Operation Research and Decision Making

The development of inference machine model for vocation psychology based on rough set theory

Li CaiHong

Computer Modelling & New Technologies 2014 18(12C) 9-15

In the paper the inference machine model for vocation psychology was build and developed by a rule-based rough set theory. At first, the rough set is used to optimize the rules for career psychological identification, by which the complexity of the neural network can be avoided. Second, the features used by the questionnaires are selected for input parameters of the classifier to incorporate more human like decision-making, whereas in other works, only a few of features or different characteristic options on the questionnaire, are used as deterministic parameters. A knowledge base of the behaviour characteristics and questionnaire analysis is developed from the feedbacks of some reputed career guides. These features are extracted from the carefully designed questionnaire. A rule-based rough set decision system is developed from these features to make an inference engine for career psychological identification.

Keywords: career, rough set theory, decision system, knowledge base, questionnaires, career psychological

Application of optimized PLS-SEM measurement model and empirical research on Chinese cultural and creative industries competitive formation mechanism

Tao Zeng, Qi Wangbing

Computer Modelling & New Technologies 2014 18(12C) 16-22

Based on reviewing the PLS-SEM measure model, and summarizing the theory and reference of other scholars, the PLS-SEM measure model is optimized, in order to contain many latent variables and relatively scientific operations. At the same time, we make comments on the framework of industrial competitiveness referring to diamond model theory. Summarize the factors affecting the competitiveness of cultural and creative industry and measurement standard, and construct the framework of mechanism model for the formation of the cultural and creative industries' competitiveness. Using PLS-SEM measurement optimization model's 62 sets of data on Chinese provinces' cultural and creative industry in 2011 and 2012 to do the empirical analysis. The final optimization model is verified rationally. The study finds that the ability of sustainable development, capacity requirement, the government support and the overall innovation capability influence on cultural and creative industries' competitive strength are the most important keys.

Keywords: PLS-SEM measurement model, application of optimization, competitiveness of cultural and creative industry, formation mechanism, empirical study

Crisis prediction in e-learning through data mining technology: an empirical investigation

Zhu Ke, Zhang Jin

Computer Modelling & New Technologies 2014 18(12C) 23-27

Crisis warning is a kind of semi-structured or unstructured problems with a lot of uncertainties. In order to examine learners' actual achievements and timely warning the problems of the students' learning, crisis prediction techniques are imperative as they assist the teachers in monitoring learners' progress and, determining their development and competencies. Many factors have no historical data and corresponding statistics, therefore crisis prediction is difficult to calculate and evaluate scientifically. There are many conventional methods of analysis has a lot of limitations and the results are not accurate enough. In this paper, a crisis pr ediction technology method for e-learning courses, based on data mining techniques and detailed student data, is proposed. An empirical field experiment involving 129 university students was conducted. The results were found to be significantly better than those reported in relevant literature.

Keywords: crisis prediction, data mining, big data analytics

US army aviation's battlefield POL assurance model simulation based on system dynamics

Tang Jian, Zhou Qingzhong, Xu Peng

Computer Modelling & New Technologies 2014 18(12C) 28-33

To solve the issue of the US Army Aviation's battlefield POL assurance, this paper proceeds from the principle of fully guaranteeing the army POL supply to establish the army aviation's POL prediction model and puts the POL parameters of US conventional helicopters into the model. Besides, this paper establishes the system flow graph of the transportation and information delay function based on System Dynamics (SD) to simulate three different battlefield situations. The transportation and information delay are formulated according to the real examples. This paper integrated them into the SD model. The simulation results show that the SDbased model can directly reflect the changing trend of various factors of the POL Assurance. Then accord the result of simulation, input different parameters can be derived the changing curve that can help to realize the computer aided decision.

Keywords: POL demand, system dynamics, US army aviation unit, delay function

The application of improved back propagation neural network model

Li Fang, Wu Changze

Computer Modelling & New Technologies 2014 18(12C) 34-39

During the granulation process of Iron ore sinter mixture, there are many factors affecting the granulation result such as chemical composition, size distribution, surface feature of particle, and so on. Some researchers use traditional fitting calculation methods like least square method and regression analysis method to predict granulation result, where exists big error. In order to provide better performance in prediction, we use improved BP (Back propagation) neural network model to do data analysis and processing. Granulating effect neural network model with a shooting rate of 92%, has a good prediction accuracy, robust, and the high ability of recognition to new sample, which can give a good guidance to granulation process. It obtains better effect than traditional fitting calculation methods.

Keywords: iron ore sinter mixture, size distribution, granulation result, BP, neural network

A hybrid minimum spanning tree method for traveling salesman problem

Li Hehua, Xiong Wei, Wang Yong

Computer Modelling & New Technologies 2014 18(12C) 40-45

Traveling salesman problem (TSP) has a wide range of applications in communication, transportation, manufacturing etc. However, it is proven to be NP-complete in mathematics. An approximate method based on the Minimum Spanning Tree (MST) with an optimal four-vertex path is presented for the triangle TSP. We first compute the MST with a complete weighted graph. Then an Eulerian graph is generated by doubling the edges of the MST from an initial vertex. The optimal four-vertex path is used to simplify the Eulerian graph into a Hamiltonian cycle. Different from the common MST heuristics for TSP, all the generated four-vertex paths in the Hamiltonian cycle are the optimal four-vertex paths. Therefore, the approximation computed with the hybrid MST method is generally shorter than that produced with the common MST heuristics. The experiments for the Euclidean TSP examples also give the same conclusion

Keywords: traveling salesman problem, minimum spanning tree, optimal four-vertex path, approximation

A secure authentication scheme based on fuzzy extractor

Zhang Lihua, Nie Yaoping

Computer Modelling & New Technologies 2014 18(12C) 46-55

The biometrics-based authentication schemes are more security and reliable than the traditional authentication schemes, and it is the inevitable trend of future development. However, between the existing schemes, the security of user's biometric template usually be ignored, the user's information security suffering from a great threat because of that. Recently, Yan et al. proposed a secure biometrics-based authentication scheme for telecare medicine information systems (TMIS), however, we found that Yan et al.'s scheme could not ensure the security of the user's biometric template and forward security. To overcome the above weaknesses, in this paper, a security enhanced scheme combine with the characteristics of the Fuzzy Extractor is proposed. Security and performance analyses show that the proposed scheme not only could overcome the weaknesses in Yan et al.'s scheme but also has a better practicability. We also propose the scheme with a formal security proof under the random oracle mode.

Keywords: Fuzzy Extractor, biometric, authentication, template security

Financial distress prediction model of dual constraint LS-SVM based on neighborhood rough set index optimization

Zhao Guanhua, Tanglu, Gao Lin

Computer Modelling & New Technologies 2014 18(12C) 56-62

In order to improve the accuracy of financial distress prediction and the effect of model forecast, and make the neighborhood rough set and genetic algorithm apply to the dual constrained least squares support vector machine. This study proposes a dual constrained least squares support vector machine prediction model based on the neighborhood rough set attribute reduction. At the same time, this study gives the steps to improve this model. The empirical results show that, after the pre-treatment of neighborhood rough set index and optimization of parameters of genetic algorithm. It not only improves the model prediction accuracy, but also reduces the model run time, therefore it confirmed that the application of the improved model to the financial distress prediction is effective.

Keywords: financial distress prediction, least squares support vector machine, dual constraint, the neighborhood rough set, genetic algorithm

Analysis of land-use change and its mechanism based on graphical information and statistical model

Liu Jiafu, Wang Ping, Zhang Bai

Computer Modelling & New Technologies 2014 18(12C) 63-68

Investigation of land-use change is important to economic development and analysis related to climate change. Using the spatial

analysis tool in GIS, the land use change information was generated and analyzed quantitatively. Results indicate that: (i) The arable land gradually increased; the grassland and forestland decreased firstly but then increased gradually; there was little change on water surface and residential area; and unused area increased annually. (ii) Square index and fractal dimension of forestland, grassland and unused land increases when the area increases, however, nearly circular index decrease, area caused by the change of shape index and fractal dimension change is much less. (iii) We constructed a linear fitting of the graphic information of land use, this model fitted well the relationship between 1991~2000 land use change and its graphical information.

Keywords: graphic information, land-use change, landscape index

Simulation study on short-term load forecasting of electric power parameter optimization based on phase-space reconstruction theory

Cai Huanyu, Cao Juhui, He Zhiqiang

Computer Modelling & New Technologies 2014 18(12C) 69-75

With the combination of theoretical achievements related to parameters study on phase-space reconstruction and short-term load forecasting of electric system in physics. The short-term load forecasting of electric power parameter optimization based on phasespace reconstruction theory is put forward, and through theoretical and simulation researches and qualitative analysis, the impact of each parameter on the precision of the power load forecast is obtained and forecasting steps of this method are summarized in this paper. According to the optimized parameters, the prediction is conducted to load, and as a result, the accuracy is improved greatly when compare forecasting results to immediate prediction. A load example is forecasted by using parametric optimization predi ction method, and the result shows that parametric optimization prediction method improves the accuracy of load prediction to some extent.

Keywords: load predication, chaos, phase-space reconstruction

The research of the interval density cluster method for piecewise linear membership function determination

Qi Liu, Sheng Li

Computer Modelling & New Technologies 2014 18(12C) 76 -78

Triangle and monotone membership functions have simple forms and clear physical meaning, which are commonly used in the research work. In this paper, a density clustering method based on the interval is brought forward, which has avoided the cluster results falling into a local minimum, also by using this method, the cluster center can be quickly obtained. Through simulation, the piecewise linear membership function of variation of total volume in petroleum drilling is determined, which solves the problem that the function is hard to be defined.

Keywords: piecewise linear membership function, interval, density cluster, cluster center, petroleum dril ling, variation of total volume

Using data mining technologies to find learning activity rules for online learning

Zhu Ke

Computer Modelling & New Technologies 2014 18(12C) 79-83

Researchers are interested to improve learners' and instructional designers' performance in online learning systems. Learning Activity are of great importance at present, since they are the building blocks of different types of online learning systems. As the number of learning activity grows exponentially and our needs for learning expand equally dramatically, the lack of information or rules about the usability of learning activity places a critical and fundamental constraint on our ability to discover, manage, and use learning activity. This study presents a new approach of data mining and an assessment scheme by combining four computational intelligence theories, i.e., the Clustering Algorithms, the Classification Algorithms, and Association Algorithms, to identify the learning activity rules in online learning systems for learner and instructional designers. Experimental results indicate tha t the evaluation results of the proposed approach and scheme are improving the work of teachers in designing and searching, and also in the management of Los in a web-based learning environment according to the obtained learning objects usability rules.

Keywords: learning activity, usability rules, data mining, learning path

Modelling and simulating adoption behaviour of enterprise environmental innovation technology under niche strategy

Zhao Aiwu, Guan Hongjun

Computer Modelling & New Technologies 2014 18(12C) 84-88

Due to the complexity and diversity of human behavior, social system is unpredictable and difficult to be quantified. In this paper, we used computational experiment method to simulate the adoption behaviour of enterprise environmental innovation technology under different scenarios. The model was rebuilt referring to the abstraction of real world. It analyzed the

relationship between internal dynamic mechanism and policy intervention during the emerging of stable innovation niche. The experimental results showed that policy intervention can influence the adoption of enterprise environmental innovation technology. Especially, through the combination of a set of policy, the advantages of environmental innovation niche can be fully employed in different market. By reducing the risks of adopting environment innovation technology, new product market can realize the phenomenon of "long tail". This would inspire more enterprises to adopt environmental innovation technologies.

Keywords: environmental innovation, niche, computational experiment, simulation

Fault diagnosis of analogue circuits based on improved genetic algorithm and neutral-network

Wang Mingfang, Wang Jie, Zhao Xuejun, Yuan Xiujiu

Computer Modelling & New Technologies 2014 18(12C) 89-95

This paper proposes a novel method for optimization of BP neutral network using improved genetic algorithm to diagnose the circuit fault in power-supply system. First, BP neutral-network's structure is determined so that its threshold values and weight values can be optimized by GA. Second, stable threshold values and weight values are obtained via the calculation of GA's operators. Finally, the values are utilized in BP neutral network as initial parameters to conduct sample iteration training. The results show that, during fault diagnosis, BP neural network and genetic algorithm combined with each other to achieve complementary advantages between the two methods.

Keywords: improved genetic algorithm, BP neutral network, analogue circuits; fault diagnosis, power-supply system

Research the sweet spot on a baseball bat based on optimization algorithms

Zhu Ke, Zhang Jin, Wang Tianyi, Zhu Miao

Computer Modelling & New Technologies 2014 18(12C) 96-102

With the popularity of baseball, numerous studies have been conducted to find methods to improve performance during a baseball match. However, it's still unclear that how the batter should hit a ball so that the batted ball speed is largest. In other words, where is the sweet spot that maximum energy is transferred to the ball when it's hit? In our paper, we take three factors into consideration to determine position of sweet spot. We build three models to confirm corresponding factors: (1) relationship between batted ball speed and distance from hit point to pivot point when the pivot point is fixed, (2) loss of energy caused by vibration of bat, (3) loss of energy caused by rotation of bat. At last, by considering the above three models to get the final energy of ball. We find tha t the COP (Centre of Percussion) point is just the sweet spot. What's more, by considering variation of mass, centre of mass and moment of inertia of bat after corking a bat, we get the new position of COP. Our conclusion is that when a batter does the same work to the two types of bat, corking a bat doesn't change batted ball speed dramatically. Therefore, "corking" doesn't enhance performance during baseball match even though it may lead to better control of the bat. At last, by statistical processing to results of baseball match in the last more than 30 years, we find that the aluminium bat shows a marked increase in hit-ball speeds. So different materials have different behaviours during a match. In addition to that, we also give reasons why Major League Baseball prohibits metal bats according to our model.

Keywords: optimization algorithms, sweet spot, mathematical modelling

The research of camping along the big long river based on optimized model

Zhang Jin

Computer Modelling & New Technologies 2014 18(12C) 103-106

This paper establishes a model to schedule trips down the Big Long River. The goal is to develop the best schedule and determine the carrying capacity of the river. This paper set out essential limits in the process of calculating the utilization ratio of the campsite to simplify the model preliminarily. It proposes scheduling groups down river in order to maximize the campsite utilization. In order to ensure each group enjoy a wilderness experience, this paper simplifies the model by the hypothesis that the travel groups behind could never catch up with the groups which are in front of them. This paper calculates the camp utilization ratio in a six-month season, and regards it as the objective function. Eventually, this paper determines the schedule to launch an optimal mix of trips, of varying duration and propulsion that will utilize the campsites in the best way possible

Keywords: optimization algorithm, optimized model, mathematical modelling

Study on prediction and spatial variation of PM2.5 pollution by using improved BP artificial neural network model of computer technology and GIS

Zhang Ping, Zhang Tao, He Liang, Wei Cailiang, Luo Sui, Miao Huan, Huo Peishu

Computer Modelling & New Technologies 2014 18(12C) 107-115

Atmospheric pollutant PM2.5 seriously harm to human health, to accurately predict its pollution condition, can avoid or reduce the risk of pollution events. In this study, we used the different algorithms and number of hidden layer neurons to improve BP artificial neural network model of computer technology, coupling GIS to evaluate the impact of different algorithms on the prediction and spatial variation of PM2.5, the results showed that, mean relative error and correlation coefficient of monitoring and predictive value by the six different algorithms and three different number of hidden layer neurons, were 14.02% and 0.97, respectively, indicating that improved BP artificial neural network model can be used to predict PM2.5 pollution. Optimization

algorithm of trainrp and trainlm had the highest prediction accuracy while the number of neurons in the hidden layer is 20. In contrast, the same algorithm, different number of hidden layer neurons had a greater influence on the simulation of PM2.5. Spatial variation of PM2.5 by different algorithms and Inverse Distance Weighted interpolation method has various degrees of difference from that of the observed, although the simulation of north-central high risk area and southeast low risk region are basically consistent to interpolation analysis of monitoring data.

Keywords: artificial neural network model, computer technology, PM2.5, prediction, spatial analysis

E-commerce pattern analysis and strategy of Tibet lamp in Yanchi county

Wang Chen, Li Jianbei, Wen Shuping

Computer Modelling & New Technologies 2014 18(12C) 116-119

The article analyzed situation of Ningxia Tibet lamp breed and the necessity of realizing e-commerce. It also came up with design principle of e-commerce pattern about expand-ability of using Tibet lamp, maintainability of the system and parameterization of business regulation, the technical frame including intelligent system and functional system. It continuously optimized the raising clients and enterprises by using digital information technology. It also used computer technology, network technology and remote communication technology to realize technical service and information communication and to let commerce running as its eletronization, digitization and networked.

Keywords: Yanchi Tibet lamp, E-commerce model, design principles, technical framework

Modelling and simulating for coupling development mechanism of regional logistics-economic complex system

Wang Yaowu, Lu Zhibin

Computer Modelling & New Technologies 2014 18(12C) 120-124

The concept and composing parts of Regional Logistics-Economic Complex System have been established firstly. System dynamics model for the coupling interactive development of RLECS has been constructed. According to Heilongjiang Province Economic and logistics data, the effectivity of the model has been tested. Coupling development evolution paths for adaptive development, logistics system exceed moderately and other industry priority have been simulated. The results show that adaptive adjustment mechanism exists in RLECS. Logistics system exceed moderately is the most favorable for priority to the long-term growth of the regional economy.

Keywords: regional logistics, regional logistics-economic complex system (RLECS), system dynamics, coupling development

A method of short term traffic flow prediction that based on the time series theory

Deng Mingjun

Computer Modelling & New Technologies 2014 18(12C) 125-129

Road flow is an important base data for traffic control and management, especially, short term future traffic flow is a critical parameter for dynamic travel induction and its control. Many methods have been developed for the problem. But previously models have some deficiency, such as bad adaptability, large amount of calculation needing and many history data requirement. The purpose of this study is to develop a model that can estimate traffic flow on road using the theory of time series treatment and prediction. Karhunen-Loeve transform and spectral analysis have good performance in time series evaluation, describes the method that applied the function of Karhunen-Loeve transform to decompose the history detection traffic flow data series, at the same time get the eigenvector coefficients, use the coefficients and current detection flow reconstructed the future some step traffic flow series, so get the goal of short term traffic prediction. The case study suggest that, the proposed method has a good performance on the prediction, furthermore, a fewer history data needing and several step can be predicted.

Keywords: short-term traffic prediction, Karhunen-Loeve transform, stochastic time series

Challenges made by digital transmission pattern to the Chinese society in the internet era

Cao Yu, Jiang Meishi, Chen Liangwei, Zhang Guisheng, Wang Guizhen

Computer Modelling & New Technologies 2014 18(12C) 130-137

This paper finds that the rapid developing Chinese digital publishing and spreading is challenged by serious political challenge, economic crisis, cultural conflict and social confrontation. In view of that, this paper tries to propose countermeasures from aspects of the government, guilds and business: The society needs to treat the ecological environment of the digital publishing and spreading, establish a scientific and reasonable regulatory mechanism, clear the responsibility of the regulatory body in various aspects and increase investment to promote technological innovation

Keywords: digital publishing and spreading, impact and challenges, public internet-based opinion events

Design of the differential chaos shift keying communication system based on DSP builder

Liu Zhiping, Zhang Jinhua, Liu Hanyu

Computer Modelling & New Technologies 2014 18(12C) 138-143

Chaotic communication has the good secrecy. It is an important branch of the modern secure communication. Differential chaos shift keying (DCSK) communication system adopts shift keying to separate the reference signal and data signal. It has a strong resistance to the multipath channel. For FPGA systems design shortcomings using a hardware description language directly, the DCSK communication system is proposed in DSP Builder software method. The simulation results show the correctness of the design system. The DSP Builder platform can be linked with FPGA seamlessly. It makes the development convenient for chaotic communication system design based on FPGA, and the designed DCSK communication system has practical value.

Keywords: chaotic communication, differential chaos shift keying, DSP builder, FPGA, logistic map

Design and implement of a university archives management mode

Yu Xinxin

Computer Modelling & New Technologies 2014 18(12C) 144-148

Recent years have seen instructional technology and online learning join academic computing, administrative computing and library services as a major focus of investment and planning on campus. Many universities are now embracing the use of Information and Communication Technologies (ICTs) in search for more efficient and competitive processes both in delivery of lectures as well as in administrative processes. This paper shares the experiences of a public University of China in implementing an archives management System (AMS), challenges faced, how it tackled these challenges, what has been achieved so far and important lessons learnt in the process. The paper concludes by proposing improvements in implementing similar systems in other institutions in the continent.

Keywords: ICT, JUT, archives management, model

Research on eco-community comprehensive evaluation model based on improved fuzzy method under the circumstance of new type urbanization development

Fan Liya

Computer Modelling & New Technologies 2014 18(12C) 149-153

In the planning of town development, the concept of eco-community is widely accepted and gradually applied to practice, which has become an important content of the new urbanization construction now. The establishment of eco-community comprehensive assessment is of great significance for the practice and development of eco-community. By the empirical analysis of the ecocommunity, establish a set of eco-community assessment index system that is in accordance with China's situation and combine qualitative and quantitative by adopting improved Fuzzy method, follow the detailed index reference standard of relevant research results both at domestic and foreign, carry out a quantum chemical calculation of various indexes and its weight.

Keywords: improved fuzzy, new-type urbanization, eco-community, comprehensive assessment

Apriori algorithm in the improvement and implementation of e-commerce based on data mining

Tao Gan

Computer Modelling & New Technologies 2014 18(12C) 154-159

With the rapid development of e-commerce business traffic increases rapidly. The traditional technology and infrastructure, it is hard to meet the increasing data management and rational utilization. E-commerce businesses overcome difficult, using data mining tools of implicit rule algorithm in the data mining, look for opportunities. Study a recommendation system using data mining algorithm is improved Apriori algorithm of association rules technology the most classic. Experimental results show that the improved Apriori algorithm efficiency is improved, the processing time in support of smaller more obvious.

Keywords: data mining, the Apriori algorithm, the electronic commerce

Special and temporal effects of the urban rail transit on the real estate values

Wang Hongping, Huang Qian, Sun Hailing

Computer Modelling & New Technologies 2014 18(12C) 160-165

Urban rail transit is the combination of an urban underground rail, light rail, monorail, tram, new traffic, high-speed maglev trains, suburban trains and other rail traffics. Because of its many advantages, such as fast and efficiency, safe and comfortableness, energy saving and environmental protection, urban rail transit is welcomed by the public and urban transportation systems and it is a major part of the urban public transport In order to research the effects of urban rail transit on real estate value. First, this paper introduces the concept and characteristics of urban rail transit, then sorts out the influence factors of the real estate value and points out the primary factor, which is the rail transit. Through building mathematical function model, we discover that property value and the rail transit are the differential multiple relationships. The study benefits the research and practice in related industries.

Keywords: urban rail transit, real estate value, the function model

Cooperative capability evaluation model of construction organization to implement cleaner production

Xu Feng, Chen Jianguo, Wang, Yujing
Computer Modelling & New Technologies 2014 18(12C) 166-170

Cleaner production (CP) has been considered to be an important means for effective pollution control and lead to a win-win situation of improving economic and environmental benefits. Cooperation is essential for project-orient construction organization to implement cleaner production. In the paper, the factors of cooperative capacity for construction organization will be analyzed and the evaluation model will be developed. There includes six capabilities: Consistency of project plan, Project information share, Stakeholders collaboration, Environment strategy alliances, Coordination with outside institutes and Market adaption. According the problem exist complex interaction between indicators, the Analysis Network Process (ANP) model is used to deal with the internal and external dependence relationship between various indicators, and SuperDecisions software is applied to the complicated calculate process of the data. The paper provides an new effective tool to evaluate and improve the cooperative capacities of construction organization for Cleaner Production.

Keywords: cleaner production, cooperative capability, construction organization, ANP

Significant multiple regression algorithm of construction occupation based on micro-optical characteristics and matrix correlation degree

Lu Na, Wu Tianyan
Computer Modelling & New Technologies 2014 18(12C) 171-178

In order to research whether the career plateau is negatively related to organizational identification and engagement, whether organizational identification has a positive correlation on engagement, and whether the career plateau has an intermediary role between organizational identity and engagement. The significant theoretical analysis is first introduced into the construction industry organizational behaviour's the relationship model among occupational plateau, organizational identification and engagement, which uses linear regression method to achieve significant computing, and in the analysis of intermediary role the introduced genetic algorithm can accelerate the convergence and cross speed of the calculation. Then, the use of VC program designs the assumptions parametric and algorithmic of significant test, and using the data interface of VC and MATLAB will directly call MATLAB program in VC, finally through the MATLAB program to realize the linear regression analysis, so as to greatly improve the efficiency and accuracy of data analysis.

Keywords: micro-optical characteristics, matrix correlation, significance, linear regression, software calling, genetic algorithm code

Energy consumption optimization method of cloud computing platform based on customer satisfaction

Xie Chuansheng, Ren Xinyu, Gerilemanda
Computer Modelling & New Technologies 2014 18(12C) 179-186

With the global climatic change and the increasing dependence on energy, energy efficiency becomes one of the main obstacles entering the new era of green cloud computing. As a new high-end computation, green computing attracts extensive attention of people, which has great influence on the development of cloud computing. The paper analyzes factors satisfaction degree of cloud computing customers on cloud computing service, and proposes the fuzzy subjection function evaluating customer satisfaction. Based on the function, the objective is to maximize customer satisfaction and minimize cloud computing energy consumption, cloudcomputing scheduling optimization model based on customer satisfaction is established, and customer value evaluation is the basis of selecting the weight coefficient of satisfactory function in the model. As cloud-computing scheduling optimization model based on customer satisfaction is multi-target optimization model, the paper optimizes objective functions in the model, uses linear weighting method to convert multi-target functions of the model into Single-objective functions, and applies improved genetic algorithm to solve the model. Finally the paper takes the examples to verify the effectiveness of the model and the algorithm.

Keywords: customer satisfaction, green cloud, control strategy, task scheduling, energy consumption

Choreography modelling based on π calculus

Jiang Jiulei, Zhang Jiao, Bao Wenxing
Computer Modelling & New Technologies 2014 18(12C) 187-194

Business process modelling is a key step in business process management, and it plays a crucial role in process analysis and optimization. When modelling complex business process interaction, the original BPMN modelling approach is not applicable, need special modelling language and methodology for process choreography. In order to solve semantic ambiguity and integrity of business process modelling, proposed a formalize business process choreography modelling method based on π calculus. First business process choreography graphical instance design is presented by BPMN2.0 choreography. Then formal definition based on π calculus of BPMN2.0 choreography's basic activities and structured activities is presented. Then an instance of business process choreography auction scene model is given, and the model is analysed and validated manually and automatically respectively. Finally, we propose a π calculus model validation algorithm with the model XML document of Visio BPMN2.0 Modeller tool as input and then implement the algorithm. Theoretical analysis and experimental results show that this method can describe BPMN choreography by π calculus and be able to validate the semantic error of BPMN in terms of translate

semantics and automatic deductive of π calculus, which makes choreography modelling more precise and specification.

Keywords: choreography, BPMN2.0, π calculus, formal modelling

BPM Software Adoption in Enterprises based on TOE Framework and IS Success Mode

He Yusi, Wang Wukui

Computer Modelling & New Technologies 2014 18(12C) 195-200

With rapid advance of enterprise management informatization, traditional methods of business process management gradually fail to meet the demand of current enterprise development. Business Process Manager (BMP), one business process management software, has become the new favourite of enormous enterprises due to the huge profit and more efficient business process it creates. The work explored BPM software adoption in enterprises with innovative combination of TOE framework and IS success model in order to provide the real-time software demand for BPM software manufacturers. This work focused on the reasonable integration of the two models above. With analysis on all aspects that influenced adoption decision and long-term acceptance in the two models, the main influence factors of BPM software adoption in enterprises were finally determined. In this work, the correlation among all influence factors of BPM software adoption was obtained by questionnaire survey and data analysis. The completed research can provide effective and reasonable adoption suggestions for enterprises as well as BPM software manufacturers.

Keywords: Enterprise; TOE Framework; IS success model; BPM softwar

Teaching Management System Based On Particle Swarm Algorithm

Xie Wei

Computer Modelling & New Technologies 2014 18(12C) 201-204

The core of school teaching management is comprehensive utilization of human, material and time resources. The work aims at building an optimization model of the above resources and solving scheduling problems of teaching management system based on particle swarm algorithm. This method is proved effectively by simulation, thus providing technical means for informatization of school teaching management.

Keywords: Particle Swarm Algorithm, Teaching Management System, Human Resource, Time Resource

Similarity Measure Based On Characteristic Values For Intuitionistic Trapezoidal Fuzzy Numbers And Its Multicriteria Decision-Making Method

Ren Shapu

Computer Modelling & New Technologies 2014 18(12C) 205-209

Abstract A similarity measure and a weighted similarity measure based on the distance between characteristic values for intuitionistic trapezoidal fuzzy numbers are proposed in this paper. Then an intuitionistic trapezoidal fuzzy multicriteria decision-making method is established based on the weighted similarity measure between the characteristic values, in which the preference values of alternatives on criteria are the form of intuitionistic trapezoidal fuzzy numbers and the criteria weights are known information. By means of the ideal alternative, the weighted similarity measure between an alternative and the ideal alternative based on the intuitionistic trapezoidal fuzzy numbers is presented to derive the optimal evaluation for each alternative. The ranking of alternatives and the best one can be determined according to the values of the weighted similarity measure for all alternatives. Finally, an illustrative example demonstrates the effectiveness of the proposed method.

Keywords: Intuitionistic fuzzy number; Intuitionistic trapezoidal fuzzy number; Characteristic value; Measuring distance; Similarity measure; Multicriteria decision-making

The Study on Evaluation of the Tourism Economics Impaction

Huang He

Computer Modelling & New Technologies 2014 18(12C) 210-215

During the last three decades, tourism industry in China has been witnessed impressive development, and China has become one of the world's most important tourism destinations as a result of the rapid growth of its economic and tourism development since economic opening and reforming in 1978. Tourism environmental impact has been a core issue in Tourism studies and its investigation has originated from 1960s abroad while it attracted researcher's attention till early 1980s in China. Although the impacts of tourism development on natural and social environment has been recognized, systematic studies of destination environment and its sustainable development in evaluation models, measure approaches, determinant factors, mechanism, integrative measures and management are still relatively rare. An evaluation index system on urban tourism radiation power that can reflect the level of the overall urban tourism economy growth, social development and ecological construction has been built based on respects like urban tourism revenue, scale of tourists, quantity of tourism resources, tourism employment and area of natural ecotourism sites. However, during the fast development, the quality issue in general has become an inevitable problem that seriously affected the competitiveness both of Chinese tourism industry and Chinese tourism enterprises in the global market. Consequently, motivating quality revolution of tourism industry in China for its sustainable development is so urgent. This paper firstly uses quantitative and qualitative methods to review total quality management (TQM) movement in

China and emphasizes the need to implement TQM which is a holistic managerial approach for improving the quality of one industry's product for its further sustainable development in Chinese tourism industry.

Keywords: Tourism, Tourism Economics, Evaluation, total quality management

Analyzing Model of Enterprises Cluster Learning Competence in Airport Economic Zone based on Self-Organization Theory

Changhui Yang

Computer Modelling & New Technologies 2014 18(12C) 216-221

Airport Economic Zone, as the new economic mode, gathering capital, technology and labor, formating enterprise cluster, resulting in the agglomeration and diffusion effect, will affect the economic development of surrounding areas. This paper expounds the connotation of enterprise scluster, think out spatial structure of enterprises cluster system consisting of the core layer, support layer and environment layer. And then analyzes the self-organization feature and mechanism of enterprises cluster evolution, discussed the prerequisite, cause, route, action mechnism and dynamisms of enterprises cluster evolution. Finally, construct the analysis model of enterprises cluster learning ability, analyzes the relationship between enterprise cluster openness, learning ability and competitiveness.

Keywords: Enterprises Cluster, Self-Organization, Learning Competence, Information Diffusion Model, Airport Economic Zone

A framework for improving urban noise map

Bin Zhang, Wencheng Hu, Linhui Peng

Computer Modelling & New Technologies 2014 18(12C) 222-226

With increase of urban noise, urban planning and design use noise maps increasingly, and 3D noise map are also paid attention increasingly. This paper investigates the possibility of developing a 3D(three-dimensional) acoustic interactive scene base on VRGIS platform for the creation of noise maps. This involves building simple 3D city model, generation of 3D observation points and noise calculation using standard noise calculation models. Beijing Olympic Center was selected as study area, fictitious data was used to calculate the noise levels of study area. Appropriate spatial interpolation methods were used to develop noise surface. Measurements were also carried out at various locations throughout the test area, which were then used to investigate the accuracy of predictions.

Keywords: VRGIS Platform; Environmental noise; Noise mapping

A rational threshold signature with hierarchical structure

Li Xiurong, Cai Yongquan, Liu Yali

Computer Modelling & New Technologies 2014 18(12C) 227-231

Rational secret sharing module combines Game theory with cryptography by taking rational behavior into consideration thus has a wider range of application. We apply rational secret sharing into threshold signature so as to construct a hierarchical structure that is described by extended game. Dynamic game of complete information is applied into partial signature's distribution and reconstruction phase where a probable value is calculated that can maximize the payoff. In each round of the game, secret key is iteratively generated in a way that any forge secret key will be detected by PKG system. Mixed strategy model is adopted instead of pure strategy model to prevent deviation, which is proved to be Nash equilibrium. Correctness and anti-deceive feature is proofed. The security is based on solving BDH problem in group so the scheme is high effective and chosen cipher text security.

Keywords: Threshold Signature; Hierarchical Structure; Mixed Strategy Model; Nash Equilibrium

Research on construction exhibition integrated information service system in airport economic zone

Changhui Yang, Xi Wang

Computer Modelling & New Technologies 2014 18(12C) 232-238

Information technology has been widely used in the daily management of enterprises. Through the use of it, construct the integrated information service system which is based on exhibition services and takes exhibition organizer, exhibitor and audience as the main service object. Implement digital exhibition service, integrated information service, scientific activity management and customer service network and meet the needs of exhibition service, information service, activity management and customer service. This paper analyzes the service object and domestic demand of exhibition integrated information service system, proposes the system structure of exhibition integrated information service system and analyzes communication platform, operation platform and application platform of the system. Application of exhibition integrated information service system is contribute to realize the interaction among the information flow, capital flow and logistics, implement the purpose of information resources sharing, efficient management and decision science, drive the comprehensive development of enterprise informatization, business electronization, logistics internationalization and supply chain informatization and promote regional economic prosperity and social progress.

Keywords: Exhibition Industry, Integrated Information Service System, System Structure, Network Topology Structure, Application System, Airport Economic Zone.

Classification algorithm of regression support vector machine and its application to make a mixed refrigerant in ground source heat pump system

Yan Manfu, Wang Jiuhai

Computer Modelling & New Technologies 2014 18(12C) 239-244

To solve the problem of the refrigerant performance in a ground source heat pump system, the paper improved the existing proximal support vector machines [1], constructed a classification algorithm model of regression Support Vector Machine (SVM), and further applied it to a new classification method of making a mixed refrigerant for the system on the basis of analyzing the refrigerant performance of ground source heat pump systems

Keywords: Ground Source Heat Pump; Refrigerant Performance; Classification Algorithm of Regression Support Vector; Support Vector Machine

The Performance Evaluation of the Listed Security Companies in China Based on the DEA Model

Zhang Yan-liang, Chu Ran-ran, Zhao-qi Xiao

Computer Modelling & New Technologies 2014 18(12C) 245-248

With the continuous development of domestic stock market, the listed security companies have stepped into a stable growth period, the study of their performance becomes also deeper. This paper firstly introduces the methods of evaluating the performance of the listed security companies, and discusses the DEA method in detail. Then we evaluate the corporate performance of 16 domestic security companies by the DEA method. Finally we analyses the empirical results from three aspects, which are technical efficiency, pure technical efficiency and scale efficiency. This paper evaluates the performance of the listed security companies with a more scientific method.

Keywords: Listed Security Company; Corporate Performance; DEA Model

Privacy Preservation in Social Network Based on Anonymization Techniques

Wang Pingshui, Zhang Xuedong, Huang Pei

Computer Modelling & New Technologies 2014 18(12C) 249-253

Social network data can be released for various purposes, such as statistical analysis, cluster queries, data mining and so on. However, when social network data are released, the privacy of some individuals and organizations may be disclosed. Serious concerns on privacy preservation in social networks have been raised in recent years. In this paper, in order to reduce the privacy disclosure, we propose a privacy preservation model and algorithm based on anonymization techniques for social network data, that is (k,l) -anonymity algorithm. The proposed (k,l)-anonymity algorithm anonymize social network data to prevent privacy attacks including both content and structural information, while minimizing the anonymization cost and reducing the privacy disclosure. Extensive experiments have been conducted on synthetic data sets comparing with previous work. The result shows that the proposed anonymity algorithm could improve the security of the released social network data while maintaining data utility.

Keywords: Social network, privacy preservation, anonymization, privacy disclosure risk.

Changes in Science and Technology Policy for the Equipment Manufacturing Industry Collaborative Innovation Impact Prediction

Yu Zhaoji, Zhou Songtao

Computer Modelling & New Technologies 2014 18(12C) 254-259

This paper takes the Equipment Manufacturing Industrys the research object, drawing on the National Innovation System, buildingscience and technologypolicy-drivencollaborative innovationsystem model ofthe Equipment Manufacturing Industry. Throughmodeling and simulation, respectively forecasts under the existing conditions of Science and Technology Policy, Equipment Manufacturing Industry trend of patent applications 2012-2017; changes of different Science and Technology Policies, Equipment Manufacturing Industry collaborative innovation effect; changes of different combinations of Science and Technology Policies, Equipment Manufacturing Industry collaborative innovation effect. The results can provide scientific decision basis for improving the Equipment Manufacturing Industry innovation ability.

Keywords: Equipment Manufacturing Industry, collaborative innovation, Science and technology policy, system dynamics.

Quantitative analysis of translation texts

Kiv A, Bodnar L, Sedov E, Britavska O, Yaremchuk N, Yakovleva M

Computer Modelling & New Technologies 2014 18(12C) 260-263

A new, stylistic-mathematical approach for analysis of literary works, particularly for analysis of translation works, is developed. The important requirement to the translation is its compliance with the structure of language in which the translation is done. We showed that this analysis can be carried out using Zipf's laws and information characteristics of literary work.

Keywords: analysis of translations, Zipf's laws, information methods

E-Commerce Recommendation System based on MapReduce

Zhao Wei, Zhang Hong Tao

Computer Modelling & New Technologies 2014 18(12C) 264-269

According to the Present Situations were that there is an urgent demand for large data analysis in Electronic Commerce, by using cloud computing‟s advantage in storing and analyzing mass data, the solution of new project which can analysis data was proposed, based on the cloud computing. Firstly, aiming to the advantages of the cloud computing platform, the novel data-analysis architecture was designed, then the business flow chart by using cloud computing analysis on the architecture. Finally the project is validated by practical application and possesses certain reference meaning in E-Commerce Recommendation System based on cloud computing.

Keywords big data; Cloud Computing; architecture; parallel computing; Cloud safety

Research on Land Utilization Intensity Control and Urban Design Fusion Mechanism Based on Spatial Hierarchy Coupling Model

Quanhua Hou, Shuang Xia, Wenhui Wang

Computer Modelling & New Technologies 2014 18(12C) 270-278

Under the work of vigorously promoting the ―whole cover‖ regulatory plan across the country, urban design also desiderates the regulatory plan of land use intensity. And of which urban design conducts fusion influencing mechanism in three levels under the engineering of fusion compilation system. This paper put forward the control of land use intensity and the fusion compilation of urban design in hierarchical regulatory plan. Through analysis on the spatial level of regulatory plan compilation in various cities, the content and scale of regulatory plan system engineering were shown. As to coupling and relevancy of the division of compilation spatial level, based on the coupling model of spatial level and the fully grasp of the connotation of spatial level system engineering, this paper presented the framework of coupling model with the consistency of its principle, scale and content. Moreover, this paper conducted the research on influencing factors of the control of land use intensity and the fusion mechanism of urban design in hierarchy. Its mechanism avoided the control and guidance of comprehensive urban design mainly on macro space, which was difficult to achieve the practical requirement in urban design.

Keywords: land use intensity, *urban design*, *regulatory plan*, *spatial system engineering*, *fusion mechanism*

Analysis of the guiding role of skill factor model in college talent entrepreneurship

Bai Yunli, Miao Miao, Li Yaowei

Computer Modelling & New Technologies 2014 18(12C) 279-282

Entrepreneurship Education in colleges and universities is not only to cultivate student's innovative thinking and entrepreneurial consciousness but foster the student's abilities in the entrepreneurial process. At this moment, the weak entrepreneurial skills has become one of the most important reason that hinder the entrepreneurship of college students, therefore, it is necessary to make the core elements of entrepreneurial skills clear for college students. This paper adopted to point out that the college students entrepreneurship skills with hierarchical structure, then Pyramid model of college students' entrepreneurial skills elements was constructed.

Keywords: Entrepreneurial skills; Key factors; Pyramid model

Symbiosis Model of Rural Tourist Attraction Based on Sustainable Development

Yi Lanlan

Computer Modelling & New Technologies 2014 18(12C) 283-286

Through the analysis on the concept of rural tourism sustainable development, this paper summarized the tourist content based on sustainable development, and pointed out the existing problems of current sustainable development in China. Combined with practical development situation, this paper put forward the countryside–scenic spot symbiosis model under sustainable environment. It elaborated from its model connotation, framework, operation and economic efficiency, with the hope of playing a good reference for the development of rural tourism.

Keywords: Sustainable development; Rural tourism; Symbiosis model.

Evaluation Analysis of College English Standard Language Ability Based on Environment Adaptive Mode

Jiao Guilan

Computer Modelling & New Technologies 2014 18(12C) 287-290

Through analyzing the concept of environment adaptive English ability assessment, this paper summarized the content of college English markup language ability evaluation based on the environment adaptive model and pointed out the role of environment plays in, put forward environment adaptive English ability evaluation model combined with the current actual situation, stated the aspects of its model framework, content, operation, in order to play a reference role in assessment and

analysis for college English standard language ability

Keywords: environment adaptive model; English standard language ability evaluation; college English; meta-evaluation

Establishing of Basketball Coach Evaluation System Based on the Grey Relevance Evaluation Model and Analytic Hierarchy Model

Zeng Jirong

Computer Modelling & New Technologies 2014 18(12C) 291-294

This article evaluated the National Collegiate Athletic Association (NCAA) coach problems through the establishing of grey relevance evaluation model and hierarchical analysis model and tested the models using the relative error method, in order to compare and evaluate model with more accurate results.

Keywords: grey relevance evaluation model, analytic hierarchy process, coach evaluation model, NCAA

The Sharing Mechanism Study of IT Enterprises' Knowledge Alliance

Yang Haiwen, Tao Changqi

Computer Modelling & New Technologies 2014 18(12C) 295-300

Knowledge alliance is a kind of strategic alliances, which is to analyze the alliance motive and content from the point of view of knowledge. This paper analyzes the impact factors, mechanism of knowledge sharing and spillover effect between IT Duopoly by building a two-stage game model and Prisoner's Dilemma model. In addition, IT enterprises' knowledge sharing process is also simulated by using MATLAB software. The results suggest that the optimal sharing level of technical knowledge will be reduced with the increasing of network effect of IT product and the equilibrium profits will increase; the bigger the complementary of technical knowledge, the lower the level of technical knowledge sharing which leads to more equilibrium profit and less equilibrium profit; with the increasing of network effects of IT products, company will share less technology and the equilibrium profit has increased; with strengthen of complementary capabilities of technical knowledge, company will share less technology, whereas the equilibrium profit increases firstly and then decreases.

Keywords: IT Enterprise; Knowledge Sharing; Knowledge Alliance; Sharing Mechanism; Spillover effect; Equilibrium Profits

An Analysis on the Facilitating Effect of Sino-Burmese oil and gas pipelines on the Regional Economy by System Dynamics

Hailiang Zhang, Man Lu, Yaxi Lin

Computer Modelling & New Technologies 2014 18(12C) 301-306

Based on system dynamic theory, this article analyzes the influence of the Sino-Burma pipelines on the southwest of China. Taking the Anning Refinery Project as an example, a model of economic development for oil refinery industry has been set up. The paper differentiates the causal relationship between Sino-Burma pipelines and refined oil price in Yunnan province, and analyzes the influence of Anning Refinery Project on Yunnan refined oil supply structure, refined oil price and the promotion of regional economy using Stella software. The results reveal inner mechanism and trends of fluctuations of refined oil price and economy development. It shows that the establishment of the Sino-Burma pipelines will change the structure of supply of energy in Southwest, alleviate the contradiction of supply and demand for energy, help to improve the comprehensive layout for the capacity of oil refining, and optimize resource allocation.

Keywords: system dynamics; Sino-Burmese oil and gas pipelines; southwest region, the Anning Refinery Project

A logical framework for describing machine knowledge

Liao Yuanxiu, Zhou Shengming, Li Zhixin

Computer Modelling & New Technologies 2014 18(12C) 307-313

Knowledge acquisition and autonomy has been a bottleneck in machine intelligence research. This paper proposes a logical framework for describing machine knowledge. The so-called "machine knowledge" refers to the knowledge acquired by robot systems in the following way. A robot uses its sensors to sense the external environment, and the sensors transfer the external states (environment) to the robot's memory in the form of sensing data, then the robot converts the data into knowledge through the system mechanisms, and the knowledge is stored in the robot‟s knowledge base, forming its own internal state(for environment awareness). Robots can autonomously use their knowledge when planning and making decision without any external intervention. The aim of our work is modelling the above process including formal representations for sensors, sensing data and knowledge, a mechanism converting sensing data to knowledge and automatically updating the internal state of the robot. The main contribution of this paper is to present a new approach for researching machine intelligence, which develops along the direction of "machine code–machine data–machine knowledge–machine intelligence". The proposed logical approach does not involve the modal logic, and its semantics is based on the sensing data rather than possible world models.

Keywords: artificial intelligence; machine knowledge; sensing data; autonomous robot; logical framework

The construction and application of impact model for social networks

Huang Liguo, Mi Lufang
Computer Modelling & New Technologies 2014 18(12C) 314-320

The co-authorship network of scientists represents a prototype of complex evolving networks. In addition, it offers one of the most extensive database to date on social networks. The focus of our work is to analyze influence and impact in research networks and other areas of society. Through the analysis over 18000 lines of raw data in the Erdos1.htm, we infer the structure of this network containing 9784 nodes and 17273 edges. Global metrics such as degree centrality, closeness centrality and betweenness centrality can be used to identify the influence. Based on the influence measurement model, we find that Alon Nogam, Harary Frank and Shelah Saharon have significant influence on the network. By analyzing the important works from its publication, we build another influence measure model, which includes the impact factor of researchers, publications and journals, to determine the papers' relative influence. The conclusion is that the second paper possesses significant influence on the network.

Keywords: Network influence; Degree Network; Density centrality; Social networks analysis method; Model

Short Term Forecasting for Wind Power Based on Cluster Analysis

Gao Yang, Xing Jing, Xu Aoran, Zhang Liu, Wang Gang, Zou Quanping
Computer Modelling & New Technologies 2014 18(12C) 321-325

In order to make full use of historical wind speed information behind the data, according to daily similarity of the wind speed and wind power, short term power forecasting method based on cluster analysis is presented in this paper. Through the original sample data is preprocessed, election history daily data that is similar with characteristic parameters of NWP of forecast day, so as to establish training samples of model. NWP information of forecast day provided by Meteorological Department will be as the characteristic parameters of forecast day, and calculating Euclidean distance between characteristic parameters will be regarded as a basis of similarity measure. Finally forecasting model is founded by adopting similar samples based on cluster. Using NWP data as input parameters, the actual wind power as a target value, many kinds of short-term wind power forecasting model is gained by training. Through the actual wind farm test, forecasting accuracy is improved obviously

Keywords: Short-term wind power forecasting; cluster analysis; K means cluster algorithm; daily similarity; Numerical Weather Prediction (NWP).

Comparisons of Firefly Algorithm with Chaotic Maps

Su Shoubao, Su Yu, Xu Mingjuan
Computer Modelling & New Technologies 2014 18(12C) 326-332

Firefly Algorithm (FA) is one of the new bio-inspired algorithm driven by the simulation of the flashing behavior of fireflies. To deal with the problems of low accuracy and local convergence in standard FA, the chaos theory is introduced into the evolutionary process of FA. Since chaotic mapping has certainty, ergodicity and stochastic property, by initializing the population of fireflies and replacing the constant value of absorption coefficient with four chaotic maps, the proposed FA increases its convergence rate and resulting precision. Comparisons experimentally show that convergence quality and accuracy are improved, which testify that modified FA with chaos is valid and feasible

Keywords: Firefly algorithm (FA), Chaotic map, biological computing, ergodicity and stochastic property

The Study on Collaborative based Marketing Sales Strategy

Qun Chen, Fang Li
Computer Modelling & New Technologies 2014 18(12C) 333-338

Deregulation of electricity markets throughout the world requires that markets be constructed so as to insure low prices and high efficiencies. However, the electricity markets are always oligopoly markets rather than being perfect competitive ones because of the special features of the power system such as a limited number of producers, large size of the investment (barrier to entry), transmission constraints which may isolate consumers from some generators, and transmission losses which may discourage consumers from purchasing from distant suppliers. Market power (MP) is the ability of a firm to raise its price significantly above the competitive price level and to maintain this high profitable price for a considerable period. This ability is usually linked to the size of the companies with respect to the whole market, which is known as market concentration. In this paper, we propose a method based on the SF in which the producers bid the slope of the SF to simulate the strategic bidding behaviour of producers under the network constraints with a DC power flow model. Different situations will be considered in order to analyse the different impacts on producer surplus and average weighted prices in network constrained electricity markets: the perfect competition without network constraints, the perfect competition with network constraints, the oligopoly condition with network constraints in which the line flow limit is unknown to producers when they bid strategically, and the oligopoly condition with network constraints in which the line flow limit is known to producers when they bid strategically.

Keywords: Collaborative based Marketing, Marketing Sales Strategy, Marketing Sales

Intermediary Role of Job Burnout between Individual-Organization Matching and Turnover Intention Based on Regression Analysis

Hui Li, Qun Wang, Lin Chen
Computer Modelling & New Technologies 2014 18(12C) 339-345

Lots of researches have been conducted on relationship between individual-organization matching and job involvement at home and abroad, while less are related with job burnout. Under the background of commercial banks in Chinese cultural context, the influence of individual-organization matching on job burnout and turnover intention was studied using multivariate hierarchical regression. The results showed that three dimensions of individual-organization matching and three dimensions of job burnout had significant negative effect on turnover intention; some job burnout behaviors played an intermediary role in the influence of individualorganization on turnover intention. Therefore, individual-organization matching should be improved to reduce the level of employee burnout, thereby reducing their turnover intention. It has important significance for Chinese commercial banks to remain competitive in future financial reform through excellent human resources.

Keywords: Individual-organization matching; job burnout; turnover intention; intermediary role

Blind Sources Separation Based on Short-Time Discrete Cosine Transforms

Yanni Zeng, Yujie Zhang, Rui Qi
Computer Modelling & New Technologies 2014 18(12C) 346-353

This paper presents a sparse blind source separation method which uses short-time discrete cosine transform (STDCT) to obtain the transformed domain information from a set of linear instantaneous mixtures of these sources. Unlike short-time Fourier transform (STFT) determining the single source point or area by using the ratio of the real and imaginary parts, we remove these points which are away from the mean direction of the cluster using the orthogonal distance between the point and the line. For the clustering part, we use, in this paper, an algorithm inspired from K-means. The final algorithm is easy to extend for any number of sources. Because the STDCT is a Fourier-related transform similar to the STFT, which using only real numbers, so it reduces the computer cost on clustering and improves the algorithm accuracy. Experimental results are provided to evaluate the performance of the proposed algorithm through comparing with STFT from the normalized mean-square error (NMSE) and signal-to-noise ratio (SNR).

Keywords: Blind source separation, Short-time discrete cosine transforms, K-means cluster, Orthogonal distance, Sparsity

A Logical based Framework for the Research on Knowledge Management

Han Ke
Computer Modelling & New Technologies 2014 18(12C) 354-360

Nowadays, there are a lot of experiences that show no success in operationalizing knowledge management project in an organization despite using different means, indicating that huge sums have been wasted and sometimes the predicted objectives for organization have faced failure. The success or the failure of incorporating a knowledge management project depends on the specialized aspects as well as the non-specialized aspects which try to provide a comprehensive outlook about organizational, technical and specialized interactions for successfully incorporating knowledge management projects within enterprise. The existence of knowledge architecture (KA) has been always necessary for ensuring the successful operationalization of a knowledge management (KM) project. With regard to the deviations from classical architecting to large-scale architecting from one hand and the lack of an appropriate KA framework within large-scale area from the other hand, the developing of a conceptual framework for conducting KA within large-scale organizations would lead to the main aims of this paper. The initial structure of the framework was established based on the information architectural framework of Zachman. Then, we arrived at the ideal KA framework by adding service abstraction and architecture level dimension besides changing the field of all the cells within Zachman‟s framework from information into knowledge. This research is descriptive in method and its validity is confirmed by executing a case study and soliciting the opinions of some KA experts. The results indicate feasibility of applying framework to other knowledge-intensive large-scale firms and the findings of paper may be beneficial for architects in the knowledge area.

Keywords: Knowledge Architecture Framework; Knowledge Management; Information Architecture; logical framework

Comprehensive evaluation to distribution network planning using principal component analysis

Ruilian Wang, Gao Shengjian
Computer Modelling & New Technologies 2014 18(12C) 361-366

This paper proposes a new comprehensive evaluation method by nonlinear principal component analysis in allusion to the problem in distribution network planning, such as a large number of factors, intense fuzziness and the nonlinear relationship between the factors. The method is presented for three different processes. Firstly, according to pre-existing achievement and considering long-range development of distribution network, the comprehensive evaluation index system taking into account the technical, economic, environmental and adaptability factors and so on is constructed. Secondly, by disposing all of the factors in the index system using fuzzy consistent matrix model to get the relative membership degree matrix of every scheme, the initial data matrix in fuzzy nonlinear principal component analysis is obtained. Thirdly, the weight of every principal component is acquired by means of the entropy conception. The superiority of the method in the paper introduced is that the method can dispose the fuzzy problem in complicated planning, simplify the computation process in comprehensive evaluation,

reduce the subjectivity and arbitrariness, and can make the conclusion more scientific and more reasonable. A combination of a flow diagram based and a concrete example, the algorithm is proved to be correctly and practically.

Keywords: distribution network planning; comprehensive evaluation; principal component analysis; fuzzy consistent matrix; entropy weight

Parameter estimation for nonlinear system using intelligent algorithm

Xu Xiaoping, Wang Feng, Qian Fucai

Computer Modelling & New Technologies 2014 18(12C) 367-371

Mathematical models are the basis of all control problems. The movement law of things described by equations is the mathematical model. The traditional paradigm of system identification employs prior information on system structures and environments and input/output observation data to derive system models. Accordingly, system identification becomes one of the current active subjects in engineering problems. It is well known that nonlinear systems widely exist in people's production and life. Consequently, in this paper, a parameter estimation method of nonlinear system is put forward based on an improved artificial fish swarm algorithm. Its basic idea is as follows. Firstly, the parameter estimation problems of nonlinear systems are changed into a nonlinear function optimization problem over parameter space. Then, the estimates of the system parameters are obtained based on an improved artificial fish swarm algorithm. Finally, in simulation, compared with other algorithms, the simulation results indicated that the presented method is rational and effective.

Keywords: Nonlinear system; Model; System identification; Parameter estimation; Intelligent algorithm

Two-stage grey support vector machine prediction model

Zhou Huaping, Yuan Yue

Computer Modelling & New Technologies 2014 18(12C) 372-378

Two-stage grey support vector machine prediction model (D2GM-SVM) is put forward by analysing the grey model GM , support vector machine model (SVM) and one-stage grey support vector machine prediction model((DGM-SVM). The prediction accuracy of grey model is improved through two-stage buffer operators D2 to predict the various relevant indexes. At the same time, genetic algorithm is used to find the optimal parameters of the support vector machine model, RBF kernel parameter and penalty parameter, which are the optimal parameters (c, g). Thus, the regression model of the optimal support vector machine is determined. Finally, the final output value is predicted by inputting the predictive value of each index into the support vector machine model. The results show D2GM-SVM has a higher prediction accuracy compared with grey prediction model , BP neural network prediction model and DGM-SVM in this case, and that grey forecasting model combined with the support vector machine model has practical value in solving practical prediction problems.

Keywords: Gary prediction model, Support vector machine, integrated forecasting, Genetic algorithm

The Research on Cross-Language Emotion Recognition Algorithm for Hearing Aid

Shulan Xia, Jilin Wang

Computer Modelling & New Technologies 2014 18(12C) 379-383

To improve the emotional perception of hearing-impaired people, the speech emotion recognition cross language algorithm is proposed. The mutual features of speech emotions in the Chinese and German corpora are analyzed and a speech emotion recognition algorithm using the Restricted Boltzmann Machine based on Parallel Tempering is proposed. First, the algorithm calculates 375 acoustic features. Then, by using the method of Fisher Discrimination Ratio combined with weighted feature fusion, 20 features are selected to be used in the speech emotion recognition. Afterwards, it sets up the Restricted Boltzmann Machine to recognize 5 types of speech emotions (anger, fear, happiness, neutral, sadness). The experiments show that this algorithm can effectively recognize the cross-language speech emotions except the neutral emotion.

Keywords: hearing aid, speech emotion recognition, Restricted Boltzmann Machine, cross-language

Error evaluation for IDW mineral reserve estimates

Zhanglin Li, Ping Wang

Computer Modelling & New Technologies 2014 18(12C) 384-389

Inverse distance weighting (IDW) is a well-known method for computer aided mineral reserve estimation. In practice, however, how to evaluate errors of the estimates has always been a problem for this method. This paper proposes an alternative solution to this issue. Firstly, based on a series of discussion and analysis, implementation procedure of IDW mineral reserves estimation method in computer software was designed and explained in detail. Secondly, two methods, comparing with measured values in a developed or developing mine and with different IDW interpolation parameters in the framework of cross validation, were proposed to evaluate error of mineral reserves estimates. At last, the procedures of this method in detail has clearly been illustrated through a typical practical application, from which the practicability of the solution based on cross validation is clearly shown. Thus, it can be concluded that the proposed method is valid and practicable both in theory and practice.

Keywords: reserve estimation; IDW; error evaluation; spatial interpolation`

Study on the optimization of maintenance strategy based on life cycle cost estimate of transformer

Han Zhang, Hai Qian, Chang An, Quan Zhou, Chao Sun, Youyuan Wang

Computer Modelling & New Technologies 2014 18(12C) 390-394

As the key equipment of power system the status of power transformer impacts the security and stability of the grid. Make appropriate maintenance strategies for life cycle according to its operating status is important for the safe operation of the power grid. The power transformer life cycle cost (LCC) is analyzed through the establishment of the power transformer LCC decomposition model from the perspective of the life-cycle management. The cost – effectiveness of maintenance strategy is studied based on the analysis of maintenance costs and military age change under different maintenance level. Then a power transformer maintenance cost-performance optimization model and introduce genetic algorithm to solve the model. The maintenance optimization model operational, scientific and effective through case studies.

Keywords: Life Cycle Cost; Condition-based Maintenance; Power Transformer; Genetic Algorithms

An Approach to Comprehensive Health Status Evaluation of Oil-Immersed Transformers

Tao Feng-bo, Wei Chao, Hu Cheng-bo, Chen Bi-jun, Wang You-yuan

Computer Modelling & New Technologies 2014 18(12C) 395-399

The oil-immersed transformers take upon important position in transmission and distribution engineering. The operation life cycle of oil-Immersed transformers is far and away lower than its designed life for the most part in Jiangsu province of China. One of its major reasons is the insufficientof running status evaluation. As everyone knows, the health condition ofpower transformer has a high degree of availability, and provides the foundation forcondition based maintenance (CBM) and decommission. The article puts forward a comprehensive health condition assessment model based on non-repairable model (aging failure model) and repairable model (status evaluation model).Therein, the first mentioned of two contains parameters which have irreversibledamage to insulation, such as long-term loading and operating environment, and the other one includes parameters which would be able to recover from the damage trough maintenance, such as oil quality test and partial discharge test.The health status value is quantized into scores between 0-100 by means of mathematical toolslike conditionclassification and fuzzy inference and so on. The model represents health condition intuitively, and modified by defectivework condition information, which has anirreversibledamage on insulating materials, and enhances theaccuracy rating. The article provides a visualized and reliable basis of CBM.

Keywords: transformer, health condition, non-repairable model, repairable model, defectiveworkcondition

Hawkeye technology using tennis match

Baodong Yan

Computer Modelling & New Technologies 2014 18(12C) 400-402

In recent years, tennis has been widely spread and development of electronic information technology and popularization application in tennis. Hawkeye technology is through the trajectories of the high-speed cameras to capture the tennis, and through the digital imaging displays it on the electronic screen, thus provides the more impartial decision basis for the game. In view of this, this article through to the present situation and the application of hawkeye technology architecture, influence value are detailed analysis, trying to provide effective feasible Suggestions for it.

Keywords: tennis tournament; Hawkeye technology; structure analysis; applied research

Comprehensive Economic Strength Assessment Based on Decision Tree Algorithm

Hou Yuan, Wu Min

Computer Modelling & New Technologies 2014 18(12C) 403-407

In this paper, we apply some computer software techniques in socio-economics to study an economic decision-making problem, the comprehensive economic strength assessment problem. To achieve delicacy socio-economical decision, we first conduct an assessment of various influencing factors involved in the decision problem based on analytic hierarchy process, and then apply two decision-tree algorithms to establish the appropriate models with corresponding classification rules. We also use Matlab to fit the data for the purpose of prediction and validation. The experiments show the effectivity and accuracy of decision-tree algorithms in supplying valuable suggestions for economic decision-making problems.

Keywords: Complex Decision; Decision Tree Algorithm; Data Mining; ID3 Algorithm; C4.5 Algorithm

Review of Human-Robot Interactive Modelling and Application for Elders

Han Jing, Xie Lun, Xu Shangmou, Wang Zhiliang

Computer Modelling & New Technologies 2014 18(12C) 408-413

As the psychological problems of the aged are increasingly obvious in the aging society, the human-robot interaction technology making psychological adjustment for the aged becomes one of the most important directions of robotics' research. Firstly, this paper describes the current development situation of interaction technology that can be applied for the service robot of elderly ps ychological adjustment. Next the methods of feature recognition and sentiment analysis in facial expression interaction,

speech interaction, and other interactions are discussed. Then several typical emotion models are analyzed in detail. Finally, the possible research directions of robot interaction technology for elderly psychological adjustment are summarized and prospected.

Keywords: Human-robot interaction; Expressive interaction; Speech interaction; Emotion model; The service robot of elderly psychological adjustment.

The application of PLSA features in the automatic assessment system for English oral test

Ming Ding, Bin Dong, Yonghong Yan, Yousheng Ding

Computer Modelling & New Technologies 2014 18(12C) 414-418

As an efficacious statistical tool for the analysis of co-occurrence data, the PLSA (Probabilistic Latent Semantic Analysis) is usually applied to the information retrieval. However, the theory foundation of PLSA is document data mining. So PLSA should also be a content understanding tool. In this paper, we try to develop its potential as an content assessment feature extraction tool for the auto English oral test rating system which need more precision and comprehensive content assessment. In the contrast group, word frequency which is extracted from the test data is used to assess the content correlation in the A&Q item as a data mining feature and it has proved to be a success .But, the word frequency feature has a significant weak point: When the system lacks test data, the capability of the feature will drop sharply. Oppositely, building the PLSA model of word frequency with the data prepared before the exam and extracting the probabilistic feature from the examinee's speech can avoid the problem above. In the result, the single dimension feature performance of PLSA feature is better than the simple word frequency feature and the assessment performance will also be improved, if the choice of PLSA model parameters is appropriate.

Keywords: word frequency, PLSA, automatic assessment, oral test

Depth Induced Feature Representation for 4D Human Activity Recognition

Zhao Runlin, Zhao Yang

Computer Modelling & New Technologies 2014 18(12C) 419-423

Human activity recognition based on RGBD data has drawn considerable attention due to recent emergence of low-cost depth cameras. Essentially, human activities are composed by human bodies moving in four-dimensional space, (x,y,z,t). The traditional human activity recognition approaches usually ignore depth information thus degrading its discriminative performance. In this paper, our contributions are two-fold. First of all, we learn an Activity Depth Mapping (ADM) over each activity from training samples, where Activity Depth Maps are represented by Gaussian Mixture of Models (GMM) and encode depth distributions of activities. Second, we propose a novel feature representation, called Depth-Induced Multiple Channel STIPs (DIMC-STIPs), for activity representation with RGB-D data where both color and depth channels are available. The proposed feature representation is evaluated on the public dataset RGBD-HuDaAct and it remarkably improves the classification accuracy over state-of-the-art approaches.

Keywords: Kinect; human activity recognition; STIPs; GMM

Research on Strategies of Pricing and Coordinating in Reverse Supply Chain for Duopoly Recovery Competition

Zhanfeng Zhou

Computer Modelling & New Technologies 2014 18(12C) 424-428

By using the Game Theory, this paper studied the pricing problem in multi-level reverse supply with a single manufacturer, a single retailer and duopoly recycler. Pricing model was established in non-cooperative game and cooperative game separately and the optimal pricing strategy was got. Considering that there are many procedures in multi-level reverse supply and the preference for the contract of each enterprise maybe distinct, this paper built a combined contract with price discount contract and revenue sharing contract. At last an example was given and the result shows that the combined contract is effective to coordinate reverse supply chain

Keywords: Game Theory; Pricing model; Contract

Research on remote oil and gas pipeline leakage detection system

He Zhang, Y Q Tang, P Ren

Computer Modelling & New Technologies 2014 18(12C) 429-432

The pipeline transport is the main mode of transportation of oil and gas which is the most important source of energy in modern society. However, leakage has become the major failure of oil and gas pipeline operation, especially the leakage accidents caused by pipeline corrosion and perforation occur frequently, which seriously interferes with the normal production, and causes huge economic loss and environmental pollution. In this paper, the remote oil and gas pipeline leakage detecting system based on the technology of Internet and ZigBee was studied. Through the wireless Internet and ZigBee network, this system realizes the remote detection of oil and gas pipeline leakage with CC2430 communication chip at the core. Experimental results show that this detecting system is capable of judging and positioning pipeline leakage in time and accurately

Keywords: Internet; ZigBee; CC2430; Coordinator node; Sensor nodes

Benefits balance mechanism of network finance based on e-commerce platform

Lingling Huang, Yuan Zhao

Computer Modelling & New Technologies 2014 18(12C) 433-437

Information asymmetry is one of the main reason which leads to the financing difficulties of small and medium enterprises (SMEs), while network financing based on e-commerce platform can reduce information asymmetry degree and provide a new approach for SMEs to solve their financing difficulties. In this article, we built some games model based on the theories and methods of game theory to analysis profit distribution and Nash Equilibrium of each participant in e-commerce financing, and we differ the finance model into accounting-based lend and network finance based on e-commerce platform. The results show that the introduction of ecommerce into financing can play a positive role in increasing the financing scales of SMEs, reducing the risks of bank, and enhancing the value-added service of e-commerce platforms. There is also an optimal solution about profit distribution, thus achieving a win-win outcome for all stakeholders.

Keywords: network finance, e-commerce platform, SMEs, game analysis

Safety analysis for expressway based on Bayesian network: a case study in China

Wang Ling, Lu Hua-pu, Zheng Yi, Qian Zhijun

Computer Modelling & New Technologies 2014 18(12C) 438-444

The accident rates and the mortality rates of expressway in china show an obviously opposite trend compared with most countries, and they are significantly higher than other classes of highways. Moreover, the rate of devastating accidents on expressway in china is higher, and road safety on expressway in china is still serious. The aim of this research is to attempt to develop the causation of traffic accidents occurred on expressway and seek the accidents mechanisms. This paper presents a safety analysis for expressway in China, analyzes the accidents occurred on one expressway of Shanxi Province in China, and selects 8 variables from four influence factors including driver characteristics, highway characteristics, vehicle characteristics, and atmospheric characteristics. The authors consider the relationship of these variables and use the Netica Software to develop BN model involved 8 nodes. Then, the sensitivity analysis is processed for each variable. The research draws a conclusion that four variables including cause (the driver‟s illegal behavior), experience, weather and lighting were the main cause of the occurrence of accidents on expressway in China

Keywords: Safety analysis, Expressway, Bayesian network

Coordination and Risk Sharing with Considering Supply Chain External Quality Fault

Yongfei Li

Computer Modelling & New Technologies 2014 18(12C) 445-450

Based on theory of Stackelberg non-cooperative game, this paper studies the coordination and risk-sharing problem in a supply chain under considering external quality fault. The Supply chain is consisted by one supplier and one retailer around a single product within one period. This paper presents the optimal profit, the optimal order quantity, coordination and the risk sharing problem in a supply chain by buyback contract under considering external quality fault. This mainly contributes of the paper are as follows. First, the supplier should avoid external quality fault and allow the retailer return his order quantity with wholesale price in a coordinated supply chain. Second, the optimal expected profit in a supply chain without quality fault is smaller than it when the external quality fault occurs, but the risk sharing in the case is larger. Third, the risk sharing of all parties in the coordinated supply chain are all positively correlated with the quality fault rate, the scrap rate, the wholesale price and the retail price but non-correlated with the buyback contract.

Keywords: Supply Chain Coordination; Risk Sharing; External Quality Fault; Buyback Contract; Stochastic Demand

Apriori algorithm for economic data mining in sports industry

Xiang Yaguang

Computer Modelling & New Technologies 2014 18(12C) 451-455

Current data mining model cannot meet the increasing requirement of economic data mining in sports industry. In view of it, this paper put forward a data mining model based on improved Apriori algorithm, firstly took Hash technology to remove unnecessary candidate item sets to improve the algorithm efficiency, and then translated the transactional databases to the form of matrix to decrease the memory consumption. The simulation experiments show that compared with standard Apriori algorithms, our proposed data mining model based on improved Apriori algorithm greatly shortens the running time, decreases the space consumption, and can be completely applied into the sports industry economic data mining.

Keywords: Sports industry economy, data mining, improved Apriori algorithm, Hash technology, memory consumption optimization

Proportionality of component factors in shipping safety cost based on GA-BP model

Li Hao, Zhang Qingnian

Computer Modelling & New Technologies 2014 18(12C) 456-463

Security is the base of development. Shipping safety is of great significance in promoting rapid and sound development of shipping economy, and the efficient investment of shipping safety cost is the guarantee of the increase of shipping safety economic benefit and shipping security level. Shipping safety cost consists of the guarantee-purpose safety cost and the cost of safety failure. It is found that the guarantee-purpose shipping safety cost composition also influences the cost of shipping safety failure, and the relationship between them is complex nonlinear. The component factors of shipping safety cost are discussed from the perspective of shipping business actual. Genetic algorithm is adopted to optimize neural network, which improves the convergence rate and precision of neural network. The genetic algorithm optimizing neural network model (GA-BP) is established to quantify the proportionality between the guarantee-purpose shipping safety cost composition and the cost of shipping safety failure through network training. This research provides data support for the effective investment decision of shipping safety cost.

Keywords: Guarantee-purpose Safety Cost, Cost of Safety Failure, Input-Output, Genetic Algorithm, Neural Network

Knowledge structure analysis of college physical education teachers based on latent class modelling

Kong Jie

Computer Modelling & New Technologies 2014 18(12C) 464-469

Objective To survey the intellectual structure of PE Teacher at colleges and investigate the distribution of university teachers' intellectual structure by the latent class model .Methods Questionnaire to collect information, to describe the knowledge of the distribution of the knowledge structure of university teachers and to use MPLUS software exploratory latent class analysis Results According to the latent class model, based on the knowledge structure, cognitive differentiation of PE teachers for four latent class groups and the lack of type (0.4169), respectively, for the general basic knowledge of cognition; appropriate knowledge structure and cognitive type (.2544); sports technology-driven(0.1658); knowledge structure, cognitive "smart" (0.1629). Conclusion College of Physical Education should be based on the different types of knowledge structure of targeted training to enhance the overall strength of the PE teachers, the gradual completion of the teaching of modern sports transition from sports to strengthen the theoretical knowledge to the higher capacity "smart type".

Keywords: Intellectual Structure, Latent Class Model, Colleges, PE Teachers

The Real Estate Enterprise Performance Evaluation Model Study. Empirical Research on the Real Estate Enterprise Statistics in China: 2009-2013

Qiu Shubing

Computer Modelling & New Technologies 2014 18(12C) 470-473

Based on our real estate business development, for the shortcomings of traditional performance evaluation methods, combined with hierarchical fuzzy neural network evaluation method, using BP neural network training corporate financial indicators, and fuzzy neural network training non-financial indicators, and then to build a fuzzy neural network evaluation model integratedly, so the value of enterprise performance evaluation results can be calculated. The results show: the model is of high accuracy, which can more accurately reflect the performance of the real estate development business.

Keywords: Fuzzy Neural Network; BP Neural Network; Real Estate Business; Business Performance

Data analysis of basketball game performance based on bivariate poisson regression model

Shen Ke

Computer Modelling & New Technologies 2014 18(12C) 474-479

Conventional methods used to process two-dimensional discrete data will produce large errors and have a narrow scope of application. Along with the development of mathematical theories and computer technologies, some scholars propose to process twodimensional discrete data by bivariate Poisson regression model, which takes correlation among data sets into consideration and has excessive variability so that results of data analysis can be more accurate. This paper firstly introduces bivariate Poisson distribution and bivariate Poisson regression model, and then uses this model to analyze performance data of each team in regular seasons of 2013-2014 CBA (China Basketball Association) and 2012-2013 NBA (National Basketball Association), and predict performance in post seasons. Through comparison between actual results and results of double independent Poisson distribution, this model can better predict game performance

Keywords: Two-dimensional discrete data, Bivariate Poisson distribution, Bivariate Poisson regression model, Basketball

Evaluation model of college basketball teaching based on fuzzy AHP theory

Li Lei

Computer Modelling & New Technologies 2014 18(12C) 480-484

Fuzzy analytic hierarchy process (AHP) uses fuzzy matrix on the theoretical basis of original AHPs, so it overcomes difference in judgment among different people well, accords with people's thinking logics and mental judgment decisions to a larger extent and has a simpler form. Physical education classroom acts as an important approach by which college students do physical

exercise and improve physical quality. This thesis takes college students' basketball teaching for example and establishes an evaluation model about college students' basketball teaching based on fuzzy AHP theory according to classroom learning status. In accordance with features of fuzzy theory and AHP and in combination with quantitative and qualitative methods, it selects evaluation factors of classroom learning, constructs comprehensive and scientific evaluation system and uses this model to implement instance analysis of students' classroom learning. Then, it obtains evaluation results, proposes corresponding promotion countermeasures and verifies effectiveness of the model.

Keywords: Fuzzy theory, AHP, Basketball teaching learning, Evaluation

Microgrid distribution system dynamic reactive power optimization based on improved particle swarm algorithms

Zhu Wenhao, Guo Qiyi, Lei Jianyun

Computer Modelling & New Technologies 2014 18(12C) 485-488

Due to the low accuracy and convergence of existing particle swarm algorithm in the micro power dynamic reactive power optimization in distribution system, this paper proposes an improved particle swarm algorithm based on the state of the particle and inertia weight optimization. This algorithm first adjusts the status of the states of the particles. Then using Sigmoid mapping to optimize the search ability of the inertia weight in particle swarms algorithm. Finally, using the optimal learning strategies to improve the convergence of particle swarm optimization algorithm. Through simulation experiments, the proposed improving particle swarm algorithm based on particle state and inertia weight optimization owing better convergence than traditional particle swarm optimization. Only small error was obtained during dynamic reactive power optimization in micro power distribution system.

Keywords: Particle Swarm Algorithm, Dynamic Reactive Power Optimization, Optimal Learning Strategies

Risk-aversion revenue sharing contract in financial industry chain

Chen Zhu, Li Lin, Tang Song, Zhu Jia

Computer Modelling & New Technologies 2014 18(12C) 489-493

Revenue sharing contract is one of the effective ways in the coordination of entity industrial chain. However, the specificity of financial industry chain leads to more risks and more complicated coordination. Therefore, this paper constructs a risk-aversion revenue sharing contract to analyze the coordination method of financial industry chain, and also makes empirical analysis on it. The result shows that the risk-aversion revenue sharing contract can play a coordinating role in the financial industrial chain, and the more strengths of peculiarity on risk aversion, the larger benefit share of the enterprise should be.

Keywords: Financial Industrial Chain, Revenue Sharing Contract, Risk Aversion

Application of definite integral methods in solving the problem of digitization

Song Gaixia

Computer Modelling & New Technologies 2014 18(12C) 494-497

Definite integral methods are widely used in solving practical problems. The methods of solving practical problems in geometry, physics, economics, and so on are discussed in this paper. Mastering some certain integral calculation methods will certainly help to solve some practical problems in life. From these few simple examples, we can see that to solve the practical problems of definite integral, the most important thing is to digitize the problem, and then writing out the formula by using the mathematical theory, and finally calculating the results by using integral principle.

Keywords: definite integral; differential element method; application

Strategic decision of competing supply chain network with multi-criteria decision making

Zhang Qinghong, Kang Kai, Li Ming

Computer Modelling & New Technologies 2014 18(12C) 498-503

In this paper, we propose a rigorous modeling and analytical framework for the design of decentralized supply chain network with a rival chain present, which involved in the production, storage, and distribution of a substitutable product to markets. The different tiers of firms, consisting of manufacturers, distributors, and retailers are assumed to be multi-criteria decision makers who seek to not only maximize the total profits, but also to minimize the emissions quantities with an appropriate weight. Qualitative properties of the equilibrium solution to the infinite-dimensional variation inequality formulation are provided. In particular, the existence and uniqueness of the results are derived. The algorithm is provided and applied to compute solutions to numerical examples in order to illustrate our approach.

Keywords: Chain-to-Chain Competition, Network Design, Nash Game, Variational Inequality, Multi-criteria Decision Making

Profit distribution model of industry-university-research alliance based on Shapley algorithm

Wang Tao, Jiang You

Computer Modelling & New Technologies 2014 18(12C) 504-508

Traditional Shapley algorithm is unfair in the profit distribution of industry-university-research alliance. In view of this situation, this paper puts forward a profit distribution model based on improved Shapley algorithm optimized by fairness factors. It firstly evaluates the contribution ratio of each member in the alliance with contribution factor, and then evaluates the risk each member bears with risk factor, evaluates the technological innovation ability with technological innovation factor, and finally adjusts the profit distribution with these evaluation results to get the final distribution. Simulation results show that compared with traditional Shapley algorithm, the improved Shapley algorithm is fairer and more stable, and makes the satisfaction degree of each member in accordance, which is conducive to the sustainable development of industry-university-research alliance.

Keywords: Shapley Algorithm, Fairness Factor Optimization, Industry-University-Research Alliance, Profit Distribution Model, Contribution Factor

An M/G/1 retrial queue subject to disasters and N-policy vacation

Chen Peishu, Zhao Guoxi, Zhou Yongwu

Computer Modelling & New Technologies 2014 18(12C) 509-515

An M/G/1 retrial queue subject to disasters and N-policy vacation is investigated in this paper. Both positive and negative customers arrival in Poisson processes independently, and positive customers receive service immediately if the server is idle upon their arrivals. Otherwise, they enter a retrial orbit and repeat their attempt again after a random time period. Once negative customers arrive, they not only remove all the customers in the system but also make the server under repair. The server leaves for an N-policy vacation as soon as the system empties. By using the supplementary variables method, we obtain the steady-state solutions for both performance measures and reliability quantities.

Keywords: Retrial queues, Disasters, N-policy Vacations, Reliability

Microblog-oriented hot topic discovery and trend analysis

Tan Chengfang, Wang Caiyin, Cui Lin

Computer Modelling & New Technologies 2014 18(12C) 516-520

Microblog has become an important means for people to obtain the first message. This paper proposes a method for hot topic detection and topic trend analysis in the massive microblog short text data set. Firstly, considering the microblog special style and clustering efficiency, we make appropriate improvements on the classical single -pass clustering algorithm to enhance the quality of clustering, and then put forward the topic heat evaluation method and rank topics of each topic cluster based on this method. Finally, in each time window, we calculate the strength of topics depending on the topic strength calculation formula, and discovery the topic evolution trend. Experiments show that the proposed method can not only effectively detect hot topics, but also can clearly find out the topic evolution process.

Keywords: Text Clustering, Microblog Text, Topic Discovery, Trend Analysis

Application of rough sets in audience rating prediction

Wu Meimei, Wang Yan, Liu Xingli

Computer Modelling & New Technologies 2014 18(12C) 521-525

The Audience Rating Prediction plays a significant role in the increasingly fierce competition in the television industry. This paper proposes an approach of combining the rough sets with the back propagation neural network, which can be used to predict complicated audience ratings with dynamic and non-linear factors. The attribute reduction based on rough sets can remove redundant information, weaken the impacts of noise data and interdependency data to BP neural network and reduce the complexity of the neural network system. Therefore, this approach can improve the accuracy of prediction and reduce the training time. Through the experiments of audience rating data, this paper compares the approach based on Rough sets and BP neural network with that of BP neural network only. These experiments represent that the Audience rating prediction based on Rough sets and BP neural network achieves better results.

Keywords: Audience Rating Prediction, Rough Sets, BP Neural Network

Weight optimization of transportation routing planning Dijkstra algorithm

Yuan Jun, Zhang Peilin, Ding Liqun

Computer Modelling & New Technologies 2014 18(12C) 526-531

As to standard Dijkstra algorithm for planning transportation routing still exists low computing speed, inaccuracy issues, this paper proposes a Dijkstra algorithm which is based on data constraints and path impacts optimization of factors, firstly, pre-process all directed-node pairs in routing traffic network, and then in Dijkstra way for reverse expanding boundary nodes, which limits its path boundary, then mark the optimal node on path nodes and take "target block" as a unit for storage, so as to speed up algorithm's running speed, at last, in order to improve the accuracy of traditional algorithm's routing planning, add routing impact factors to the traditional algorithm, and weight optimize it. Simulation results show that, compared with the standard Dijkstra algorithm, the Dijkstra algorithm proposed in this paper is based on data constraints and routing impacts optimization of factors, its speed of operation is greatly shortened, routing planning accuracy is greatly increased, and it has an good robustness.

Keywords: Dijkstra Algorithm, Transportation Routing Planning, Data Constraint, Reverse Expand, Routing Effected Factor, Weight Optimization

Contract selection between one supplier and two competing retailers

Sun Rongting, Guo Yiqun

Computer Modelling & New Technologies 2014 18(12C) 532-540

This paper investigates a contract-selection scheme for coordinating a supply chain consisting of one supplier and two competing retailers. The supplier, as a Stackelberg leader, offers a wholesale-price contract and a quantity-discount contract to two competing retailers; the competing retailers have to choose one of the contracts and decide the quantities they would order. On the basis of anticipated responses and actions of the retailers, the supplier designs the contract combination in order to coordinate the supply chain. Adopting the classic Cournot competition model and using game theory, we show that the contract-selection scheme could coordinate the competing supply chain and provide a relative better performance than the single quantity-discount contract. A numerical study is presented to illustrate the findings.

Keywords: Supply Chain, Coordination, Contract Selection, Competing Retailers

Cooperative benefit allocation mechanism of logistics service integrated supply chain on electronic products

Dai Ying, Shi Yun, Song Han, Qin Yanhong

Computer Modelling & New Technologies 2014 18(12C) 541-548

Considering the business partnership between logistics service integrator and functional logistics enterprise, we build a cooperative benefit allocation mechanism of logistics service supply chain about electronic products. Then operational effects and influence factors are analyzed. The result shows that logistics services integrator only need to consider output elasticity coefficients of both sides when setting optimal allocation coefficient. The optimal allocation coefficient is negatively correlated with output elasticity coefficient of logistics service quality invested by logistics integrator, positively correlated with output elasticity coefficient of logistics service quality invested by functional logistics enterprises. Optimum logistics service quality is positively correlated with output coefficient, negatively correlated with cost coefficient. The optimal fixed payment is negatively correlated with output coefficient, positively correlated with cost coefficient.

Keywords: Electronic Products, Logistics Service, Integrated Supply Chain, Benefit Allocation

Marxist theory database query optimization based on improved ID3 algorithm

Jiang Fan

Computer Modelling & New Technologies 2014 18(12C) 549-552

Focused on the problem that the data query of Marxist theory database requires to be optimized, this paper proposes a database query optimization strategy based on improved ID3 algorithm. It firstly changes the measure of property selection in data set so as to decrease the computational expense and generation time, then adjusts the calculation of information gain to the calculation of residual value of information gain and selects the property with minimum residual value as a new standard to replace the original information gain. Simulation experiment shows that improved ID3 algorithm is superior to standard ID3 algorithm in accuracy and time consumption in the establishment of decision-making tree.

Keywords: Marxist Theory Database, Data Query Optimization, Decision-making Establishment Optimization, Stabilization Optimization, Improved ID3 Algorithm

Physical model of virtual human response motion captured in the taekwondo

Quan Guohua

Computer Modelling & New Technologies 2014 18(12C) 553-557

Motion capture technology that sprang up in 1990s is widely used in assisted animation creation. The main work of this paper is to explore new ways for animation creation by capture data. Available technologies includes concurrent route composition based on taekwondo motion graph optimization, computer virtual puppet animation created by exploration of capturing motion, concurrent interactive control based on motion graph optimization and response motions of virtual characters. This article not only establishes a physical model of virtual human response motion captured in the taekwondo, but also establishes the motion frame changes for taekwondo characteristics.

Keywords: Taekwondo, Motion Capture, Motion Graph Optimization

Evaluating electric vehicles demand influence based on fuzzy extended AHP

Junchao Yang, Liping Wang

Computer Modelling & New Technologies 2014 18(12C) 558-561

Vehicle emission is a hot issue for a big city health environment developing, and electric vehicle is a shortcut way to reduce the vehicle emissions. How to enhance electric vehicle's demand in vehicle's market is a multi-criterion decision problem. The aim of

this paper is to identify and discuss some of the important critical indicators for the decision problem. A totally fourteen indicators are selected for the electric vehicle's demand influence evaluation system from the aspects of vehicles' performance, service and personal preference three aspects. Fuzzy extended analytic hierarchy process (FEAHP) is proposed solving the problem because it has the advantages of simple, less time taking and capture the vagueness of human thinking. Finally, a case study and the results show the proposed model is feasibility and effective for the evaluation.

Keywords: Electric Vehicle, Demand Influence, Fuzzy Extend AHP

Optimizing of ready-mixed concrete vehicle scheduling problem by hybrid heuristic algorithm

Zhang Guochen, Zeng Jianchao

Computer Modelling & New Technologies 2014 18(12C) 562-569

RMC (Ready-mixed concrete) vehicle scheduling problem is a complex combinatorial optimization problem with intersection of several research areas, such as logistics, just-in-time production and supply chains etc. We integrates RMC production scheduling and vehicle dispatch problems in the same framework by network flow techniques and establishes a mixed integer programming model for ready-mixed concrete vehicle scheduling problem. Then, we put forward a hybrid heuristic algorithm to optimize the RMC vehicle scheduling problem based on the characteristics of ready-mixed concrete vehicle fleet operations. The main idea of proposed hybrid heuristic algorithm is decomposing complex RMC vehicle scheduling problem into simple problems. Finally, the algorithm is used to solve specific simulation examples and to verify the effectiveness of the proposed hybrid heuristic algorithm.

Keywords: RMC Vehicle Scheduling, Hybrid Heuristic Algorithm, Network Flow Technique, Mixed Integer Programming Model

Textual opinion summarization based on Cluster_HITS model

Li Yancui, Feng Hongyu, Feng Wenhe

Computer Modelling & New Technologies 2014 18(12C) 570-576

Textual Opinion summarization aims to concentrate and refine the text data so as to generate a summary of the text regarding the expressed opinion. We collect and annotate an English multi-document corpus on product reviews, which provides a basic resource for the research on textual opinion summarization. Specifically, we incorporate the opinion and helpful information into the Cluster_HITS model to consider the impacts of them. Experimental results show that the proposed method apparently outperforms baseline in terms of ROUGE measurement.

Keywords: Opinion Summarization, Cluster_HITS Model, Opinion Information, Helpful Information

Operational risk quantification for loss frequency using fuzzy simulation

Liu Shuxia, Mi Haijie

Computer Modelling & New Technologies 2014 18(12C) 577-581

The estimation of the frequency parameter of operational risk quantification has received increased attention under the new Basel proposal. This paper proposes an advanced measurement approach using fuzzy point estimation. In this approach, prior membership function could be obtained through fuzzy maximum entropy rule. When operational risk loss data is given, posterior membership function can be easily calculated by using fuzzy point theorem. After posterior mean is exploited as fuzzy point estimate, loss frequency distribution is gotten. Finally, an empirical analysis on this model is conducted based historical data obtained from a Chinese commercial bank. The result shows that economical can reduce the complexity and communication cost.

Keywords: Operational Risk, Basel II Advanced Measurement Approach, Fuzzy Point Estimation, Loss Distributional Approach, Fuzzy Variable

An optimal combined forecasting method to prediction of ownership for private cars

Yang Junchao

Computer Modelling & New Technologies 2014 18(12C) 582-584

With the high speed economic development of China, the number of private cars is also increasing rapidly. However, car emission has an important influence for air pollution; it needs to consider controlling private cars demand when the government makes automotive industry's strategy. It should forecast the future private car accuracy. In this article, a combined forecasting model with simulate anneal algorithm optimizing weights of private car is carried out. The proposed model can improve the performance of each single forecasting model such as regression, Grey and SVM. Finally, a case study with Chinese private cars number is presented, and the results are shown that the proposed model is superior to each single model.

Keywords: Ownership Demand Prediction, Combined Forecasting, Simulation Anneal Algorithm

Gini coefficient estimation using parabolic mode

Niu Xiaoqi, Chang Baoping

Computer Modelling & New Technologies 2014 18(12C) 585-588

The goal of this paper is to establish a parabolic model for Gini Coefficient estimation. With the help of computer simulation and programming, this paper develops a new method of Gini Coefficient estimation and provides statistic support for the administrative and the decision-making departments of the government to scientifically measure the income gaps and to adjust the distribution policy and macroeconomic policy.

Keywords: Gini Coefficient, *Lorenz Curve*, *Parabola Model*, *Coefficient Estimation*

Construction and Implementation of Foreign Language Teaching based on Virtual Reality Technology

Ren Xia

Computer Modelling & New Technologies 2014 18(12C) 589-592

The development and progress of technology brings good developing opportunity for foreign language teaching. This paper applied computer virtual technology into foreign language teaching, constructed the teaching model based on virtual reality technology, and deeply analyzed its main functions combined with the characteristics of foreign language, which will produce certain influence on foreign language teaching and achieve good teaching effects.

Keywords: virtual reality technology; foreign language teaching; environmental construction; implementation

Qualitative of Real Estate Enterprise Financial Shared Services Center Based on Knowledge Management Model

Yongxia Chen

Computer Modelling & New Technologies 2014 18(12C) 593-596

Through the analysis of connotation of the knowledge management model, this paper briefly summarized the framework of knowledge management model and pointed out the present situation of the current real estate organization management in our country and existed risks of financial shared services center construction. In addition, it put forward the establishing of real estate enterprise financial shared services center based on knowledge management model starting from the actual situation combined with financial shared services center concept, stated from its multi-aspects of construction ideas, construction contents and key points for construction and analyzed the running condition, in order to play a reference role in the construction of real estate enterprise financial shared services center.

Keywords: knowledge management model, *real estate enterprise*, *financial shared services center*, *construction*

Green Supply Chain Level Measure and Analysis Model Based on Fuzzy Information Amount

Ma Chang'an

Computer Modelling & New Technologies 2014 18(12C) 597-599

The management of green supply chain is a method which is aimed at considering environment influence and optimal use of resources synthetically. In this article, we started from the concept and content of green supply chain, schemed out a set of performance evaluation system which is based on fuzzy theory, set up a relevant evaluation model and verified it with example correspondingly.

Keywords: Green supply chain; Performance evaluation; Evaluation index system; Fuzzy method Introduction

Comparative Analysis of Experiment on Lower Limbs Flexibility of the Artistic Gymnastics Students Based on the PNF Stretching Training Method

Wu Guangliang, Wang Fuqiu

Computer Modelling & New Technologies 2014 18(12C) 600-603

Through the analysis of the concept of PNF stretching training method, this paper summarized its basic principles and common methods, used the method of PNF stretching training under the condition of different resistance time to test the subjects, and tested the forward-backward and transverse and longitudinal split. Combined with the actual results, corresponding suggestion for the artistic gymnastics students of lower limbs flexibility training was proposed to promote the flexibility training of students.

Keywords: PNF stretching training method; Flexibility quality; Transverse and longitudinal split.

The Mathematical Model Analysis by Direct Negotiation of the Price in Small Procurements for Pharmaceutical Factory Construction Projects

Wei Zeng

Computer Modelling & New Technologies 2014 18(12C) 604-608

This paper is to study the mechanism by direct negotiation of the price in small procurements for the pharmaceutical factory construction projects. Provided that two parts estimate the construction price as the sum of cost and profit, the paper forms target price for owners and contractors after adjustment of the profit and price by each other according to the owner and contractor's principal and subordinate, friendly and information asymmetry situation, then imitates the contract price according to the owner and contractor's principal and subordinate situation

Keywords: owner; contractor; direct negotiation; mathematical model

The Coupling Mechanism Industry System of Ecological Agriculture and Ecological Tourism Based on The Constraints of Resources and Environment

Luo Yi

Computer Modelling & New Technologies 2014 18(12C) 609-618

Coupling development of ecological agriculture and ecological tourism based on the constraints of resources and environment is the upgrade and transformation for the traditional development pattern of agriculture and tourism in our country. Ecological agriculture improves agricultural productivity level, original ecological level of agricultural product and the income level of farmers. Ecological tourism advocates to abandon consuming resources disorderly and immoderately in traditional tourism, and to proceed tourism development under the constraints of tourism carrying capacity, thus to improve the high taste, environment protection and economical benefits. Establishing an industry system based on coupling development of ecological tourism and ecological agriculture, this paper realized the maximum of social benefit of industry system with this industry system, and the optimization of dynamic industry resources allocation under the constraints of resources and environmental carrying capacity. It also described the influence of different types of resources (eg. renewable and non-renewable resources, original resources and secondary resources), pollution (eg. different rate of decay and different environmental capacity) as well as parameters change such as technology progress, size change, structure change on industry growth pathway on the economical growth of coupling industry system. This study provides suggestions and helps for government to formulate development planning and macro policy of coupling industry system.

Keywords: Constraints of resources and environment, *Ecological agriculture*, *Ecological tourism*, *Coupling industry system*, *Benefit maximum*

Analysis on the Efficiency of Engineering Based on Engineering Structure

Jiaqi Yang

Computer Modelling & New Technologies 2014 18(12C) 619-623

Structural simulation analysis has become an effective and general research means in engineering field. Through the finite element modeling and calculation, we can obtain the engineering performance, stress mechanism, collapse state, etc so as to guide practical engineering application. This paper attempted to respectively elaborate the characteristics of conceptual model, mathematical model, calculation model and construction idea and method by putting forward a kind of integrate system. Whether they had reached to the effectiveness index was examined through comparing the results of effectiveness experiment and simulation analysis. The accuracy of this simulation analysis was obtained through defining the effective index and comparing the results between effectiveness experiment and simulation analysis. It has provided reliable system evaluation for whether the simulation analysis results of effectiveness experiment can be applied or not.

Keywords: effectiveness, *verifiability*, *engineering structure*

Optimization of Automization Control Project Progress Based on MS Project

Hou Yunhai, Wang Lei

Computer Modelling & New Technologies 2014 18(12C) 624-628

This paper first states theory of project control and theory and method of project progress management, introduced the project management software MS Project; then it introduced the scientific research project management system of institute A, platform C project as well as platform automization control project in detail. Moreover, it used MS Project to make integral WBS decomposition on automization control project of platform C in institute A, found out critical path of automization control project and proposed and concluded various typical problems; after that, the proposed optimization idea and method were applied to make progress optimization on automization control project, and abstract work and WBS decomposition of detailed project were given out after optimization; at last, automization control project of platform C was compared before and after optimization in aspects of project schedule, network planning of project, project personnel and the new added parts after optimization. Finally, it was concluded that, the significantly reduced time limit of automization control project of platform C after optimization was feasible. Afterwards, it analyzed two aspects that affect scientific research progress, that is, plan of scientific research project and personnel management problems of scientific research project and some opinions and suggestions were given out.

Keywords: Project management; MS Project software; WBS; tabular management.

Real-Time Dynamic Data Fusion Technology Based on Traffic Information Control Model

Yan Xiangong

Computer Modelling & New Technologies 2014 18(12C) 629-633

The safety monitoring capacity of our shipping enterprises on inland craft Have weak place because of geographically separation of ship and shore, and it is lack of effective monitoring to the state of shipping and goods carrying. The advanced computer information technology, communication technology and network technology should be used to combine the safety monitoring

management of ship and shore organically. The interactive data at any time and collaborative management of ship and shore can ensure the safety and efficiency of inland water transport. This paper analyzed the multi-level sensor data fusion technology based on the summary of existing data fusion technology, and the data fusion model of navigation environment was put forward. This paper put forward the data fusion model of multiple data sources and its main algorithm based on multi-data fusion of traffic information control model and information collection of research field of Yangtze River shipping.

Keywords: Navigation Environment; Integration of Ship and Shore; Multi-data Fusion.

Promotion of Electronic Product Performance by Optimizing PCB

Wang Linna, Hu Yi, Zhang Jinglu

Computer Modelling & New Technologies 2014 18(12C) 634-640

Aiming at the problem of electromagnetic interference exceeding in switching power supply compatibility experiment of electronic system, and combined with the design example of LLC half bridge resonance switch power supply, this paper put forward the optimum design method of PCB electromagnetic compatibility. By taking switching power supply as research object, it firstly analyzed the effect of electromagnetic interference on PCB electromagnetic compatibility. Based on method of field circuit combination, PCB simulation model was established so as to analyze the PCB electromagnetic compatibility of switching power supply. Next, according to the figure of PCB surface current and the near field distribution of electromagnetic field, and based on optimization design process of PCB electromagnetic compatibility, valid rectification measures was taken so as to improve PCB design and enhance PCB electromagnetic compatibility. At last, the simulation results showed that electromagnetic field intensity has widely reduced, which verified the reasonability of the improvement of PCB in design phase.

Keywords: LLC; Field analysis; PCB design; Electromagnetic compatibility; Simulation analysis.

Design and Realization of Hotel Management System

You Fuxiang

Computer Modelling & New Technologies 2014 18(12C) 641-644

Under the environment of informatization, key of current development of hotel industry is to effectively design and realize hotel management information system and make clients fulfill online hotel reservation more conveniently. This study provides support for the design and realization of hotel management information system through computer technology, database technology and software architecture technology. It also determines system work flow chart, system business process and data analysis of system by analyzing demand of hotel management information system and attaches importance to hotel service, which provides basis for establishing hotel management system.

Keywords: Hotel management information system; Individual service; Design.

Multi-Objective Optimization Algorithm Based on Game Theory and Its Application in Scheduling of Real-Time Tasks

Chen Lin, Wang Xianjia

Computer Modelling & New Technologies 2014 18(12C) 645-649

Biological through survival of the fittest competition, to optimize today's nature. Optimization is an effective way to draw inspiration from the natural evolution of human beings to solve its difficulties; it provides a general framework for solving complex optimization problems. And compared with the game theory demands completely rational assumption, game is on the premise of limited rational optimization algorithm, the game parties by repeating the game in the process of learning, imitation, competition, finding a good strategy, improve their own interests, finally the structure is achieve a dynamic balance on the basis of the optimization algorithm of game theory, this paper studied the production scheduling problem based on evolutionary game. First outlined the game related theory, optimization algorithm and multi-objective optimization algorithm for a class of real-time task scheduling problem, the corresponding evolutionary game model is established, using heuristic genetic algorithm to obtain the corresponding equilibrium solution, using multi-objective optimization algorithm is demonstrated by the simulation results of game theory to solve production scheduling problem is a good idea and has a broad development prospects.

Keywords: Game theory; Multi-objective optimization algorithms; Task scheduling; Game model.

Development and Research on Remote Online Education Information System Based on Web

Liu Min, Cao Jing, Xue Yanru, Yao Yinghua, Zhao Xuezuo

Computer Modelling & New Technologies 2014 18(12C) 650-656

Remote education is a way of developing education teaching activities which transmits outstanding teaching resources to massive students scattered in different time and space by the Internet, satellite and other methods of communication technologies. The Internet is the most convenient way to participate in distance learning. This paper applies B/S three layer architecture and ADO data access technology to complete the design of the remote online education information system based on Web. The system according to the actual business needs of remote education, carry on the design based on the role of application and division of the task, and it composed of modules of courseware on demand, online management, online

examination, online exercise, teacher management, student management, etc.

Keywords: remote online education; information system; Internet

The Acceleration of the Excellent Document Resources of Medical Colleges and Universities' Libraries Bring to Key Subject Construction

Zheng Chengbi, Sun Siqin, Sun Jingyi, Li Qiming, Wang Yu, Sun Baoliang

Computer Modelling & New Technologies 2014 18(12C) 657-660

The document resources of medical colleges and universities' libraries has great function to the key subject construction and meanwhile is a main route for teachers and students to cognize the medical development at present. This paper discusses the connotation, level and mutual transformation of key subject of medical colleges, including the construction standard of excellent document resource of medical college libraries and the functions to key subject construction. It points out that document resource construction is a manifestation of strength of colleges and universities. Not to be marginalization in the key subject construction, the college must optimize the distribution of document resource and set up management council of key subject document resource. Through research of each research direction of key subject, collecting excellent document resource and reporting back to libraries of colleges and universities, colleges and universities make the document resource adequately functioned.

Keywords: library of medical college and university; excellent document; key subject construction

Professional Talent Competition in Colleges and Universities under the Perspective of "Game Theory"

Qin Runying

Computer Modelling & New Technologies 2014 18(12C) 661-664

Talent competition of colleges and universities is becoming fiercer under the background of continuous development in economy, science and technology. Notably, the competition between the similar professional talents is indeed common occurrence. For the above hot topic, this article quoted the concept of the game theory to discuss its main concepts and types, analyzed the view of employment between similar professional talents of colleges and universities and the cultivation ways of the core competitiveness through the exploration perspective of game theory, in order to create an employment environment conducive to the college talents competition.

Keywords: game theory; job selection; competitiveness

The Function of New Enterprise Management Mode and Method in the Reform of Enterprise Teaching Management in Colleges and Universities Based on ERP

Zhang Jingliang

Computer Modelling & New Technologies 2014 18(12C) 665-668

Teaching purpose of enterprise management course in colleges and universities is that students can master the basic knowledge of enterprise management, and apply the enterprise management theory skillfully to solve the problems in the enterprise management practice correctly and reasonably. With the deepening of the reform and opening along with the unprecedented fast development of national economy in our country, the management environment of enterprise is changed significantly and profoundly. At present, many enterprises doubt about management ability and business level of students in the teaching status of enterprise management in colleges and universities. For this purpose, enterprise management teaching in colleges and universities should explore restriction factors on their developments by setting out from themselves, carrying out teaching system reform by taking the market as the guidance, building reasonable and effective teaching process, adopting reasonable teaching means and methods under the guidance of advanced teaching idea. ERP (enterprise resource planning) plays an important role in the reform of enterprise management in colleges and universities as a kind of new enterprise management mode and method with the combination of production and learning in the background of knowledge economy. As a result, the detailed analysis is conducted.

Keywords: Enterprise Resource Planning; enterprise management; teaching; innovation

Path Analysis Model of Influence Factors in Japanese Keigo Learning

Liu Fen

Computer Modelling & New Technologies 2014 18(12C) 669-672

Keigo is a difficult point which perplexes Chinese students in their Japanese learning. This paper aims to analyze the factors which affect Keigo learning through path analysis. We tested the Japanese and Keigo proficiency of 120 Japanese learners and established a path analysis model. After analyzing the causal relationship between the variables, we found there was no causal relationship between the length of Japanese study and the Keigo proficiency; exalted expressions proficiency is directly affected by Jyosi and Hikatsuyogo; there is no direct relation between Katsuyougo and Hikatsuyogo, they have causal relation with Jyosi and they affect Keigo acquisition through Jyosi. The results above suggest, grammar factors such as Jyosi etc directly affect Keigo acquisition.

Keywords: Keigo; path analysis; exalted expressions; humble expressions

Evaluation of Sustainable Development Coordinated Ability in Jing-Jin-Ji Region Based on Fuzzy Information

Dou Lichen, Zhao Cui, Cheng Guirong

Computer Modelling & New Technologies 2014 18(12C) 673-677

The coordinated ability of regional development is one of the significant representations of regional sustainable development. This paper adopted the statistical data and materials of each relevant department of social economy, and established the evaluation index and each level evaluation criteria of regional sustainable development. In addition, this paper also analyzed the sustainable development coordinated ability in Jing-Jin-Ji region between 2000 and 2010 by using the harmonious development evaluation model of IDC state sort in fuzzy information method. The results indicated that Beijing and Tianjin belonged to uncoordinated development between 2000 and 2004, and they gradually stepped into weak coordinated development between 2006 and 2010. However, during the research phase, Hebei province belonged to uncoordinated development all the time; compared with the coordinated ability index of Jing, Jin and Ji in 2000, those in 2010 were respectively increased by 27.86%, 8.87% and 18.51%, and the improvement of coordinated development in each province was not apparent and consistent; this paper proposed specific suggestions on the domain development of Jing-Jin-Ji region, but it is still necessary to strengthen the regional cooperation and the definition of each function is especially important. The research results provided scientific basis and guidance for the formulation and implementation of whole planning in Jing-Jin-Ji region, and also established foundation for the sustainable development of Bohai economic rim.

Keywords: Fuzzy information method; Sustainable development; Coordinated ability; Evaluation model; Jing-Jin-Ji.

Practice on Green Design of Building Energy Efficiency Based on BIM

Hua Zhu

Computer Modelling & New Technologies 2014 18(12C) 678-681

According to China current situation of building energy efficiency design and from the perspective of building design, this paper conducted digitized expression on the facility entities and functional characteristics of engineering project. It also analyzed and shared the building energy consumption with building energy conservation and environmental protection as research orientation as well as with the technical model of BIM as guidance that is based on three-dimensional digital technology. Therefore, it can provide effective theory, process, method and technological means in building design phase, so as to realize the target of building energy saving.

Keywords: BIM, building energy saving, green design

Exploitation of Network Information Technology to the Development of English EducationFu Hongzhang

Fu Hongzhang

Computer Modelling & New Technologies 2014 18(12C) 682-685

Network information technology has become the necessity of the reform of modern education. The English education in China has converted from tool subject to cultural subject which is still not mature. This paper firstly summarized the development status of English education and the advantages of network information technology. Then it discussed influence of the advantages and disadvantages of network technique on the comprehensive and modernized development of English education. Finally, in terms of network information technology, it put forward the viewpoint and advises on the development of English education. In order to better realize the resource sharing of the good teaching of English course and improve the English accomplishment of teacher and students, it has established a new teaching thought and teaching platform.

Keywords: network information technology, English education, Application platform

Tourism Development Structure Feature Analysis Based on Ecological Footprint Mode

Zhao Jianqiang, Weng Gangmin

Computer Modelling & New Technologies 2014 18(12C) 686-688

With the expansion of human tourism activity scale, the development of tourism brings considerable economic benefits for local as well as a series negative effect for local environment, society and culture. The key point and difficult point of tourism research is how to reasonably construct structural system in tourism development and lead it to a sustainable way. Based on absorbing theories and methods at home and abroad, this paper uses the newest international method for measuring sustainable development-ecological footprint model for reference, and studied assessment of sustainable development of regional tourism in the perspective of theory, method and practice.

Keywords: Tourism sustainable development; Ecological footprint analysis; Ecological footprint calculation.

The Application of SECI Model Theory in Ideological Teaching

Wang Yan

Computer Modelling & New Technologies 2014 18(12C) 689-691

Time teaching of ideological course is getting more and more attention nowadays. But there are a lot of problems showed up because of the immaturity of time teaching. This paper started from the core of SECI model theory- the perspective of tacit knowledge theory, introduced the tacit knowledge and implicit knowledge, discussed the function of tacit knowledge in ideological practice teaching, and then obtained the inspiration of ideological practice teaching application.

Keywords: SECI model; Tacit knowledge; Ideological course; Practice teaching.

Research on Assessment Index System and Comprehensive Evaluation Model of Informatization Level of Chinese Top Three Hospitals

Li Xingjiang, Zhao Xiaodong, Bai Jie

Computer Modelling & New Technologies 2014 18(12C) 692-696

This paper revealed the problems of Chinese top three hospitals' informatization thus provided basis for the government to enact relevant policy measure and for the hospital to adjust their informatization construction and planning. We formulated the comprehensive assessment model of informatization level for Chinese top three hospitals, which constituted by 6 dimensionalities and 57 indexes, through document research, comprehensive scoring method and expert consultation method. We checked and evaluated the reliability and validity of the model with sampling survey. The result showed that the model has good reliability and validity, and was appropriate for the comprehensive assessment of Chinese top three hospitals' informatization level.

Keywords: informatization level, top three hospitals, comprehensive assessment model

The Application of DEA Method in University Employment Service System

Hu Cuiping

Computer Modelling & New Technologies 2014 18(12C) 697-700

This paper established C 2R model and the corresponding projection model and evaluation index system using data envelopment analysis (DEA) method. In recent years, the application of DEA method in management of university employment service system has increasing, which produces various effects since efficiency evaluation of data envelopment analysis (DEA) for multiple input multiple output system has unique advantages. Analysis showed that, college students' public employment service system had efficiency loss in dealing with the problem of college students' employment after 2009, in which indicators of the number of teachers in colleges and universities, the number of public employment service agencies and financial subsidies for college graduates entrepreneurship had bigger influence on the effectiveness of college public employment service system, at the same time there is room for improvement.

Keywords: DEA method, projection model, employment service system, financial subsidies

Strategy of the Conventional Metaphors in English Study and Construction of Analytical Model

Wang Jing, Jiang Lang, Wang Hui

Computer Modelling & New Technologies 2014 18(12C) 701-704

In cognitive research of metaphor, comprehending processing of metaphor is always a significant research topic. Research on metaphor comprehending of foreign language learner can not only help us to clearer know the comprehending mechanism of language, but also is beneficial for us to reveal the cognition activities and cultural interaction of learners in second language acquisition process, promote students' foreign language thought and culture their metaphor competence and concept fluency, thus to improve efficiency of foreign language teaching. This paper discussed the metaphor comprehending strategy and model of Chinese English learners in the form of questionnaire test and in the perspective of thinking process and output of learners. This study found that, English learners in China mainly applied sentence context and literal translation method to understand metaphor; second is to use English background knowledge and mother language background knowledge; in addition, learners also use guess, mental imagery and sentence analysis to understand metaphor. Therefore, English learners in China have specificity in metaphor comprehending process, and use analytical model to deduce the significance of English conventional metaphor.

Keywords: metaphor; foreign language learner; comprehending strategy; analytical model

Influence on Variation in Technology Management Quality Based on the Model of Engineering Cost Index

Wei Jing

Computer Modelling & New Technologies 2014 18(12C) 705-709

Development and changes in economic environment encourage the construction enterprises to make and improve their own core competency, as well as transform from the traditional extensive management mode to a meticulous, intensive and low-carbon one. The improvement of professional competence is a necessary requirement for a new development mode of construction enterprises. So as to improve this competence, we should make evaluation of the present management levels of all construction professional technologies at first and then find some weakness within, and further take some measures for

improvement. This paper, from the perspective of cost index theory, built an enterprise engineering cost index model reflecting the variation of management levels in construction enterprises. Based on this model, we can calculate the link relative engineering cost index for enterprises every year, and according to the index, we are able to judge the trend and range of variation so as to improve their management quality.

Keywords: engineering cost; construction enterprises; technology management quality; generation model.

Online school frequency and time service of high precision clock based on the generalized regression model of GPS

Zheng Jiazhu, Gao Yehemin

Computer Modelling & New Technologies 2014 18(12C) 710-714

In order to improve accuracy and stability of GPS wide area time service, this paper established generalized regression model of clock based on the different characteristics of GPS clock and crystal clock, and estimated crystal frequency by generalized least squares (GLS) method. Algorithm corrected the error caused by measurement value frequency drifting in the existing regression model, thereby realizing accurate estimation when crystal frequency drifting is large or interval of measurement value is long. Based on that, time service of pulse per second that is synchronous with coordinated universal time (UTC) was generated. Through phrase compensation algorithm, the phrase difference between the generated pulse per second and pulse per second GPS was corrected to realize accurate time service, thereby providing accurate time scale for wide area measurement and fault location and meeting the online wide area time service requirements of power system monitoring system.

Keywords: GPS, generalized regression model, high precision; least square method

Evaluation on Ecological Service of Urban Green Space System and Estimation on System Carrying Capacity

Ji Fengquan, Lu Jing

Computer Modelling & New Technologies 2014 18(12C) 715-718

Urban green space system is an important component of urban natural ecosystem, which has significant function of ecological service. This paper evaluated the green system according to the comprehensive index of ecological service efficiency. Based on analysis of landscape accessibility and combined with the street population density, it estimated the service population of green system and the carrying capacity, which provided effective and technical quantization means for urban sustainable development.

Keywords: urban green space system, ecological service function, landscape accessibility, carrying capacity

Exploration on the Construction and Management of Laboratory for Hotel Management Major

Liu Yanfang

Computer Modelling & New Technologies 2014 18(12C) 719-722

Higher education aims to develop the practical abilities for students, while the practical teaching is an important way to help enhance their abilities. Teaching practice is directly related to whether school can meet the needs of society, develop it own characteristics and reach a high level. This paper based on analyzing and exploring the present problems in the lab construction and management for hotel management major, raised some measures for improvement accordingly.

Keywords: higher education; hotel management; lab management

Research on Affection-based Implicit Interaction in Entertainment

Wei Wang, Xiaodan Huang

Computer Modelling & New Technologies 2014 18(12C) 723-729

Achieving implicit interaction in entertainment is a topic worth investigating. For a game or entertainment product to become more interesting, computers must interact and collaborate with human beings actively and adaptively. This paper proposes and applies a method to increase the entertainment value of a computer game. First, the main part of this method, namely, the emotional Hidden Markov Model (eHMM), is investigated. Second, the details on the construction of the emotional state transferring probability and observed matrices are provided. Third, the application of this model in a chess game, particularly with consideration of the current behaviors of the user, is described. Finally, some experiments are performed, during which the gaming process is recorded and analyzed. By adjusting the entertainment process, we find that the proposed model can cause computers to be more active and adaptive to their users, hence demonstrating the favorable application of such model.

Keywords: implicit interaction, affective computing, modeling, entertainment, chess gaming

Evaluation of Sports E-commerce Service Quality Based on SERVQUAL Model

Kuixiu Dai

Computer Modelling & New Technologies 2014 18(12C) 730-735

E-commerce development has progressed increasingly in recent years. A service quality evaluation index system should be established under the background of modern information technology to better understand e-commerce services and effectively supervise and manage e-commerce. Sports online shopping (e-commerce) is regarded as an example in this study to analyze the relevant factors that influence e-commerce service quality through the SERVQUAL model according to the current situation of ecommerce service quality. A comprehensive and scientific evaluation system is constructed through fuzzy theory and analytic hierarchy process. An instance analysis of e-commerce service is also conducted with the aforementioned model. Evaluation results are obtained, and corresponding improvement strategies are proposed.

Keywords: SERVQUAL model, FAHP, Factor analysis, Sports e-commerce, Service quality evaluation

A Task Distribution Based Q-Learning Algorithm for Multi- Agent Team Coordination

Sun Qiao, Zhibo Chen, Chen Feixiang, Xu Fu, Shi Yanan

Computer Modelling & New Technologies 2014 18(12C) 736-740

It is difficult to apply traditional Q-learning algorithm to Multi-Agent environment, because in this case, the size of state-action space is so huge that it is hard to obtain the global optimal solution. In the paper, a task distribution based Q-learning algorithm is proposed to solve this problem. In this algorithm, at each learning step, it first distributes sub-task to each Agent dynamically. The Learning processes include the learning of task-distribution strategy and the learning of action-selection strategy synchronously, and every Agent shares the Q value table. Both Theoretical analysis and experimental results demonstrate that the proposed algorithm outperforms conventional Q-learning algorithm.

Keywords: Machine learning, Q-learning, Multi-Agent System, State-action space

Application Research on the informationization Architecture of Diversified State-owned Enterprise Groups Based on TOGAF

Hongjun Chen, Bo Liu

Computer Modelling & New Technologies 2014 18(12C) 741-747

Enterprise architecture theory provides an effective way to avoid problems related to information construction in diversified stateowned enterprise groups. According to the characteristics of diversified state-owned enterprise groups in China at the present, this paper puts forward a general application framework which is suitable for informationization of diversified state-owned enterprise groups in China based on the enterprise architecture model---TOGAF, and has discussed the establishing steps and key points of implementation for the enterprise architecture of diversified state-owned enterprises group from the following three aspects: clarity of objectives, architecture design and architecture implementation.

Keywords: Enterprise informationization; enterprise architecture; Diversified enterprises group; informationization planning;

Consumer Ethnocentrism and Its Effects on Attitude and Behaviour of Chinese Consumers

Du Yu

Computer Modelling & New Technologies 2014 18(12C) 748-753

Recently, China has attracted foreign investment at growing speed, and made many foreign corporations penetrate to domestic market. Even though the competition between domestic and foreign corporations becomes more and more intense, Chinese consumers are reluctant to buy foreign products rather than domestic products. Consumer ethnocentrism (CE) is one of the reasons that people choose domestic products than foreign products. It is necessary to investigate the causes of CE and its effects on attitude and behavior among Chinese consumers. In this study, conservatism has a positive effect on CE of young consumers even though they tend to be liberalized gradually, and collectivism shows relatively strong influence on their CE. In addition, CE has strong effect on purchase intention to mobile phone and household appliances, but not to automobile. This empirical result means that CE has a different effect on purchase intention depending on product categories. This means that people cannot predict the positive effect of CE on purchase intention to all products.

Keywords: Consumer Ethnocentrism; Conservatism; Collectivism; Attitude; Subjective Norm; Purchase Intention

Developing Model of Public Physical Education Teaching Based on Mathematical Theory in the Perspective of College Students

Guo Hongtao, Wang Qingtao, Wang Zijie

Computer Modelling & New Technologies 2014 18(12C) 754-759

As an important part of college education, physical education (PE) teaching aims to enhance students' health and physique. This is key factor accelerating students' growths. PE combines with other subjects of education to cultivate varied talents required by sociology. In this research, the development of Sanda (free combat) teaching in the contemporary society was investigated based on Sanda teaching of modern college students. Firstly, this research conducted the statistics on the cognition degree of Sanda culture for college teachers and students to obtain satisfied results. So that the popularizing degree of Sanda culture in college teaching are recognized; afterwards, using correlation analysis and adaptive filter algorithm, the Sanda subject preferred by college students was analyzed. The results show that college students are likely to prefer Sanda subject which is characterized

by low technical content and field limits due to the influence of technical content. The result indicates high stratifying degree and shows that the college teachers and students' cognition to Sanda culture requires to be enhanced. In addition, the emphasis degree of Sanda teaching should be strengthened. This research provides development research of public PE teaching with a theoretical support.

Keywords: College students; public PE teaching; Sanda

Exercise Load Research on Common Ball Skill Practice Way of Volleyball Specialized Course in Colleges and Universities

Wang Qingtao, Guo Hongtao

Computer Modelling & New Technologies 2014 18(12C) 760-767

Teaching of physical education discipline not only requires students to master exercise skills, but also requires students to master teaching techniques of exercise skills. Reasonably arranging exercise load when exercising has significant influences on mastering exercise skills. However, researches on exercise load of common ball skill practice way of volleyball specialized course are still unclear at home and abroad currently. This paper discusses exercise load of common ball skill practice way of volleyball, with the purpose to provide reference basis for teaching design of volleyball specialized course of physical education discipline. This paper mainly adopts the experimental method with students of the volleyball specialized course of 2012 physical education discipline as experimental subject to analyze exercise load of common ball practice way of volleyball. In the experiment, those experiment subjects wear Actigraph instrument to record energy consumption data. Via statistic analysis model on experiment data, it obtains research conclusion as follows: for students of different genders, the same practice way has different exercise loads; practice load of jumping is larger than non-jumping items; similarly, for students of different genders, the same practice means has different practice loads; difference in load may also be caused by psychological factors and skill factors, etc

Keywords: Volleyball Specialized Course; Ball Skills; Exercise Load Model; Colleges Physical Education

Experimental Research on the Properties of Sludge Thickening in Laboratory

Yang Guoli, Sun Yong, Ma Lishan, Liu Yueming,

Computer Modelling & New Technologies 2014 18(12C) 768-770

Experimental research was performed to the properties of sludge thickening by increasing the pressure and shortening the path of water flowing in laboratory. And the relations between the diameters of sand columns and pressure on sludge water thickening were obtained. The results show that shortening the drainage path can enhance the compression effect, and the increasing of pressure can force water pass through filter layer quickly. The dosage of flocculants can be generally controlled; hereby can afford flocculants the variety and quantity in the process. The research results will be the guidance to the sewage treatment plants for tomorrow and to improve the current municipal wastewater treatment plants.

Keywords: Pressure; Sludge thickening; Flocculants

Functional Relationship Model-based Research on Participation of Non-government Organization in Social Management Innovation

Chuanli Huang

Computer Modelling & New Technologies 2014 18(12C) 771-775

Participation of non-government organization (NGO) in social management is an inexorable trend of current social progress. Social management innovation needs NGO which can assist government in social management with their advantages. Studying participation of NGO in social management plays an important role in facilitating social prosperity, stability and development. Firstly, this paper analyzed the necessity and significance of NGO participation in social management. Secondly, development problems of NGO were discussed through function relationship and curvilinear relationship. Results demonstrated that development and perfection of NGO are the symbol of social maturity, and NGO is an essential component of the new social management with Chinese characteristics. Finally, suggestions on perfecting participation of NGO in social management were proposed.

Keywords: functional relationship model; NGO; social management mode; social management innovation

Poverty Alleviation Programs, Fiscal Decentralization and Economic Growth: a General Equilibrium Mode

Lai Yue, Cheng Tian-zhu

Computer Modelling & New Technologies 2014 18(12C) 776-780

How to measure and evaluate the effect of poverty alleviation program is an important issue. We should understand that the program expenditures and economic growth are reciprocally affected. The state-level government transfers payments aiming at poverty alleviation to local-level governments, which contribute to the output directly. On the opposite, inefficiency allocation of local public resources caused by distorting local decision-making will bring negative effects on economic growth. A general equilibrium model was established based on the framework of endogenous growth theories, to analyze these complicated effects. The conclusions showed that, as the proportion of poverty alleviation expenditure in the state-level governments

increasing, the economic growth rate firstly increased, and then fell down ultimately. Numerical simulation also revealed a negative relationship between poverty alleviation proportion and fiscal decentralization rate. It is suggested that the efficiency improvement of local public resources allocation at practice would be urgent.

Keywords: Poverty Alleviation Programs; Fiscal Decentralization; Economic Growth; General Equilibrium Model

Revenue-sharing Contract Coordination in the Tourism Service Supply Chain based on Fairness Concerns

Cheng Zhang, Zhijian Zhang, Nian Zhang.

Computer Modelling & New Technologies 2014 18(12C) 781-785

The paper introduce the behaviour of fairness concerns into the tourism service supply chain system, and study the influence of tour organizing agency's fairness concern to the effectiveness of tour organizing agency, the revenue of local travel agency and the whole supply chain's effectiveness, and used the revenue sharing contract to coordinate supply chain, and get the feasible interval and feasible interval length of the income share factor. The research show that the revenue sharing contract could coordinate the whole supply chain system and improve the effectiveness of the tour organizing agency, the local travel agency and the whole supply chain. The degree of improvement is decided by the fairness concern degree. The feasible interval length of revenue sharing factor would get shorter by the increase of fairness concern degree. Finally, the examples are presented to validate the conclusion.

Keywords: Fairness Concerns; the Tourism Service Supply Chain; Tour Organizing Agency; Local Travel Agency; Revenue-sharing Contract

The Evaluation of Stadium Status in China Based on Fuzzy Comprehensive Evaluation

Zhang Chunhua

Computer Modelling & New Technologies 2014 18(12C) 786-789

With rapid development of economy, China has witnessed increasing development of sports industry which is regarded as a social cultural phenomenon. On this basis, the stadium, as the essential part of sports industry, is constantly developing. In this research, questionnaire and literature analysis and cluster analysis were adopted to determine the comprehensive evaluating indexes of domestic stadium status and sorted the indexes determined. Then, by taking Hongkan stadium in Shanghai as research object, the mathematical model of evaluating the domestic stadiums based on fuzzy comprehensive evaluation (FCE) was constructed. The conclusion showed that the level of stadium is sorted as level 2 with evaluated score of 71.53. These results indicate that the construction and management of domestic stadiums need to be improved further.

Keywords: FCE; stadium; evaluation system

The Study Based on Cross-theory Model and the Application in Physical Exercising Behavior of Contemporary College Students

Li Yafei

Computer Modelling & New Technologies 2014 18(12C) 790-793

A good habit of doing sports exercises can improve the physical fitness, and optimize body functions and prolong life. However, in the current society, few college students take exercise because of active consciousness and the physical fitness of overall students is not positive. Regular exercise in school is often arranged by school and it is not enough. Meanwhile the ways to stimulate students to exercise in consciousness are scanty. So the Cross-theory Model should be introduced in physical exercising behavior of contemporary college students and in this way the physical exercising behavior of the students can be gradually improved and their overall physical fitness can be improved.

Keywords: Cross-theory;Model; Exercise

The Technology Research of The Semantic Text Classification

Xu Guixian, Qiu Lirong

Computer Modelling & New Technologies 2014 18(12C) 794-800

Semantic text classification is to classify the text according to the concepts of semantic relation. It can improve the performance of classification. This paper provides an efficient and accurate method of semantic text classification. First, the classification ontology is constructed by using the concepts extracted from Hownet. Second, Text is represented by semantic vector and general vector space. Then the semantic similarity calculation method is proposed among concepts. The similarity of concepts is calculated based on it. At last, semantic text classification is conducted based on KNN. The comparison of semantic classification and traditional classification is studied. Experiments show that the text classification method based on semantic relation can improve the classification accuracy effectively. The research is meaningful in the application of text clustering, information retrieval, natural language processing and construction of high-quality Tibetan corpus.

Keywords: Semantic Similarity Calculation, Text classification, Ontology, KNN

Virtual Reality Technique-based Digital Restoration of Chinese Ancient Architectural Scene

Yubin Liu, Yufen Feng, Xianrui Deng
Computer Modelling & New Technologies 2014 18(12C) 801-805

By introducing the function of virtual reality technology, this paper starts with the feature of Chinese ancient architecture and takes Yuanmingyuan Imperial Garden, a building in Qing Dynasty, for the research object, to present a key introduction of the system design process in which virtual reality technology is used to reconstruct building landscape. The system includes reconstruction system, real-time rendering system and roam system; the lifelike virtual result proves that virtual reality technology, with an obvious application effect in the reproduction of building landscape, is worthy of approval and promotion.

Keywords: virtual reconstruction; rendering system; roam system; Yuanmingyuan Imperial Garden

Analysis on Privacy and Reliability of Ad Hoc Network-based in Protecting Agricultural Data

Ye Yongfei, Feng Suqin, Liu Minghe, Yali Yuan, Zhao Zhisheng
Computer Modelling & New Technologies 2014 18(12C) 806-809

To analyze the privacy and reliability of Ad Hoc Network-based algorithms used in agricultural wireless data transmission, the paper introduces the routing protocols including DSDV, AODV and DSR, based on which a farmland model is built to simulate the speed and density of mobile node, and regards the success rate of data transmission (R/S Rate), average latency of end-to-end (E2E Delay) and average hops as the evaluation indicator of farmland information transfer system. As a result of the analysis, the privacy and reliability are influenced by the speed and density of mobile nodes; the higher the speed is and the lower the density is, the lower the R/S Rate is; AODV routing protocol is better in R/S Rate while DSDV routing protocol does better in both E2E Delay and average hops. It is concluded that DSDV routing protocol suits most the Ad Hoc network-based farmland information transfer system.

Keywords: Ad Hoc Network; DSDV Routing Protocol; AODV Routing Protocol; DSR Routing Protocol

Analysis on the Development Trend of China's Foreign Trade Structure based on Five Forces Model

Xiaojian Zong
Computer Modelling & New Technologies 2014 18(12C) 810-814

It becomes an inevitable era development trend to solve modernization construction by using new technologies. As a model often used to study enterprise competitiveness, Five Forces Model is applied to study development of China's foreign trade structure in this paper. Five forces in the Five Forces Model take five important influencing factors of China's trade structure, namely, China's economic structure and changes, China's economic policy adjustment, foreign economic structure and changes, foreign economic adjustment as well as word trade demand. Analysis results demonstrate that China's foreign trade development will slow down in future. Export growth will decelerate, while import growth will accelerate, which will change existing trade deficit of China gradually. Moreover, technical level of import and export products will be increased. Attentions will be shifted to service export instead of resource and product export.

Keywords: Converter Five Forces Model; foreign trade; trade structure; trend

Analysis on the Difference of Dynamic Relationship between Development of Culture industry and Economic Growth of China and the U.S.

Xia Yidan
Computer Modelling & New Technologies 2014 18(12C) 815-822

Nowadays, the viewpoint that culture industry could contribute to economic growth has become the mainstream. Many scholars have proved economic role of cultural industries in their researches, but very few scholars have carried out researches on dynamic relationship of industrial development and economic growth. In view of comparative perspective between China and the U.S., in this paper, the difference of dynamic relationship of culture industry development and economic growth is researched by constructing SVAR model. Results show that culture industry has formed a complete system in the U.S., displaying a significant economic role which is stable and lasting, and in return economic growth also promotes the rapid development of culture industry, both of which shows an obvious interaction promotion mechanism. However, in China, culture industry scale is small, and it does not perform positive economic role, but instead brings economic growth long term fluctuations. Moreover, the promotion of economic growth to the development of culture industry is limited, and no promotion mechanism exists between them. Therefore, the development of culture industry should be advanced gradually, and correspondingly some policies and suggestions are presented in this paper.

Keywords: SOFC; Discrete Sliding Mode; Control; DC/AC; Converter

Application Analysis of Computer-aided Information Technology in Automatic Assignment and Reservation of Ping Pong Tables in Universities

Zhang Ming
Computer Modelling & New Technologies 2014 18(12C) 823-827

A society develops with the development of information technology (IT). Despite the increasing number of materials and

category complication, computer-aided IT has provided much convenience for material management and assignment. With computer-aided IT, this study aims to achieve the automatic assignment and reservation of ping pong tables so as to improve the convenience and utilization efficiency of material assignment. In combination with a database for data storage, ping pong table information is preprocessed (including classification and merging). C# programming language is utilized for system design in combination with an SQL server database. A program is compiled to display the design result and thus complete the automatic assignment and reservation of ping pong tables.

Keywords: Computer-aided information technology, Automation, Assignment, Application

Application of Improved GM(1, 1) Model in Predicting Nutritional Status of Youth Athletes from She Minority Group

Songwei Wu

Computer Modelling & New Technologies 2014 18(12C) 828-832

GM(1, 1) is a gray dynamic prediction model that is applied most extensively in gray system theory. Nutrition is an important issue in the healthy development of youth athletes. In this study, we take youth athletes from the She minority group as an example and predict their nutritional status based on the improved GM(1, 1) model to better determine and effectively improve the nutritional status of these athletes. Based on a nutrition survey of youth athletes from the She minority group, gray system theory and relevant research on GM(1, 1) model are used to conduct data analysis of the nutritional disease detection rate of youth athletes from the She minority group in the past five years as well as construct a comprehensive and scientific prediction system. Moreover, we conduct instance analysis of their nutritional status using the GM(1, 1) model and obtain analysis results and the corresponding prediction conclusions.

Keywords: gray system theory, GM(1, 1) model, youth athletes, nutrition

Application of the TOPSIS Method and Gray Correlation Model in the Competitiveness Evaluation of Basketball Teams

Changwu Huang

Computer Modelling & New Technologies 2014 18(12C) 833-837

The technique for order preference by similarity to an ideal solution (TOPSIS) method is frequently used in multi-factor selection, whereas the gray correlation analysis method is used to study uncertain systems. Thus, a comprehensive model is constructed for 12 teams that are participating in the 2012 London Olympic Games, and the competitiveness of each team is evaluated through these two methods. Results show that the American team is strong enough to win. Furthermore, the evaluation results of the other teams were fundamentally similar to the final results, although they also differed. This model can also reflect the strength of each team objectively in terms of offense, defense, and a combination of both pass and exclude subjective interferences. Therefore, this model feasibly assesses multi-factor competition events in the field of sports.

Keywords: TOPSIS, Gray correlation, Evaluation, Competitiveness, Basketball team

Application Study of the Grey Prediction Model in Emergency Decisions on Accidents in Stadiums

Wenxiao Lu

Computer Modelling & New Technologies 2014 18(12C) 838-842

Public security is an important problem in the process of social development. Accidents that occur in stadiums are investigated in this study. The focus is on the complicated randomness of such accidents. Grey theory is utilized for modeling, and the grey prediction model is applied to emergency decisions on accidents in stadiums. The GM(1,1) model is adopted to predict accidents in stadiums. Specifically, two models are established: a GM(1,1) model for the number of times accidents occur and a GM(1,1) model related to death tolls in accidents in stadiums. Experimental results show that the two established models satisfy the accuracy required for prediction and exhibit rapid computing speed and small time consumption. These models have good stability in terms of long-term prediction and thus have a potential for practical application

Keywords: Gymnasium, Accidents, Grey prediction model, GM(1,1) model

Causes and Early-warning Model Analysis of ST: Comparison based on Financial and Non-financial Indexes

Xihui Wu

Computer Modelling & New Technologies 2014 18(12C) 843-846

ST is the special treatment of stock exchange to all enterprises with management problems, which all listed companies concern and try to avoid. Although ST generally involves financial problems, it is influenced by both financial and non-financial factors. As a result, a ST early-warning model was established in this paper based on financial and non-financial indexes of enterprises. The established model includes 14 financial indexes (e.g. profitability, debt paying ability, growth potential, operation and management, as well as utilization of assets) and 15 non-financial indexes (e.g. ownership structure, board size and composition, major connected transactions of enterprises and investor protection). Both Z and P of the model can reflect risks of ST. This

paper analyzed 9 conditions and ST possibility of enterprises with different Z values for two successive years according to their practical situations. To avoid ST, enterprises are suggested to discover risks promptly and improve their management, organizational structure and cost control.

Keywords: ST members; early-warning model; financial index; decision making reference

Channel Safety Assessment in Ship Navigation Based on Fuzzy Logic Model

Yuan Wu, Hao Hu

Computer Modelling & New Technologies 2014 18(12C) 847-852

With the progress of economic globalization, international shipping trade is developing rapidly, resulting in a gradual rise in the volume of channel traffic. In turn, maritime affairs occur more frequently due to that than before, and the circumstance of transportation in channel is getting more and more complex. It has a great influence to the safety of ship navigation. This paper establishes a multilevel index system and constructs a fuzzy logic model based on fuzzy set to give an in-depth assessment on the channel safety. Previous researches show that fuzzy logic model can be used to manage multi-factor in safety assessment. However, the application for channel safety is an experiment and innovation. The model is applied to Yangtze Estuary deep water channel, and the output results are consistent with the practice. At the meantime， the assessment system has important value to make integrity planning of the channel.

Keywords: Channel; Safety; Fuzzy Logic; Assessment System; Model

Classifier Model Based on Neighbourhood Rough Set and Genetic Neural Network

Wu Ganzhou

Computer Modelling & New Technologies 2014 18(12C) 853-858

In this study, the backpropagation (BP) neural network data classifier model optimized by genetic algorithm (GA) and neighborhood rough set is proposed. First, we integrate the attribute reduction technique with the neighborhood rough set, which is used to delete the redundant attributes of training samples. Second, we optimize the weights and thresholds of the BP neural network by using GA. As such, the training speed and generalization capability of the BP neural network are improved to obtain the optimal weights and thresholds. Finally, the experimental results show that the proposed algorithm performs well.

Keywords: BP neural network; genetic algorithm; neighborhood set; reduction

Effects of Physical Exercise on Self-concept of College Students Based on Meta-analysis Mode

Qi Aili, Wang Fatao, Shen Chengchun

Computer Modelling & New Technologies 2014 18(12C) 859-863

Meta-analysis is a scientific quantitative comprehensive analytical method. With respect to individual research, meta-analysis is characterized by high effectiveness and extensive and accurate quantification. This thesis uses meta-analysis to conduct quantitative analysis of the effects of physical exercise on the self-concept of college students. The relationship between physical exercise and self-concept is also determined. Therefore, average effect size of intervention of physical exercise in effects on the self-concept of college students is 0.45. This value is classified under medium intervention level. In addition, results of deviation indicate that the effects of physical exercise are relatively stable and have no evident deviation. The results also present a reliable scientific basis for psychological education that colleges provide to their students and intervention methods in mental health.

Keywords: Self-concept, Meta-analysis, Physical exercise, Offset, Intervention effect

Establishment of Continuous Business Auditing Model in XBRL Environment

Lei Liu

Computer Modelling & New Technologies 2014 18(12C) 864-867

XBRL technology enjoys great application prospect by enterprises and plays an important role in their business development. A deep analysis on the content and application range of XBRL was conducted in this paper. Effect of XBRL on enterprise operation and management was analyzed, mainly including higher operation standardization, higher data normalization, internal information systematization and data sharing. Later, based on characteristics and advantages of XBRL, a continuous business auditing model was established using trend analysis approach from financial and non-financial indexes. Due to the XBRL technology, the established model can acquire related indexes automatically and implement fundamental data computation and analysis. Model results can be reflected quickly. To safeguard flexibility and timeliness of the model, enterprises are suggested to keep indexes updating upon development, update XBRL technology in time, improve audit analysis and evaluation capacities of auditors, as well as enhance mutual dependence between obligation and rights of auditing department and other departments.

Keywords: XBRL technology; business decisions; Continuous Business Auditing Model

Evaluation Analysis of Music Education in China Based on Fuzzy AHP Method

Ma Lin

Computer Modelling & New Technologies 2014 18(12C) 868-872

Music is not only an art, but also an education practice. Currently, education field in China has paid more attention on music education by means of improving the capability of musical teachers, performing music education reform, and cultivating students' learning interest. By carrying out data mining and exploration, a teaching model for music education in China was established; and the optimal evaluation of the model quantitatively investigated the teaching modes from the aspect of data. To begin with, based on ordinary education mode, relaxed education mode and multimedia assisted education mode, the specific definitions of their secondary modes were explained, and a researching model for music teaching mode was constructed based on optimal evaluation model. Then, the construction of teaching mode evaluation model for music education based on hierarchical structure revealed that the relaxed teaching mode presented a highest weight, and its secondary modes, teamwork and competition teaching modes had a largest response in music education. Therefore, to promote music education, the paper suggested to combining theory and practice, improving classroom efficiency, motivating learning enthusiasm, and building a new situation where teachers and students progress together, and the education situation and teaching mode reform are perfected by technological means.

Keywords: music education, data mining and exploration, optimal evaluation model, hierarchical structure

Evaluation Model and Simulation of Basketball Teaching Quality Based on Maximum Entropy Neural Network

Xiaodong Zhang

Computer Modelling & New Technologies 2014 18(12C) 873-877

Establishment and implementation of models of teaching quality evaluation are important tasks for teaching management in colleges. In this thesis, we use a neural network (NN) model optimized by maximum entropy principle, conduct fitting for complicated nonlinear relationship between many indices and evaluation results to evaluate basketball teaching quality, and implement simulated residual comparison with back propagation (BP) NN model that has not been optimized. Results demonstrate that the evaluation results of maximum entropy NN model are better than those of the BP NN model that has not been optimized in experimental function simulation and example verification, thereby indicating that the optimized model has strong generalization ability and high degree of confidence. This optimization algorithm is feasible in establishing evaluation models for basketball teaching quality.

Keywords: Maximum entropy, Neural network model, Optimization algorithm, Evaluation model, Basketball teaching quality

Evaluation of English Writing Teaching Effect with Output-based C2GS2 Mode

Yuanyuan Tai

Computer Modelling & New Technologies 2014 18(12C) 878-882

An evaluation system for English writing teaching effects with the output-based C 2GS2 model is established in this study to better understand the teaching status of English writing teaching effects and allow for effective reform and implementation of teaching methods. An evaluation model is constructed for English writing teaching effects, English writing teaching status, and students' learning effects. Qualitative, quantitative, and data envelopment analyses are applied. The C 2GS2 evaluation model is adopted through teaching example verification and statistical analysis of data. The important function of data envelopment analysis in teaching effect analysis is expounded from different aspects.

Keywords: data envelopment analysis, C 2GS2 evaluation model, English writing, teaching effect

Research on Innovation Efficiency Loss of State-Owned Enterprises: An Empirical Analysis in China Based on DEA

Xiaoqing Dong, Jian Zhao, Pengwei Yuan

Computer Modelling & New Technologies 2014 18(12C) 883-889

The efficiency loss of state-owned enterprises has recently attracted increasing interest. In traditional view, it only emphasizes the productivity efficiency loss of state-owned enterprises, while it ignores the innovation efficiency loss. The production efficiency of state-owned enterprises has been improved by series reforms which still can't solve the problem of inefficient in china. It indicates that there are more critical factors affecting the efficiency improvement. Many qualitative studies have proved the technical innovation is the main factor affecting the efficiency of enterprises, but empirical tests are few. Therefore, in this study, we utilize Malmquist index method based on DEA model to disaggregate, evaluate and test the innovation efficiencies of state-owned enterprises and private enterprises in 5 major Chinese high-tech industries. The results show that except for aerospace vehicle manufacturing industry, the state-owned enterprises' innovation efficiencies in all the industries are significantly lower than private enterprises'. In a word, the innovation efficiency loss is the main factor which makes state-owned enterprises into survival dilemma.

Keywords: State-owned Enterprises, Innovative Efficiency, Innovation Efficiency Loss, Method of Malmquist Index; DEA model.

Research on Modeling and Evaluation of Chinese Tourism Competitiveness based on Double Diamond

Mode

Yang Xia

Computer Modelling & New Technologies 2014 18(12C) 890-894

Double diamond model was proposed by Michael Porter in 1990 who is a famous strategic management scientist of Harvard Business School. It is used to analyze how a country develops overall advantages to win strong international competitiveness. In this paper, the evaluation model of Chinese tourism competitiveness was established based on the double diamond model and six influencing factors, including resource factors, demand conditions, supporting industries, enterprise composition in tourism industry, government function and industrial innovation capacity. For the sake of data authenticity and availability, the established evaluation model divided world tourism consumption region into developed countries and developing countries. It evaluated different regions or regional consumers. Finally, some policy suggestions against the poor competitiveness of Chinese tourism were proposed.

Keywords: Converter double diamond model; tourism; competitiveness; evaluation

Investment-Cash Flow Sensitivity and Financial Constraints–Evidences from British Firms

Yu Zuwei, Zhang Biao, Shao Ji-shu, Hu Hongwei, Liu Sulang.

Computer Modelling & New Technologies 2014 18(12C) 895-903

This paper investigates the relation between financial constraint and the sensitivity of investment to internal cash flow. The regressions are run by using a large panel of publicly traded non-financial British firms. The sample is sorted and divided into subsamples by means of applying most objective and commonly used proxies of financing constraints including leverage and other proxies. Our result shows that investment cash flow sensitivity is neither monotonically increasing nor decreasing when the proxies change. The hypothesis of monotonicity is violated empirically in our study. Conversely, an M-shaped curve is observed when leverage is used as the proxy.

Keywords: Investment cash flow sensitivity; financing constraint; leverage; capital market imperfections

Research on the Forecast and Development of China's Taxation based on ARMA Model

Jinlin Zhou

Computer Modelling & New Technologies 2014 18(12C) 904-907

China's tax revenue has increased quickly in recent years, significantly higher than China's economic growth. This not only goes against performance of government functions and economic development, but also increases burden to enterprises and individuals. This paper carried out a deep analysis on the tax changes of China from 1995 to 2013 based on the collected data of China Statistical Yearbook for Regional Economic. Moreover, short-term tax changes in future forecasted by ARMA model and reasons of its quick growth were analyzed. The analysis discovered that China's taxation still will maintain quick growth in the short run. This indicates that China's tax growth will be accelerated, which will further increase burdens to enterprises and individuals. To slow down the tax growth and guarantee performance of government functions, it is suggested to: 1) strengthen tax supervision and strictly prohibit increasing tax items and rate blindly; 2) improve tax structure, reduce tax items and prevent double taxation; 3) implement transformation from production-type VAT to consumption-type VAT; 4) promote reform of taxation expenses and correct taxation disorder.

Keywords: ARMA model; taxation forecasting; economic regulation

Risk Evaluation about Green Building Engineering Development Projects Based on AHP-MF Mode

Gengfang Xie

Computer Modelling & New Technologies 2014 18(12C) 908-912

To construct a risk assessment model which is appropriate for green building engineering development projects and provide scientific basis for project decisions and risk judgment, quantitative evaluation on risk indexes of green building project development are obtained based on AHP-MF model algorithm and in combination with example analysis. According to cycle and process of project development, risk factors affecting project objectives are divided into four primary indexes including risk at the decision-making stage, risk at the preparatory stage, risk at the implementation stage and risk at the rental, sales and operational stage. Besides, risk rating of indexes at each level of indexes is analyzed further, by which value of risk evaluation on each risk factor is obtained quantitatively. On the basis of example analysis, good effect is got.

Keywords: AHP-MF model, *Green building project*, *Risk identification*, *Risk index*

Study on Corporate Identify System of Mercedes Benz 4S Shop

Li Jie, Song Jiantong, Zhu Chunhong

Computer Modelling & New Technologies 2014 18(12C) 913-917

To improve the promoting effect of corporate identify (CI) system to the China's enterprise brand, this study constructed the CI model of auto 4S shop. Basing on this model, it analyzed the characteristics, color, material, and effects of the external and decorative CI on the column, glass curtain wall, roof eaves, door bucket, workshop curtain, indoor floor, stairs, and the resting

area in the Mercedes Benz 4S shop. The results showed that the internal and external CI systems of Mercedes Benz 4S shop were harmonious and unified. By organically integrating with the enterprise culture, a standard "enterprise individuality" was propagated to the society and promoted the enterprise development. Thus the CI system was the important brand-name trademark strategy of enterprises. China's national brand should optimize their CI in reference with the CI systems of outstanding enterprises to directly and widely propagate and deepen enterprise culture and establish favorable enterprise brand.

Keywords: r Mercedes Benz; Auto; 4S shop; CI system

Study on Finance Procedure Optimization of Small-Medium Logistics Enterprises Based on Bayesian Game

Zhang Xin, Tan Dingzhong, Zhang Cheng

Computer Modelling & New Technologies 2014 18(12C) 918-922

Bayesian game is employed to study the applicability of modern financial products for small-medium logistics enterprises, analyze the roles and service procedure of innovative financial products in logistics industry. In loan market, product competitiveness affects market behaviors significantly, while market information asymmetry weakens small-medium logistics enterprises in the game of the market, making them pay more for loans than others. As revealed in Nash equilibrium solution, small-medium logistics enterprises can achieve the fund for their development through innovative financial products including logistics finance and network finance. After the model and procedure of financial service for the small-medium logistics enterprises was changed, the fund needed for their development was the most optimal way. These products include market network design, competition, information technology, perceived risk, trust , information, and process design. Based on the framework, a case study was carried in logistics field.

Keywords: Bayesian game, small-medium logistics enterprises, finance procedure optimization

The Application of Game Theory in Library Booking System

Cheng Huirong, Wang Ruifeng

Computer Modelling & New Technologies 2014 18(12C) 923-926

Library booking is an important problem nowadays, which decides budgets of the whole library. Therefore, we should present proper model or method to solve this problem. This paper applies cooperative game theory and non-cooperation game theory when designing a library booking system to analyze the above problem. More especially, we analyze the problems in library booking system towards the view of game theory. Then we present two applications of cooperative and non-cooperation game theory respectively. Simulation experiments are set up according to the applications and the results are of consistence to the former analyses. Therefore, we solve the booking problem with game theory. Finally we conclude that game theory is an efficient tool, which can solve various problems in library booking and can also give credible results to improve efficiencies.

Keywords: Booking System; Nash Equilibrium; Cooperative Game; Non-cooperation Game

Relationship between Sports Consumption and Economic Growth based on A State-space Model

Hao Wang

Computer Modelling & New Technologies 2014 18(12C) 927-931

Research has focused on the application of state-space models to economics. -Such models are also known as dynamic system theory, which assumes that the studied system is decided by an unobservable vector sequence over time. Sports consumption is an important aspect of sports economics and of consumption in modern living. As the economy develops, the social consumption mode and economic structure change significantly, and sports consumption displays good market demand. By establishing the state-space model in relation to sports consumption and economic growth, this thesis verifies and estimates the model parameters and concludes that sports consumption increases by 0.431%—0.439% when Gross Domestic Product (GDP) increases by 1%.

Keywords: State-space model, Model test, Economic development, Sports consumption

Application Study of All-or-Nothing Assignment Method for Determination of Logistic Transport Route in Urban Planning

Hui Cai

Computer Modelling & New Technologies 2014 18(12C) 932-937

With the increasing need for urban logistic transportation, the establishment of a reasonable urban logistic transport route with high efficiency has become a critical element in alleviating urban traffic jam, meeting urban logistics and infrastructure construction, and improving the efficiency of urban logistics. The determination of a logistic transport route based on the all-or-nothing optimization algorithm in an urban system is investigated in this study. A logistic assignment model is established, and logistic transportation examples are combined. The optimized method retains the characteristic of simple calculation through the all-or-nothing algorithm. Owing to the consideration of road network conditions in the assignment process, the assignment

results are more practical and can adapt to the characteristics of urban systems, such as complicated road networks and heavy traffic volume. Therefore, the logistic transport route in urban planning can be planned and designed with the optimized all-or-nothing algorithm.

Keywords: All-or-nothing algorithm, Logistic transportation, Urban system

Planning mode of the "urban-rural-field-garden" for the new suburban countryside in the Chengdu-Chongqing region of China

Mengdie Xu, Guochun Sun, Yuhui Xu, Ying Huang

Computer Modelling & New Technologies 2014 18(12C) 938-942

In China, the construction of a new countryside necessitates the successful implementation of strategic goals that are in line with recent urbanization and the integration of urban—rural development. As a typical site of urban—rural integration planning, the Chengdu-Chongqing region has become the "Overall Urban-Rural Comprehensive Matched Reform Experimental Zone". In line with this aim, this study proposes the "Urban-Rural-Field-Garden" planning mode that is suitable for the construction and development of the new suburban countryside in the Chengdu-Chongqing region. We base our analysis on the current state, problems, and the requirement for new urbanization and integrated urban—rural development . We then analyzed the constitutional content, function, organization, layout, form, and guarantee mechanism of the proposed mode. Finally, we determined the general applicability of the proposed model given the construction areas of the new countryside, which differ in terms of dominating type, to provide references for the determination of a suitable mode for new countryside construction in other Chinese regions.

Keywords: New suburban countryside, planning mode of "Urban-Rural-Field-Garden", new countryside construction, new urbanization in China, urban—rural development

An Empirical Study of Dynamic Financial Early Warning Based on Grey Correlation and BP Neural Network

Wang hui zhen

Computer Modelling & New Technologies 2014 18(12C) 943-946

Current research on early warning of financial crises mainly focuses on financial early warning such as multivariate linear prewarning and Bayes discrimination, whereas the research methods are inclined to mathematical statistics, so there are rigorous requirements for data and hypotheses. Nevertheless, corporate financial risks and predetermined indices for early warnings are possibly changeable. In consideration of ineffective control of crises by earning warning, crises were dynamically monitored with a BP neural network based on Grey Model (1, 1) from the perspective of risk and crisis forecast (the only measures available for financial crisis in modern enterprises). Besides, a three-tier BP neural network was constructed by transforming fitting accuracy of exponential functions. The results have suggested that the changing indices about corporate financial crises have direct impacts upon corresponding early warning results. All simulation trainings based on BP neural network have been validated and can be used to further verify dynamic grey correlations in the process of financial early warning. Furthermore, all ST enterprises were predicted to face crisis by the pre-warning mechanism based on grey model, BP neural network training and the analog control, while corresponding non-ST enterprises were forecasted to be sound. Hence, it is helpful for listed enterprises to effectively forecast their possible and potential financial crises.

Keywords: Financial Early Warning, BP Neural Network, grey model, Grey Model (1, 1)

Analysis and study on the stadium personnel evacuating strategy using performance-based model

Hong Zhao

Computer Modelling & New Technologies 2014 18(12C) 947-951

To protect the personal safety of people during entertainment in the technologically advanced society, this study investigated the safe personnel evacuation strategy in case of emergencies in stadium, in an attempt of minimizing the personnel losses. Considering the influences of personnel panic, evacuation exit flow, perception time, and the evacuation experience of staffs, the proportions of factors influencing the emergent stadium personnel evacuation efficiency were obtained using analytic hierarchy model, i.e., disorder evacuation, short evacuation time, and slow evacuation accounted for 0.386, 0.272, and 0.342 respectively. This result suggested that disorder evacuation and slow evacuation were the main factors for inducing the low efficiency of stadium personnel evacuation, while short evacuation time took a low proportion. Therefore, it was proved that the evacuation routes in most of the buildings were reasonably designed; the disorder evacuation caused by personnel panic acted as the main factor inducing the low personnel excavation efficiency; the personnel evacuation experience deficiency of most of the staffs resulted in the slow evacuation speed. Therefore, to prevent large accidents, the masses should strengthen the learning for scientifically coping with accidents. Meanwhile, the stadium managers should conduct professional quality training to the staffs at regular time

Keywords: SOFC; performance-based model; evacuation strategy; analytical hierarchy process

Chinese Stock Index Futures' Effects on the A Share Market — A Study Based on the Improved TGARCH

Model

Bi Jianxin, Lei Lianghai

Computer Modelling & New Technologies 2014 18(12C) 952-962

The paper improves the TGARCH model, and then builds three state transition models for the population sample of Hushen (Shanghai and Shenzhen) 300 Index. The paper selects the samples in the two years before and after the launch of stock index futures, and then uses the improved TGARCH model for market modelling, and makes a comparison with the original TGARCH model. The paper finds that after the launch of stock index futures, the A share market's volatility ratio decreased greatly and volatility asymmetry weakened significantly, but still existed. The paper finally analyses the causes why stock index futures can stabilize A share market volatility and comes to a conclusion.

Keywords: stock index futures, GARCH model, TGARCH model, A share market, Hushen 300 Index

Educational Psychology Analysis Based on Dynamic Game Model

Wang Jian, Wu Haiyan

Computer Modelling & New Technologies 2014 18(12C) 963-966

Accurately grasp students' mental, is essential to achieve expected teaching objectives. From the psychological point of view, the behavior of students is generally bounded rationality, and its decisions are often influenced by other students. In this paper, make student as the research content, dynamic game model was constructed based on game theory to analyze whether herding effect swill occur in the process of student enrollment. In the model, investigated exchange proceeds, exchanges scope, cost factors and other conditions in student exchange process. Experimental results show that exchange proceeds is the most important factor to determine whether the student elective behavior will occur herding effect, in addition to the exchange scope, cost factors also have some influence on whether students form a herd mentality.

Keywords: Educational psychology; Dynamic game model; Student enrolment; Herd behavior

Empirical Analysis of the Influencing Factors of Human Resource Management Mode of Petroleum Enterprises in China

Shi Jun, Liu Xiantao, Chen Guangjiu

Computer Modelling & New Technologies 2014 18(12C) 967-971

Human resource management is considered as a practical art. Enterprises in various industries have different human resource management modes. By taking Chinese petroleum enterprises as an example, empirical analysis was performed on the influencing factors of human resource management mode by conducting questionnaire investigation. Results show that there are 8 principle factors influencing the human resource management mode, which can be divided into three categories, including internal constraint factors, external constraint factors, and strategic interests. The research indicates that the construction of human resource management mode of adapting to current economy requires to be green and low carbon, the eight factors can be considered to reduce the blindness and repeatability of petroleum enterprises in human resource management and improve the management efficiency and effectiveness.

Keywords: Human Resource Management; Mode; Influencing Factors; Petroleum Enterprises

Empirical Study of Rhetoric Appeal Based Writing Model

Jian Li, Qingming Li

Computer Modelling & New Technologies 2014 18(12C) 972-976

Nowadays, there is an increasing awareness of the upset situation concerning English writing among college English teachers. More and more teachers come to expose themselves to various approaches to teaching writing in order to remedy the unsatisfying teaching situation. Process and product approaches are most commonly used in English writing teaching. But with product approach, composing process skills are given relatively small role and to a certain degree students‟ motivation and interests remain undeveloped, while when applying process approach to teach writing, more and more teachers realize the disadvantages of this socalled "enabling" approach. Based on the study of interrelationship between rhetoric and writing, the purpose of this paper is finding an effective model of writing instruction for students from rhetorical perspective, and through an experiment of composition writing, testing the feasibility of rhetorical model in writing action.

Keywords: Rhetoric Appeal, Writing Model, Ethos, Pathos, Logos

Innovation of Small and Medium Enterprises Management Based on Cloud Computing

Rongbing Wang

Computer Modelling & New Technologies 2014 18(12C) 977-982

Market resources assessment in small and medium enterprise (SME) often shows weak strategic decisions owing to SME have insufficient abilities to cope with the changes in external environment, and is likely to be influenced by big business and market fluctuations. To solve this problem, this paper studied the cloud computing environment. The ways of innovation management for SMEs were investigated also. The results suggest that SME should focus on innovation management as following: the

concept of innovation management, human resource management innovation, organizational structure innovation, and business model innovation.

Keywords: Enterprises; Management innovation; Cloud computing; Virtualization

Organizational Innovation of Integrated Design of Infrastructures in Large-scale Park

Wu Dingyuan, Gang Feng

Computer Modelling & New Technologies 2014 18(12C) 983-988

Infrastructures in large-scale park are the most basic substance to realize the function of the park, and the important basis for the sustainable development of the park. Because infrastructures in large-scale park involve multi-system and multi-specialty such as municipal traffic, electric power energy and communication network and then were designed by different design units according to different reference standards, infrastructures in large-scale park have inconsistent design standards, unharmonious design schedule, unshared design achievement and so on, therefore, the integrated design pattern should be taken. This paper will give an overview of integrated design of infrastructures in large-scale park in the first place, and then put forward organizational operation mode and communication mode of integrated design of infrastructures in large-scale park on the basis of the thought of organizational adhesion, and finally construct organizational game model of integrated design of infrastructures in large-scale park in virtue of the theory of positive game and analyze income distribution of each member in integrated design organization by the use of Shapley value method.

Keywords: Infrastructures in Large-scale Park; Integrated Design; Organizational Innovation; Positive Game; Income Distribution

Regional Spatial Econometric Empirical Comparison for the Input and Output of Research and Development on Environment-friendly Innovation

Li Aijun, Liang Changyong

Computer Modelling & New Technologies 2014 18(12C) 989-993

With the economic growth and increasing improvements of supporting measures, the innovation, as well as research and development (RD) exhibit apparent output and spillover effects. By taking the patent grand in environment-friendly innovation and RD as a dependent variable, and the factors such as personnel and innovation capital of RD as independent variables, the empirical comparison and validation based on regional spatial econometric model were conducted. The results showed that environmentfriendly RD presents a prominent positive implicative effect on the RD innovation output with spatial spillover. Meanwhile, the spatial error model is proved to be more convinced than spatial lag model and ordinary least square methods. Besides, this research also provides some suggestions and countermeasures for promoting further environment-friendly innovation RD and economic growth.

Keywords: Environment-friendly; RD Input; RD Output; Spatial Econometric

Relationship Analysis between Urbanization and Building Energy Consumption in China Based on a Structural Equation Model

Ma Xianrui, Xia Wang, Yongjie Du, Weiguang Cail

Computer Modelling & New Technologies 2014 18(12C) 994-1002

n this paper, a qualitative analysis is firstly conducted on the relationship between urbanization and building energy consumption from five perspectives which are: urbanization rate, floor space of newly built residential buildings in urban areas, value-added of the tertiary industry, annual per capita consumption of residents and new urban population. Based on the qualitative analysis, a structural equation model is built and quantitative analysis is carried out. The result confirms that there is a strong positive correlation between urbanization and building energy consumption, as well as, the correlation coefficient is gained. Lastly, some suggestions on building energy-saving are given accordingly with the results of the analysis.

Keywords: Urbanization; Building Energy Consumption; Structural Equation Model

Research on the Identification of the Key Elements of Mega Project System

Shi Xiangang,, Liu Huabin, Qin Beibei, Ma Xianrui, Wang Peng

Computer Modelling & New Technologies 2014 18(12C) 1003-1008

The social attribute of mega project, the complexity of stakeholders and the arduousness of management objectively require managers to identify the key elements of the system from the perspective of social networks. This research constructs a social network structure of mega project to study the centrality of social networks of mega project system with social network analysis (SNA). With Local centrality, Closeness centrality and Betweenness centrality, the key index of elements is established and these elements are reordered according to the importance. This paper makes an empirical analysis in which the key elements of Chongqing Metro Line 6 project are defined with UCINET. The results are expected to simplify the structure of social networks with the key elements identified, and it can improve the management efficiency to achieve the expected management goals more effectively.

Keywords: Mega Project; Key Elements; Social Network Analysis

Space Syntax Method Based Study on Price Adjustment of Land Location: A Case Study of the Development of GY Island

Yongjie Du, Xianrui Ma, Huabing Liu

Computer Modelling & New Technologies 2014 18(12C) 1009-1014

Based on theoretical analysis of Space syntax and other associated concepts, the essay developed an innovative method of land location price adjustment. We take GY Island (in the Yangtze River) as research object. With the help of space syntax and Mindwalk software, we conducted detailed analysis on each land block, and finally give rate depending on locations. The results show the convenience and accuracy of adopting space syntax in calculating the land price by the location adjustment coefficient.

Keywords: Space syntax; Land appraisal; Price adjustment on locations

Study of Cost Estimation in the Project Design Phase Based on the Gray System Model

Peng Wang, Runting Gong, Dandan Li

Computer Modelling & New Technologies 2014 18(12C) 1015-1020

With the rapid development and transformation of the construction industry, the construction project cost has been increasing in recent years. It has not only affected mark competitiveness of the construction enterprise, but also consumed the more social resources. Then how to make the construction project cost control precisely and effectively is a key problem, especially in the project design phase. Based on the previous research, the paper summed up that the project managers had a single method of cost control and forecast, and also the accuracy was not high. This paper then explored a fit method for forecasting and controlling the budget in project design phase based on the Gray System Model (1,1).Comparing with several commonly prediction methods on project cost, it summed up their differences and selected a prioritization scheme—Gray System Model (1,1) for testing. In order to control and forecast the budget with a timely and reasonable, this paper lastly applied Gray System Model (1,1) for the project design phase of engineering practice and it proved that the evaluation method was feasible.

Keywords: Project Cost; Estimates for Prediction and Control; Gray System Model

The Approach of Improving Environmental Quality for the Industrial Interactive Development of Producer Services and Manufacture Industry

Fei Shen

Computer Modelling & New Technologies 2014 18(12C) 1021-1025

The influence analysis of the interactive association between the manufacture industry and producer services was conducted. On this basis, the factors including energy consumption, capital and labor are selected to construct the STIRPA model concerning stochastic impacts of regression on population, affluence, and technology. The environmental effects of the two industries" interaction are analyzed. The results confirm that the structural differences of carbon productivity improvement of industrial development in economically developed eastern and central regions in China is greater than that of other regions, while the latter mainly depends on manufacture industry and producer services to achieve environmental protection growth, so the labor factor should be combined with capital to promote the improvement of carbon productivity

Keywords: SOFC; Manufacture Industry; Producer Services; Interactive Development; Environmental Quality; Carbon Productivity

Analysis and Design of the B/S based Dynamic Management System for the Budgets of University Scientific Research Projects

Zhijun Chen

Computer Modelling & New Technologies 2014 18(12C) 1026-1031

Budget of university scientific research project mainly includes budget preparation, budget execution, budget adjustment, budget control and budget performance evaluation. By managing and the budgets of university scientific research projects using a management information system, the technical director of projects can make full use of the budget in scientific research based on reasonable budget setting. The scientific funds can therefore be effectively utilized. In this research, the series of functions such as source management, budget management, expenditure management and inquiry statistics are realized using B/S frame and NET distributed framework, and Visual Studio 2005 is taken as development tool and SQL Server2005 as background data management system. Therefore, the practical and effective dynamic management and planning of funds and budgets for university scientific research projects are realized.

Keywords: B/S; Scientific Research Project; Fund budget

Research on Effect of Venture Capital to Technological Innovation in China

Zhi Chen

Computer Modelling & New Technologies 2014 18(12C) 1032-1037

Basing endogenous economic growth theory and incentive-supervision theory, this paper expounds the effect of venture capital (VC) to technological innovation. Referencing the input-output method, technological innovation is thought as common goods, which can be produced during general production process. Then it chooses VC and R&D personnel as input factors, patent applications as output factor, and measures the effect of Chinese VC to technological innovation by calculating the Grey Relationship Degree (GRD). Data shows that VC's effect is stronger and stronger, even the relevant degree of government capital and technological innovation is high. By using kernel density, six pictures show that VC's distribution is disequilibrium; they reflect the main features of Chinese regional economic. Conclusions support that VC has significant effect on Chinese technological innovation. a way that using governmental invest to attractive folk and aboard is needed. Government should try to diversify the technology and investment market.

Keywords: venture capital (VC), technological innovation, Grey Relationship Degree (GRD), kernel density

Study on the Relationship of Folk Finance and Rural Small and Medium-Sized Enterprise

Guan Hai-ling

Computer Modelling & New Technologies 2014 18(12C) 1038-1043

As the integral part of finance markets, the rural folk finance exists extensively and has been playing an important role in small and medium-sized enterprise financing. This paper points out the way to implement the Nash Equilibrium of both the lender and the borrower of rural finance. Based on borrowing behavior of rural finance by the game analysis, we find that establishing folk restriction mechanism, such as reputation mechanism, guarantee mechanism and third-party restriction and supervision mechanism is an optimal way to solve the problem existing in rural finance. With the aid of cob-Douglas production function, which shows that there is a huge financing gap existing in rural small and medium-sized enterprises. So,it's important to seek more financial support from the rural financial market; the development of the folk finance speeds up the progress of rural small and medium-sized enterprises, and vice versa.

Keywords: Folk finance, rural small and medium-sized enterprises, game

The Processing of business resources using data warehouse based on Hybrid Methodology

Yuan Quan

Computer Modelling & New Technologies 2014 18(12C) 1044-1048

In computing, a data warehouse (DW, DWH), or an enterprise data warehouse (EDW), is a system used for reporting and data analysis. In working environment resources are commonly shared between tasks, and sometime multiple resources are necessary to commence a single task, this scenario makes the resource utilization complex. Making it simple to understand this, we classify resources into human resources, because the two types of resources behave differently leaving different impact on process performance. Quality of data produces is evaluated though an empirical study, that is confirming the claim of highly relevant information generation. Data warehouse conceptual design is based on the metaphor of the cube, which can be derived from either requirement-driven or data-driven methodologies. Each methodology has its own advantages. The first allows designers to obtain a conceptual schema very close to the user needs but it may be not supported by the effective data availability. On the contrary, the second ensures a perfect trace ability and consistence with the data sources—in fact, it guarantees the presence of data to be used in analytical processing—but does not preserve from missing business user needs. To face this issue, the necessity emerged in the last years to define hybrid methodologies for conceptual design.

Keywords: Business Resources; Data Warehouse, Hybrid construction

Research on Learning Resources Personalized Recommendation Based on Knowledge Topic Ontology

Jianqiong Xiao

Computer Modelling & New Technologies 2014 18(12C) 1049-1055

At present, the connection of network course learning resources are generally formed man-made hyperlinks, which can't reflect inner semantic association of resources. How to set up dynamically and mine various semantic association among network courses resources, it is an important issue to realize network course learning resources associated evolution. Ontology of semantic web is introduced into building model of knowledge, Knowledge ontology is used as the basis of knowledge description and expression in construction of network course learning resources, to establish dynamically and mine semantic association among learning resources and domain curriculum knowledge. The research designed a network courses learning sources personalized recommendation system based on knowledge topic ontology by using the processing of personalized recommendation. Experiments show that the system can recommend dynamically suitable learning sources to learners, promote preferably construction of curriculum knowledge, to realize active recommendation of personalized learning resources recommendation service

Keywords: Knowledge Topic Ontology; Semantic Association; Personalized Recommendation; Learning Resources

Finite-time synchronization of unified chaotic system

Huang Yaolin, Jiang Zhuo, Xie Chengjun, Wang Shuangli, Zhao Jinyan

Computer Modelling & New Technologies 2014 18(12C) 1056-1060

This paper presents finite-time synchronization for the unified chaotic system. The master-slave system synchronization is achieved within a pre-specified convergence time. Based on the Lyapunov stability theory and the finite-time stability theory, the finite-time controller is derived to make the state of two unified chaotic systems synchronized within finite-time. At the same time, the state of the slave system exponentially synchronizes state of the master system. At last numerical simulations are presented to shows the effectiveness of theoretical analysis

Keywords: finite-time synchronization, Lyapunov stability theory, unified chaotic system, finite-time controller

The research on reasoning of tourism information and knowledge based on semantic Web

Liu Zhiqiang, Su Yila, Wang Fei, Li Huimin

Computer Modelling & New Technologies 2014 18(12C) 1061-1067

As a kind of modelling tool of describing knowledge framework based on semantics and knowledge, ontology provides a standardized description of concepts and lays a foundation for the sharing of knowledge. This paper constructs a tourist information knowledge base body via ontology tools, and meanwhile makes s series of reasoning based on the constructed knowledge base. Furthermore, one can manually construct inference rules to probe into the field of knowledge and complete the key objectives of the Semantic Web-"machine-understandable." For the uncertainty which cannot be described by descriptive logic, this paper recommends the introduction of Bayesian networks, which can not only easily construct conditional probability tables, but can conduct a rapid reasoning of probability and finally provides people with a reasonable travel plan.

Keywords: semantic web, ontology, tourism, reasoning

Computational model based on the reputation incentive and punishment mechanism in P2P environments

Hua Sun, Jiong Yu, Zhenyu Zhang, Hong Jiang

Computer Modelling & New Technologies 2014 18(12C) 1068-1073

Rating reputation of the peers is a key problem in P2P environments, a computational reputation model based on incentive and punishment mechanism is proposed. This model considers both direct and indirect transactions with target peers before their next transactions. The mechanism puts different weights to get the value of reputation, and the model incents the good behaviours and punishes the bad ones through adjustment factor. Through experiment, the model can hold back malicious peers and ensure higher success transaction rate.

Keywords: P2P, reputation, incentive, punishment

Research on customer requirements driven scheme decisionmaking of product service system

Sheng Zhongqi,Wang Yazi, Zhang Shujian

Computer Modelling & New Technologies 2014 18(12C) 1074-1082

Product service system development aims at making manufacturing enterprises adapt to globalized market development trend, and provide overall solutions to meet personalized customer requirements. Conceptual design process of product service system development is very complicated and time-consuming. As the key process of conceptual design, scheme decision-making directly affects the efficiency and success rate of product service system development. According to the classification result of customer requirements, this paper establishes the indicator system of scheme decision-making of CNC machine tools product service system. For the quantitative indicators, entropy weight method is used to determine its objective weight, AHP method is used to determine its subjective weight, and combined weight method is used to determine the comprehensive weight. For the qualitative indicators, fuzzy AHP is used to determine the weights. Finally, this paper uses improved TOPSIS method based on fuzzy Kano model to carry out schemes sorting for CNC machine tools product service system. Taking ETC series horizontal CNC machine tools as an example, the proposed method is verified.

Keywords: product service system, scheme decision-making, customer requirements, improved TOPSIS, CNC machine tools

Application of improved analytic hierarchy process in SME's competitiveness evaluation

Wang Xianwu

Computer Modelling & New Technologies 2014 18(12C) 1083-1088

With small and medium-sized enterprises (SMEs) becoming a significant engine for regional economic development, it is extremely important to evaluate SME's competitiveness in an appropriate way. So far, many scholars have explored theories and introduced practice on this, yet the theoretical system of the evaluation of SME's competitiveness in China still needs perfection. Therefore, this paper tries to establish an evaluation model of SME's competitiveness in China based on their features and former theories. Also, it proposes an improved analytic hierarchy process (IAHP) with consideration of expert weight applicable to the evaluation. After brought into test, the process can well apply to the evaluation of the competitiveness of SMEs in China..

Keywords: SMEs; competitiveness evaluation; improved analytic hierarchy process (IAHP); evaluation model

Complex mechanism scheme design based on knowledge extension reuse model

Wang Tichun, Chen Xiaoyi, Zhong Shisheng, Zhang Yongjian
Computer Modelling & New Technologies 2014 18(12C) 1089-1094

Due to the multi-hierarchy, multi-attribute and creativity exist in the structure configuration process of the large-scale complex product scheme design; a reuse model for scheme design knowledge based on extension theory is presented here. The basic-element in model can unified describe the design information with the combination way on both qualitative and quantitative, the retrieval and matching of basic-element are realized by retrieval algorithm based on distance, the best reuse objects are obtained to applied to new scheme design. Finally, an illustration verifies this proposed model.

Keywords: Knowledge Extension Reuse, Scheme Design, Extension Theory, Artificial Design

Improvement of bidding procurement model of engineering materials based on analytical hierarchy process and Delphi method

Youzhen Wang
Computer Modelling & New Technologies 2014 18(12C) 1095-1100

The bidding procurement of engineering materials aims at selecting cost-effective materials and better suppliers in a fair, just, and open way but the current material bidding procurement model is very unreasonable. This paper will analyse the current bidding procurement model, point out its unreasonableness, and offer suggestions for improvement based on Analytical Hierarchy Process and Delphi method.

Keywords: Engineering Materials bid ; Procurement model; Analytical Hierarchy Process ;Delphi method

The research on agricultural products logistics efficiency in China based on DEA-Malmquist model

Zhong Sheng
Computer Modelling & New Technologies 2014 18(12C) 1101-1106

Low efficiency has been the bottleneck that is hindering agricultural products logistics to play the role in improving economic and social development. But relevant research achievements are not many. This paper studies agricultural products logistics efficiency from 2008 to 2011 in China based on DEA and Malmquist index and finds that during later period of study, the total factor productivity of agricultural products logistics industry in the whole nation, east region, central region and west region was in a growing trend, mainly due to technological advance. During later period of study, technical efficiency of national agricultural products logistics was basically at a standstill. Among it, pure technical efficiency did not develop, but scale efficiency kept growing. From the perspective of regions, technical efficiency in east region showed downward trend and the development of pure technical efficiency and scale efficiency kept a standstill. In central region, technical efficiency and scale efficiency both fell, except that pure technical efficiency rebounded during the last period of study. The pure efficiency and scale efficiency in west region both developed, which accelerated the improvement of technical efficiency of this region from 2008 to 2011. Scale efficiency was the major influencing factor on the increase in logistics technical efficiency.

Keywords: Agricultural products logistics; efficiency; DEA; Malmquist index;

A Compositional regression model based on fuzzy weighted evaluation method

Gong Mengqi, Cheng S
Computer Modelling & New Technologies 2014 18(12C) 1107-1112

This paper adopts 6 indexes from regression model evaluation criterion, regards the membership grade of the optimal index set of the given equation distance as the weight, linearly weights the corresponding equation and establishes the compositional regression model with the fuzzy evaluation method. The practical applicat i on indicates this method gets better fitting and predicting effect compared with the traditional regression model and it is a relative and perfect optimization method.

Keywords: fuzzy weight; membership grade; compositional regression model

SME technical efficiency and scale revenue calculation methods and selection of indicators

Chuanli Wei
Computer Modelling & New Technologies 2014 18(12C) 1113-1116

In the SME technical efficiency and scale gains calculation method, we give estimates of technical efficiency and scale gains SMEs theoretical approaches and models, discuss the DEA method in research methodology and modelling methods. Model can be used to evaluate whether the decision-making unit for both technical efficiency and scale gains effective and to determine the scale of decision making unit gain position. Model can only technical efficiency of decision making units makes evaluations. If organically combined use of these two models, comprehensive analysis, we can get more valuable information. And further clarified the decision making units with DEA method to evaluate technical efficiency and scale gains steps. Also given the choice of indicators and access methods, a clear DEA model is mainly selected input and output indicators.

Keywords: SME technical efficiency index system returns to scale

College students jump performance prediction based on NGA-BP neural network and the computer

simulation

Dan Dou, Suqiong Feng

Computer Modelling & New Technologies 2014 18(12C) 1117-1123

In recent years, with the aggravation of the schoolwork burden, the physical quality of the student is declining. In order to encourage the college students to exercise, the State Council promulgated the "National Physical Training Standards". In this standard, the long jump is a very important physical test project. Using the computer technology to predict the long jump performance can make the targeted training effectively for the long jump performance. In the traditional prediction methods, BP neural network is a very common method. However, in the traditional BP neural network, there exist some questions about the weight and parameter setting. In order to overcome the questions, in this paper, we propose NGA-BP neural network based on k-mean clustering. Then, we use this algorithm to predict the long jump performance for the college students with the computer simulation. The finial computer simulation shows that the method has good results.

Keywords: Jump performance prediction; BP neural network; K-mean clustering; Computer simulation

Reflections on quantitative analysis of sustainable ecotourism development based on Butler model

Chao Wang

Computer Modelling & New Technologies 2014 18(12C) 1124-1130

This paper uses the Butler Model to give a quantitative description of the sustainable ecotourism development. It is supposed that the ecological system is stable under the best condition. The increase in the number of tourist has presented the following features: limited, rapid and constant. The number of tourist will not exceed the environmental capacity K. The rising velocity r, the number of tourist N and the rising number of tourist per unit time dN/dt present a symmetric relation. There is a linear relationship between r, N, dN/dt and t. According to the theory of Butler, we can obtain the formula for the prediction and the assessment of the sustainable ecotourism development. This paper takes the Bird Island of Qinghai Lake as an example to account for the Butler Model and conduct the quantitative analysis.

Keywords: Ecotourism; sustainable development; Butler Model; quantitative analysis

College students' cultivation evaluation index system and grey performance measurement mode

Li Liang, Guo Tao

Computer Modelling & New Technologies 2014 18(12C) 1131-1137

The performance evaluation of the quality of higher schools' talents cultivation is an effective way of measuring higher schools' abilities of cultivating high talents. It also works efficiently for measuring higher schools' adaptabilities and abilities to serve the society. The process of evaluating performance of higher schools' talent cultivation is complicated and affected by many factors. With analyses of the factors that can affect the quality of higher schools' talents cultivation, a talents cultivation evaluation index system is established. With a metric analytical investigation of relevant evaluation criteria of the index system, and based on the grey system theory, a grey performance measurement model of higher schools' talents cultivation is proposed. The grey relevancy of the performance evaluation of higher schools' talents cultivation is obtained by considering weights of different evaluations. Then higher schools' abilities and qualities of cultivating talents can be evaluated and analysed based on the grey relevancy. Lastly, the model and algorithm are analysed and verified through specific application cases: it is proven that the model and algorithm are operable and functional

Keywords: Higher school; talents cultivation; performance evaluation; grey system; model)

A novel KMV-based commercial bank credit risk assessment model

Chen Xian Sheng

Computer Modelling & New Technologies 2014 18(12C) 1138-1143

Commercial banks has great risks. Commercial banks credit risk evaluation, as an effective way of financial regulation, is an integral part of banking regulation system. Given that scholars applied the same credit risk evaluation method to all kinds of banks, error are unavoidable. This paper targets at Z BANK, a commercial bank in China and designs a suitable credit risk evaluation model to evaluate its customer credit and debt credit. This paper draws KMV method when calculating the possibility of default PD. With some adjustments, this method can be applied to other commercial banks, providing an effective approach to financial regulation in China.

Keywords: commercial banks; credit risk; evaluation model; possibility of default

An information content model of teachers' teaching ability improvement in higher school based on information axiom

Yuhong Zhang, Quixiang Shi, Xiaofang Hao

Computer Modelling & New Technologies 2014 18(12C) 1144-1150

One way to ensure the teaching quality of institutes of higher learning is by improving university teachers' teaching ability is an important approach to. This paper proposes an information content model of teachers' teaching ability improvement based on

information axiom. Accurate and reliable, this paper analyses factors than influence the teaching ability and constructs an evaluation indicator system by Analytical Hierarchy Process. It works out the calculation model of information content targeting at different indicators with the help of fuzzy theory and information axiom. After weight is taken into account, it acquires the comprehensive information content model and measures teachers' teaching ability. Case study proves that the model and the algorithm are effective.

Keywords: Higher education; teaching ability improvement; information content; information axiom; evaluation model

A competitiveness model of production-teaching-research cooperation mode for enterprises and universities based on fuzzy ideal domain

Fengan Wen

Computer Modelling & New Technologies 2014 18(12C) 1151-1157

This paper proposes an improved competitiveness model of production-teaching-research cooperation mode for enterprises and universities based on fuzzy ideal domain to enhance the overall quality as well as the competitiveness of high-tech talents in universities and enterprises. Through the analysis of the cooperation mode and after standardization of indicators, we are able to get the comprehensive fuzzy correlation between evaluation object and fuzzy ideal domain based on fuzzy correlation calculation model. As a result, we can get the competitiveness of production-teaching-research cooperation mode. Empirical study shows that the algorithm and the model are effective.

Keywords: Universities; production-teaching-research cooperation mode; fuzzy ideal domain; multiple attribute evaluation; competitiveness model

Return policy and contract design under asymmetric return rate information

Yang Jun, Li Taotao, Shao Lulu

Computer Modelling & New Technologies 2014 18(12C) 1158-1163

In this paper, we mainly discuss how a manufacturer should provide return service with different market-return rates when offers a partial refund. We consider a supply chain model that a dominant manufacturer supplying a single product to a retailer under the revenue sharing contract, in a single-period. The market demand is assumed to be dependent on the return price offering by manufacturer. We first analyse the model with the full information about market-return rate, which shows that manufacturer can determine the optimal return price according to the consumer's sensitivity of return price and the market-return rate. However, when the retailer has more private information about market-return rate, manufacturer can screen out the private information of the retailer through the contract menus in the terms of return price and revenue sharing ratio.

Keywords: revenue sharing contract, *market-return rate*, *return price*, *contract menu.*

Does biomass energy development affect the price fluctuation of international agricultural products?

Cheng S, Yang Y

Computer Modelling & New Technologies 2014 18(12C) 1164-1169

The price fluctuation of international agricultural products, especially the continuous rising of that, slows down the global economic recovery. In case that measures to control the price of food are not taken in each country, food crisis like the one happened in 2007- 2008 would burst out more and more frequently. Based on the related studies, this paper found by building an econometric model that: 1. the uppermost factor that affecting the price fluctuation of the international agricultural products is the change in structure of supply and demand in the global leading market of agricultural products which is caused by the development of the biomass energy; 2. the domestic economic changes in United States do not affect the price fluctuation of the international agricultural products.

Keywords: Price of international agricultural products; Fluctuation; Biomass energy

Smart city evaluation using non-equilibrium statistical mechanics method

Zaohong Zhou

Computer Modelling & New Technologies 2014 18(12C) 1170-1175

In recent years, with the rapid development of network information technology, such as IoT, cloud computing, big data and so on, smart city presents a development trend of networking, distributed, intelligence and systemization. Because smart city system is a dynamic, complex, distributed, uncertainty and heterogeneity system, in which sub-element has large influence on each other in the respective field. More research should be done to smart city, especially in the development evaluation. In this paper, we firstly define and put forward the physical model of complex smart city system which includes smart people, smart economy, smart mobility, smart environment, smart living, smart governance,. Then, a non-linear information dynamics mode for integrated smart city evaluation is introduced based on the maximum flux principle during the modeling process. The integrated evaluation frameworks of smart city can be done by giving reasonable weights of each influence factors to stabilize the system. Finally, using empirical analysis method, we obtain the ideal results to prove the correctness and efficacy of the evaluation model.

Keywords: smart city, non-equilibrium statistical mechanics, development evaluation

Emergency logistics vehicle scheduling based on improved differential evolution

Shan Yazhou, Wu Kaijun, Wu Yuechun

Computer Modelling & New Technologies 2014 18(12C) 1176-1180

Emergency logistics vehicle scheduling is an issue of NP combination which possesses important practical value. In order to overcome the problems such as long computing time and easy to fall into local optimal solution for traditional heuristic optimization algorithm, an improved differential evolution is proposed. In the algorithm, a greedy algorithm is used to generate the initial population, legalized method is used to repair mutation and improved order crossover is used, then, a new selection mechanism is added in after the mutation operator. In the paper, the algorithm is used to solve emergency logistics vehicle scheduling problem, the mathematic mode which minimize total cost with the emergency time constraint is established and the solution algorithm is developed. The simulation results of example indicate that the algorithm can efficiently solve emergency logistics vehicle scheduling problem through the comparison of GA and the DE algorithm.

Keywords: emergency logistics vehicle scheduling; differential evolution; NP combination problem; greedy algorithm

An evaluation model of teaching quality of universities based on multi-index fuzzy decision analysis method

Guo Tao, Jia Qi Jian

Computer Modelling & New Technologies 2014 18(12C) 1181-1186

Teaching quality of universities is affected and restricted by many types of factors, thus evaluation of teaching quality of universities is of great importance to enhance teaching quality and ability. For this reason, this paper studies teaching quality of universities and proposes an evaluation model based on multi-index fuzzy decision analysis method. By analysing many factors that can affect the improvement of teaching quality of universities, an evaluation model of teaching quality with hierarchical structure is established and different types of evaluation indexes in this evaluation index system are normalized. On the basis of the Fuzzy system theory, Fuzzy memberships of relevant evaluation indexes are constructed, after which weights of these indexes are gained based on the entropy weight. And then a multi-index Fuzzy decision analysis matrix and related Fuzzy correlation degrees of universities' teaching quality are generated. Therefore the level of teaching quality of universities is obtained. The paper also attempts to test the effectiveness of the proposed model and algorithm via specific case studies.

Keywords: teaching quality; higher school; multi-index decision analysis; fuzzy system theory; evaluation model

Dynamic coverage optimization for wsn based on ant colony algorithm

Tao Yang, Zeyu Sun, Yong Zhang

Computer Modelling & New Technologies 2014 18(12C) 1187-1194

In order to better meet the coverage requirements, is presented based on Ant Colony Algorithm for solving the covering problem in geometry, mapping algorithm between the node and the target, effectively cover the use of mobile nodes in the part area coverage model, including process is through the node energy consumption nodes moving strategy to identify the network coverage, coverage hole process to eliminate or not completely covered, so as to realize the multiple coverage. The experimental results show that, the algorithm can not only use the minimum node to complete the effective coverage area of local, and through mobile strategy and scheduling nodes to balance the energy consumption of all nodes, prolong the network life cycle.

Keywords: Wireless Sensor Network (WSN); Coverage Rate; Sensor Nodes; Ant Colony Algorithms; Relational Model

Chaos control within finite time of the chaotic financial system based on CLF theory

Yuling Wang, Fengshan Si,Yunling Luo, Xia Qing

Computer Modelling & New Technologies 2014 18(12C) 1195-1198

In this paper, we deal with the finite-time chaos control in the chaotic financial system. The control law are proposed to drive chaos to equilibria within finite time based on the control Lyapunov function (CLF) theory. Numerical simulations are provided to show the effectiveness of the proposed controller.

Keywords: Finite-time control, Control Lyapunov function, chaotic financial system

An optimization calculation method of transformer operating cost

Yuxiang Liao, Zhiyong Li, Jingyu Xie, Yu Liang, Xue Li

Computer Modelling & New Technologies 2014 18(12C) 1199-1203

In this paper, based on the theory of life cycle cost (LCC), the LCC of transformer was analyzed, and the life cycle cost calculation model of transformer was established. For calculating the cost of transformer loss, in order to make the final calculation results more accurate, the correction coefficient of electricity price is considered to improve the calculation model. Then, in order to reduce the loss of the transformer operation and save cost, the load rate of transformer is combined with

efficiency to get the optimal load rate, so as to calculate the operating loss of transformer. Finally, these two improvement scheme were proved through the calculation and contrast analysis of examples.

Keywords: power transformer; life cycle cost; correction coefficient of electricity price; optimal load rate

Research on the food safety supply chain security information resources sharing platform based on multi-agent

Liu Kefei

Computer Modelling & New Technologies 2014 18(12C) 1204-1210

In recent years, the consumers and the food regulators pay more and more attention to the food security works due to the frequent food security problems. Because the food supply chain security information resources sharing platform can prevent the food security problem on the source, it is concerned by the producers, consumers and the food regulatory. In this paper, we propose the food safety supply chain security information resources sharing platform which is based on the multi-agent. And we expound the functions of each agent module. In this platform, the managers, producers and consumers can interact the information effectively. Finally, we analyse the functions of this platform.

Keywords: Food Safety Supply Chain,Multi-Agent, Security Information Resources Sharing Platform)

The research for effect of aspects extraction of Chinese commodity comments on supervised learning methods

Zhao Yan, Dong Suyu, Yang Hua, Yang Jing

Computer Modelling & New Technologies 2014 18(12C) 1211-1218

With the advent of Web 2.0, there are more and more websites for shopping. These websites often allow customers make comments of the commodity which they have purchased. Therefore, three is an increasing number of online reviews. More importantly, these reviews contain a mass of sentiment. The sentiment is meaningful for merchants and customers. This paper focuses on the extraction of aspects of online review of products. We will use Supervised Learning methods to extract aspects of online review of products. Through the experiment of this paper, we found that Machine Learning can be used for aspects extraction of Chinese online review of products. Using ME and presence character representation can achieve 85.6% accuracy.

Keywords: Aspects extraction; Product reviews; Machine Learning

A multilevel fuzzy analysis model of higher education teaching quality

Xiaofang Hao, Yuhong Zhang, Guolin Li

Computer Modelling & New Technologies 2014 18(12C) 1219-1225

To improve the overall quality of teachers and enhance the teaching ability as well as the teaching quality of institutes of higher learning for the purpose of nurturing high-tech talents, this paper proposes a multilevel fuzzy analysis model of higher education teaching quality based on fuzzy system theory. It constructs a multilevel evaluation system and acquires the fuzzy evaluation set of teaching quality and fuzzy value of a quantity. Through calculation we can get the fuzzy membership between teaching quality and fuzzy evaluation set. Fuzzy membership is applied to standardization according to different types and scales of indicators to get the integrated weighted fuzzy membership. This will realize the evaluation on teaching quality of institutes of higher learning and helps to increase the overall quality of teachers. A case study is introduced to prove the efficacy of the model and the algorithm.

Keywords: higher education; teaching quality; fuzzy analysis; multiple attribute decision making; evaluation model

Applied research on data mining platform for weather forecast based on cloud storage

Song Haiyan, Li Leixiao, Fan Yuhong

Computer Modelling & New Technologies 2014 18(12C) 1226-1230

This paper analyses the weather data mining, cloud storage and Hadoop framework. A cloud storage platform model of weather data mining is constructed based on Hadoop framework. With this platform two major accomplishments are made: 1)a data model is designed for weather data Mining; 2)a Weather Forecast System is set up through experiment design, data set gathering and prediction algorithm compute. The experimental results showed that this platform is expandable, maintainable, and manages the massive meteorological data with high efficiency

Keywords: (Mass Data Cloud Storage Hadoop Platform Model Weather Forecast)

Research on performance evaluation in logistics service supply chain based unascertained measure

Suo Juanjuan, Li Yancang, Dong Huimin

Computer Modelling & New Technologies 2014 18(12C) 1231-1236

The comprehensive model on performance evaluation of logistics service supply chain was established based on unascertained measure. On the basic of considering the factors influencing logistics service supply chain, the comprehensive evaluation index

system were determined from four aspects, which includes logistics service capacity, logistics service quality, collaborative development ability and social influence. In view of different influencing factors of logistics service supply chain, the index weight was calculated through entropy weight coefficient method. Then, the grade division was finished by credible degree recognition criterion. Finally, the comprehensive evaluation model was used in engineering example. The test result through the application practice showed that the model proposed can carry on reasonably and effectively comprehensive assessment for the performance evaluation of logistics service supply chain.

Keywords: logistics service supply chain, unascertained measure, credible degree recognition, evaluation

Correlation between coordination cost and spatial distribution of enterprises

Wu Jian, Wu Guangdong, Li Mi

Computer Modelling & New Technologies 2014 18(12C) 1237-1242

It introduces the coordination cost to NEG model to analyze the impact of coordination cost on the spatial dispersion of enterprises. By solving the model and numeral simulation it finds that the enterprises' agglomeration in central place declines when the coordination cost reduce. As long as the coordination cost keeps a constant relates to diversity of worker's wage and product's substitution elasticity, the spatial distribution of enterprises will not be affected by trade freedom.

Keywords: coordination cost, trade freedom, enterprises' distribution

An approach of detecting structure emergence of regional complex network of entrepreneurs: simulation experiment of college student start-ups

Shen Yan, Wu Bao

Computer Modelling & New Technologies 2014 18(12C) 1243-1248

The article explores structure emergence of regional complex network of entrepreneurs, by proposing an integrated detection framework of community structure and its evolution based on social capital theory and complex network approach. Simulation of network dynamics, detection of community structure and tracing of network structure changes are integrated to investigate structure emergence and its link with entrepreneurs' social capital. And the article gives an experimental case about the emergence of stable network structure among a group of college student start-ups. Simulation result using the framework proposed by the article fits with actual network evolution traced in tracing program. The framework is effective and useful in explaining structure emergence of regional complex network of entrepreneurs.

Keywords: network structure; network dynamics; clique percolation; community detection; social capital

Characterization of drawing movement as schooling advances in primary school

Sun Zengwu, Lin Qiushi, Luo Jianfei, Ren Tingting, Wu Zhongcheng

Computer Modelling & New Technologies 2014 18(12C) 1249-1253

This study was to investigate the development characteristics of several parameters as schooling advances in primary school using computerized movement analyses.Sixty children without handwriting deficits were selected from a Chinese primary school, and they were asked to perform drawing tasks on a digital tablet for kinematic data collecting. In this study four drawing tasks were used: horizontal strokes, vertical strokes, squares and circles. We investigated a series of kinematic parameters such as velocity, acceleration and drawing force, to exam how these parameters change as schooling proceeds. The mean velocity and mean acceleration increase across the grade in all drawing tasks. The mean force of x-axis decreases only in vertical strokes and circles, while the mean force of z-axis decreases across the grade in horizontal strokes and squares. However, there was no significant correlation between grade and the force of y-axis in all tests.The digital tablet is an effective tool to determine the development of hand movement skills of children. This dynamical analysis technique can be used to study the underlying pathology of fine motor disorders.

Keywords: drawing movements, kinematic analysis, digital tablet, children.

A simulation approach to model cascading bankruptcy of interdependent business network

Wu Bao, Li Mingzhu, Ding Zihang

Computer Modelling & New Technologies 2014 18(12C) 1254-1258

The article proposed a simulation technique which illustrates the cascading process of financial failure through interdependent business network. Based on theoretical modelling of inter-firm risk propagation, network dynamics of risk contagion was integrated into the simulation model proposed by the article. And the simulation approach was applied to two realistic cases with quite different Network Paradigms. Simulation results showed the method suggested by the article is effective.

Keywords: simulation; risk contagion; cascading bankruptcy

A novel overlapping community mining algorithm for micro-blog platform

Zhaoyin Zhang

Computer Modelling & New Technologies 2014 18(12C) 1259-1268

This paper concentrates on the problem of overlapping community mining for micro-blog platform, which is an important problem in social network mining. Firstly, we convert of overlapping community mining to a weighted graph computation problem, in which nodes represent users and vertex denotes the relationship between users. Secondly, we introduce the concept of user influence to solve the problem of overlapping community mining, which is a main innovation point in this paper. To calculate the user influence in the micro-blog platform, two types of micro-blog information are utilized (that is, user properties and micro-blog properties), and then the analytic hierarchy process is used to calculate the weight of each influencing factor. Furthermore, user properties contain user ID, user type, attention number, number of fans, number of micro-blog, number of mentions and so on. On the other hand, micro-blog attributes contain micro-blog number, publishing date and time, forwarding number, comment number and so on. Thirdly, a weighted network based overlapping community mining algorithm is proposed, in which the original overlapping communities are discovered in advance, and then final results are obtained by expanding the original ones. Finally, to testify the effectiveness of the proposed, experiments are conducted on several datasets and compared with other related works. Experimental results demonstrate that the proposed algorithm can detect overlapping communities in micro-blog platform with high accuracy, and our algorithm is suitable to be modified to run in the parallel mode, hence, the large-scale overlapping communities can also be solved by this proposed algorithm.

Keywords: Overlapping community, Micro-blog platform, weighted graph, User influence, Membership degree

Disaster evaluation of debris flow based on hierarchical architecture

Jianhua Zhao

Computer Modelling & New Technologies 2014 18(12C) 1269-1275

The natural factors affecting the occurrence and development of debris flow are discussed in this paper. Some mathematical schemes to evaluate the disaster of debris flow are also studied, to establish an indicator system for existing debris flow disasters. We individually establish a disaster evaluation indicator system from three aspects including point, line and area, to evaluate the disaster of debris flow, and to determine the parameters for relative indictors in disaster evaluations. Meanwhile, quantity scoring method and analytic hierarchy process are adopted to perform consistency test on its results. So a more accurate evaluation of the degree of risk for some specific section or area can be acquired. It is verified to provide scientific direction of the construction of highway and disaster prevention.

Keywords: debris flow; factors; AHP; fuzzy comprehensive evaluation

Multi-objective optimization of dynamic load balance on smart grid based on economic dispatch

Xin Li, Tian Liang

Computer Modelling & New Technologies 2014 18(12C) 1276-1283

In this paper, hybrid electric vehicles and renewable energy resources are combined to consider as optimization objective to reduce the remission of greenhouse gas. Electric vehicles can provide assistance to the power grid abbreviated as V2G, which changes single interests of power suppliers under the traditional economic operation mode. The intermittence of renewable energy generation and random charging behaviour of electric vehicles owners needs stronger power grid regulation ability. In this paper, we design a dynamic economic dispatch model for smart grid, which contains the plug-in hybrid electric vehicles and renewable energy power resource. By minimizing of power generation costs including V2G service cost, the lowest charging cost of PHEV owners, least air pollution, and maximizing synthetic load ratio, the model contains four optimization objectives. To solve the multi-objective problem, NSGA-II as a popular method to deal with multi-objectives optimizations is employed. Under the premise of keeping up with the demand of power, dynamically adjust the charging/discharging time and power of plug-in hybrid electric vehicles to match the fluctuations of loads and renewable energy generation. In simulations, we applied this model and methods on a 10-generatingunit system. The simulation results show the rationality and validity of the proposed model.

Keywords: lowest generation costs of power; smart grid; dynamic economic dispatch; multi-objective optimization.

Optimistic and pessimistic decision making based on interval-valued intuitionistic fuzzy soft sets

Wen Xue, Xiao Zhi

Computer Modelling & New Technologies 2014 18(12C) 1284-1290

This study explores the application of using the interval-valued intuitionistic fuzzy soft sets (IVIFSS) approach to the multi-criteria group decision making problem. Firstly, we define the concept of the IVIFSS value vector, including the IVIFSS weighted averaging, the optimistic IVIFSS value and the pessimism IVIFSS value. Then, some of their desirable properties are investigated in detail. Furthermore, we prove that the decision makers, as the parameter sets, and their IVIFSS value vector, as mapping rule, may be consider as a new IVIFSS for all decision makers and the vector of this IVIFSS could be considered as the valuation of the alternatives that all the decision makers decide, whose score functions could be rank the alternatives. Finally, an approach to multicriteria group decision making based on IVIFSS is given and an illustrative example is employed to show the validity of this approach.

Keywords: Fuzzy Soft Sets; Interval-valued Intuitionistic Fuzzy Value; Interval-valued Intuitionistic fuzzy Soft Sets; Multi-criteria Group Decision Making

Regional tourism competitiveness evaluation method based on fuzzy analytic hierarchy process

Zhou Yan

Computer Modelling & New Technologies 2014 18(12C) 1291-1297

To promote the regional tourism competitiveness capability, regional tourism competitiveness should be evaluated objectively and accurately, and then provide useful suggestions to support government decision making. Therefore, in this paper, we focus on the problem of regional tourism competitiveness evaluation using fuzzy analytic hierarchy process. In order to enhance the performance of standard AHP, we exploit the fuzzy theory and then make the comparative judgments through trapezoid fuzzy numbers. Seven types of quantitative factors are used in our evaluation model, such as "Essential factors of tourism competitiveness", "Tourism enterprises competitiveness", "Tourism market competitiveness", "Tourism basic industry competitiveness", "Tourism Supporting industry competitiveness", "Government competitiveness", and "Others". Furthermore, trapezoid membership functions are defined for each quantitative factor, and then the level of the regional tourism competitiveness evaluation can be obtained by computing the highest membership utilizing the membership matrix. To demonstrate the effectiveness of our proposed, we collect related data from ten different regions of China using the Statistical yearbook to make dataset. Then, experiments are conducted to make performance evaluation compared with AHP and Fuzzy DEA. Experimental results testify that our proposed fuzzy AHP based method performs better than others.

Keywords: Regional tourism competitiveness, Fuzzy theory, Fuzzy analytic hierarchy process, Membership function, Judgment matrix

The analysis and evaluation method for small samples from the perspective of regression

Boya Yin, Chenyi Li

Computer Modelling & New Technologies 2014 18(12C) 1298-1301

It is well-known that regression analysis often suffers from the small sample problem while big data is a necessity to greatly improve the credibility of research. We propose an analysis and evaluation method to judge the quality of small samples accurately through taking full advantage of these representative data. To achieve it, regression analysis was adopted to describe and expand the small amount of data. Meanwhile, principal component analysis would be performed to give the comprehensive evaluation of the forwarded data. We demonstrate the method by taking micro alloying of adding aluminium and rare earth as an example to explain ◊data expansion and forwarding◊the feasibility and accuracy of this analysis system. It proceeds as follows: stepwise regression principal component analysis. The paper ends with recommendations that adding rare earth benefited the ensemble more to illustrate this analysis method can describe the general trend of data.

Keywords: polynomial interpolation, regression analysis, stepwise regression, positive data, principal component analysis

A survey on adaptation decision-making of business processes and the affected web service compositions

Lu Qinghua, Li Shanshan, Zhang Weishan

Computer Modelling & New Technologies 2014 18(12C) 1302-1308

When changes occur in the business processes and their implemented Web service compositions, the Web service compositions are required to be adapted at run-time to accommodate the changes. To guide development of new decision-making algorithms and corresponding frameworks for management of Web service compositions, there is a need to examine and classify problems involved in adaptation. In this paper, we studied the existing work in the area of adaptation of Web service compositions and performed a classification of problems in adaptation decision-making for business processes and their affected Web service compositions. We classify the adaptation decision-making problems using the 5WH question and propose six dimensions of classifications of problems in adaptation decision-making: causes of the adaptation (corresponding to "When"), goals of the adaptation (corresponding to "Why"), scope of the adaptation (corresponding to "Where"), adaptation decision-maker (corresponding to "Who"), planning of the adaptation (corresponding to "How"), and changes made by adaptation (corresponding to "What"). The classification identifies aspects that are not studied sufficiently in the past works and helps us explore the requirements for adaptation decision-making software. The study observes that autonomic business-driven decision-making is a promising research area, with many unsolved challenges and there is a gap on business-driven decision-making for concurrent adaptation of multiple Web service composition instances.

Keywords: Business-driven IT management; Runtime adaptation; Decision-making; Web service management; Business process management; Autonomic computing

An effective human resource management mode via analytic hierarchy process

Chen Chi, Zhang Zhongyi, Chen Li, Lv Yongbo

Computer Modelling & New Technologies 2014 18(12C) 1309-1314

With the rapid development of social economics, there are a large number of enterprises in China. However, the profitability of some enterprises is still not satisfied. The reasons lie in that human resource allocation and management ability of these enterprises should be improved. Therefore, in this paper, we focus on the problem of human resource management mode selection based on analytic hierarchy process. Functions of human resource management consist of basic work, routine work,

and strategic work. Afterwards, a three level index system of the human resource management problem is provided which can cover the above three functions. Then, we propose a novel human resource management mode selection approach based on analytic hierarchy process, which is a multicriteria decision-making calculating method via relative assessment and prioritization of alternatives. Finally, experiments are conducted using the data collected from listed companies. Experimental results show that the performance of the proposed method is quite close to the ground truth, and "Management rules", "Salary and welfare", and "Enterprise culture" are the most important factors in the proposed problem. Furthermore, we can find that 1) human resource management mode selection of a specific enterprise must be consistent with its business strategy, 2) enterprise culture and staff incentive mechanism are also have profound impact on modern enterprise development.

Keywords: Human resource management, Analytic hierarchy process, Index system, Comparison matrix of criteria

Mathematics teaching quality evaluation research based on harmony search BP neural network

Que Jianhua

Computer Modelling & New Technologies 2014 18(12C) 1315-1319

The focus of improving the quality of mathematics education is to improve the quality of teaching, so that teaching evaluation is the key to improve the teaching quality of education. BP algorithm is used to evaluate mathematics teaching quality, but it is easy to fall into local optimum and has low convergence speed. Harmony search is used to optimize weight and threshold of BP neural network. Then mathematics teaching quality evaluation based on improved BP neural network is proposed. The experiment results show that the improved BP neural network has faster convergence speed and is more precise than traditional BP neural network. It can evaluate teaching quality more scientifically and accurately.

Keywords: mathematics teaching quality evaluation; BP neural network; harmony search.

Regional large-scale science instruments configuration efficiency evaluation method based on multi-objective optimization and fuzzy decision-making model

Xiaojun Zhang

Computer Modelling & New Technologies 2014 18(12C) 1320-1327

This paper concentrates on the problem of regional large-scale science instruments configuration efficiency evaluation, which is a typical multi-objective optimization problem. As large-scale science instruments have not been utilized with high efficiency, it is of great importance to promote the efficiency of large-scale science instruments configuration. Firstly, the multi-objective particle swarm optimization model is proposed, in which three objectives are considered (such as Economic benefits, Utilization rate of equipment, and Social benefits). Exploiting the proposed multi-objective particle swarm optimization model, Pareto optimal solutions can be obtained. Secondly, a fuzzy decision-making model is provided to choose an optimal solution from the set of Pareto optimal solutions by implementing the intersection of all fuzzy criteria and the related constrains. Thirdly, to make performance evaluation, we collect the data from statistical yearbooks of ten provinces in China to construct dataset. Experimental results demonstrate that the proposed method can effectively evaluate regional large-scale science instruments configuration efficiency.

Keywords: Multi-objective optimization, Particle swarm optimization, Fuzzy decision-making model, Science instruments

Network intrusion detection model based on improved BP algorithm

Qun Luo, Zhen-dong Liu

Computer Modelling & New Technologies 2014 18(12C) 1328-1331

With the rapid development of network, the performance of intrusion detection system that ensures the security of network information has been paid more and more attention. In order to overcome the disadvantages of RBF neural network, a novel RBF scheme based on improved particle swarm optimization is proposed, which can overcome the disadvantage of premature convergence. The experiment result shows that the proposed algorithm has better detection rate and false positive rate than traditional algorithms based on RBF, and it can provide important reference for network intrusion detection system in practice.

Keywords: network intrusion detection; RBF neural network; particle swarm optimization

A logistics production-distribution scheme based on intelligent computing

Liu Xing, Liu Hai

Computer Modelling & New Technologies 2014 18(12C) 1332-1336

How to improve the overall level of the supply chain of the logistics industry has become the focus of enterprises and scholars. Firstly, production-distribution model is investigated, including the object function and constraint conditions. Then the optimized production-distribution scheme based on genetic harmony algorithm is proposed. At last, the experiment results show that the proposed scheme can solve the problem of the production-distribution and can achieve the goal of minimizing cost.

Keywords: logistics production-distribution; genetic algorithm; harmony algorithm, cost.