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Emerging Trend and Hot topics Researches in Modeling and Management Science

Abstract *The modeling and simulation technology has been an influential technology in the research of management science. The information technology and application has been more and more important in scientific research. In the following is to introduce some emerging trend and hot topics researches in modeling and management. The title and abstract are presenting here and the full paper can be tracked by Google scholar. These papers had been peer-reviewed by the scientific committee from an International Workshop on the Modeling and Management Science that was held in Zhengzhou University, during Dec. 9-11, 2011.*

Streszczenie. *W artykule przedstawiono zestaw artykułów opracowanych w uczelniach chińskich a dotyczący modelowania I symulacji oraz wykorzystania technik informacyjnych w zarządzaniu. (**Nowe kierunki i główne tematy badań nad modelowaniem oraz zarządzaniem**)*

Keywords: Hot topics, Modeling, Management Science
Słowa kluczowe: modelowanie, zarządzanie

Demand Response Resource Value Post-Evaluation Model Based on Fuzzy-Rough Sets

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With the market-oriented development of demand response projects, the implementation of demand response is playing an important role in the progress of smart grid construction in China. Considering the characteristics of demand response projects, a multi-level post-evaluation index system of resource value of demand response was constructed from five aspects: generation side, grid side, large customers, residents and society. Then, in order to make up for the deficiency of the traditional evaluation method in information processing, fuzzy rough sets theory was introduced to construct comprehensive evaluation model. At last, take a demand response project for example, the feasibility and effectiveness of proposed model was verified.

Keywords: demand response; resource value; post-evaluation; rough sets.

Generation Capacity Investment in China Based on Improved Portfolio Optimization Model Considering Wind Power Integrated into Grid

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With the strategic deployment of rapid development of clean energy resources and renewable resources in the twelfth five-year in China, the optimization of capacity investment is badly needed to address the disorderly development of domestic wind power. With the investment portfolio theory, the installed capacity of wind power is analyzed systematically, and a new investment portfolio optimization model is constructed considering wind power grid-connected. Through a numerical example, the best installed capacity of wind power and the best scale of investment are obtained.

Keywords: wind power integration; generation capacity; portfolio optimization.

The Prediction and Simulation of Electric Vehicles and Fuel Vehicles Based on System Dynamics

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People give more and more attention on electric vehicles because of their environmental characteristics. Therefore, to predict the prospects of its development is very necessary. Based on the theory of system dynamics, this article analyzes the relationship between electric vehicles and fuel vehicles in China. The system dynamics model of electric vehicles and fuel vehicles is established, and the factors, such as market maximum capacity, the competition coefficients of the two kinds of vehicles are taken into account to simulate their total amount of future. On this basis, benefits of power supply enterprises are estimated due to the development of electric vehicles, and the system simulation error is analyzed. The result shows that the prediction results can meet the accuracy requirements, what's more, the ownership of China's electric vehicles will be more than the fuel vehicles' and reach above 150 million in 40 yeas. Electric vehiclesdevelops well in the future.

Keywords: system dynamics; electric vehicles; fuel vehicles; simulation; prediction

A New Management Evaluation Indicator System of DSM Projects Considering the Whole Process

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In order to promote the development of DSM projects, it is necessary to establish a management evaluation indicator system considering whole process. This paper analyzes key factors of every stage of DSM projects combining with the whole process theory, and proposes a new evaluation indicator system of DSM projects management. Also we use fuzzy analytic hierarchy process which combines analytic hierarchy process and fuzzy comprehensive evaluation method to evaluate DSM projects management considering the whole process.

Keywords: DSM project; whole process; management evaluation; indicator System.

An Application of Fourier Transformation and Back-Propagation Neural Network for Brain-Computer Interface Cursor Control

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The purpose of this research is to design a real-time brain computer interface to find out some EEG characteristics through analyzing the messages from the brain waves. To these significant EEG characteristics, neural network learns and distinguishes them. Then, the brain wave can be used to control the cursor's one-way motion and becomes a useful tool to the disability. The research is trying to use two ways to search out the characteristic signals to control the

movement of cursor: image different colors and compare the status of imagination with the status of relaxation. The selected electrodes include frontal lobe (Fz, Cz, C3, C4) , arietal lobe (Pz, P3, P4), occipital lobe (O1, O2), and temporal lobe (T3, T4, T5, T6) in the brain. Collection of brain wave information through the Fast Fourier Transform will be done to observe their differences of energy. And then use the analysis of statistic to confirm the effects between these two ways. in the end, the way of imaging and relaxing, combining with the frequency bands of α and low-β, was used to control movement. After the training of neural network, their weight was tested on clinical experiments immediately. The correct classification rate of 75% has reached a preliminary practicability.

Keywords: Brain Computer Interface (BCI); Fourier Transform; Man-Machine-Environment; Back-propagation neural network

A hybrid evolutionary algorithm for environmental and economic dispatch of smart microgrid

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This paper presents an optimization algorithm to solve the environmental and economic dispatch of smart microgrid that includes wind, solar and micro-turbines using the mutative search scale chaos optimized fuzzy quantum genetic algorithm (MSSCOFQGA). The proposed method is able to determine the optimal solution quickly and accurately (i.e. to obtain the minimum cost for power generation in the shortest time) with two steps. The first step is to propose the wind and solar output model, and the environmental and economic dispatch (EED) model which is to minimize fuel cost and emission cost. The second step is to solve the EED problem with MSSCOFQGA. Simulations have been made on a IEEE-30 network test comparing the proposed algorithm with several other algorithms commonly used to solve optimization problems. The actual implementation result proves that the proposed algorithm is environmental, economic, fast and practical. It is quite valuable for further research.

Keywords: smart microgrid; environmental and economic dispatch; mutative search scale chaos optimized fuzzy quantum genetic algorithm

The Application of Cloud Computing Technologies to Construct an Efficient Load Balancing Learning Environment

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In recent years, the IT industry rushes sights on the business opportunity of cloud computing, regards cloud computing as the development trend of the industry in the next 10 years, and further continues to promote more related innovative applications. The service of cloud computing may seem to have endless development potential; however, the demand end is obviously less passionate when comparing with the positive attitude of the market supply end. Most of the past studies related to cloud computing mostly focused on technology application and safety risk, and rarely focused on the establishment of cloud system, software compatibility and performance. Therefore, the study focuses on employing App-V to establish a cloud system, and publishes this software to the learners through this system and observes whether there is a significant difference between the two different software implementation methods, system stabilities, resource consumption and learning effectiveness. The study result shows that employing App-V can indeed rapidly establish the service of cloud system, and the system stability and implementation effectiveness are both better than the native software implementation method.

Keywords: Cloud computing technologies; Load balancing environment; Application virtualization; Software as a service (SaaS)

Comparisons between the Hybrid Taguchi-Genetic Algorithm and Genetic Algorithm

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Hybrid Taguchi genetic algorithm can be used to solve the global continuous optimization problems. Aside from the global search capability of traditional genetic algorithm, it further combines Taguchi experimental method to explore the optimal feasibility of the offspring. Taguchi method is inserted between the crossover and mutation operations of the traditional genetic algorithm. Hybrid Taguchi genetic algorithm also seems to outperform the traditional genetic method in obtaining the optional or near optimal solutions because of its fast convergence ability and robustness.

Although the hybrid Taguchi genetic algorithm is more powerful than the traditional genetic one in the optimization of global continuous function, yet it still needs further investigation to conclude if it also offers better solution than the latter to the optimization of global discrete function.

Therefore, this study tries to compare the two algorithms in each individual's performance in the optimization of global discrete function. It aims to figure out whether the hybrid Taguchi genetic algorithm is better than traditional genetic algorithm or not.

Keywords: Hybrid Taguchi-Genetic algorithm; Genetic algorithm; Optimization problems

The Comparison of Entry Mode on Transnational Corporation in NIE

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The research on entry mode about transnational corporations, however, the literature on entry mode in developing countries is relatively few. Based on literature review, the paper takes BRIC countries as a research objective, and analyzes the different FDI entry mode adopted by BRIC countries, points out that M&A was a much more prevalent choice, summarizes the similarities and differences of entry mode choices in BRIC countries, and offers some suggestions and strategies for Chinese transnational corporation growth.

Keywords: BRIC; Foreign Direct Investment; Entry Mode

Using Data Mining Techniques to Explore the Relationship of Long-Latency Auditory Evoked Potentials P300 and IQ

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P300 is the most commonly employed endogenous ERPS to study cognitive activity in stimulus evoked potential, and it is widely applied in detecting patience with cognitive impairment, however, it is rare to see studies related to P300 changes for normal people. Therefore, the study divides the samples into "Lower IQ Performance", "Medium IQ Performance", and "Higher IQ Performance" according to Wechsler Adult Intelligence Quotient. The statistical method applies One-Way ANOVA to test whether the three groups have difference respectively in parietal point (F7, F3, Fz, F4, F8, T3, C3, Cz, C4, T4, T5, P3, Pz, P4, T6, O1, O2)'s P300 peak latency and amplitude, and then applies Scheffe's Post Hoc to identify groups that cause difference. In Data Mining, Classification and

Regression Trees (CART) decision tree is applied to identify the parietal point parameter and amplitude range that impact IQ level to be the model to classify normal people's IQ level.

The study result found that the P300 amplitude of Performance Intelligence Quotient (PIQ), Verbal Intelligence Quotient (VIQ), and Full Intelligence Quotient (FIQ) has reached a significant level in several parietal points, and the P300 amplitude of "Higher IQ Performance" and "Medium IQ Performance" is greater than the P300 amplitude of "Lower IQ Performance", and most of the parietal points that reached a significant level concentrated in posterior sites; however, the P300 peak latency has no significant difference. The IQ level classification model that CART decision tree build according to the P300 amplitude of each parietal point has more than 80% accuracy. The study also found that the P300 amplitude of normal people with different IQ levels is different, and the classification model identifies the factors that impact IQ level variation with a high accuracy rate.

Keywords: Event-Related Potentials (ERP); P300; Data Mining; Wechsler Adult Intelligent Scale Revised (WISC-R)

One Dynamic Filtering Method for GPS Based on Multi-Scale

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Aiming at the study of GPS dynamic filtering method, this paper firstly uses the method of multi-scale analysis: combining the "current" statistical model of automotive carrier with multi-scale signal transformation method which is based on statistical properties. Then, the normal Kalman filter algorithm is also used to establish the new algorithm of multi-scale data fusion for GPS dynamic filter. Finally, we achieve the optimal fusion estimated value of the target states based on global information at the finest scale. When using the above algorithm to study dynamic filter, we get the simulated results showing that the proposed algorithm can effectively increase the estimated precision of target states compared with the conventional KF.

Keywords: GPS dynamic position; multi-scale estimation; dynamic filtering method; wavelet transformation

Research for Relationship between Motivation of Word-of-mouth and Effect of Advertising on the Web

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This paper aims at studying relationship between motivation of word-of-mouth and advertising effect on the web（research material:Siemens scanner advertisement on the web http://www.sohu.com/）.After factor analysis,nine factors are abstracted.After regression analysis,model is established as follows:Y=0.224×(emotion share) +0.250×(community development) +0.117×(service improvement) +0.222×(information rewards) +0.165×(punish/support businessman).

Keywords: Word-of-mouth; Motivation; Advertising Effects; Web

Research on enhancement mechanism of core competitiveness of construction enterprises based on corporate culture

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The corporate cultureis the softcore competitiveness for the enterprises. It is a necessary way to cultivate and enhance thecore competitiveness of construction enterprisesthroughcorporate culture construction for the developmentofan enterprise. According to the analysis on the characteristics of construction corporate culture, the paper discusses the relationships between construction corporate culture and its core competitiveness, proposes the mechanism model to enhance the core competitiveness of construction enterprises.

Keywords: Corporate culture, Construction enterprises, Core competitiveness, Enhancement mechanism

Does CEO Compensation Stimulate Firm Performan-ce effectively in China?

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Incentive is an effective way to stimulate the management to improve firm performance. And many firms have done it. The paper has analyzed the performance flexibility of CEO compensation with the sample of listed companies in recent yearsin China. The result suggests there is flexibility between CEO compensation and firm performance to some extent, but it is lower. And there is no significant relation between the flexibility and future performance. These results suggest the incentive effect of CEO compensation is not significant in China and the paper also analyses the possible reason.

Keywords: CEO compensation; Incentive effect; Compensation and performance flexibility

Construction on "Four Degrees" Theory of Channel Mix

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The classical theory of marketing channel considers that the channel mix has only two "degrees", that is, the "length" and "width". Few scholars once create other different concepts, at the same time, there are lack of clear definition and reasonable explanation, which can not be proved in reality effectively. In all, theory of channel mix filled with confusion, chaos and lack of authority and reasonable explanation, cannot effectively guide the practical enterprise channel operation, and lead directly to research, learners' confusion and bewilderment. Based on deep discussion and research, in reference to "Product Mix" theory, here think "two degrees" theory of traditional channel mix failed to fully describe enterprise channels in the actual condition, and had misgivings in specific definitions. However, practices of operating a large number of channels show that the channel mix should include four basic elements, namely, length, width, depth and correlation, referred to as "four degrees". Through examples of evidence and theoretical argument, this article amends "depth" and "width" misuse of language in classical theory, proposes the new concept of "correlation", constructs model of measuring "correlation", and discusses trends of channel decision. As a dowsing of the research field of marketing science, the "Four Degrees" theory of channel mix is an useful supplement for channel theory which makes it clear and perfect, it will help to promote the correlatively basic theory of marketing to develop further.

Key words: channel, length, depth, width, correlation

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Modification of Antheraea pernyi Silk with N-(2-Hydroxyl) Propyl-3-trimenthyl Ammonium Chitosan Chloride

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In order to improve the water-solublity of chitosan macromolecules, N-(2-hydroxyl) propyl-3-trimethyl

ammonium chitosan chloride (quaternary chitosan) was synthesized by the heterogeneous reaction between glycidyl-trimethyl-ammonium chloride and chitosan. The synthesized quaternary chitosan was then applied to Antheraeapernyi (A. pernyi) silk in the presence of 1, 2, 3, 4-butane tetracarboxylic acid with sodium hypophosphite as catalyst. The Scanning Electron Microscopy (SEM) technique was used to identify morphological changes on the silk fiber surface. The mechanical properties, wrinkle-resistant property, dyeing property and anti-bacterial property of A. pernyi silk before and after quaternary chitosan treatment were studied. It was found that the quaternary chitosan treatment contributed to enhance the mechanical properties including breaking strength, breaking elongation, initial modulus and rupture work of A. pernyi silk filaments. In addition, the wrinkle-recovery angles, dye uptake and K/S values with two acidic dyes of Lanaset Blue 2R and Acid Red B, and bacterial reduction against Staphylococcus aureus（S. Aureus） of the treated A. pernyi silk fabric increase greatly in comprison to that of the untreated ones.

Keywords: A. pernyisilk, quaternary ammonium salt of chitosan, wrinkle-resistant property, dyeing property, anti-bacterial property

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