chen, Yanhui Du, Panke Qin, Lei Zhang, Jin Du
Title: A New Single Sign-on Solution in Cloud
Abstract. In order to deliver centralized visibility for login activity, reduce identity proliferation and confusion, increase user adoption and security, reduce administrative costs, and support for entire identity management lifecycle in cloud, a new single sign-on solution is proposed in this paper. By introducing OAuth protocol combined with identity federation mechanism and identity mapping, the new single sign-on model can give the cloud user that has succeed through an identity authentication the permission to access other cloud services in a reasonable time period without entering the username and password repeatedly. Empirical results show that the solution will be used as an impactful measure in scenarios where frequent interactions among different cloud services and clouds that results significant impact across multiple security domains. The OAuth based single sign-on solution can effectively solve the problems of complexity of identity management and cross-domain authentication in cloud environment and thus increased the security and improved the user's efficiency.

Keywords: single sign-on; cloud; identity federation; OAuth

N307 Zhuang Miao, Qianqian Zhang, Songqing Wang, Yang Li, Weiguang Xu, Jiang Xiao
Title: A Resource Information Organization Method Based on Node Encoding for Resource Discovering

Abstract. In order to discover a variety of network resources of structured P2P, resource information organization methods are required, which should have scalability and robustness. However, structured P2P has bad performance because of churn, so it cannot be widely used currently. To solve the problem, a resource information organization method based on node encoding is provided in this paper. A node group based resource information organization and resource distribution algorithm based node encoding are presented. Redundancy tables are established based on the overlay of the node. The proposed algorithm can decrease the burst of transmission and reduce the traffic load of transited information. The experiment results show that the presented method is tolerated to churn.
Keywords: resource discovery; structured P2P; churn; resource information organization

N312 Wa Gao, Fusheng Zha, Baoyu Song, Mantian Li, Pengfei Wang, Zhenyu Jiang, Wei Guo
Title: Real-time Filtering Method Based on Neuron Filtering Mechanism and its Application on Robot Speed Signals

Abstract. In order to implement the real-time filtering and tracking of robot signals with high efficiency, a novel real-time filtering method based on neuron filtering mechanism is developed in this paper. By considering the ubiquitous of resonance in mammal and combining the mechanism of neural information processing, the derived details and the feasible parameter criterion under minimum error variance condition are given. For illustration, the application on quadruped robot is discussed. The quadruped robot feet speed signals are processed by developed real-time filtering method and Kalman filtering algorithm respectively, and the computation time of both methods are tested. Experiment results show that the performance of developed real-time filtering method is better than that of Kalman filtering algorithm, not only in filtering and tracking performance, but also in filtering speed. The novel real-time filtering method based on neuron filtering mechanism can effectively implement the real-time filtering and tracking with regard to robot signals.
Keywords: Filtering; Tracking; Resonance; Real-time; Quadruped robot

N316 Yi Yang, QingShan Man, PingLiang Rui
Title: A Collaborative Load Control Scheme for Hierachical Mobile IPv6 Network

Abstract. With consideration of the invalid registration flows and load balance problems in hierachical mobile IPv6 (HMIPv6) networks, a collaborative load control scheme (COLC) for HMIPv6 networks is proposed to reduce registration flows and balance load. In COLC, mobile anchor point (MAP) is allowed to transfer part of its packet-delivery load to its neighboring MAPs with lower load, by which the invalid registration flows decrease, and more mobile nodes (MNs) register with their favorite MAPs without capacity expanded. The validities of the scheme in reducing registration flows of HMIPv6 and performing better load balance are examined in the simulations.
Keywords: Hierarchical mobile IPv6 network; Cost optimization; Load control scheme; Regional registration; packet delivery

N319 Huiqun Zhao, Biao Shi

Title: The Implementation of Electronic Product Code System Based on Internet of Things Applications for Trade Enterprises

Abstract. In order to solve the EPC codec problems based on Internet of Things(IOT) applications for trade enterprises, in this paper a EPC codec system is designed for enterprise applications. According to the "Tag Data Standards", we design the encoding and decoding algorithm/schema of SGTIN-96. On the basis of the algorithm/schema, the system has improved its coding and decoding algorithm, making the coding algorithm more simple and practical and improving the efficiency. Besides, it also has realized the transformation between SGTIN-96 and GTIN-14, which makes the final printed electronic tag contain both a bar code and the EPC code, and realizes the compatibility of bar code and EPC code. The coding and decoding system can code and decode well for the products of the trade enterprise. Through the system, SGTIN-96 labels can be generated and printed. And the content of SGTIN-96 labels can be decoded. Finally, we test the codec system to prove that it can achieve our established requirements.
Keywords: EPC; SGTIN-96; GTIN-14; RFID

N320 Mengwan Jiang, Haoliang Li
Title: Vehicle Classification Based on Hierarchical Support Vector Machine

Abstract. In order to solve the problem that the mature vehicle classification cannot meet the requirements of accuracy and speed concurrently, this paper chooses the contour features and SURF features of vehicles, and then adopts a hierarchical support vector machine（SVM）classifier for vehicle classification. At first, the system uses the contour features which are simple and fast in the first layer of classifier, so that it will filter out the easy samples. Second, the system utilizes the rich information and stable SURF feature in the next layer of classifier. We conducted extensive experiments against a number of baseline methods, and the accuracy of proposed method was increased by about 20%, and the time was shortened by 2/3, significantly outperforming the baselines. The method of double features and hierarchical SVM has a good tradeoff between speed and precision.
Keywords: vehicle classification; contour features; SURF; SVM

N323 Yanxia Liu, Wenjun Xiao, Jianqing Xi
Title: The Characteristic and Verification of Length of Vertex-degree Sequence in Scale-free Network

Abstract. Many natural large-sized complex networks exhibit a scale-free, power-law distribution of vertex degree. To better understand the formation mechanism of power law in the real network, we analyze the general nature in scale-free network based on the vertex-degree sequence.We show that when power exponent of scale-free network is greater than 1, the number of degree-k_1 vertices, when nonzero, is divisible by the least common multiple of $1, k_2^\gamma / k_1^\gamma, ..., k_i^\gamma / k_1^\gamma$, and the length of vertex-degree sequence l is of order $\log N$, where $1 \le k_1 < k_2 < ... < k_l$ is the vertex-degree sequence of the network and N is the size of the network. We verify the conclusion by the co-authorship network DBLP and many other real networks in diverse domains.
Keywords: complex network; scale-free network; power-law distribution; vertex-degree sequence

N324 Hong Tao, Chenping Hou, Dongyun Yi
Title: Multiple View Spectral Embedded Clustering Using a Co-training Approach

Abstract. It is a challenging task to integrate multi-view representations, each of which is of high dimension to improve the clustering performance. In this paper, we aim to improve the clustering performance of spectral clustering method when the manifold for high-dimensional data is not well-defined in the multiple view setting. We abstract the discriminative information on each view by spectral embedded clustering which performs well on high-dimensional data without a clear low-dimensional manifold structure. We bootstrap the clusterings of different views using discriminative information from one another. We derive a co-training algorithm to obtain a most informative clustering by iteratively modifying the affinity graph used for one view using the discriminative information from the other views. The approach is based on the assumption that the clustering from one view should agree with the clustering from another view. Comprehensive experiments on four real-worlds multiple view high-dimensional datasets are presented to demonstrate the effectiveness of the proposed approach.
Keywords: multiple view; co-training; spectral embedded clustering; high-dimensional data

N330 Leela Sedaghat, Brad Duerling, Xiaoxi Huang, Ziying Tang
Title: Exploring Data Communication at System Level through Reverse Engineering: A Case Study on USB Device Driver
Abstract. Interactions among operating system, drivers and peripheral devices are important for users to understand data communication at low system level, system architecture, and hardware programming. In this paper, we study low-level data communication and resource management by conducting the development of a USB device driver. A reverse engineering approach has been adopted in this study and we focus on exploring the USB protocol and developing a device driver for the Linux operating system. We have performed various experiments to evaluate the device driver from different aspects and all testing results are remarkably good. We believe this work can provide users a clear practical understanding of data communication from the hardware level to user-space applications as well as theoretical foundations to reproduce any unsupported peripheral hardware devices.
Keywords: USB; device driver; reverse engineering

N332 Yanyan Xu, Bo Yang, Zhengquan Xu, Tengyue Mao
Title: A High-efficient Selective Content Encryption Method Suitable for Satellite Communication System
Abstract. Data transmitted by satellite communication system should be encrypted in order to provide confidentiality. A selective content encryption method suitable for satellite communication system is presented in the paper, and the key content information in the compressed stream is extracted and encrypted, and the variable modulus encryption method is proposed to solve the problem of variable length code encryption, thereby the encrypted stream can be format-compliant. This method can improve the efficiency of encryption and achieve fast, secure and high efficient encryption of satellite communication system. The experimental results prove the effectiveness of our method.
Keywords: DVB-RCS; satellite communication ; selective content encryption ; format-compliant

N337 Yan Xiao
Title: Image Splicing Detection Based on Machine Learning Algorithm
Abstract. Image splicing is a common method to construct forged image which decreases the authentication of the traditional image. Resizing operation is usually necessary to create a

convinced forged image. Though the forged image leaves no visual clues, resizing operation using interpolation method destroys the relationship between neighboring pixels, thus leaving traces which can be captured by statistical feature. We first convert the traces left by resizing to feature and then feed features from enough sample images to support vector machines to train for detector. Finally, we use detector to determine whether the image is tampered and point out which parts of image are tampered by block-wise method. Experimental results verify the effectiveness of our proposed method.
Keywords: image tampering; machine learning

N338 Chuansheng Wu
Title: Feedback the Earliest Deadline First development Asynchronous Dynamic Voltage Scaling Hardware Assisted
Abstract. The hardware software co-design of a feedback dynamic voltage scaling algorithm and a new processor capable of executing instructions in the frequency voltage conversion. We study several energy-aware feedback schemes based on earliest deadline first scheduling, dynamic adjustment of the behavior of the system, for different workload characteristics. Study on several kinds of hard real-time dynamic voltage scaling scheme, infrastructure, including feedback dynamic voltage scaling algorithm, we realized in the embedded development board NEC, 530. System structure and algorithm overhead evaluation of dynamic voltage scaling scheme for different. Dynamic voltage scaling algorithm feedback we save at least frequently than previous dynamic voltage scaling algorithm, an additional 18% energy reduction peak saves more energy.
Keywords: embedded processor; earliest deadline first; dynamic voltage scaling

N340 Qian Tao, Zhexue Huang, Chunqin Gu, Chenxin Zhang
Title: Optimization of Green Agri-food Supply Chain Network Using Particle Swarm Optimization Algorithm
Abstract. The green agri-food supply chain network (GASCN) design is critical to reduce the total transportation cost for efficient and effective supply chain management. This paper proposes a new solution based on Particle Swarm Optimization (PSO) to find optimal solution for GASCN problem. PSO adopts transforming operator to modify particles in the population. The novelty of the transforming operator is that it can avoid applying the penalty function so that the diversity of populations is decreased. To show the efficacy of the algorithm, PSO is also tested on three cases. Results show that the proposed algorithm is promising and outperforms GA by both optimization speed and solution quality, especially when the scale of problem is large.
Keywords: supply chain network; Particle Swarm Optimization; transforming operator

N341 Jinrong Bai, Guozhong Zou, Shiguang Mu, Yu Ma
Title: Using Spatial Analysis to Identify Tuberculosis Transmission and Surveillance
Abstract. Tuberculosis is a chronic infectious disease which can make serious hazard to human health and cause large social and economic burden on a country. So for experts and researchers, tuberculosis is one of the biggest public heath challenges. The cause of this disease can be effectively studied by precise analysis of the spatial distribution of the disease. This paper demonstrates that using existing health data, spatial analysis and GIS in conjunction with epidemiological analysis can identify tuberculosis transmission. This paper also demonstrates some of the valuable results of GIS in disease surveillance and mapping. The decision-makers could master the epidemic of tuberculosis dynamically and then take

better measures to control tuberculosis. Moreover, this study may add some value to the traditional and molecular epidemiology, and provides an alternative method that may provide insight into the transmission of tuberculosis.

Keywords: tuberculosis; GIS; spatial analysis; statistics

N345 Jiguang Liu, Jianbing Wu, Zhiguo He

Title: Design and Realization of General Interface Based on Object Linking and Embedding for Process Control

Abstract. Based on analysis of existing problems of interface software development process of industrial control, the importance of building the general interface system based on OPC (Object Linking and Embedding for Process Control) was proposed. The data model was given with database technology. On the basis of the data model, the configurable general interface system based on OPC was implemented. Versatility and configurability is the most important feature of the interface system. By simple modification of configuration information, the interface system will meet the needs of different projects. The application results show that the interface system greatly reduces the development cycle of the related software, improves the reliability and stability of the application system, reduces costs of system operation and maintenance.

Keywords: OPC; process control; PLC; DCS; general interface system; configurability

N358 Ming Xia, Yabo Dong, Qingzhang Chen, Kai Wang, Rongjie Wu

Title: Network Design of a Low-power Parking Guidance System

Abstract. A parking guidance system can help a driver quickly find an available parking space. Most currently available parking guidance systems require wire deployment in installation, thus entailing high installation costs. In this paper, we discuss the network design of a low-power parking guidance system. We developed a tiered communication architecture including Wireless Sensor Network (WSN), General Packet Radio Service (GPRS) network and internet to realize wireless parking space availability data transmission, and thus installation complexity can be greatly reduced. In order to reduce the battery replacement frequency of the WSN, we designed a power-minimized Medium Access Control (MAC) protocol. The proposed MAC protocol divides one network working cycle into four dedicated intervals to realize robust network organization and energy efficient data delivery. Experimental results showed that the proposed MAC protocol can extend the battery lifetime of the WSN to more than ten years. Based on the collected parking space availability data, we built a portable parking guidance terminal to let drivers locate available parking spaces conveniently.

Keywords: Wireless sensor network; Parking guidance; Network design; Mac protocol

N363 Yanlin Yin, Dalin Jiang

Title: A Stateful and Stateless IPv4/IPv6 Translator Based on Embedded System

Abstract. In order to solve intercommunication problem between IPv4 network and IPv6 network more flexibly, this paper has proposed an improved IPv4-IPv6 translator based on embeded system. By using an optimized address mapping regulation, it can support both stateful and stateless translation method. In addition, a lightweight SIP-ALG and Modbus-ALG has been designed to assist the translator to process the datagram, which may take address and domain information at the 7-layer of OSI model. The results show the translator can work well between sensor network and Internet, and the mixed use of stateful and stateless method has much less memory usage than stateful method and nearly the same

process delay as stateless method.
Keywords: IPv6; Stateful Translation; Stateless Translation; IVI; NAT-PT

N364 Lin Gao, Zhijun Wu
Title: A Preemptive Model for Asynchronous Persistent Carrier Sense Multiple Access
Abstract. In order to analyze the problem of packets collision in the asynchronous mode of persistent carrier sense multiple access (p-CSMA), in which there is no timeslot different from synchronous mode and propagation delay have heavy effect on the probability of packets collision, a preemptive asynchronous p-CSMA probability model is established for the first time in the paper. From sub-cycle conditional probability, the model gives the expectations of idle and busy period. On the basis, performance targets, e.g. throughput\delay\success rate and channel efficiency, are gotten. For illustration, VDL2 (a typical asynchronous p-CSMA network) simulation model is set up on OPNET platform and experiments are also carried out to verify the correctness of this model in diverse scenarios. Through simulation, the results of fixed position distribution have the good consistency with the preemptive probability model. Finally, the conclusion is achieved that packets collisions will aggravate with the stations distribution becoming more uneven.
Keywords: p-CSMA; propagation delay; asynchronous mode; Poisson distribution; VDL2

N365 Zhi Xue, Yaoxue Zhang, Yuezhi Zhou, Wei Hu
Title: A Novel Collaborative Filtering Approach by Using Tags and Field Authorities
Abstract. Traditional collaborative filtering is widely used in social media and e-business, but data sparsity and noise problems have not been solved effectively yet. In this paper, we propose a novel approach of collaborative filtering based on field authorities, which achieves genre-tendency of items by mapping tags to genres, and simulates a fine-grained word of mouth recommendation mode. We select nearest neighbors from sets of experienced users as field authorities in different genres, and assign weights to genres according to genre-tendency. Our method can solve sparsity and noise problems efficiently and have much higher prediction accuracy. Experiments on MovieLens datasets show that the accuracy of our approach is significantly higher than traditional user-based kNN CF approach in both MAE and Precision tests.
Keywords: Recommender System;Collaborative Filtering;Tag; Genre;Field Authority; Rating Prediction; Nearest Neighbor

N367 Bo Li, Ming Tian, Yongsheng Zhang, Shenjuan Lv
Title: Strategy of Domain and Cross-domain Access Control Based on Trust in Cloud Computing Environment
Abstract. Under the current cloud computing environment, a reasonable and practicable access control strategy is needed, which is a guarantee to protect cloud computing suppliers to provide services and many cloud users access to services. In this paper, on the basis of analysis of many cloud computing safety features, trust management is introduced into the cloud computing service access control, within the domain of a trust - based access control strategy, in domain, presents a trust - based access control policy. Credible value will be given through the comprehensive treatment of the entity, then AAC（Authentication and Authorization Center）authorizes the appropriate access rights to achieve the control of the monomer in the domain. Combined with the characteristics of the existing cloud computing environment multiple management domains, proposes a role mapping, with the role mapping relationship between the domain, which can make the inter-domain access to resources and

security shared access between different domains, in order to avoid the problem of permission penetration and privilege escalation, this paper presents the mirror-role based on role-mapping, ultimately solves the problem.

Keywords: cloud computing; trust; access control; cross-domain; mirror-role

N370 Jingduan Dong, Changhao Xia, Wei Zhang

Title: A New Model for Short-term Power System Load Forecasting using Wavelet Transform Fuzzy RBF Neural Network

Abstract. Power load changes periodically. And the effects of climatic (precipitation, relative humidity, temperature, wind speed) on the load should be fuzzy. In order to solve the problem, this paper presents a method combining wavelet transform, fuzzy set concept and neural networks for short-term load forecasting. Through the wavelet transform, the load sequence decomposes into sub-sequences consist of different wavelet coefficients. On the other side, by the fuzzy neural network, the samples of five meteorological factors influencing power load are transformed into fuzzy input with the sub-sequences, and then select the suitable RBF neural networks for the forecasting. Finally, the load forecasting sequence is obtained by the reconstruction of the forecasted results from the sub-sequences. The simulation results demonstrate the proposed method possesses validity and practicability with a mean absolute error below 1.5%.

Keywords: wavelet transform; fuzzy system; RBF neural network; short-term load forecasting; forecasting model

N374 Meiyan Zhang, Wenyu Cai, Liping Zhou, Jilai Liu

Title: Energy Effective Frequency Based Adaptive Sampling Algorithm for Clustered Wireless Sensor Network

Abstract. The objective of wireless sensor networks is to extract the synoptic structures (spatio-temporal sequence) of the phenomena of ROI (Region of Interest) in order to make effective predictive and analytical characterizations. Energy limitation is one of the main obstacles to the universal application of wireless sensor networks. Recently, adaptive sampling strategy is regarded as a much promising method for improving energy efficiency. In this paper, we dedicate to investigating how to regulate sampling frequency of sensor nodes in different clusters dynamically following the change of signal frequency. The Adaptive Frequency based Sampling (FAS) algorithm proposed in this literature is to measure periodic signal frequency online in different clustered region, afterwards regulate signal sampling frequency following with minimal necessary frequency criterion, as a result, the previous desired level of accuracy is achieved and the energy consumption is decreased. The simulation results are compared with that of fixed sampling rate approach with respect to energy conservation.

Keywords: wireless sensor networks (WSN); adaptive sampling; frequency based sampling; energy effective

N375 Bo Yin, Feng Yang

Title: Characteristics of Impedance for Plasma Antenna

Abstract. Impedance analysis is very important for antenna design. In this paper, the internal impedance of the plasma antenna is analyzed by building the model of high frequency electromagnetic waves acting with plasma. At the same time, a model of surface current for plasma antenna is developed in accordance with the eigenvalue equation of guided mode, and the radiation resistance of plasma antenna is analyzed according to the method of

Poynting vector. From results, we find that the internal impedance and the radiation resistance of the plasma antenna are affected distinctly by the plasma density and electron-neutral collision frequency. The internal resistance could be reduced, and the radiation resistance would be added efficiently by increasing the plasma density and decreasing the collision frequency.

Keywords: plasma column antenna; internal resistance; radiation resistance; method of Poynting vector

N376 Chaobo Chen, Bofeng Zhang, Song Gao
Title: A Lane Detection Algorithm Based on Hyperbola Model

Abstract. In order to improve the problem of recognition rate and inaccurate in the curve, this paper proposed a lane detection algorithm based on hyperbola model, which uses Canny operator to detect the edge of the lane and wields the Hough transform to extract lane boundary points, and utilizes extended Kalman filter to reduce road scanning range. By fitting points on pair road boundaries into the hyperbola model, and completes the lane boundary reconstruction. Some experimental studies are conducted, and the results show that the accuracy of the algorithm has reached 93.4% and the processing speed of each image needs 77.4ms. Our method is able to make full use of lane boundaries with existence partial occlusion, blur and low contrast. Meanwhile, it can quickly and accurately identify lane line, and it has high performance and robustness.

Keywords: Lane detection; Hyperbola model; Hough transformation; Extended Kalman filter

N377 Caoqing Jiang, Shi Ying, Shanming Hu, Hua Guan
Title: Construction Method of Exception Control Flow Graph for Business Process Execution Language Process

Abstract. Traditional control flow graph of exception handling is usually lack of an explicit description of exception handling and propagation, and can not be used to well analyze the exception situations and exception handling error. To solve these problems, this paper presents a construction method of exception control flow graph (ECFG) for BPEL process. This method uses a label that is marked exception and be of power for collection computing to describe exception information of BPEL process in building the ECFG. Moreover, experiment shows that ECFG generated can clearly express exception information and propagation process in BPEL process.

Keywords: BPEL process; exception control flow graph; ECFG; exception handling

N379 Yibo Li, Xiting Liu
Title: An Indoor Three-dimensional Positioning Algorithm Based on Difference Received Signal Strength in WiFi

Abstract. To further solve the problom that using the positioning algorithm directly based on received signal strength (RSS) in WiFi technology has lower positioning accuracy because the characteristics of the wireless channel affect the signal attenuation largely and randomly, an indoor three-dimensional positioning algorithm based on difference received signal strength (DRSS) is proposed through the analysis that two close propagation paths have similar interference. It can reduce the large positioning error caused by time-varying interference and directly using the fluctuant values of the interfered received signal. Meanwhile, the wireless signal attenuation model with a parameter of time-varying environment factor is used. A method of real-timely estimating and modifying the

parameters by least square estimation (LS) and the way of average is proposed to solve the problom that the model can not describe the real-time changes of signal attenuation accurately. The environmental test results show that this method not only can obtain a more accurate model, but also has higher positioning accuracy in three-dimensional multi-interference environment.

Keywords: WiFi; difference received signal strength; indoor three-dimensional positioning

N381 Saeed Panahian Fard and Zarita Zainuddin
Title: The Universal Approximation Capability of Double Flexible Approximate Identity Neural Networks

Abstract. This study investigates the universal approximation capability of three-layer feedforward double exible approximate identity neural networks in the space of continuous functions with two variables. First, we propose double exible approximate identity functions, which are a combination of double approximate identity functions and exible approximate identity functions as investigated in our previous studies. Then, we prove that any continuous function f with two variables will converge to itself, if it convolves with double exible approximate identity. Finally, we prove a main theorem by using the obtained results.

Keywords: Double exible approximate identity functions; Double exible approximate identity neural networks; Double approximate identity functions; Flexible approximate identity functions; Mellin approximate identity functions; Universal approximation

N382 Seyed Aliakbar Mousavi, Muhammad Rafie Hj. Mohd. Arshad, Hasimah Hj. Mohamed, Putra Sumari, Saeed Panahian Fard
Title: P300 Detection in Electroencephalographic Signals for Brain Computer Interface Systems: A Neural Networks Approach

Abstract. Brain computer interface systems are communicative mediums between human brain and external device. One of the applications of these systems is P300 speller. This application provides the ability to spell the characters on the screen for disable people. In this study, we review the character recognition and its relation to P300 detection. Then, we used three neural networks models with flexible activation functions to detect P300 patterns from electroencephalographic signals more accurately. The obtained results have shown the accuracy of the character recognition based on the precision and recall measures.

Keywords: P300 detection; EEG signal Classification, brain-computer interface; biomedical signal Processing; microelectromechanical systems; nonliner dynamics

N386 Zhenyu Jiao, Xiaoben Yan, Jinjin Sun, Yuchen Wang, Jiangbin Chen
Title: Web Content Extraction Technology

Abstract. In this information era, we are facing the knowledge explosion, and the information on the Internet is multifarious. It is not convenient enough for us to access to information directly on cell phones due to their limitation. Based on parsing a web page with regarding it as a DOM (Document Object Model) tree, we extract the valuable information with considering three factors: structure, content and programming habits. For illustration, 28 websites are utilized to show the feasibility of the method in web information extraction, and we design the mobile client to present the web content on the cell phones. The Practice has proved that using the web page extraction technology related to this article to browse the corresponding news websites, only consumed 8% of cell phone traffic of the existing mobile phone browser did. And the user experience is improved. This method can help people to get rid of costing too much on the cell phone traffic, redundant information, complicated

operations and so on.
Keywords: Information extraction; android; Jsoup; DOM

N389 Zhiqin Zhang
Title: A Novel and Realtime Hand Tracking Algorithm for Gesture Manipulation
Abstract. Direct use of the hand as an input device is an attractive method for providing natural human–computer interaction (HCI). Computer vision (CV) has the potential to provide more natural, non-contact solutions. As a result, there have been considerable research efforts to use the hand as an input device for HCI in recent years. Hand tracking is the most important procedure for HCI. This paper presents a novel hand tracking algorithm which can track a hand stable and is real time, and we review on the latter hand tracking research direction, which is a very challenging problem in the context of HCI. Our algorithm is based on mean-shift and we improved it to fit for robust hand tracking by using integrated GIH and skin color mask, our improved algorithm can track hand reliably even in clutter environments. Finally, we demonstrate the benefits of our approach in contrast to existing methods.
Keywords: Hand tracking; HCI; CV; Gesture manipulation; Mean shift

N392 Jhin-Fang Huang, Jiun-Yu Wen , Yong-Jhen Jiangn
Title: A Low Voltage 5.8-GHz Complementary Oxide-mental Semiconductor Transceiver Front-end Chip Design for Dedicated Short-range Communication Application
Abstract. A 5.8 GHz transceiver front-end applied in dedicated short-range communication (DSRC) systems which is developed in public traffic transportation to improve the safety is fabricated on a chip using TSMC 0.18 μm CMOS process. The proposed prototype includes an asymmetric T/R switch, a current-reused LNA, and a class A power amplifier (PA) on the low voltage operation in order to minimize the power consumption. Measured results achieve the power gain of 11 dB, the NF of 4.9 dB, the third-order intercept point (IIP3) of -5.4 dBm and the power consumption of 3.9 mW in the receiving (Rx) mode. On the other hand, the power gain of 12.4 dB, the output 1 dB compression point (OP$_{-1dB}$) of 11.4 dBm, the PAE of 14.7 % at P$_{-1dB}$, the IMD3 of -15.8 dBc at 1 dB compression level, the output power of 2.6 dBm with a $50\,\Omega$ load and power consumption of 116.3 mW are obtained in the transmitting (Tx) mode. The overall chip area is 1.5 (1.32 x 1.14) mm^2. This RF CMOS transceiver front-end includes all matching circuits and biasing circuits and no external components are required.
Keywords: transceiver front-end; power amplifier; DSRC

N401 Dong Zhao, Yang Gu, Zhenchun Huang
Title: A New Data Intensive Parallel Processing Framework for Spatial Data
Abstract. The explosive increase of scientific data brings in the "Forth Diagram" research method by Jim Gray. In order to accelerate the processing speed for these big data, parallel distributed processing is needed. As the data intensive computing requires high throughput of IO, the data transfer from different node should be cut down as much as possible. Current technologies focus more on the framework for local reliable network with homogeneous resources, but the parallel processing framework for scientific data intensive problems such as spatial data shared with internet and queried by semantics is not fully studied. In this article, we proposed a new data intensive parallel processing framework for spatial data– Robinia DSSSD (Distributed Storage and Service for Spatial Data), which provides the flexible ability to support data distribution and allocation across Internet, and semantics

query. Experiments shows that Robinia DSSSD can achieve good acceleration with low overhead and it can well support data intensive computing.
Keywords: data intensive; parallel processing framework; spatial data

N405 Qingxue Yu, Yunhui Luo, Maohai Lin, Quantao Liu
Title: Comparisons and Analyses of Image Softproofing under Different Profile Rendering Intents

Abstract. This paper presents some results from an experiment of image softproofing under different ICC rendering intents, which will be available for selecting an appropriate rendering intent in printing processes. In a screen softproofing procedure, image is converted via ICC profile embedded in image itself to output device profile, then to proofing device profile. With the rendering intent of absolute colorimetry in the second conversion, the effects of different rendering intents in the first conversion have been investigated through a softproofing software developed in Matlab 7.0. A variety of testing images, including light tone, shadow detail, etc., are used for image softproofing. The color differences between original images and proofed images are calculated under the SCIE L*a*b* color difference formulae. Comparisons and analyses on the obtained images under four rendering intents show the effects of color characteristics of original images on rendering intent selection.
Keywords: image softproofing; rendering intent; ICC profile; color management

N406 Xin Xia, Shaoyan Gai
Title: An Improved Dense Matching Algorithm for Face Based on Region Growing

Abstract. Traditional dense matching algorithms for face based on region growing have a lot of flaws. To generate a better disparity map, a novel improved method is proposed in this paper. Firstly, SIFT (Scale Invariant Feature) algorithm is adopted to detect feature points for a pair of images, which are taken from two different angles. Secondly, this paper uses NCC (Normalized Cross Correlation) to get match points and uses RANSAC (random sampling consensus) algorithm to eliminate mismatches. Several robust seeds are generated after this step. At last, by using an improved strategy of region growing, in which seeds are evaluated to help determine the locations and sizes of the search windows dynamically, the matching relations of seeds propagates to other parts of images. Experiments show that this method can obtain a good disparity map and has high computation speed.
Keywords: dense matching; region growing; mismatch eliminating

N408 Zhidong Chen, Buyang Cao, Yuanyuan Liu
Title: Detecting Unhealthy Cloud System Status

Abstract. In this paper, in order to detect the unhealthy status in the cloud system, a Basic Detection Strategy and a Threshold Strategy based on mathematic theory and statistical knowledge is proposed to solve this problem. By introducing unhealthy status percentage parameter α , both Basic Detection Strategy and Threshold Strategy are combined to detect and monitor the unhealthy cloud system status. For illustration, an eBay company example is utilized to show the feasibility of Basic Detection Strategy and Threshold Strategy. Empirical results show that Basic Detection Strategy with setting a suitable value to α can pinpoint most of unhealthy status in the cloud system, however, for some special unhealthy status, it must adopt the Threshold Strategy to pinpoint. The combination of Basic Detection Strategy and Threshold Strategy can effectively detect and pinpoint the unhealthy status in the cloud system and help staff to improve the performance of cloud system.
Keywords: unhealthy cloud system status, Basic Detection Strategy, Threshold Strategy;

mathematic theory, statistical knowledge

N409 Jhin-Fang Huang, Jia-Lun Yang, Kuo-Lung Chen
Title: A 5.8-GHz Frequency Synthesizer with Dynamic Current-matching Charge Pump Linearization Technique and an Average Varactor Circuit

Abstract. A 5.8 GHz frequency synthesizer is implemented in TSMC 0.18 um CMOS process. This paper proposes a dynamic current-matching charge pump linearization technique and uses a current-switching differential Colpitts VCO to lower the phase noise, and an averaged varactor circuit to increase the linearity of the VCO tuning range. At the supply voltage of 1.8-V, measured results achieve the locked tuning frequency from 5.55 to 5.94 GHz, corresponding to 6.8% and the phase noise of -105.83 dBc/Hz at 1MHz offset frequency from 5.8 GHz. The overall power consumption is 21.6 mW. Including pads, the chip area is 0.729 (0.961×0.761) mm^2.
Keywords: voltage-controlled oscillator; VCO; PLL; phase-locked loop; frequency synthesizer

N417 Xin Chen, Yuqing Zhang, Long Cao, Donghui Li
Title: An Improved Feature Selection Method for Chinese Short Texts Clustering Based on HowNet

Abstract. Short texts have played an important role in the field of text data mining. Because of the problems arousing from the complexity of Chinese semantics and data sparseness, which is an obvious characteristic of short texts, it is necessary to explore some new semantic-based methods to cluster Chinese short texts. An improved approach of feature selection based on HowNet is applied in this paper to address data sparseness of Chinese short texts. By redefining Vector Space Model in semantic level and merging generalized synonymy features, we present a new feature generation strategy. Experimental results show that by merging semantic similar feature, our method is effective in feature dimension reduction and gets better clustering performance. The proposed HowNet based feature selection method is suitable for Chinese short texts clustering.
Keywords: HowNet; Feature selection; Short texts clustering; Semantics

N418 Chunqin Gu, Qian Tao
Title: A Transforming Quantum-inspired Genetic Algorithm for Optimization of Green Agricultural Products Supply Chain Network

Abstract. The green agricultural products supply chain network (GAP-SCN) design is to provide an optimal platform for efficient and effective supply chain management. This paper proposes a new solution based on transforming quantum-inspired genetic algorithm (TQGA) to find optimal solution for the GAP-SCN problem. TQGA adopts transforming representation to convert the Q-bit representation to float-point number, and the float-point number to Q-bit representation, uses transforming operator to modify chromosomes. The novelty of the transforming operator is that it can avoid the diversity of populations is decreased. To show the efficacy of the algorithm, TQGA is tested on two cases. Results show that the proposed algorithm is promising and outperforms the classic GA by both optimization speed and solution quality.
Keywords: quantum-inspired genetic algorithm (QGA); optimization; supply chain network; transforming

N419 Peng Luo, Qizhi Qiu, Wenyan Zhou, Pei Fang

Title: A Shortest Path Algorithm Suitable for Navigation Software

Abstract. In allusion to the shortage of hardware configuration in the mobile devices and high time-complexity of Dijkstra algorithm, the paper comes up with a shortest path algorithm based on cut-corner for restricted searching area. This algorithm aims at shrinking the smallest searching area quickly, and considers the advantages of Ellipse algorithm and Rectangle algorithm. When tested in the simulator, we find that the time-complexity of Cut-corner algorithm is reduced by 5%-20% compared with that of other conventional algorithms. Thus, it has better effect when used in navigation software of low-end mobile device.

Keywords: Dijkstra algorithm; restricted searching area; shortest path; Android; navigation software.

N420 Zhifang Yang, Zhongxing Yu, Chenggang Bai
Title: The Approach of Graphical User Interface Testing Guided by Bayesian Model

Abstract. GUI(Graphical User Interface) is becoming increasingly important in the software field for the reason that it is a friendly way for the users to interact with the software through GUI. Testing in GUI, however, is faced with many challenges, due to the immense number of event interactions. Testing all possible event interactions is impossible, since the number of required test case is huge in numbers. GUI testing mainly serves two goals: First, to establish confidence in assessment of GUI; Second, to find that more software defects in GUI testing while limiting the number of test cases. For this purpose, any testing method must be better at detecting defects. This article proposed a new technique that can be used for GUI testing, which can guide the GUI testing and find more defects as soon as possible. In this paper, it introduces an approach of GUI testing guided by Bayesian model optimization scheme, discusses the Bayesian model topology and its issues encountered in the modeling process. It presents solutions in connection with the parameters problem. In the end, a simple case verifies the validity of the model during the GUI testing.

Keywords: Bayesian models; GUI testing; Topology; Bayesian estimation; Test design

N421 Yongxiang Liu, Yi Ren, Yi Wang
Title: Full-Wave Design of Wireless Charging System for Electronic Vehicle

Abstract. This article studies magnetic resonance based on Wireless Power Transmission (WPT) system for Electronic Vehicle (EV). In this system, the two resonant coils mounted on the bottom of vehicle and on the ground were simultaneously analyzed by the Method of Moments (MoM), an accurate and efficient full-wave electromagnetic analysis method. Then, compared with traditional WPT in ideal circumstance, the different performance of WPT in wireless charging system of EV is studied. Finally, a new design of the WPT integrated with circumstance is proposed, which achieves 90% energy transmission efficiency at the resonant frequency of 13.56 MHz with the distance between two resonant coils varying within 15-25cm.

Keywords: magnetic resonance; Wireless Power Transmission; Electronic Vehicle; Method of Moments

N423 Huihui Liang, Min Li, JiWen Chai
Title: Internet Worm Detection and Classification Based on Support Vector Machine

Abstract. This paper proposes a novel internet worm detection and classification method. The behaviors of worms are different from each other's, and they are also different in terms of the normal internet activities. So we can detect and classify worms by the extracted

features of the network packets. At first, we sniff raw network packets from the Local Area Network (LAN), and extract thirteen features from the packet header, and then select ten important features using the information gain algorithm. With the labeled features, we train Support Vector Machine (SVM) classifiers. The classifiers can classify the behaviors of the worm apart from the normal internet activities. And this approach can also classify network attacks and internet worms, although the network attacks and the internet worms have similar behaviors. In the experiments, this approach performs well in worm detection and classification.

Keywords: worm detection; classification; SVM

N429 Wentao Zhao, Pengfei Wang, Fan Zhang
Title: Extended Petri net-based Advanced Persistent Threat analysis model

Abstract. In order to display the attack scene in the description of the multi-step process-oriented attack—Advanced Persistent Threat, a specific model on Advanced Persistent Threat behavior analysis—EPNAM is proposed, which is based on the Petri Net and combined with the characteristics of APT. Firstly we carry out hierarchical analysis on the attack scene with AHP method to build the APT architecture and extract scene factors, then associate the attack scene with Petri net to construct extended Petri net, finally, traverse the extended Petri net to generate the formal expression. The proposed model can achieve the combination of attack scene, attack process and state space, and its feasibility is proved by the application on actual case analysis of RSA SecurID theft attack.

Keywords: Advanced Persistent Threat; APT; Extended Petri net; Hierarchical Scene Analysis; Formal Expression;

N434 Yujia Zou, Leibo Liu, Shouyi Yin, Min Zhu, Shaojun Wei
Title: A Hierarchical Local-Interconnection Structure for Reconfigurable Processing Unit

Abstract. Reconfigurable computing is being widely used in computation-intensive applications. With the rapid development of applications, we have higher requirements for the computational efficiency of reconfigurable computing. In order to improve the computational efficiency, the array size gradually increased for applications that are more complex. With the upgrade of the array size, the hardware overhead of traditional interconnection structure used for reconfigurable processing unit (RPU) increases significantly. This paper proposed a new interconnection structure called hierarchical local-interconnection for reconfigurable processing unit (RPU). Comparing to traditional full-mesh structure used in Morphsys, the hierarchical local-interconnection greatly enhanced the area efficiency while retaining the flexibility of interconnection. When the array scale is 8x8, hardware overhead of new structure is 28.6% of the traditional structure.

Keywords: reconfigurable processing unit; hierarchical local-interconnection; area efficiency

N438 Mingqiang Chen, Xianhai Tan
Title: An Energy-Balanced Clustering Routing Algorithm for Wireless Sensor Networks

Abstract. Aimed at the problem of nodes energy imbalance, which is caused by the heavy burden of cluster heads in clustering wireless sensor networks, an uneven clustering routing algorithm based on multi-hop communication has been proposed for wireless sensor networks. An election algorithm is used for reasonable selection of cluster heads based on candidate threshold and time-driven, the independent nodes are introduced to reduce burden of the cluster heads, and the multi-hop routing based on angle is applied to optimize the

inter-cluster routing algorithm. Simulation results show that the algorithm can save the network energy effectively, and balance the energy consumption.

Keywords: wireless sensor networks; uneven clustering; survival time; multihop communication

N440 Wei Nie, Ying Wu, Dabin Hu
Title: Scoring System of Simulation Training Platform Based on Expert System
Abstract. In order to reduce the cost of operation training and improve efficiency of examination, the development of simulation training platform has achieved very good results. An intelligent scoring system based on expert system plays the role of the teacher, and gives the student a just assessment. It uses the professional theory and practical experience as the evaluation criteria, analysis the operator's operation process to realize the automatic scoring through the program algorithm. The application of scoring system evaluates the operation level of students and gives students guiding opinions and error analysis.
Keywords: expert system; simulation training platform; scoring system; data analysis

N446 Shuangcheng Wang, Yepeng Guan, Ruiyue Xu
Title: Real-time Fall Detection Based on Global Orientation and Human Shape
Abstract. Fall detection is an important problem in the research of abnormal behavior recognition. In this paper, a novel real-time method is proposed to detect human fall with a single uncalibrated camera by the changes of global orientation and human shape. Our algorithm has three basic parts: moving object extraction, fall pre-detection and fall confirmation. The overall orientations derived from the combination of Gaussian mixture model and motion history image. The shape deformation is quantified from the silhouettes by an approximated bounding box. Standard deviations of the overall orientation and aspect ratio of bounding box are checked to pre-detect a fall, and a fall is confirmed by unmoving shape of the bounding box with the defined fall angle. Experimental results show that our method can detect all possible types of human fall accurately and successfully.
Keywords: Intelligent Video Surveillance; Fall Detection; Global Orientation; Human Shape

N450 Tiezhu Zhao, Zusheng Zhang, Huaqiang Yuan
Title: Analysis of Distributed File Systems on Virtualized Cloud Computing Environment
Abstract. Although various performance characteristics of distributed file system have been documented, the potential performance efficiency of distributed file system on virtualized cloud computing infrastructure is not clear. This paper focuses on the performance of Hadoop Distributed File System (HDFS) on virtualized Hadoop. We construct a virtualized Hadoop platform and perform a series of experiment to investigate the performance of HDFS on the virtualized Hadoop cluster. Experimental results verify the efficiency of distributed file system on virtualized Hadoop to process the mass-intensive application.
Keywords: cloud computing; distributed file system; Hadoop; virtualization

N452 Zhongping Chen, Jinding Gao
Title: Simulation and Analysis of Binary Frequency Shift Keying Noise Cancel Adaptive Filter Based on Least Mean Square Error Algorithm
Abstract. Pseudo-random binary frequency shift keying（2FSK）sine wave signals with the frequency of 1200bit/s and 2200bit/s are produced by using the rand function in MATLAB. A noise cancel adaptive filter based on least mean square error LMS algorithm is designed and simulated on MATLAB. The relationships between the adaptive parameters (filter taps N

and iterations step lengthμ) and the convergence speed and precision are analyzed. The optimized adaptive parameters which are not only sufficed for filtering performance but also suited for FPGA hardware implementation is found out, and that is: filter taps N=22, and iterations step lengthμ=0.006. It may provide a good foundation for FPGA hardware implementation.

Keywords: 2FSK; LMS algorithm; adaptive filter; simulation

N453 Kaiguo Qian

Title: Energy-efficient Routing Protocol Based on Probability of Wireless Sensor Network

Abstract. This paper mainly discusses the problem of wireless sensor network routing protocols. Based on analysis of the disadvantages of information implosion and overlapping caused from implementation mechanisms of the flooding protocol, Energy-efficient Routing Protocol Based on Probability of wireless Sensor Network (ERPBP) is proposed and evaluated. It uses the nodes distance and residual energy as the weights to calculate the forwarding probability of neighbor nodes and chooses some of maximum forwarding probability nodes as router. It saves the energy by avoiding redundancy packet copies produced and improves the disadvantage of flooding routing protocol. Performance analysis and simulation experiment show that the new protocol effectively reduces the data redundancy, reduces the energy consumption and prolongs the network lifetime.

Keywords: Wireless sensor network; routing protocol; forwarding probability

N454 Qiang Chen, Yun Xue

Title: A Decision Support System with Dynamic Probability Adjustment for Fault Diagnosis in Critical Systems

Abstract. In order to locate and remove the faults in the critical systems where the faults occur, this paper proposes a three-layer decision support system for fault diagnosis, in which both static and dynamic information of the system is used to find out suspicious components. In the process of locating the faults, a bipartite graph is applied to describe the relation between the symptom and the components, on the basis of which a method is proposed to calculate the value of fault evidence of a component. Then, the components whose values are larger are chosen as the result. Meanwhile, the decision support system adjusts the data of the bipartite graph according to the actual situation in order to improve the effectiveness of the diagnosis. The experiment shows that the fault diagnosis process in the decision support system can locate the fault more effectively.

Keywords: decision support system; fault diagnosis; fault localization; bipartite graph

N456 Xiaoqing Geng, Yu Wang

Title: A Model for Reverse Logistics with Collection Sites Based on Heuristic Algorithm

Abstract. Reverse distribution has received growing attention throughout this decade. Built on the concept of green supply chain management (GSCM), this paper presents a mathematical programming and distribution model for reverse logistics with collection sites. Due to the complexity of the GSCM model, a heuristic solution is given and improved. The solution adds a heuristic concentration procedure, where sub-problems with reduced sets of decision variables are iteratively solved to improve the optimality, and it improves the capacitated plant location problem (CPLP). Computational test demonstrates that high-quality solution is obtained with the improved model.

Keywords: reverse logistics; collection sites; heuristic; GSCM

N457 Xixi Huang, Xiaofeng Wang
Title: The Classification of Synthetic Aperture Radar Oil Spill Images Based on the Texture Features and Deep Belief Network
Abstract. This paper introduces a new method to classify the SAR oil spill images. That is Deep Belief Network (DBN). Through the experimental certification, it is shown that the SAR images' information extracted by Gray-Level Co-occurrence Matrix (GLCM) can have a better effect in classification then that extracted by Gabor wavelet features. And using DBN to classify 240 samples including oil slick, looks-like oil slick and seawater, we can reach high total classification accuracy up to 91.25%. Finally, we get a result that the method of DBN with GLCM features can better meet the needs of the SAR oil spill images classification.
Keywords: SAR oil spill image; Gray-Level Co-occurrence Matrix (GLCM); Gabor wavelet; Deep Belief Network (DBN)

N458 Zusheng Zhang, Tiezhu Zhao, Huaqiang Yuan
Title: A Dynamic Routing Protocols Switching Scheme in Wireless Sensor Networks
Abstract. Many sensor query processing systems have been developed to acquire, process and aggregate data from wireless sensor networks. The energy consumption of query processing is significant impacted by routing protocol. In this paper, we propose a dynamic routing protocol switching scheme for query processing. The scheme supports multiple kinds of routing protocols coexisting in a single sensor node, and these protocols can be switched according to query tasks. Simulation results show that the dynamic scheme is more energy efficient than single routing protocol.
Keywords: wireless sensor network; query processing; dynamic routing switching

N465 Kunlun Li, Qi Meng, Shangzong Luo, Hexin Li, QianWang
Title: Density-Sensitive Semi-Supervised Affinity Propagation Clustering
Abstract. A density-sensitive semi-supervised affinity propagation clustering algorithm (DS-SAP) is proposed in this paper. The DS-SAP uses supervised information of the pairwise constraints for adjusting data points distance matrix. Then we introduce a novelty similarity metric based on the characteristics of global and local data distribution. This metric can effectively reflect the reality of data distribution. The DS-SAP clustering algorithm is based on the frame of the traditional AP algorithm, and has extended data processing capacity compared to the traditional AP algorithm. Experimental results show that the new algorithm is outperforming traditional AP clustering algorithm.
Keywords: affinity propagation; semi-supervised clustering; density-sensitive; pairwise constraints

N466 Qile Wang, Zhu Shen, Long Ma, Shi Yin
Title: The Storage of Wind Turbine Mass Data Based on MongoDB
Abstract. With the large-scale development of wind power, the storage and analysis of wind turbine's data gradually become more and more important, there are huge amount of information about wind turbines, the traditional relational database has been difficult to meet the demand of mass data storage and analysis. This paper proposes the solutions that data storage is based on non-relational databases (MongoDB), and compares SQL server with MongoDB about the storage ability and query performance. The results show that using this method can increase storage speed and query performance significantly.
Keywords: nosql; non-relational databases; mongodb; wind trubine; mass data

N468 Shengkui Cao, Guangchao Cao, Kelong Chen, Chengyong Wu, Tao Zhang, Jie Yuan
Title: The Ground Objects Identification for Digital Remote Sensing Image Based on the BP Neural Network

Abstract. Spectral information of ground objects target in remote sensing image is complex, more noise and highly nonlinear. It makes traditional data processing method no longer significant effective and efficient. The BP neural network classification-recognition method provides a more ideal solution. Used the TM remote sensing images as the example, this paper experimented the application of the BP neural network to the remote sensing image classification and recognition. Results showed that the classification precision of cultivated land was very low for both the BP neural network and traditional maximum likelihood methods because the spectrum difference between the new cultivated land and the bare land having low plant-covered in this area was not significant. Maximum likelihood method wrongly regarded the bare land which had higher soil moisture content by lakeshore as water body. Except to the grass land, the classification effect of the BP neural network was superior to maximum likelihood method. The overall classification accuracy by the BP neural network reached 81.79 percentage, however, the one by the maximum likelihood method was the 79.08 percentage, indicating that the BP neural network classification and recognition was superior to the traditional maximum likelihood method.
Keywords: BP Neural Network; Remote Sensing Image; Classification and recognition

N470 Yi Xiao, Yu Liu
Title: The Implementation of A Hybrid Particle Swarm Optimization Algorithm Based on Three-level Parallel Model

Abstract. In order to improve the efficiency of hybrid particle swarm optimization algorithm (PSO), a PSO merging simulated annealing and hill climbing (SAHCPSO) is implemented based on a three-level parallel model to increase its convergence speed and to decrease the operation time. SAHCPSO can enhance the diversity of the population and avoid population premature convergence. By analyzing and optimizing the SAHCPSO, we complete the task mapping on the model and make full use of CPU/GPU heterogeneous cluster resources. Optimization for parallel accessing further improves the efficiency of the algorithm. The parallel SAHCPSO implements the coarse-grained parallelism between computation nodes and fine-grained parallelism within each node, greatly reducing the operation time. The experimental results show that with the increase of particle scale, higher speedup can be obtained. The high efficiency of the parallel strategy of the model makes the parallel SAHCPSO more easily to solve large-scale problems.
Keywords: parallel computing; cluster computing; hybrid particle swarm optimization

N472 Jinqian Zhai, Di Su, Wenjian Li, Feng Li, Guohong Zhang
Title: High Impedance Fault Location in Distribution System Based on Nonlinear Frequency Analysis

Abstract. A methodology is presented to detect and locate high impedance faults in radial distribution system by means of nonlinear frequency analysis. The proposed technique is based on the analysis of the feeder responses to power line carrier signals, which are periodically injected at the outlet of transformer. The effectiveness of the method has been verified through simulation studies. The results demonstrated that the proposed method has the potential to be applied in practice to resolve high impedance fault real time monitoring problem.

Keywords: high impedance fault; distribution system; nonlinear frequency response

N473 Jinqian Zhai, Di Su, Wenjian Li, Feng Li, Guohong Zhang
Title: Early Fault Detection of Distribution Network Based on High Frequency Component of Residual Current
Abstract. A methodology is presented to detect incipient faults in distribution networks by means of DWT and energy detection algorithm. The proposed technique is to extract the characteristic of incipient fault by DWT method, that is, to extract the d5 coefficient of wavelet decomposition of residual current and residual voltage. Compare energy value with normal situation using an energy detection algorithm, incipient faults are detected. The proposed technique has been investigated by ATP/EMTP. Simulation results show that this technique is effective and robust, and the proposed method has the potential to be applied in practice to resolve incipient fault real time monitoring problem.
Keywords: incipient fault; discrete wavelet transform; fault detection; isolated neutral system

N474 Jinqian Zhai, Xin Chen
Title: Incipient Fault Diagnosis in Distribution Network Based on S-transform and Polarity of Magnitude Difference
Abstract. It is difficult for conventional relaying algorithms to detect incipient faults, such as insulator current leakage, electrical faults due to tree limbs, transient or intermittent earth faults, which are frequent in distribution networks. With the time, they may lead to a catastrophic failure. In order to avoid this situation, S-transform technique is proposed to extract the suitable features of incipient fault in this paper. A least square support vector machine (LS-SVM) classifier is developed utilizing the features so that incipient fault is distinguished from the normal disturbances. Then the polarity of magnitude difference of residual current is used to determine the fault section of distribution network. The proposed technique has been investigated by ATP/EMTP simulation software. Simulation results show that this technique is effective and robust.
Keywords: incipient fault; distribution network; S-transform; support vector machine

N475 Takashi Matsuhisa
Title: Network Communication Forming Coalition- S4n-Knowledge Model Case
Abstract. This paper is to introduce the new concept of coalition Nash equilibrium of a strategic game. A coalition Nash equilibrium for a strategic game consists of (1) a subset S of players, (2) independent mixed strategies for each member of S, (3) the conjecture of the actions for the other players not in S with the condition that each member of S maximises his/her expected payoff according to the product of all mixed strategies for S and the other players' conjecture. Let us consider that each player communicates privately not only his/her belief about the others' actions but also his/her rationality as messages according to a protocol and then the recipient updates their private information and revises her/his prediction. Then we show that the conjectures of the players in a coalition S regarding the future beliefs converge in the long run communication, which lead to a coalition Nash equilibrium for the strategic game.
Keywords: S4n-Logic, Communication, Message, Nash equilibrium, Protocol, Conjecture, Non-corporative game, Knowledge.

N477 Junshen Jiao

Title: A Complementary Metal Oxide Semiconductor D/A Converter with R-2R Ladder Based on T-type Weighted Current Network

Abstract. The mathematical expression and physical implementation is analyzed for a D/A converter and illuminated the T-type network framework of a binary digital-to-analog transform by dividing current means in this paper. Based on it, slice of half-dividing current is suggested by way of the symmetry of the drain and the source terminals in CMOS transistor. The paper puts forward a novel CMOS D/A converter based on T-type weighted current network with R-2R ladder. It has the merits of low power consumption and easy making of integration. Simulation result reveals a monotonic characteristic of the D/A converter.

Keywords: weighted Current; T-type network; CMOS; D/A converter; R-2R ladder

N478 Xiao Zhang, Guoli Li, Zhizhong Li
Title: Optimization of Inverse Planning Based on an Improved Non-dominated Neighbor-based Selection in Intensity Modulated Radiation Therapy

Abstract. Intensity Modulated Radiation Therapy (IMRT) is a principal cancer treatment at present, and the optimization of inverse planning is the core to realize the IMRT treatment planning, so it is important to study how to optimize the inverse planning as much as possible. The optimization of inverse planning in IMRT refers to a number of parameters, and requires rapid calculation speed clinically, so an improved NNIA for multi-objective is adopted in this paper. At first, according to the IMRT dose constraints of multiple targets, an average dose-based function is used, and then the optimization results compared with the SAGA algorithm under the water phantom show the feasibility and efficiency of the improved NNIA algorithm.

Keywords: NNIA; multi-objective optimization; IMRT

N479 Guoyong Li, Leibo Liu, Shouyi Yin, Dajiang Liu, Shaojun Wei
Title: Design and Implementation of an SD Interface to Multiple-target Interface Bridge

Abstract. The design and implementation of an SD card controller circuit architecture for multiple-target interface, suitable for communication function extension of existing electronic device for UBICOMP, are presented in this paper. The SD to multiple targets bridge includes an SD memory controller, a ping-pong FIFO and a target selectable interface, such as UART, SPI, parallel and NAND Flash IO. The bridge follows SD memory card v2.0 specification so that it is fully flexible in terms of portable device without any special drivers. The ping-pong FIFO increases the throughput of this system and the availability of UART, SPI, parallel and NAND flash interfaces provides flexibility for implementation of applications that requires the conversion of data to feed the SD bus. A tidy NAND flash is also implemented in the multiple-target interface for FTL of NAND flash. The new design has been verified and implemented in FPGA. It has also been synthesized and will be taped out through a 0.18um CMOS technology. Experiment reveals that the proposed architecture presents superior performance in platform-independent, interface-scalability and integrality compared with existing works.

Keywords: SD; Multiple-target; Ubiquitous Computing; Interface Bridge; NAND flash

N481 Zhiyun Zheng, Shaofeng Zhao, Xingjin Zhang, Zhenfei Wang, Liping Lu
Title: Cloud Storage Management Technology for Small File Based on Two-Dimensional Packing Algorithm

Abstract. In order to improve storage efficiency of small files in the cloud storage systems based on HDFS (Hadoop distributed file system), this paper proposed a merging process approach based on Two-dimensional packing algorithm, called TDPHDFS (two dimensional packing for HDFS). In it the correlations between file size and arrival time are comprehensively considered to assist the small files to be merged into large ones. The simulation results demonstrate that the storage efficiency of small files is improved while the stability remains the same yet less resource is consumed. The TDPHDFS algorithm can effectively reduce the performance penalty in both storage space and memory consuming while managing massive small files.
Keywords: Cloud Storage; HDFS; Small file; Packing Algorithm; storage efficiency

N482 Xiaoxuan Hu, Fan Jiang
Title: Advertising Media Selection and Delivery Decision-making Using Influence Diagram
Abstract. The influence diagram (ID) is introduced into advertising media selection and delivery strategy making by reducing uncertainty in the process of decision-making. This paper conducts a survey and selects relevant variables including product category, advertising budget, target audience, media selection, authority, coverage, et al. The topology layer of the ID model is constructed by distinguishing the causal relationship among variables and the parameter layer is defined through the judgment of conditional probability. Empirical results show that scientific assessments of the various expected utility in the decision-making program are put by probabilistic reasoning, so that the larger profit is obtained with smaller cost. Therefore, the model does an effective job and provides reference for decision makers.
Keywords: influence diagram; advertising delivery strategy; media selection; decision-making

N484 Fei Wang, Zhenfei Wang, Dun Li, Bingjie Yang
Title: Improvement of Extraction Method of Correlation Time Delay Based on Connected-element Interferometry
Abstract. This study proposes a method using mean comparison to improve the accuracy of interferometry processing correlation time delay under the low signal-to-noise ratio and low residual time delay. The method uses the means of taking the average of stripe subsection, comparing threshold and eliminating outliers, which offsets the influence of channel noise on the accuracy of the signal. Using the direct method under the same SNR strike delay simulation comparison proved that the mean comparison method can get relatively high accuracy of time delay information.
Keywords: connected-element interferometry; mean comparison; time delay

N485 Zhen Xu, Yi Yang, Fei Wang, Jiao Xu, Zhong Li, Fuqiang Mu, Lian Li
Title: A Recommendation System for Paper Submission Based on Vertical Search Engine
Abstract. In this work, the proposed orchestrating and sharing system for online paper aims at managing papers from information collecting, paper editing, paper type-setting, paper submitting to paper sharing. In the five aspects above, there are many available tools which help science researchers write papers, but these tools work separately not cooperatively. Orchestrating and sharing system for online paper integrates functions of these tools, which offers one-stop service. As an important part of this system, the recommendation for paper submission is to provide valuable information about the latest international conferences and journal for paper publication. When papers are written, our system, a context-aware solution

for paper, automatically obtains the keywords from context. Given that the recommendation for paper submission is subject-oriented search, we design a recommendation system for paper submission based on vertical search engine, which enhances the search accuracy by the improved URL-based filtering algorithm and the improved content-based filtering algorithm.
Keywords: search engine; vertical search; paper submission; PageRank algorithm

N486 Liu He, Xuhong Li, Dawei Chen
Title: An Optimization Model of the Layout of Public Bike Rental Stations Based on B+R Mode
Abstract. In order to find out the optimal layout of bike rental stations for B+R mode, a bi-level programming model combined of genetic algorithm and the joint model with mode spilt and traffic assignment model is built. The optimal layout plan can minimize the total travelling cost and facility cost. A case is used to test and verify the practicability of the model. The result shows that the model can effectively solve the layout problem of bike rental stations for B+R mode and can offer suggestions for related planning.
Keywords: traffic; B+R mode; public bike; bike rental station; bi-level model; genetic algorithm

N488 Shanshan Fei, Qiaoyan Wen, Zhengping Jin
Title: Analysis and Improvement of SPRINT Algorithm Based on Hadoop
Abstract. With the rapid development of computers and networks, the growth of data causes the data mining increasingly difficult. To solve this problem, this paper proposes an improved SPRINT algorithm based on the Hadoop platform. By analyzing the traditional SPRINT algorithm, we improve it in three aspects: eliminate unnecessary and repetitive calculations in the processing of discrete attributes; none pre-sort of continuous attributes and split by line directly when splitting; add the node field for attributes list in the data structure. For illustration, a performance test of acceleration and accuracy is executed to prove the effectiveness of the improved SPRINT algorithm. Compared to the original SPRINT algorithm, experimental result shows that the improved SPRINT algorithm guarantees the accuracy and reduces the computing time for the best split point thus accelerates the speed of decision-tree construction.
Keywords: loud computing; Hadoop; MapReduce; data mining; SPRINT

N510 Zhongyuan Qin, Zhongyun Yang, Yuxing Di, Qunfang Zhang, Xinshuai Zhang, Zhiwei Zhang
Title: Detecting Repackaged Android Applications
Abstract. The rapid development of the smartphone brings immense convenience to people. Recently more and more developers publish their own applications (or apps) on the Android markets to make profits. The so-called repackaged apps emerge by embedding malicious codes or injecting ads into the existing apps and then re-publishing them. In this paper, focusing on the shortcomings of existing detection system, we propose an efficient repackaged apps detection scheme based on Context Triggered Piecewise Hash (CTPH). We also optimize the similarity calculation method (Edit Distance) and filter unnecessary matching process to make the matching more efficient. Experimental results show that there are about 5% repackaged apps in pre-collected data. The proposed scheme improves the detection accuracy of the repackaged apps and has positive significance to the ecosystem of Android markets.
Keywords: Android; Repackage; CTPH; Similarity

N516 Bo Li, Shenjuan Lv, Yongsheng Zhang, Ming Tian
Title: The Application of Trusted Computing Technology in the Cloud Security
Abstract. For the lack of safety and reliability of the information in the cloud computing environment, in order to create a more flexible and adaptable security mechanism, the combination of cloud computing and credible concept is a major research direction in today's security. Based on mentioned above, this paper strengthens the research of trust computing technology to solve the security issues in cloud and cloud-based trust transfer, on the basis of the practical work of the experts and scholars on the trust transfer technology, expands the theoretical model of the trust chain. This paper uses the stochastic process algebra and Petri nets as modeling tool to build two trust chain models, demonstrates the credibility of certain behavioral characteristics of the chain, analyzes several constraints of credible chain, and may provide a valuable reference for engineering practice of the credible chain.
Keywords: cloud security; trusted computing; trusted cloud; trust; integrity measurements

N517 Yinghan Tang
Title: The Application Level of E-commerce in Enterprises in China
Abstract. Based on the process of corporate value formation and performance system, this paper extracts key factors indicating E-commerce application level in enterprises and has established a set of E-commerce measurement indicator system. In addition, this paper uses Delphi method and Analytic hierarchy process to identify the coefficients of various factors. By applying this model to measure the E-commerce application level in 23 heterogeneous enterprises in Chinese domestic market, this study proves that the proposed model can yield a relative accurate measurement of E-commerce application level in enterprises. The results also indicate that there are strong individual differences among different enterprises in China. The E-commerce application level in individual enterprises is affected by corporate strategy, informatization level, E-commerce application performance and human resources. The nature and the size of enterprises have significant correlation with E-commerce application level. The study also finds that the big-sized enterprises will become stagnant when they develop to a certain level, which is known as a "trap".
Keywords: E-commerce Application Level; Measurement Indicators

N518 Haitao Zhang, Binjun Wang, Guangxuan Chen
Title: Prediction Model for Trend of Web Sentiment Using Extension Neural Network and Nonparametric Auto-regression Method
Abstract. In order to solve the problem of prediction for long-term web sentiment, a prediction model is built using the proposed method in this paper. First, a novel clustering method based on the extension neural network (ENN) is introduced to recognize the types of sub class of web sentiment. For each class of social events, the class model library of the development trend of web sentiment is established by cycle analysis and ENN clustering combined nonparametric auto-regression analysis (NAR) method. Then the adaptive transform is applied to the already known development trend of a new social event, and the min-sum of mean square error (MSE) from the library is selected to predict the future development trend of web sentiment. Empirical findings indicated that , compared with the traditional methods, such as the GM(1,1) and least squares estimation(LS) method, the approach presented in this paper yields a higher correlation value in predicting the long-term development trend of web sentiment, and can predict the turning points of the development

trend more effectively. The ENN and NAR based prediction model can effectively solve the problem of prediction for long-term web sentiment.

Keywords: extension neural network; web sentiment; grey model; prediction model; cycle analysis; NAR; least squares method

N520 Kunlun Li, Hexin Li, Bo Yang, Qi Meng, Shangzong Luo
Title: Detection of Image Forgery Based on Improved PCA-SIFT
Abstract. In view of the problem existing in abusive using of image copy-move forgeries, this paper proposes an image forensics algorithm for detecting copy-move forgery based on improved PCA-SIFT. The presented method works first by extracting features of an image and then reducing its dimensionality, and the method uses k-nearest neighbor to operate forgery detection. Owing to the similarity between pasted region and copied region, the descriptors are then matched between each other to seek for any possible forgery in images. Extensive experimental results are presented to confirm that the algorithm is able to precisely individuate the tampered image and quantify its robustness and sensitivity to image post processing and offer a considerable improvement in time efficiency.

Keywords: image forensics; copy-move forgery; PCA-SIFT; forgery detection

N525 Pengfei Hu, Leizhen Wang
Title: Design of Wireless Local Area Network Security Program Based on Near Filed Communication Technology
Abstract. In order to solve wireless local area network (WLAN) security problem due to the open wide nature of wireless radio and the improvement of computing power, a design of WLAN security program based on near filed communication (NFC) is presented in this paper. In this paper, the importance of having access to handshake for WPA2 brute-force is explained. The proposed design protects the four-way handshake by taking advantage of NFC short-rang character to eliminate the risk of intercept. For implementation, Android system is selected as mobile device development platform. The compatibility with the current IEEE 802.11i ensures the design massive expanding. Furthermore, the design simplifies operations to improve users' experience without much extra hardware cost and offers an option to the owner of WLAN to control the access physically, which benefits commercialization of NFC. From one perspective, this design can solve the wireless network security problem effectively.

Keywords: Near Filed Communication; NFC; Security; Wireless Local Area Network (WLAN)

N526 Hai Yang
Title: K-optimal Chaos Ant Colony Algorithm and Its Application on Dynamic Route Guidance System
Abstract. Dynamic route guidance system is an important part of the intelligent transportation system, the core part of which is optimal path algorithm. This paper has analyzed the main influencing factors on the choice of optimal path, then provided an improved K-optimal chaos ant colony algorithm (K-CACA). The road impedance factor in K-CACA is based on the length, crowdedness, condition and traffic load of the road sections. The optimizing procedure of the algorithm is speeded up by introducing the included angle threshold of direction. The chaos perturbation effectively refrains the algorithm from trapping into local optima. The results of simulation experiment show that K-CACA is

effective and has much higher capacity of global optimization than Dijkstra algorithm and basic ant colony algorithm for optimal route choice.

Keywords: dynamic route guidance system; ant colony algorithm; K-optimal path; chaos perturbation; road impedance factor

N530 Yong Huang, Qingchun Hu
Title: Toward a Trinity Model of Digital Education Resources Construction and Management
Abstract. This paper aims to solve the problem of how to construct and manage digital educational resources effectively. It puts forward a trinity mode based on system architecture, workflow and technology system. The trinity model consists of "Pre-Stage, Mid-Stage, Post-stage", "Theory, Practice, Regulation" and "Approach, Tool, Rule". By combining the trinity mode with case studies, the issues concerning construction and management of digital educational resources are to be analyzed, including topic selection, relationship between quantity and quality, implementation. Over the past year, results have showed the trinity model could shorten more than 50% of the development cycle of the project. The model could greatly help improve the construction and management of digital educational resources.
Keywords: Technical Support; Learning System; Digital Publishing; Software Engineering; Educational Technology

N531 Bingqing Xu, Lichen Zhang
Title: Modeling of Train Control Systems Using Formal Techniques
Abstract. Train control systems must guarantee a very high level of safety because their incorrect functioning may have very serious consequences such as loss of human life, large scale environmental damages, or considerable economical penalties. The software reliability is related to several factors, such as completeness, consistency and lack of ambiguity. Formal methods are widely recognized as fault avoidance techniques that can increase dependability by removing errors during the specification of requirements and during the design stages of development. In this paper, a brief overview of existing results on formal specification of train control systems is first presented. Then we propose an integrated formal approach to specify train control systems, this integrated approach combines CSP, Object-Z with Clock theory to specify the Railway Control System concerning both the linear track and crossing area, especially the time delay between any two aspects of the railway system.
Keywords: Train Control Systems; Object-Z; CSP; Clock Theory; Formal Specification

N533 Bingqing Xu, Lichen Zhang
Title: A Clock Based Specification of Cyber Physical Systems
Abstract. In cyber-physical systems, the elapse of time becomes the most important property of system behavior and time is central to predicting, measuring, and controlling properties of the physical world. A cyber-physical system is composed of two interacting subsystems, a cyber-system and a physical system. The behaviour of the cyber system is controlled by the execution of programs on a distributed digital computer system, while the laws of physics control the behaviour of the physical system. The different models of time—continuous physical time in the physical system versus discrete execution time in the cyber system, and the impossibility of perfect synchronization of the physical clocks of the nodes of a distributed computer system, lead to interesting phenomena concerning the joint behaviour of these two subsystems.The paper describes the case studies in applying clock theory to the production cell. The clock theory described is very simple, in that it models

clocks as potentially infinite lists of reals. Xeno's paradox and similar problems are avoided by specifying limits on clock rates, which effectively means that the model sits somewhere between a discrete synchronous model and a fully dense continuous time model as assumed by some other formalisms. Case study the specification of the production cell shows that using clock theory to specify cyber physical systems can give a more detailed description of the every subsystem and give a much more considerate observation of the time line and sequence of every event.

Keywords: Cyber physical systems; continuous and discrete; clock; time analysis

N535 Shuguang Feng, Lichen Zhang

Title: A mechanism of transforming Architecture Analysis and Design Language into Modelica

Abstract. One of the fundamental challenges in research related to cyber-physical system is accurate modeling and representation of these systems. The main difficulty lies in developing an integrated model that represents both cyber and physical aspects with high fidelity. Among existing techniques, an approach to integrate Modelica with AADL is a suitable choice, as it can encapsulate diverse attributes of cyber physical systems. AADL modeling language provides a comprehensive set of diagrams and constructs for modeling many common aspects of systems engineering problems, such as system requirements, architectures, components, and behaviors. Complementing these AADL constructs, the Modelica language has emerged as a standard for modeling the continuous dynamics of cyber physical systems in terms of hybrid discrete event and differential algebraic equation systems. Integrating the descriptive power of AADL models with the analytic and computational power of Modelica models provides a capability that is significantly greater than provided by AADL or Modelica individually. A transformation of AADL into Modelica is developed that will support implementations to transfer efficiently the modeling information between AADL and Modelica models without ambiguity. This paper propose an approach to transform the models of AADL into the models of Modelica , clarify the transformation principles and to illustrate the important synergies resulting from the integration between these two languages.

Keyword: AADL; Modelica; MDA; model transformation; Integration

N536 Lichen Zhang, Shuguang Feng

Title: Aspect-Oriented QoS Modeling of Cyber Physical Systems by the Extension of Architecture Analysis and Design Language

Abstract. Cyber physical systems have varying quality-of-service (QoS) requirements driven by the dynamics of the physical environment in which they operate. Developing cyber physical systems is hard because of their end-to-end quality-of-service (QoS) requirements. Aspect-Oriented development method can decrease the complexity of models by separating its different concerns. We can model QoS as a crosscutting concern of cyber physical systems to reduce the complexity of cyber physical system development. In this paper, we propose an aspect-oriented QoS modeling method based on AADL. We present our current effort to extend AADL to include new features for separation of concerns, and we make a AADL extension for QoS by aspect-oriented method. Finally, we illustrate QoS aspect-oriented modeling via an example of transportation cyber physical system.

Keywords: QoS; Cyber Physical Systems; Aspect-Oriented; AADL

N537 Tiezhu Zhao, Xin Ao, Huaqiang Yuan

Title: Modelling and Evaluation of the Performance of Parallel/Distributed File System

Abstract. The mass data storage systems need to be coupled with efficient parallel/distributed file systems, such as Lustre and HDFS, which can effectively solve the problems of the mass data storage and I/O bottlenecks. This paper systematically studies the performance factors and distribution of parallel/distributed file systems and proposes a valuation scheme for the classic parallel/ distributed file system by capturing the changes in workload characteristics. The experiment results show that the proposed evaluation scheme can reach better accuracy and efficiency.

Keywords: parallel/distributed computing; performance analysis; performance evaluation

N538 Shijiao Zhu, Jun Yang, Xuefang Zhu
Title: A Thinning Model for Handwriting-like Image Skeleton

Abstract. In order to solve the letter skeleton problem with handwriting-like attributes, a thinning model is used in this paper. By introducing improved reservation and eliminating produces, additional pixels are constrained by thinning nearest pixels. In the experiment, the proposed method is compared with others in the literature English letters by using the one pass thinning algorithm (OPTA) and Hilditch methods. Empirical results show that the proposed model can thin handwriting-like skeleton in terms of reserving topology and eliminating extra pixels.

Keywords: image skeleton; thinning procedure; binary image

N542 Huihui Liang, Jiwen Chai, Yong Tang
Title: Polymorphic Worm Detection Using Position-Relation Signature

Abstract. This paper proposes a novel worm signature that is appropriate for the polymorphic worm detection. Most of the recent worm signatures are constructed based on worm bytes themselves or relationships between worm bytes. In this case, most of these signatures cannot detect the polymorphic worms successfully. Our worm signature takes the worm bytes themselves and the relationships between worm bytes into consideration. So, it is called Position-Relation Signature (PRS). The new signature is capable of handling certain polymorphic worms. The experiments show that the algorithm could be used as a basis to implement a worm detection system.

Keywords: worm detection; Polymorphic; Position-Relation Signature

N544 Jian Zhang, Huaqiang Yuan
Title: A Certainty-based Active Learning Framework of Meeting Speech Summarization

Abstract. This paper proposes using a certainty-based active learning framework for extractive meeting speech summarization in order to reduce human effort in generating reference summaries. Active learning chooses a selective set of samples to be labeled by annotators. A combination of informativeness and representativeness criteria for sample selection is proposed. The results of summarizing parliamentary meeting speech, show that the amount of labeled data needed for a given summarization accuracy can be reduced by more than 40% compared to random sampling. The certainty-based active learning framework can be effectively reduced the need of labeling samples for training. Furthermore, compared with lecture speech summarization task, the experiments show that the proposed active learning method of meeting speech summarization is obviously more affected by choice of different kinds of classifiers.

Keywords: Sample Selection; Certainty-based Active Learning; Spontaneous Speech Summarization

N545 Rijun Zhang, Caishui Hou, Hui Lin, MeiYan Zhou, MeiXin Zhang, Zhongsheng Li, Wuli Sun, Fengqin Lin

Title: Application of the Wavelt-Anfis Modle

Abstract. Since many predicting methods, such as CS, PP, etc. are not very precisely. WAVELT-ANFIS with high estimation precision is always used to modeling the decomposed series recently. This paper uses wavelet analysis to decompose water level series, then uses ANFIS to modeling the decomposed series, in the end it combined these series and predicted Lingxi Reservoir's runoff. The runoff forecast of reservoir is essential for its flood control safety.The forecast result shows that, the prediction accuracy of WAVELT-ANFIS is very high , the model is quite fit to use in daily runoff and water level predict.

Keywords: Forecasting Model; Wavelet analysis; ANFIS; Wavelet-ANFIS; runoff forecast

N546 Peng Wang, Huaxi Gu, Yan Zhao, Xiaoshan Yu

Title: CoCell: A Low Diameter, High Performance Data Center Network Architecture

Abstract. As critical infrastructures in the Internet, data centers play an important role in supporting large scale distributed applications as well as data intensive computing. This paper presents CoCell, a server-centric architecture, which uses servers to relay packets. CoCell has several nice properties for desired data center networking. The average node degree in CoCell network is close to 3, and the longest routing path length is no larger than 7. Besides, CoCell network is able to provide high network capacity to support bandwidth intensive applications. Leveraging the multi-paths between any pairs of servers in CoCell network, we propose relative routing schemes and make a comparison among these paths. The evaluation indicates that CoCell performs well in all-to-all traffic pattern.

Keywords: data center network; server-centric architecture; nice topological properties

N548 Qian Yu and Chang N. Zhang

Title: Using RC4-BHF to Construct One-way Hash Chains

Abstract. Cryptographic hash functions play a fundamental role in today's security applications. In general terms, the principal applications of a cryptographic hash function are to verify the integrity of the data, which refers to data authentication or data integrity. The one-way hash chain is an important topic in key management and is also an important cryptographic primitive in many security applications. As one-way chains are very efficient to verify, they are also the primitives to design security protocols for ultra-low-power devices. In this paper, an RC4 based hash function RC4-BHF is introduced and how to use RC4-BHF to construct efficient one-way hash chains is proposed. The proposed construction for one-way hash chains is efficient and is designed for ultra-low-power devices.

Keywords: RC4-BHF; RC4 Based Hash Function; RC4 Stream Cipher; Key Management; One-way Hash Chain

N550 Fang Huang, Wenjie Xiao, Hao Zhang

Title: Visualization of Clustered Network Graphs Based on Constrained Optimization Partition Layout

Abstract. Hybrid layout is a common visualization technique for clustered network graphs. Since most previous hybrid layout methods do not consider a reasonable balance between screen utilization and layout aesthetics of the network graphs, the inappropriate partition of the display region may result in unpleasant display effect of network graphs. This paper

proposes to address this problem with nonlinear constrained optimization techniques. This paper analyzes why the circle algorithm would fail in region partition. To ensure that every sub-group of network nodes can be assigned to a rectangular region, the maximal utilization of the display area is taken as an objective function and the rectangular ratio is taken as constraints. The constrained optimization layout model leads to efficient balance between regional utilization and layout aesthetic. Experimental results show that the constrained optimal partition layout generates more balanced relation network graphs with better visual effects.

Keywords: visualization of clustered network graph; hybrid layout; constrained optimizing layout; region partition; aesthetic criterion

N552 Xu Chen, Jun Tang

Title: Application of Improved BP Neural Network in the Frequency Identification of Piano Tone

Abstract. For the problems existing in the identification process of piano tone, this paper puts forward an MFCC-based (Mel Frequency Cepstrum Coefficient) feature extraction algorithm and a new piano tone identification method with BP neural network as the matching model. Using the MFCC feature extraction algorithm to extract parameters is a good alternative, which could improve the identification rate. Regarding the improved BP neural network as the matching model of tone identification consumes moderate training time and owns high recognition rate. Simulation results show that the piano tone identification combining the BP neural network with the MFCC algorithm is simple, fast and highly accurate.

Keywords: BP Neural Network; Frequency Identification; Piano; MFCC

N553 Huaqiang Hu, Dandan Wen

Title: Simulation Investigation of Counterwork between Anti-radiation Missile and Active Decoy System

Abstract. Simulation test has provided a favorable method and platform for quantitatively evaluating impact on countering ARM, by overcoming the disadvantage of high price and poor privacy in regard to outfield experiment. The essay tries to make a deep research on modeling simulation of active decoy and ARM, and thus to formulate active decoy interference model and anti-radiation missile movement model. Then it carries through simulation process of active decoy's effect; the simulation result validate model's effectiveness and accuracy, and therefore it has provided theoretical bases for designing and deploying active decoy and ARM's base station program.

Keywords: Anti-radiation missile (ARM); Active decoy; Simulation

N554 Yulin Yang, Lijuan Qiu

Title: Simulation Jamming Technique on Binary Phase Coded Pulse Compression Radar

Abstract. Binary phase coded signal is usually used in Pulse Compression (PC) radar, which are mostly used for surveilling and tracking targets. Two prominent characteristics of the binary phase coded signal are introduced in this article, according to these characteristics some jamming forms are analyzed which can be used to jam binary phase coded PC radar, simulation with MATLAB is done to test these jamming forms. The result indicates that noise jamming has less effectiveness on binary phase coded PC radar, continuous and partial code replicated jamming have preferable effectiveness on it. Because binary phase coded signal is compressed to narrow pulse when it is received by receiver, jamming signal can

easily capture the range-gate when the jamming side adopts range-gate pull-off (RGPO) and so the jamming effectiveness is perfect.

Keywords: binary phase coded; PC; partial code replicated; range-gate; range deception

N557 Yichun Peng, Yunpeng Wang

Title: Geographic Information System in the Cloud Computing Environment

Abstract. Cloud computing has became a very popular vocabulary in recent years. The combination of clouding computing and GIS(Geographic Information System) can improve the performance of GIS. By analyzing the technology of cloud computing, this paper introduces the concept of GIS based on cloud computing, based on the current major GIS application development trends, key technologies of cloud GIS are proposed, finally four application modes of cloud GIS are presented. Cloud GIS can improve stability and efficiency services to end users by optimized network resource allocation of underlying data and services.

Keywords: cloud computing; cloud GIS; PaaS; SaaS; IaaS

N559 Tiefeng Li, Ou Li, Zewen Zhou

Title: An Ultra-Wideband Cooperative Communication Method Based on Transmitted Cooperative Reference

Abstract. In order to decrease the power waste of relay node, the paper presents a novel Ultra-Wideband cooperative communication method that using two relay nodes to transmit reference impulses and data impulses separately. A transmitted cooperative reference UWB cooperative communication model is developed in this paper. Based on the model and sampling expansion approach, a closed-form SER expression was deduced for Delay-Hopped Transmitted-Reference UWB systems which using cooperation strategy of decode and forward relaying, equal-gain-combining. Simulation results show that the transmitted cooperative reference method can obtain multi-order diversity gains.

Keywords: ooperative communication; transmitted cooperative reference; delay- hopped transmitted reference UWB; sampling expansion

N561 Wu Zeng, Rong Wang, Jiao Ming

Title: Discrimination of the White Wine Based on Sparse Principal Component Analysis and Support Vector Machine

Abstract. In allusion to the urgency of the white wine identification, and the key shortcoming of PCA (Principal Component Analysis),whose all loadings are non-zero, the sparse PCA (SPCA) is employed to enhance the explanatory and remove unnecessary variables. By using elastic net Zou Presented, SPCA can seek sparse factors and explain the maximum amount of variances in the data. For illustration, a comparison of strategy between PCA and SPCA, which combined with the specified categorizer—Support Vector Machine (SVM) and Infrared (IR) Spectroscopy is utilized. The finally classified result of white wines based on SPCA is up to 93%, but the PCA's 83%, and directed categorizer's 80%. Obviously, the SPCA can extract characteristics more effectively, which benefits the classification accuracy of SVM.

Keywords: PCA; SPCA; IR; SVM; classify