ABSTRACT BOOK

ICIEM

The 14th International Conference on Industrial Engineering and Management

第十四届工业工程与管理国际会议

Online Conference

June 16-17, 2022

目录/Index

大会简介/ Introduction

旨在汇集领先的学术科学家、研究人员和研究学者，在工业工程和工业管理的各个方面交流和分享他们的经验和研究成果。它还为研究人员、从业人员和教育工作者提供了一个重要的跨学科平台，以展示和讨论工业工程和工业管理领域中最新的创新、趋势和关注点以及遇到的实际挑战和采用的解决方案。由维多利亚大学—伦敦主办，International Association of Management Science & Engineering Technology (IAMSET 艾慕赛特) 承办的“**第十四届工业工程与管理国际会议**”（The 14th International Conference on Industrial Engineering and Management，简称 ICIEM2022）拟定于 2022 年 6 月 16 日-17 日召开互联网线上会议。

本次大会的议题分别为：

议题 1：工业互联网

议题 2：自动化和控制系统

议题 3：工程，电气和电子

议题 4：工程：环境

议题 5：工程：制造

议题 6：运筹学和管理学

议题 7：物流工程

议题 8：信息系统

议题 9：工效学/人因工程学……

本次会议广泛诚邀国内外高校、科研机构的知名专家、企业界人士及其他相关领域人员参会交流，提供一个扩大业内影响、提高学术认同、促进学术成果转化及科研交流的合作平台。

In order to bring together leading academic scientists, researchers and research scholars all around the world to exchange and share their experience and research results on all aspects of Industrial Engineering and Industrial Management.

It also aim to provide a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Industrial Engineering and Industrial Management, **The 14th International Conference on Industrial Engineering and Management(ICIEM2022)**, which is organized by University of Victoria - London, co-organized by International Association of Management Science & Engineering Technology (IAMSET), will be held on the Internet during June 16-17, 2022.

The highlights are shown as follows:

Topic 1: Internet Industry

Topic 2: Automation & Control Systems

Topic 3: Engineering, Electrical & Electronic

Topic 4: Engineering, Environmental
Topic 5: Engineering, Manufacturing
Topic 6: Operations Research & Management Science
Topic 7: Logistics Engineering
Topic 8: Information Systems
Topic 9: Human Factor
…

ICIEM2022 aims to provide a cooperative platform for researchers, practitioners and educators to exchange and share their research results and frontier technology about Biomass Resources with academic scientists, researchers, engineers, academicians as well as industrial professionals from all over the world.

组织机构 Organization

- **主办单位**
- 维多利亚大学—伦敦
- **承办单位**
- 国际管理科学与工程技术协会

- **Host Organizer**
- University of Victoria – London
- **Co-organizer**
- International Association of Management Science & Engineering Technology (IAMSET 艾慕赛特)

- **在线会议入口**

点击链接入会，或添加至会议列表 https://meeting.tencent.com/dm/7wTeDmCjKGWc

会议主题：ICIEM 2022-6.16

会议时间：2022/06/1616:30-21:00 (GMT+08:00) 北京时间

#腾讯会议：815-280-209

会议密码：121100

复制该信息，打开手机腾讯会议即可参与

- **Online conference website entrance**

Please download the VoovMeeting application here and sign up an account.

https://voovmeeting.com/download-center.html?from=1001

Meeting Topic: ICIEM 2022-6.16

Conference Time：2022/06/16 09:30-14:00 (GMT+01:00) London Time

Conference ID: 815-280-209

Password: 121100

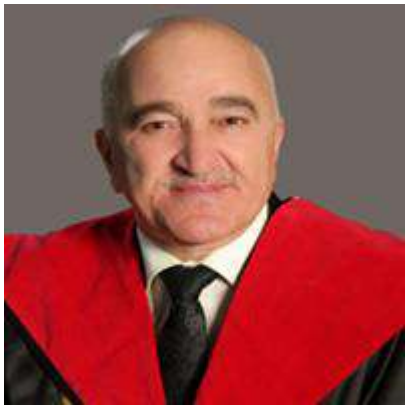
- **荣誉会议主席 Honorary Chairman**

Dr. Wisam Alshaikhli

University of Victoria - London

Dr. Wisam Alshaikhli is the president of University of Victoria - London, he is also the president of International Federation of Sports Science, he is the director of the Academy of Scientific Research & Training in Britain, he is the Secretary General of Arab Academy of Physical Education and Sport Sciences, member of scientific committees & International scientific (More than 38 Scientific journal), member of the International Federation of Sports Medicine, member of British and European Federation in Sport Medicine, he have attended more than 200 International conferences and scientific workshops, 60 international lectures research in sports medicine and sport injuries, he have more than 300 honor certificates from different countries, he have published more than 120 research papers and 3 books/sports medicine and injuries.

- **会议主席 Chairman**



Dr. Rami Al-Hadeethi

University of Victoria - London

An international, award winning Professor of Industrial Technology & Operations Management whose solid understanding of business administration in an engineering context, passion for learning, and consultative leadership style are the driving forces behind a progressively successful 29+ year career. Enjoys inspiring students across the EMEA to achieve their full academic and personal potential. Founder of academic departments, colleges and programmes, and participant in worldwide conferences. Dr. Rami holds PhD and MSc both degrees from well-recognised UK universities and he is the coordinator of Innovative Projects in the field of education, The Oxford Academic Union, Oxford, UK and Industrial Engineering Thematic Leader, Education Society Chapter, IEEE United Kingdom and Ireland Section. He is an Internationally-recognised consultant with a unique prospective on mixing engineering knowledge and administrative abilities in the design, delivery of worldwide training courses and his scientific research efforts have resulted in the publication of 59 papers and three books. Dr. Rami is certified in instruction and e-learning systems and has taught online courses, supervised and examined online individual, group projects and postgraduate theses, and media appearance and interviewed by TV channels.

国际期刊 International Journals

ICIEM 组委会鼓励作者通过提交摘要或全文参加会议。会议接收工业工程与工业管理相关的各领域的高质量研究论文。

会议与知名出版商的国际认证期刊合作，会议参与者有机会在这些期刊上提交他们的完整论文进行在线发表。所有投稿都要进行双盲同行评议，投稿结果将取决于同行评审意见。

建议与会者在决定合适的期刊之前，先阅读期刊的范围和目的。会议遵循普遍接受的出版道德规范。

您所选择的期刊的投稿指南和作者说明将在会后通过电子邮件单独提供。

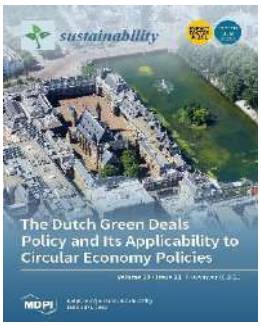
包含但不限于以下期刊：

The ICIEM organizing committee encourages authors to participate in the conference by submitting abstracts or full papers. The conference accepts high quality research papers in all fields related to Industrial Engineering and Industrial Management. We are working with internationally accredited journals from renowned publishers and conference participants are provided with the opportunity to submit their full papers for online (closed access) publication in these journals. All supporting journals are subjecting submissions to the double-blind peer-review process. The decision on publication will depend on the peer-review process. Participants are advised to read the journal's scope and aim before deciding the suitable journal. We follow universally accepted ethics on publication. **Guides on submission and author instructions of your preferred journal will be provided separately via an email after the conference.**

Journals include but are not limited to:

Sustainable Development

WILEY
IF: 6.159



Sustainability

MDPI
IF: 3.251

Production and Operations Management

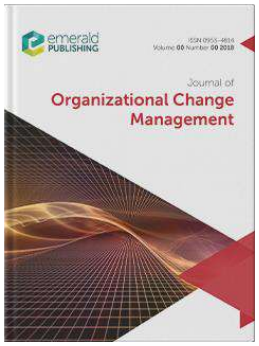
WILEY
IF: 4.965

Journal of Organizational Change Management

Emerald Publishing
IF: 2.293

Science and Public Policy

Oxford University Press
IF: 2.725



Operations Research Letters

Elsevier
IF: 1.154

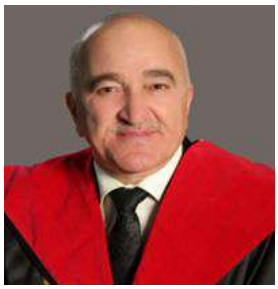
Journal of Environmental Planning and Management

Springer
IF: 2.735

Asia Pacific Business Review

Taylor & Francis
IF: 2.361

主讲嘉宾 Keynote Speaker



Rami Al-Hadeethi, Professor

PhD in Industrial Technology & Operations Management

The coordinator of Innovative Projects in the field of education, The Oxford Academic Union, Oxford, UK and Industrial Engineering Thematic Leader, Education Society Chapter, IEEE United Kingdom and Ireland Section.

His scientific research efforts have resulted in the publication of 59 papers and three books.

Website:https://www.researchgate.net/profile/Rami-Al-Hadeethi

Zhihan Lv Distinguished Professor

Qingdao university

Editor-in-Chief of Internet of Things and Cyber-Physical Systems(KeAi). an Associate Editor of 22 journals including ACM Transactions on Multimedia Computing, Communications, and Applications, IEEE Transactions on Intelligent Transportation System, etc.

Leading Guest Editors for 40 special issues including 9 IEEE. Co-Chair or TPC of 50 conferences including ACM MM 2021, ACM IUI 2015-2022.

Website: http://dsse.qdu.edu.cn/info/1089/2039.htm

Ahmad Khasawneh, Professor, President

Hashemite University of Jordan, Irbid National University

President Irbid National University.

Professor of Information Systems at the Hashemite University of Jordan.

Dr. Khasawneh holds B.Sc., M.Sc. in Computer Engineering and Automatic Control and Ph.D. in Information Systems Science.

Yining Liu Professor

Guilin University of Electronic Science and technology

He is currently a professor in the School of Computer and Information Security of Guilin University of Electronic Science and Technology. A member of IEEE, Chinese Computer Society, Chinese Cryptologic Society, China Privacy Protection Professional Committee, and Guangxi Information Security Society.

Website: https://www.guet.edu.cn/people2/1170085.html

Zhangping Song Professor

Xi'an University of architecture and technology

Head of Shaanxi tunnel and underground engineering new technology innovation team； Deputy director of Shaanxi Key Laboratory of geotechnical and underground space engineering； Institute of tunnel and underground structure engineering, Presided over more than 100 vertical and horizontal scientific research projects such as the "12th Five Year Plan" National Science and technology support plan project, the national fund general project, "Western Transportation Project", the Ministry of housing and urban rural development science and technology research project. Won 15 awards for scientific research achievements and 2 national construction methods.

Website: https://civil.xauat.edu.cn/info/1065/1243.htm

Tao Zhang Associate Professor

China Agricultural University

An associate professor at the College of Resources and Environment, China Agricultural University, China.

A Member of the Water Treatment and Reuse Committee of the Chinese Society of Environmental Sciences and a member of the Circular Economy Committee of the Chinese Society of Environmental Sciences.

Website:http://zihuan.cau.edu.cn/art/2016/11/29/art_24900_486693.html

口头报告 Oral Presentation

Liangcai Dong Associate Professor PhD

Shanghai Maritime University

The Director of the Department of Industrial Engineering of the School of Logistics Engineering

Lei Pang Associate Professor PhD

Yunnan Normal University

School of Economics and Management

Zhihao An

YanTai University
School of Economics and Management

Yechen Cui Lecturer
Henan University of Economics and Law

Chunwei Shi

Associate professor

Liaoning Petrochem1ical University

会 议 信 息 Information

- **在线会议入口**

点击链接入会，或添加至会议列表 https://meeting.tencent.com/dm/7wTeDmCjKGWc

会议主题：ICIEM 2022-6.16

会议时间：2022/06/1616:30-21:00 (GMT+08:00) 北京时间

#腾讯会议：815-280-209

会议密码：121100

复制该信息，打开手机腾讯会议即可参与

- **Online conference website entrance**

Please download the VoovMeeting application here and sign up an account.

https://voovmeeting.com/download-center.html?from=1001

Meeting Topic: ICIEM 2022-6.16

Conference Time：2022/06/16 09:30-14:00 (GMT+01:00) London Time

Conference ID: 815-280-209

Password: 121100

- **会务联系方式 Contact**

Email: info@iciemconf.org; icieminfo@gmail.com

ICIEM Organizing Committee

- **温馨提示 Kindly Reminder**

各位参会人员

请发言代表注意自己的发言日期和时间，并提前作好准备。演讲时间 20-25 分钟。提问 5-10 分钟。为防止网络不顺畅，最好录制一份 20-25 分钟的演讲视频备用。

To all Chairs and Speakers

Notification

Duration of each Presentation:

Restricted speaking time: 20- 25 Minutes of Presentation. There will be a Q&A session about 5-10 minutes in the online conference ICIEM 2022.

In case the network is not very good, we would like that you may record a video of your presentation about 20-25 minutes.

会 议 日 程 Schedule

ICIEM 2022 SCHEDULE						
Date	**Project**	**London Time (UTC±1.00)**		**Beijing Time (UTC/GMT+8.00)**		**Schedule**
16-Jun-22	Opening Ceremonye	9:30-10:00	9:30-9:40	16:30-17:00	16:30-16:40	Host: Chunhui HUANG, Host: Menghao LI
			9:40-9:50		16:40-16:50	Dr. Wisam Alshaikhli
			9:50-10:00		16:50-17:00	Dr. Rami Al-Hadeethi
	Keynote Speech	10:00-12:10	10:00-10:30	17:00-19:10	17:00-17:30	Zhihan Lv
			10:30-10:50		17:30-17:50	Dr. Rami Al-Hadeethi
			10:50-11:10		17:50-18:10	Ahmad Khasawneh
			11:10-11:30		18:10-18:30	Yining Liu
			11:30-11:50		18:30-18:50	Zhangping Song (Xu Li)
			11:50-12:10		18:50-19:10	Tao Zhang
	MEAL TIME		12:10-12:30		19:10-19:30	participant
	Oral Presentation	12:30-13:50	12:30-12:50	19:30-20:50	19:30-19:50	Liangcai Dong
			12:50-13:00		19:50-20:00	Lei Pang
			13:00-13:15		20:00-20:15	Zhihao An
			13:15-13:35		20:15-20:35	Yechen Cui
			13:35-13:50		20:35-20:50	Chunwei Shi
	Disscusion		13:50--		20:50--	participant
17-Jun-22	Gratitude					

Schedule	TITLE
Host: Chunhui HUANG, Host: Menghao LI	ICIEM Opening introduction
Dr. Wisam Alshaikhli	Speech from Conference Honorary Chairman
Dr. Rami Al-Hadeethi	Speech from Conference Chairman
Zhihan Lv	Virtual Reality
Dr. Rami Al-Hadeethi	Qualifying Industrial Engineering (IE) Graduates for Industry 5.0 Jobs
Ahmad Khasawneh	Air quality monitoring system based on IOT
Yining Liu	GAN-based Dummy Trajectory Generation Scheme
Zhangping Song	3D visualization platform for multi-information fusion of open-pit mines
Tao Zhang	Thermal conversion and modified biochar / hydrochar sorption to enhance phosphorus recovery from swine manure wastewater: microscopic and spectroscopic investigations
Liangcai Dong	Multi-AGV path planning problem in container yard based on 3D A* algorithm
Lei Pang	Has the two-way direct investment promoted the transformation of the industries from old to new drivers? -- Empirical evidence from Chinese data
Zhihao An	Analysis of the degree of integration between manufacturing and productive service industries in China
Yechen Cui	The research on agricultural eco- efficiency in Xinjiang
Chunwei Shi	Ultrasonic desulfurization of amphiphilic magnetic-Janus nanosheets in oil-water mixture system

THEME 1

Internet Industry

ID: IEM2003

Research on Ultrasonic Ranging Signal Filtering Algorithm based on Two-step Correlation Method

Z.B. Wang

Abstract:

At present, a threshold value is set in ultrasonic ranging for filtering. This method is not suitable for remote ultrasonic measurement. This paper designs a filtering algorithm of ultrasonic ranging signal based on two-step correlation method. Firstly, the cross correlation function between transmitting signal envelope and echo signal envelope is used to modify the range of ultrasonic wave. Then, the transmission function of ultrasonic ranging spatial filter is studied to shorten the processing time of the algorithm. Finally, the projection function is designed to complete the filtering process. Experimental results show that the algorithm has strong anti-interference ability and the anti-interference performance is improved obviously.

Keywords: Ultrasonic ranging, Projection Functions, Filters

ID: IEM2004

Detection of Malicious Nodes at the Boundary of Computer Network - Based on Multivariate Classification Detection Method

W.S. Huang

Abstract:

Computer networks are often randomly deployed in locations without the underlying network infrastructure. When a computer node is exposed to a malicious attack environment, the node is vulnerable to unknown attacks, resulting in misalignment errors. Traditional node detection methods are difficult to operate safely without human involvement and have slow detection speeds. In this paper, a boundary malicious node detection method based on multivariate classification is proposed. First, the background and purpose of the study are introduced. The detection method has been studied. Experimental results show that the proposed method can quickly identify unknown attack problems and complete the detection of boundary malicious nodes through effective detection methods, which has the characteristics of fast speed and low false detection rate.

Keywords: Computer network, Malicious attacks, Network Environments, Multivariate Algorithms

ID: IEM2005

Block Center-Symmetric Local Binary Model and Weighted Principal Component Analysis Algorithm

Y.L. Li, G. Li

Abstract:

With the goal that the traditional correlation pattern recognition algorithm cannot accurately identify low-resolution images, an algorithm for detecting low-resolution image correlation patterns based on the local binary model of block center symmetry and the algorithm for weighted principal component analysis is proposed. First, the Block CS-LBP operator is used to extract features from low-resolution images. The weighted PCA operator is used to collapse the feature and the classification feature is retrieved. Second, the optimal classification class is selected from the nearest neighboring classifier, the detection rate is calculated, and the entire algorithm is analyzed. Finally, the experiment is carried out. The experimental results showed that the algorithm has a good detection effect on ORL and is robust against changes in light and weather.

Keywords: Optimal Classification, Low-Resolution Images; Recognition algorithm

ID: IEM2011

Equation Transformation based on Discriminant Algorithm of Polynomial Classification System

W.H. Li

Abstract:

Under the traveling-wave transformation, the power-law BBMP equation can be transformed into ordinary differential equations. This paper uses a polynomial complete discriminant classification system to classify all one-row wave solutions for the field. The solution is not available by any indirect method.

Keywords: Differential Equation, Polynomial, Equation Classification, Discriminant System

ID: IEM2026

Traffic Evaluation System Model - Based on DEA

G.J. Jiang, L. Liu* and H.D. Lv

Abstract:

In this paper, DEA is applied to the evaluation of transportation systems to improve the efficiency of transportation systems and avoid duplicate construction and unreasonable use of resources, using indicators such as fixed asset investment, route network scale, and equipment investment, as a way to establish evaluation systems and models adapted to different transportation systems and studies. This study makes up for the defects of traditional evaluation methods such as lack of basis for weighting and subjectivity, and outputs evaluation results more scientifically and accurately to achieve efficient allocation of system resources.

Keywords: Transportation system, DEA, Efficient allocation.

ID: IEM2035

A Study of Complex System Modeling Methods Using Hybrid Methods

X.P. Xu* and F. Wang

Abstract:

Complex systems branch across a wide range of domains from physical and technological systems to social and biological systems. As the first step in the analysis of any complex system, modeling is an important task in the field of scientific research. In recent years, both the theory and practice of complex systems modeling have received much attention. It is well known that system identification is a theory and method for building mathematical models of complex systems. Therefore, this paper proposes a class of identification methods for complex nonlinear systems. The core of the identification method is to use the system model composed of classical models to initially transform the system structure identification problem into a combinatorial optimization problem. Then, the artificial fish swarm optimization algorithm is used to achieve the identification of the system structure and parameters simultaneously. Finally, in the simulation, the simulation results show that the proposed scheme is feasible compared with other algorithms.

Keywords: Complex Systems, Modeling, System Identification, Classical Models, Intelligent Algorithms.

ID: IEM2057

The Empirical Research about the Degree of Urban Industry Integration: Taking Typical Chinese Cities as an Example

L. Su; J.J. Jia*

Abstract:

As the score issue of new urbanization, urban industry issues have received more and more attention from the government and academia. However, the fusion phenomenon of urban industry still exists during the development of China. This paper would analyze this issue from the "quality" point of development in terms of the urban industry integration. In the dissertation, capacity Measurement Indicator System of the urban industry integration is built and then the use of DEA method is improved so as to determine the index weight capacity, thus empowering the city's re-integration. The physics of the system coupling method are improved before the application to the measure of the urban industry integration. Finally, Shanghai, Beijing, Chengdu and Wuhan, the four representative samples are selected in the paper. With Shenzhen as a benchmark, the city produced an empirical analysis of the integration measure. Based on the result analysis, the deep-seated causes of no-fusion in the city are introduced and then concrete suggestions are proposed in this paper.

Key words: Urban industry confluence; improved DEA weighting method; improved coupling model

ID: IEM2092

Visualizing Exact Solutions to Two-Dimensional Problems by Machine Learning

L. Li

Abstract: Differential equations that contain multiple independent variables are called partial differential equations. The computation of partial differential equations has a wide application background, and many problems in scientific research and engineering can be represented in the form of mathematical models of partial differential equations. Except for a few special cases, the vast majority of partial differential equations are difficult to obtain exact solutions for. For most application workers, it takes a lot of effort to obtain numerical solutions using either the finite element method or the finite difference method. In the article, the exact solution procedure for high-speed two-dimensional problems is introduced through MATLAB programming. The data process and numerical results are also visualized. It provides a fast and practical intuitive method for application workers to use partial differential equations in two-dimensional space.

Keywords: partial differential equations, high-speed two-dimensional problems, data processing, machine learning.

ID: IEM2102

Econometric Model Construction and Empirical Study of Tax Exemption Policy - The Case of Hainan

C.D. Luo*

Abstract:

Based on Granger causality test, this paper analyzes the correlation between duty-free stores and tourism in Hainan, and the correlation between duty-free sales and GDP of China and Hainan Province. Accordingly, this paper develops an empirical model: the effect of offshore duty-free policy on Hainan tourism sales and the effect of duty-free quota increase on duty-free sales in Hainan Province. Thus, it analyzes the scale of the impact of offshore duty-free policy on Hainan's tourism economy in order to provide guidance for the government's economic decision on Hainan tourism.

Keywords: duty-free policy, duty-free goods, model, Hainan economy.

THEME 2

Engineering

ID: IEM2012

Selection of Herbicide-resistant Mutants in Wild Wheat

B. Yuan, X.M. Cao

Abstract:

To obtain herbicide-resistant germplasm in wild wheat lineages, Tove (Tolium.perenneL.), R123 (e.c elongata (Host) Nevski), Napoleon (Tolium.perenneL.), Y100 (Ae.OvataL.) were used on different doses of Dalabon MS medium, respectively. and Ae42 (Ae.Tauschii.) Mutant screening was performed. The callus treated by shuttle has stable Dalabon resistance. All five cultivars obtained resistant plants from resistant callus, increasing resistance by spraying Darapan. 0.195% resistant plants of wild capillaries (rachiaris (Trin) Nevski) were screened using Dalabon as seed-level screening material. is obtained. These results suggest that there are natural Dallapon-resistant mutants of a certain frequency in the wheat proximity.

Keywords: Antibody Plants, Mutant Screening, Dalabon Mutants

ID: IEM2020

Evaluation of Ecological Impact of Tourism Resource Development Based on Gray Model

C.Y. Wang

Abstract:

Tourism is one of the largest industries in the world, and has long played an important role in combating unemployment, promoting economic development and protecting the environment. Along with the rapid expansion, the environmental problems caused by tourism activities have become increasingly prominent. It has been realized that environmental problems emerge long before the regulation of policies and planning, and that the impact of tourism resource development on the ecological environment must be evaluated in order to solve resource and environmental problems. In this paper, we first screen and weight the evaluation factors, then quantify the evaluation indexes, and finally construct an evaluation model based on gray system, and focus on the comprehensive evaluation index system of the impact of tourism resource development on ecological environment. environment, and play a guiding role in the reasonable development of tourism resources.

Keywords: Environmental impact evaluation, Evaluation factors, Factor weights, Grey system comprehensive evaluation model.

ID: IEM2025

Application of Finite Element Software ANSYS to Optimize the Frame Design of 2ZB-1.8 Type of Barrier Planting Seeder

H.X. Chen, G.J. Jiang*, W.S. Yan, W.J. Yan and RandaBen M.

Abstract:

The 2ZB-1.8 type planting barrier seeder was designed in combination with the serious soil desertification and the difficulty of sand control in the northern agricultural and pastoral areas of China. The structure and dimensions of the frame were determined by combining the working width of the machine and the structural distribution of the components. The finite element software ANSYS was applied to analyze and optimize the frame statically. The results show that stability, stiffness and strength are better when the dimensions and frame material are 100mm×80mm×5mm and 45# square steel, respectively. The stress and strain of the machine after loading can only meet the working performance requirements.

Keywords: Seeder Frame, ANSYS, Optimized Design.

ID: IEM2040

Ecological Compensation of Songhuaba, Yunlong, and Qingshuihai Water Source Regions in Kunming

G.J. Zhang, W.J. Zeng *

Abstract:

As an important approach to improve eco-environment quality, coordinate conflicts between eco-environmental protection and social economic development, Ecological compensation has been widely applied into practices. Through questionnaire and symposium, this paper had surveyed current situation of local PES of Songhuaba, Yunlong, and Qingshuihai water source regions, and induced major influential factors of PES mechanism by causal analysis graph method. According to information of basic features, cognition discrepancy and environmental protection awareness of participants, this paper get a general picture of lower income and education background, and insufficient popularity of local policy, which has a large effect on residents' activeness in participating ecological protection activities and will increase difficulties in promoting their environmental protection awareness. Addition to that, problems such as morbidity of regulations and laws, lacking of smooth in department coordination, single mode of compensation, difficulties in measuring eco-values, and lacking effective management system have hindered local PES mechanism from sufficient implementation. Based on the analysis above, this paper promotes five mechanism suggestions: strengthen organizing and coordinating capacity, broaden funding channels, increase protection intensity, attach importance to protection propaganda and education, and conduct performance appraisal.

Keywords: Ecological compensation, Causal analysis graph method, Water Source Region, Kunming.

ID: IEM2042

Research on Optimization of the Tool Selection Based on Big Data

C.Y. Wang, W. Zhao*,

Abstract:

In the tool selection stage, in order to effectively use the production process data (PPD) to drive tool selection and improve the accuracy of tool selection, the tool selection process and optimization method based on big data are proposed. According to the mapping characteristics of PPD in the tool selection process, an intelligent tool selection model is established. On this basis, the key influencing factors are analyzed and calculated to explore the topological relationships between the data. Based on the cosine similarity algorithm, the optimization algorithm for tool selection is derived. The optimization algorithm outputs the importance value of tool selection by inputting PPD as the impact factor, which supports the user to select the tool. Using the intelligent tool selection model, a Java-based tool selection optimization system was developed. The system verifies the feasibility and effectiveness of the optimization method.

Keywords: tool selection, big data, optimization scheme, optimization algorithm, intelligent tool selection model

ID: IEM2045

Simulation and Adjustment of Environmental Economy System Based on SD Model

J.G. Tao

Abstract:

The environment is increasingly becoming an important factor restricting economic and social development. Environmental carrying capacity is an important indicator reflecting the relationship between resources and environment and economic and social development, and has become a hot spot in current research. Through the analysis of environmental economic systems, this paper establishes a system dynamics model and analyzes the dynamic changes of regional environmental carrying capacity. Taking Shaanxi Province as an example, taking the coordinated development of economic development and environmental protection as the goal, the policy combination is designed, and the dynamic time series analysis of the dynamic model of the environmental economic system in Shaanxi Province (2013-2025) is carried out to optimize the environmental carrying capacity of Shaanxi Province. Simulation results show that the model can dynamically simulate the bearing capacity of the real environment based on system dynamics. In the near future, Shaanxi Province can appropriately adjust the industrial structure and long-term economic growth, and on the basis of adjusting the industrial structure and economic growth, increase the intensity of environmental pollution control, improve the level of environmental science and technology, strengthen the capacity building of environmental management, and adopt comprehensive strategies and means to achieve coordinated economic and environmental development. The research results can provide a theoretical basis for the development planning of Shaanxi Province.

Keywords: Simulation and adjustment, Environmental carrying capacity, Coordinated development

ID: IEM2046

The Improved ANN Model and its Application in the Evaluation of the Efficiency of Industrial Integration: Taking Equipment Manufacture Industry and Producer Services as Example

L.Q. Qi, Y.Y. Cai and C.D. Wang *

Abstract:

This paper sets focus on the improved ANN model and its applications in the Evaluation of the Efficiency of Industrial Integration of equipment manufacture industry and producer services. Based on the traditional ANN models, this paper designs the improved ANN model as the research method which can make decisions independently according to their own knowledge without affecting by other modules. On this foundation, this paper makes an empirical study for evaluating the Evaluation of the Efficiency of Industrial Integration of equipment manufacture industry and producer services by using the ANN model, and the results show that: the ANN model can simulate the industry convergence practice effectively and provides the basis for the prediction and decision of related problems in industrial convergence field, the convergence efficiency of equipment manufacture industry and producer services is promoted by total assets for convergence, and the effects of industry convergence depends on the investment of convergence.

Keywords: Improved ANN Model; Industrial Convergence; Equipment Manufacture Industry; Producer Services

ID: IEM2053

Experimental and Numerical Studies on Small Scaled Soil Structure Model under Seismic Loads

Mohammed E.H. * J.X. Ma*

Abstract:

This paper aims to determine the appropriate scaling coefficient rigorously in the dynamic analysis of structure via small shaking table tests to represent the full real case with considering the soil-structure interaction problem. The real model consists of seven concrete moment resisting frames on silty clay soil. For this purpose, a small-scaled soil-structure model is executed with a scaled factor of 1:50 according to shaking table characteristics. Consequently, the scale steel skeleton of the structure was built to represent the real superstructure. In addition, three real and scaled earthquakes are applied for both real and scaled models, respectively. The first phase of this study is to simulate the accuracy of the small scaling coefficient between real and scaled results to represent the small scaling coefficient in dynamic analyses. The second phase studies the dynamic effects of structures considering soil-structure interaction compared with a fixed base. According to obtained experimental and numerical simulations, the small scaling factor of 1:50 can represent the seismic response of full construction conditions with acceptable precision. In addition, the flexible base assumption is proper to represent the seismic response structure in comparison with the fixed base. Consequently, the structure behavior is affected.

Keywords: shaking table tests, finite element analysis, soil-structure interaction, seismic response.

ID: IEM2059

Modeling of Safety Evaluation of Extra-large Pile-group Foundation in Deep Water

T.Xue*; M.X. Jiang ; P. Sun

Abstract:

In order to make a reasonable safety assessment for extra-large pile-group foundation in deep water during the period of construction and operation, based on the existing observations, the safety assessment is modeled by a combination of safety monitoring technology and mathematical methods. Based on the analysis of the content of safety monitoring, the research firstly we fused various sensors to a single target state estimation. Secondly, according to the national standards, industry standards and the existing research and practice experience, we analyzed and determined the set of safety evaluation factor, simultaneously constructed the membership function of each factor with different characteristics and establish the weight of each one. Thirdly, we evaluated result by optimal decision fusion. It comes out that this model can be a good judge method for safety of Extra-large pile-group foundation in deep water.

Keywords: Extra-large Pile-Group Foundation; safety evaluation factor

ID: IEM2075

Effects of Atmospheric Turbulence on Wireless Optical Communication Systems

J. P. Wu, L. Song*

Abstract:

With the development of information technology, free-space optical (FSO) communication has a wide range of applications in future communication networks. However, the performance of FSO communication can vary depending on the strength of atmospheric turbulence. The intensity scintillation effect caused by atmospheric turbulence can interfere with the intensity signal received by the receiver, which will lead to the interruption of FSO communication. The failure probability is an important performance indicator of wireless optical communication systems. In this paper, we analyze a communication system model based on direct detection of OOK modulation and obtain an expression for the outage probability analysis of wireless optical communication systems in strong turbulent channels based on moment generating function and inverse Laplace transform. The numerical simulation results prove the effectiveness of the above method. Also, the K-distribution illustrates the influence of channel parameters on the interruption probability in the strong turbulence model. In order to improve the performance of the outage probability, a combined diversity technique is selected to reduce the effect of atmospheric turbulence, and the corresponding proof is obtained.

Keywords: strong turbulence, failure probability, disruption probability

ID: IEM2085

Evaluation of Green Buildings Based on Various Residential Evaluation Methods

X. Zhang

Abstract:

Through the promulgation of documents in policy and practical application in some areas in practice, green buildings have attracted wide attention from all walks of life, but after all, green buildings are still in the initial stage, and in order to make the concept of green buildings deeply rooted in people's hearts, it is necessary to go further and finally promote green buildings into the substantial application stage, which requires standardized evaluation criteria. Therefore, this study adopts a multi-level evaluation method and a combination of qualitative and quantitative methods to evaluate green buildings. Based on the research of domestic and foreign residential evaluation methods such as the United Kingdom, the United States, transnational and Chinese eco-houses, the essence is learned and the defects are discarded to establish the green building evaluation under the ecological perspective. This study uses a multi-level evaluation method to evaluate the green performance of buildings, which can be better compared in terms of sustainable effectiveness and utilization of clean energy, etc., and facilitate promotion in a larger and even national scale to promote practical applications.

Keywords: green building, sustainability, evaluation method, clean energy.

THEME 3

Operations Research

&

Management Science

ID: IEM2002

Enterprise Massive Sensitive Information Management Algorithm Design -- Based on MMBST Linear Data Structure

B. Yang

Abstract

Due to the confidentiality principle of massive sensitive information, it is difficult to achieve efficient management. The traditional management algorithm has the problem of large error and long time consuming. This paper proposes an algorithm for managing massive sensitive information based on linear tree thinking. A MMBST linear data structure is designed. The MMBST divides sensitive information into information blocks of fixed size and establishes the corresponding information management line tree. Data is balanced by setting priority and sensitivity probabilities. Experimental results show that this algorithm has high precision and less time consuming, and can effectively manage sensitive information in enterprise resource sharing platform.

Keywords: linear data, data balancing, enterprise management

ID: IEM2013

Raw Material Inventory Optimization for MTO Enterprises under Price Fluctuations

G.H. Chen, Y. Zhao, B. Su,

Abstract:

The rapidly changing market environment will lead to changes in raw material prices, and many manufacturing enterprises are difficult to develop procurement strategies suitable for practical management. Therefore, the optimization of raw material inventory is an important research issue for MTO special manufacturing enterprises. Current literature studies assume that all product orders can be satisfied, or ignore the inconsistency in the actual situation of MTO enterprises. The method of introducing the customer order rate into the raw material inventory optimization model and arranging it within the specified range in accordance with the actual situation of MTO enterprises is the direction explored in this document. The raw material price change model of MTO enterprises, which takes the minimum total cost as the object, contains the constraint variable Q. The total fee consists of a fixed subscription fee, a purchase fee and a penalty shot fee. Then a rough algorithm GA is designed to analyze the approximate proportion and obtain the time complexity, where N is the number of raw materials. Finally, xi 'an Control Equipment Co., Ltd. is taken as an example to verify the effectiveness of the model and algorithm.

Keywords: Enterprise Optimization, Optimization Model, Raw Material Inventory and Price Fluctuations

ID: IEM2014

Risk Disaster Management Between Potential Accidents ZND Disasters in Coal Mines

H. Huang, Q.J. Wang, M.L. Wan

Abstract:

In order to find a valuable relationship between the control of the main disasters in the Z coal mine, the relationship between the potential accidents in the Z coal mine and the main disasters was studied. ICTCLAS (Chinese Lexical Analysis System) and The Paretto Rule analyzed 4641 potential accident data recorded in the past two years, extracted high-frequency keywords, and used relevant rule algorithms to mine relationships. Studies have shown that there is a certain relationship between some potential accidents and hazards, which can guide risk management and improve the level of prevention and control of potential accidents.

Keywords: Safety Management, Potential Accident, High-Frequency, Hazard, Relationship.

ID: IEM2015

Hybrid Optimization Model of Coal Supply Network in Low-Carbon Economy

B.S. Wu

Abstract:

Based on the analysis of the problems affecting the optimization of coal supply network, this paper establishes a hybrid optimization model of coal supply network in low-carbon economy. Carbon footprint and cost are measured using carbon sequestration and introduced into coal supply networks and optimization models, and hybrid optimization models are established to integrate the low-carbon economic dimensions with the smallest total cost. The model is used to calculate the instance and verify the effectiveness of the model. This study has decision-making application and reference value for building a coal supply network with low-carbon economy.

Keywords: Optimization Model, Hybrid Model, Coal Economy, Hybrid Optimization Model

ID: IEM2016

Optimal Management of Industrial Development in The Three Northeast Provinces of China: Based on Decoupling Model Analysis

L. Zhang, X. Zhang

Abstract:

Low-carbon industrial processes are different from province to province in China, and the industrial economic development and carbon emission separation quality are also different. To formulate more effective emission reduction policies, the paper analyzes the separation quality of the 3 provinces of the Northeast, including the primary industry, horizontally and vertically, using the separation model, separation value stability, separation quality and decoupling quality deviation formula. Industry; construction; transportation, warehousing, postal industry; Wholesale, retail, accommodation and catering. The results are as follows: There is a gap between the development of 5 industries in the 3 provinces of the northeast and the separation stability of carbon emissions. Compared to Heilongjiang Province, Liaoning and Jilin are relatively stable. Second, there is a difference in the quality of the industrial development of 5 of the 3 provinces in the Northeast and the separation of carbon emissions. The separation quality of Jilin Province and Liaoning Province is better than that of Heilongjiang Province. Third, there are differences in the process of low-carbonization of the 3 provinces in the Northeast. The low-carbonization process in Jilin Province and Liaoning Province is good, and the low-carbonization process is significantly different in other parts of Liaoning Province. Finally, it proposes measures for the development of low-carbon industries in Jilin Province and provides reference materials for the development of low-carbon industries in Jilin Province.

Keywords: Energy Conservation and Emission Reduction, Industrial Optimization, Low-Carbon Industry Development, Decoupling Quality Analysis

ID: IEM2018

How does the audit mechanism of online loan platform affect individual credit Risk

H.Z. Ma, X.R. Wang

Abstract

The management and prevention of credit risk in P2P net loans has become an important issue in China's Internet financial markets. Identify the factors influencing P2P credit risk from three perspectives: platform, borrower, and environment. Explanatory structural models are used to investigate the intrinsic relationships between these factors. The results of the study reveal that factors such as the auditing mechanism of P2P net lending platforms directly affect the credit risk of P2P net lending. Factors such as borrower morality, job stability, and policy environment also comprehensively affect the credit risk of P2P net lending.

Keywords: Online Loan Platform, Audit Wit, Credit Risk, Structural Model Analysis

ID: IEM2036

Construction of a dynamic model of government public welfare investment project-owner integrated management organization coordination

X. Chen*, Y.S. Liu

Abstract:

Owners of government public benefit investment projects need to establish an integrated management organization to achieve construction goals. Synergy refers to the elements generated by the coordination of subsystems in a large complex system beyond their own independent functions, which forms the unified function and joint role of the whole system. The synergy of the integrated management organization of the owner of a government public interest investment project can help the owner coordinate the relationship of the participants. The management organization can be integrated throughout the life cycle. System dynamics is the link between natural science and social science. The theory can help the owner to realize the synergy of the owner's integrated management organization. Optimal social benefits can be achieved. First, the construction unit, design unit, supervision unit and management/consulting unit are constructed through the owner's synergy effect model subsystem. Construct the coordination model of owner's integrated management organization. The dominant dynamics equation of the owner's integrated management organization is the basis of synergy analysis of government non-profit investment projects. The owner can establish an integrated management organization to ensure the smooth construction of the government nonprofit investment project. This template explains and demonstrates how to prepare a photo-ready paper for Trans Tech Publications. The best way to do this is to read these instructions and follow the outline of this paper.

Keywords: Government investment, Integration, Management organization, Dynamic model.

ID: IEM2023

Selection of The Best Coaches in Colleges and Universities Using A Comprehensive Evaluation of Multiple Analysis Methods

J.J. Zheng, Y.H. Fu, S. Liu, D. Foata and Q.D. Feng*

Abstract:

In this paper, we focus on the selection of college sports coaches in the twentieth century. First, we established a reasonable evaluation index system, taking basketball as an example, and in the study, nine evaluation indexes were selected, which were the number of years of coaching, the number of major competitions attended, and the percentage of competition wins. Due to too many indicators, it brings difficulties to construct a matrix for judgment. Therefore, through principal component analysis, we not only obtained fewer indicators that could almost explain the original indicators, but also obtained the corresponding weight coefficients. In addition, based on the results, we gave the evaluation scores of basketball coaches and then ranked them from top to bottom. The hierarchical analysis method and comprehensive evaluation method were combined to test the ranking results. Thereafter, the evaluation model was applied to soccer and field hockey fields in conjunction with reality to select the best coach.

Keywords: Evaluation Model, Principal Component Analysis, Hierarchical Analysis Method, Comprehensive Evaluation.

ID: IEM2027

C-Rank - A Core Algorithm for ASP-based Manufacturing Industry Chain Building Enterprise Search Engine

Q. Gao, W. Zhao *, X.J. Liu, and Lucian Maticiuc

Abstract:

This paper addresses the needs of manufacturing industry chain enterprises to explore and select partners, and proposes a solution to build a generic industry chain enterprise cooperation network based on ASP collaborative business platform. To solve the problem of finding suitable business and evaluating enterprise value, the company ranking algorithm of enterprise cloud network is derived by constructing the evaluation model of search engine weight of industrial chain enterprises based on the idea of PageRank algorithm. On this basis, the algorithm is finely controlled by using the influencing factors and some corrections are made to adapt to the actual situation of enterprise cooperation. Using corporate cooperation records as the data source, the cooperation network is constructed, and the conversion formula is determined by establishing fine-grained mapping relationships. The effectiveness of the algorithm is verified by examples.

Keywords: manufacturing industry chain, ASP, C-Rank, firm importance.

ID: IEM2029

Contagion Analysis Effect of Systemic Risk in Chinese Listed Banks-Based on Infection Matrix Paradigm Theory

Z.M. Dai*, Y.M. Li and Z.Y. Jiang

Abstract:

Effective measurement of systemic risk of banks plays an important role in financial market stability. The minimum differential entropy analysis and stress testing methods changed in this paper are used to precisely plan the metric of this problem by combining the innovative matrix theory paradigm with the rank and file paradigm to construct a systemic infection risk matrix paradigm theory. This study empirically analyzes all equity holders' related assets listed on SSE and their interbank movements and systemic risk profiles. The results show that there are differences in the scale of systemic risk and the impact of banks in the industry, so the establishment of a "bankruptcy-centered" financial institution exit mechanism is essentially a way to get rid of the habitual thinking of "the end of financial security". Therefore, the establishment of the "bankruptcy-centered" financial institution exit mechanism is essentially to get rid of the "end of financial security" habitual thinking, while effectively reducing and preventing systemic risks in the financial operation of the capital market and creating better conditions for deepening the reform of the banking system.

Keywords: Banking system, Systemic risk, Contagion effect, Equity holders

ID: IEM2031

The importance of studying the dynamic capabilities of real estate developers under structural innovation

H.K. Yuan

Abstract:

Although China's economy as a whole has entered a new phase of "slowing growth, industrial upgrading and structural adjustment", the dual structure of China's economy between urban and rural areas and the long-standing complex regional differences still exist objectively. Our society and enterprises will inevitably enter a phase of "change", or even a transitional period characterized by "rapid change". How can enterprises find "change", understand "change", make "change" and finally adapt to "change"? "These have a direct impact on the accumulated competitive advantages of enterprises and determine their market position in the competition. Therefore, highlighting the importance of dynamic capabilities and studying the content and working mechanism of dynamic capabilities are of great importance to the practice and theory of Chinese enterprises. This paper describes the literature theories such as the content and measurement related to dynamic capabilities, and further demonstrates with questionnaire responses from key Chinese real estate developers to study the content and working mechanism of dynamic capabilities in order to provide useful insights and references.

Keywords: Dynamic Capabilities; Structural Innovation; Economic Structure

ID: IEM2032

Modeling Complex Information Systems Based on Hierarchical Decision Theory

J.J. Zhang, K. Qiang

Abstract:

Based on the concept of hierarchy in systems science, the theory of going through three stages of intelligence, design and selection in decision making process led by decision makers proposed by Simon is selected as a management idea, and using multi-level terrain construction, this paper establishes a framework model of complex information management decision making, and the corresponding decision process and solution generation models. It is proved that the concept of hierarchy in systems science combined with multilevel terrain construction is applicable to the work of modeling decision making with complex information and provides support and assistance in modeling such situations.

Keywords: Decision Making, Complex Information Systems, Management Models, Hierarchical Decision Theory

ID: IEM2036

Construction of a Dynamic Model of Government Public Welfare Investment Project-owner Integrated Management Organization Coordination

X. Chen*, Y.S. Liu

Abstract:

Owners of government public benefit investment projects need to establish an integrated management organization to achieve construction goals. Synergy refers to the elements generated by the coordination of subsystems in a large complex system beyond their own independent functions, which forms the unified function and joint role of the whole system. The synergy of the integrated management organization of the owner of a government public interest investment project can help the owner coordinate the relationship of the participants. The management organization can be integrated throughout the life cycle. System dynamics is the link between natural science and social science. The theory can help the owner to realize the synergy of the owner's integrated management organization. Optimal social benefits can be achieved. First, the construction unit, design unit, supervision unit and management/consulting unit are constructed through the owner's synergy effect model subsystem. Construct the coordination model of owner's integrated management organization. The dominant dynamics equation of the owner's integrated management organization is the basis of synergy analysis of government non-profit investment projects. The owner can establish an integrated management organization to ensure the smooth construction of the government nonprofit investment project. This template explains and demonstrates how to prepare a photo-ready paper for Trans Tech Publications. The best way to do this is to read these instructions and follow the outline of this paper.

Keywords: Government investment, Integration, Management organization, Dynamic model.

ID: IEM2037

A Quantitative Risk Analysis Method for Information Security-Combining Fuzzy Synthesis Analysis with Information Entropy

Y.D. Cheng, J.D. He and F.G. Hu

Abstract:

Quantitative risk assessment method based on information entropy: Due to the lack of effective assessment method for the risk level of the whole information system. This study introduces information entropy into information security risk assessment. Firstly, the definition of riskiness, which is the likelihood estimate of the probability and impact of risk, is given to measure the riskiness of the whole information system. For the problem that the evaluation of the probability of occurrence and impact of risk is fuzzy, the fuzzy comprehensive evaluation method is used to evaluate the risk factors. For this method, the weight of each risk will be obtained by the entropy weight coefficient, thus avoiding the subjectivity of expert assignment. The fuzzy comprehensive evaluation is combined with information entropy to obtain the degree of risk and measure the degree of risk of the information system. In addition, some examples are given in this paper to demonstrate the application of this method.

Keywords: Risk Assessment, Quantitative Methods, Fuzzy

ID: IEM2039

A Study of Regional Industrial Transfer Behavior in China-Based on Evolutionary Game Theory

Y. Su

Abstract:

With the rapid development of China's economy, the behavior of regional industrial transfer is becoming more and more active. Unlike international industrial transfer, the main body of regional industrial transfer in China is government participation, not only enterprises. In this context, this paper explores the evolutionary mechanism of regional industrial transfer in the Chinese context based on sustainable development under industrial upgrading and transformation. The paper first extends the basic dynamic evolutionary game model of regional industrial transfer behavior and analyzes the evolutionary stabilization strategy, and then further develops the evolutionary game model considering government incentives. Numerical examples and simulations also provide evidence for the proposed theoretical results. The results show that the evolutionary stabilization strategy is influenced by the initial input cost, excess profit and profit distribution ratio. Moreover, the system evolves to different equilibria under different boundary conditions. It is also found that more effective government incentives can increase the probability of regional industrial transfer implementation.

Keywords: Evolutionary game, Regional industrial transfer, Finite rationality, Evolutionary stabilization strategy.

ID: IEM2041

The Cultivation of Autonomous Learning Ability of College Students in Tianjin from the Perspective of Habitus and Field

Y.B. Zhang, T.T. Ning, and T. Xue

Abstract:

The 21st century is an era of talent competition, which requires talents to have the awareness of independent innovation and the ability to innovate. Study by Bass, American educational psychologist, shows that before the 1960s, knowledge learned before university graduation can be used until retirement, but in the 21st century, this figure is reduced to 25%. That is to say，75% of knowledge and skills needed for a career after college students' graduation from university needs to be acquired from the big class of society. Availability of the knowledge and skills is closely related to a person's autonomous learning ability. Thus, to improve autonomous learning ability is an inevitable requirement for social development. To train college students' autonomous learning ability is an important content and task of teaching, also an important mean for colleges to improve effectiveness of teaching. Autonomous learning ability not only becomes one of overall qualities that college students should have in colleges and universities, but becomes an indispensable capability in their subsequent development in life after graduation. Thus, improving current undergraduate education model from the perspective of strengthening college students' autonomous learning ability can not only make up in insufficient ability training among today's college students in China's basic education system, but also facilitate upgrading of college students' individual autonomous learning ability, with a view on college students' good career development and overall quality upgrading of college graduates.

Keywords: College students, Autonomous learning ability , Subsequent development

ID: IEM2043

General Series Expansion Method by Selecting the Product of Power Function and Exponential Function as the Basis Function

W.H. Li*

Abstract:

By using general series expansion method ,this paper used the more complicated base function $\left\{(t- t_0)^m e^{- nt} \middle| m = 0,1,2,\mathrm{L}\ ; n = 1,2,\mathrm{L}\right\}$ to study the differential equation $V\phi(t) = 1- V^2(t)$, $V(0) = 0$. We could get a better result than the homotopy analysis method.

Keywords: General series expansion method, Basis function,

ID: IEM2044

Application of Cointegration Test Model on Economy Growth and Energy in Henan Province

Li HE

Abstract:

Taking the GDP, energy production and energy consumption data of Henan Province from 1978 to 2010 as a sample, this paper empirically studies the long-term interaction and short-term dynamics between GDP, energy production and energy consumption using the cointegration test, and the Granger causality test and ECM aim to reveal the correlation between economic growth and energy production and energy consumption.The test results indicate the long-term dynamic interaction between GDP growth and energy production、energy consumption. In addition, energy production and consumption are the Granger cause of GDP, and energy consumption is the Granger cause of energy consumption. In analysis of the tests, the dependence of GDP growth on energy supply was defined.

Keywords: Cointegration Test Model, Granger Causality, Energy Production,Energy Consumption

ID: IEM2048

Research on the Education Model of Electrical College Students Based on The Guidance System

Rong Yu

Abstract:

There is a problem of the current college students' entrepreneurial guidance system, which is not perfect and unscientific. However, how to design a reasonable system of entrepreneurial guidance is a difficult point in the research. The effective evaluation of the elements in the guidance system is one of the key difficulties in the research. The current director of professional electrical college students career guidance education system as the research object, the content of different parts in the system were design evaluation model. The design from the characteristics of director of professional electrical college students of entrepreneurship guidance system of College Students' creative ability is simplified as the quality of entrepreneurship, entrepreneurial quality and practical ability of enterprise. Fuzzy comprehensive evaluation method, creatively established a set of specialized in radio and television director professional college students entrepreneurship education system assessment mathematical model. In order to quantify the means of the Venture guidance system for comprehensive and accurate assessment, so as to establish a set of reasonable and effective guidance system for venture practice to provide theoretical reference.

Keywords: Mathematics model; Electrical college students; fuzzy assessment method; entrepreneurial guidance system

ID: IEM2050

An integrated approach for improving logistics systems: A case study on hospital logistics

Lina Al-Qatawneh[1], Dania Makahleh[2]

Abstract:

Purpose - The purpose of this paper is to provide an integrated approach to improve healthcare logistics.

Design/methodology/approach - The proposed methodology integrates the analysis of logistics decisions made at the three hierarchical levels with the problem analysis and improvement suggestions. These levels are strategic planning level, network design level and operational level. The proposed methodology suggests that information generated from analyzing the logistics hierarchical decisions should be kept in a specific database to be utilized in a structured way during the analysis and improvement of the logistics problems.

Findings - The paper presents the implementation of the proposed methodology at a Jordanian hospital. The identified problem was linked to several logistics decisions, including the definition of customer service, the extent of information technology used and the forecasts of demand magnitude. Following a thorough analysis of the problematic logistics decisions, alternative decisions were suggested to improve the current logistics system. The new decisions included suggesting how the customer service should be defined in relation to logistics, how information technology can be used to support demand forecasting methods and finally suggesting new techniques to forecast the demand.

Originality/Value – The proposed methodology provides a new structured problem-analysis and problem-solving processes for healthcare logistics. Given the increased interest among healthcare organizations to provide better services, the proposed methodology is expected to be a valuable management tool to improve the quality of patient care.

Keywords: hospital logistics, process improvement, hierarchical logistics decisions, strategic planning level, network design level, operational level

ID: IEM2052

Propose New Method to Solve Line balancing Bottleneck Problem in Single-Model Line

Maha A. H. A.

Abstract:

Bottleneck is one of the problems occur in line balancing when assigning works to workstations, and determining the required number of workstations is a critical issue for process managers to ensure optimum assignment of tasks to workstations. This paper proposes a method to solve line balancing problems when the actual required number of workstations exceeds the minimum theoretical number, and the standard time of the floating task (work center) exceeds the cycle time in single-model line. The floating task will represents a critical bottleneck activity in line. The proposed method depends on minimizing the standard time of critical bottleneck and non-critical activities by a minimum free floating time depends on the average of slack times of the non-critical activities. The proposed method increases the line efficiency from (77%) to (88%), and balance delay is minimized from (23%) to (12%).

Keywords: bottleneck; floating activity; free float time; line balancing

ID: IEM2054

A method for Estimating Water Level in Sedimentation Channel with Sluice gate

M. Shi, X. Luo, W.G. Luo*

Abstract:

In this study, based on previous studies on sedimentation, and related mathematical methods, considering from the three aspects of the water and sediment condition, the banked-up water level condition, and the sediment characteristic condition, we proposed a method for estimating water level in sedimentation channel with sluice gates, and the calculated results of it are in good agreement with the assumed results. It has high expansibility, which can be used to calculate the change of water level under other channel with sluice gates factors. In general, it can provide scientific theory and decision basis for channel with sluice gates dispatch of sedimentation channel with sluice gates in practical engineering.

Keywords: Channel with sluice gates; Water level estimated method; Banked-up water level; Water and sediment conditions; Sediment characteristic.

ID: IEM2055

Restudy of Expectation Hypothesis Based on Time-varying Term Premium

T.T. Wang*， C.H. Ma

Abstract: Since the expectations hypothesis was proposed, scholars have studied it extensively. We can see the important role of expectations hypothesis in finance. This paper also studies the expectation hypothesis (EH) on the term structure of interest rates. Our analysis is based on the time-varying term premium. Fully in line with classical EH's speculations, the slope of the yield curve and time-varying and random term premiums were found to help predict the evolution of bond yields. We use partial least squares to extract a single predictor from macroeconomic variables and use macroeconomic factors to predict the time-varying term premium. The findings provide evidence to support the time-varying term premium and expectation assumptions.

Key words: Expectation Hypothesis, Time-varying Term Premium, Partial Least Squares, Bond Return Forecasting, Bond Return Volatility.

ID: IEM2056

Research on Self Coordination Mechanism of Neighborhood Effect Based on Mutual Inductance Network

L. Wang*, Y.C. Ren

Abstract:

In a complex interaction network, collaborative behavior between individuals is the basis for ensuring the orderly operation of the network system. By establishing an automatic coordination mechanism between individuals, the complex collective bargaining process can be avoided and the efficient and orderly operation of complex networks can be achieved. In this study, MATLAB was used to simulate the model to verify the effect of self-coordination mechanism between individuals.

Keywords: interactive network; Individuals; MATLAB; Self-coordination mechanism

ID: IEM2058

The Moderating Role of CEO Tenure in the Relationship between CEO Discretion and EPPS

C.Z. Zhang*; G.L. Zhang

Abstract:

According to the latest research trend which argues that the effects of CEO discretion on executive pay-performance sensitivity (EPPS) are some "contingent effects" instead of the "fixed effects", the paper innovatively addresses the moderating role of CEO tenure in the relationship between CEO discretion and EPPS. For this purpose, based on the insights of game theory, the study creates a comprehensive theoretical algorithm model of EPPS with the introduction of two new critical variables, namely CEO discretion and CEO tenure into the classical principal-agent models of EPPS. By adopting the method of differential calculus, the model solution is calculated and further discussed. According to the model results, CEO tenure can moderate the relationship between CEO discretion and EPPS. To be specific, CEO discretion of the fresh CEOs is positively related to EPPS; while for the senior CEOs, CEO discretion is negatively related to EPPS. This finding is significant to reconcile the conflicting views on the relationship between CEO discretion and EPPS by proving the fresh CEOs' firm-serving motivations and the senior CEOs' self-serving motivations in R&D activities, which is helpful to promote the research progress on this topic. Implications of the conclusions, both theoretical and practical, are discussed in the end.

Keywords: CEO discretion; EPPS; CEO tenure; Comprehensive theoretical algorithm model

ID: IEM2061

Collaborative Evaluation of Industry-University-Research Institute Synergetic Innovation System Based on Knowledge Creation

Z.Z. Tu; X.Gu*

Abstract:

Industry-university-research institute (IUR) synergetic innovation (SI) has become the leading-edge innovation mode to promote significant knowledge and technological innovations in China. This article establishes an evaluation index system and evaluation model for system collaboration based on knowledge creation combining the innovation theory with a multi-level extension evaluation method. The index system divides the system synergy of IUR-SI into four subsystems including knowledge synergy capability, relationship synergy capability, innovation synergy capability and synergy performance. we verify the evaluation model taking IUR-SI system of a region in China as an example. The purpose of the paper is to systematically, scientifically describe and analyze various constituent elements of IUR-SI system, as well as various level indicators reflecting efficiency and effectiveness of the system, in order to find the key points of system operation, and enhance the level of collaborative development of scientific and technological innovation systems in China.

Keywords: Industry-University-Research Institute (IUR); Synergetic Innovation (SI); Scientific and technological innovation systems

ID: IEM2062

Innovation Strategy of Human Resources in Colleges and Universities in Post-massification Stage: Taking Anhui Province as an Example

Y.L. Zhao**;** Z. Tao *

Abstract:

This paper establishes a human resources evaluation index system for colleges and universities, and compares the human resources of universities in Anhui Province and Taiwan under the same economic level in the same year. Comprehensive evaluation of grey situation decision-making using a one-objective model. Through these analyses, we can conclude that Anhui province has made some progress in the construction of human resources in colleges and universities, but it still lags behind Taiwan. At present, higher education in Anhui Province is in the post-popularization stage, the number of students has increased rapidly, and the demand for the quantity and quality of teachers has expanded rapidly. In order to solve these problems, we have proposed an innovative strategy for human resource management in Anhui universities on the basis of drawing on Taiwan's advanced experience in the 1980s. It is hoped that through the research in this paper, it can provide suggestions for the continuous improvement of the human resource management level of colleges and universities in the Post-massification stage of higher education provinces.

Keywords: Innovation strategy, Human resources, Post-massification stage

ID: IEM2063

Research on the Hedging of European Indexed Stock Options

J.H. Guo

Abstract:

Different from general European option with fixed exercise price, this paper studies the hedging of European indexed stock options, whose exercise price is a variable varying with the market index. Firstly, using the expectation of the squared error between option's terminal value and hedging portfolio to measure market risk and under the constraint of self-financing, a quadratic hedging decision model is built; Then, based on the Principle of Dynamic Programming and backward recursion method, we acquired the optimal hedging positions' analytical expressions; Lastly, all hedging results with different option maturities and different position rebalancing frequencies show that there is dependent relationship between hedging positions and option's maturity time limit; hedging positions also rely on the relative variation of the underlying asset price compared to the market index; position adjusting frequency should be reasonably decided according to option's maturity date and asset price variation, excessive or insufficient position adjusting frequency all are infeasible.

Keywords: Indexed Stock Option, Hedging, Jump-diffusion process， Position adjusting frequency

ID: IEM2064

Study on Whether Beneficiary Has Ability of Perceiving the Performance in Poverty Alleviation: A Case Study of Sichuan

L. Sun*

Abstract: In the government and independent third-party poverty alleviation assessment systems, beneficiary satisfaction is increasingly valued. However, the validity of subjective evaluations of beneficiaries for objective performance has been questioned by scholars. There are few empirical studies on the project in the country. This article fills that gap. In this study, a multivariate logit model is used to analyze whether subjective evaluation can reflect objective performance with "beneficiary perception" as the mediating variable. Taking Sichuan Province as an example, the results show a significant correlation between poverty alleviation performance and the subjective satisfaction of beneficiaries. In a sense, the beneficiaries of poverty alleviation projects can perceive the objective performance of poverty alleviation projects.

Keywords: Beneficiary satisfaction; Multivariate logit model; Subjective evaluation; Poverty alleviation performance

ID: IEM2068

Study the harm and impact of major disasters on the economy

P. L. Chen*

Abstract:

After a major disaster breaks out, its harm and impact on the economy are multi-angle and multi-level. How to realize the evaluation under information science according to the nature of information science economic harm becomes a key issue. Based on the characteristic root method of Group Eigen value method, the evaluation process of major economic losses is studied. In the index system construction stage, the accuracy and efficiency of expert evaluation are improved by matrix transposition, and the reliability of index weights is verified by entropy model. Linear interpolation A specific assessment of economic losses is made. Finally, the calculation results are verified by an example.

Keywords: Major disaster, Group Eigen value method, Reliability demonstration

ID: IEM2072

Analyzing and Improving Lean Manufacturing Processes in Company S's Press Shop as an Example

W. Cao*, X. Zhang

Abstract:

Abstract: The increase of diversified market demands, the rapid development of production technologies, and the changes in production management theories and methods have led to dramatic changes in production patterns. Lean production is an advanced production and management concept, the core of which is to reduce waste in production and to exchange the minimum input for the maximum output. Its ultimate goal is to provide the quickest response to market demand with the lowest cost price and highest product quality. In this paper, based on the understanding and study of lean production theory and value stream mapping, we collected and analyzed the current production process data of the stamping plant of Company S, mapped the current value stream mapping, identified the existing problems, developed relevant solutions, and designed a new value stream map accordingly. Based on the bottlenecks identified in the production situation and the ideal state of the value stream map, detailed analysis and improvement were carried out using methods such as assembly line unitization and board management system. Ultimately, the improved value stream map showed that significant inventory and waiting time were eliminated, resulting in significant improvements in production cycle time and productivity.

Keywords: lean manufacturing, value stream mapping, analysis and improvement

ID: IEM2087

A Study on Structured Teaching Evaluation System Based on Fuzzy Analysis Theory

J. S. Zhong, H.T. Guo

Abstract:

Teaching quality evaluation is a comprehensive effect feedback and grasp of teachers' teaching activities, which should be carried out in multiple levels, perspectives and methods. The current relevant research lacks an objective judgment factor. This paper accordingly proposes a method combining subjective evaluation and objective evaluation based on entropy theory". It is a structural analysis method of weight coefficients combining qualitative analysis and quantitative analysis. Its basic idea is to combine the collection of expert opinions with fuzzy analysis, and then calculate the entropy value of typical ranking according to the given formula, analyze its blindness and deal with the data of potential differences. It provides a new evaluation index system for the evaluation of teaching quality, thus adding objectivity to the evaluation of teachers' teaching quality.

Keywords: fuzzy analysis, structural analysis, teaching quality evaluation, evaluation index system

ID: IEM2089

Analysis of the Influence of Confucian Culture on Leadership and Employee Discourse in Businesses

H. Liu*

Abstract:

The traditional Chinese Confucian culture has influenced Chinese society in every aspect, and Chinese enterprises have gradually formed hierarchical and power-disparate organizational structures under the influence of this deep-rooted culture. The management style of top leaders of enterprises is manifested as a kind of paternalism. In the competitive environment of global integration and rapid development of knowledge-based economy, enterprises hope to mobilize employees' sense of ownership in order to maintain their competitive advantages and to be able to actively propose ideas or suggestions to the organization to change the status quo of the organization, so as to achieve organizational innovation and maintain continuous competitiveness. This paper uses regression analysis to explore the influence of patriarchal leadership under the influence of Confucian culture on employee discourse behavior and employee motivation, and to explore the acquisition of employee self-esteem and sense of ownership in companies under this leadership style to promote continuous innovation and maintain sustained competitiveness.

Keywords: Confucian culture; patriarchal management; employee motivation; corporate innovation.

ID: IEM2094

Optimizing Medical Emergency Resource Allocation Using Matlab Edit Programs

L. LI

Abstract:

This paper uses the Matlab editing program to optimize the allocation of medical emergency resources in the emergency service system and improve the rescue facilities. When an emergency occurs, the allocation is reasonable according to what is needed. The M/M/c queuing system with priority is applied to the allocation of emergency resources in medical units. Matlab is used to calculate the specific value of each attribute index in the system. Based on the known arrival rate and service rate, the system capacity problem is addressed in a targeted manner. After testing, some experimental values are derived in this paper.

Key words: Matlab, medical emergency, resource allocation, public health.

ID: IEM2097

Transmission and Impact of International Oil Prices on China's Macroeconomy Based on Structured Vector Autoregressive Model

Z.G. Li *

Abstract:

A structured vector autoregressive model is used to comparatively analyze the impact of international oil price fluctuations on China's macroeconomy before and after the opening of the crude oil wholesale and retail markets. The results show that the opening of the wholesale and retail crude oil markets accelerated the transmission of international oil price volatility to the Chinese economy. At the same time, oil price volatility exacerbated domestic inflation in China. The implementation of a tight monetary policy has eased inflationary pressures to some extent, but there is still a risk of excess. As the external dependence of crude oil increases, the Chinese government must take active measures to cope with the impact of international crude oil prices on the Chinese economy.

Key words: international oil price, Chinese economy , structured vector autoregressive model, transmission.

ID: IEM2098

A Maximum Run Length Scaling Method for Baseline Character Extraction - An Example of Manchu Script

R. R. Zheng, M. Li*

Abstract:

By combining morphological thinning and Hough transform, a maximum run length ratio method is introduced. This paper proposes a new baseline extraction method for Manchu character images. By combining morphological thinning and Hough transform, the new method determines the exact position of the baseline and improves it according to the characteristics of Manchu characters, thus proposing a region-constrained maximum run length ratio method. Experiments on 400 images of Manchu characters show that the extraction method proposed in this paper is effective and its extraction accuracy reaches 100%, and the new baseline extraction method is also applicable to characters that also have baselines.

Keywords: morphology, refinement, hough transform, baseline characters.

ID: IEM2099

Factors Influencing Investment Efficiency: Taking China's Manufacturing Listed Companies from 2004 to 2013 as an Example

Z.H. Zhu*

Abstract:

This paper takes China's manufacturing listed companies from 2004 to 2013 as a sample, and finds that the controlling shareholders of companies with high equity concentration not only have the ability and motivation to grab the interests of minority shareholders for the People's Bank of China, but also can alleviate the impact of investor sentiment on the company's investment efficiency. influences. The influence of investor sentiment on the company's investment efficiency is studied from the perspective of controlling shareholder's catering. In addition, there are differences in the proportion of shares held by different controlling shareholders, the separation of control rights and cash flow rights, and the nature of controlling shareholders in their adjustment.

Key words: controlling shareholder, investor sentiment, investment efficiency, Chinese manufacturing companies.

ID: IEM2103

A Simulation Model of Evolutionary Game in the Perspective of Food Safety Industry

F.X. Han

Abstract:

Currently, food quality and safety issues in China have attracted the attention of the whole society. It is imperative to strengthen government regulation. The perceived benefit parameter value function is introduced and reasonable improvements are made. Based on this, an evolutionary game simulation model of food safety based on improved prospect theory is established. It is shown that due to the finite rationality of both sides of the game, it is difficult to satisfy the conditions $C \leq \rho\varpi F2$, $T \leq (1-\varpi)F2$, $C \leq F1+\rho(1-\eta)\ F2$ and $T \leq F1+\eta F2$ simultaneously in reality, which means it is difficult to achieve a stable food safety evolutionary strategy effectively.

Keywords: food safety, evolutionary game, simulation model management strategy.

ID: IEM2104

Predict Waist Circumference of Female College Students based on Machine Learning Combines and Cloud Data

Y. K. Cai

Abstract:

In this paper, machine learning was used to obtain the body dimensions of 110 female college students, and the 3D point cloud data were corresponded to the input and output units of an optimized generalized regression neural network (GRNN) and the independent and dependent variables of a multiple linear regression (MLR) model. Waist circumference was measured from the 3D point cloud data using Imageware software, and training and test samples were used to build and test the performance of the GRNN and MLR models. The results showed that the error of GRNN was much smaller than that of MLR. GRNN outperformed MLR in waist circumference prediction.

Keywords: machine learning, garment making, cloud data, neural network.

THEME 4

Information Systems

ID: IEM2006

Research on Image Deviation Correction Adaptively Corrects Two-Dimensional Image Bias

Ch. Kong

Abstract:

This paper proposes a minimal square method for adaptively correcting distortion of two-dimensional images. The resulting image is 2D, so we need some adjustments to make the right adjustments. Thus, after processing to remove the edge outlines of the extracted two-dimensional image, it uses the smallest square method to derive a straight line from these variables Experimental results show that the proposed method is fast, adaptive, and improves the accuracy of the adaptive adjustment method.

Keywords: Visual communication design, 2D image, Image Deviation, Image Distortion Correction

ID: IEM2007

Intelligent Detection Of Complex Multipath Channel Based On Fractional Fourier Transform

J.N. Cai, Z.J. Zhu, Y.F. Lu

Abstract:

The MIMO broadband frequency modulation signal intelligent detection algorithm based on quadrature matching tracking has the disadvantages of high network congestion rate, large signal noise and large storage space in complex multipath channels. This paper proposes a complex multi-channel MIMO broadband frequency modulation signal intelligent detection algorithm based on fractional-order Fourier transform. During signal detection, hierarchical search is introduced to analyze the noise in the signal. Normalize the signal and improve the signal detection algorithm. Experiments show that the algorithm can effectively reduce the noise content in the signal, occupy less computer memory space, and reduce the impact of detection on the computer network.

Keywords: Wideband Signal Detection, Noise Processing, Algorithm Detection, Intelligent Detection Algorithm Optimization

ID: IEM2008

Research on visual construction algorithm of new micro-course system

Y.J. Kang, L. Ma, G.C. Gong

Abstract:

Aiming at the problems of slow module decomposition and poor mapping effect in the visualization of micro-course resources, a new visual construction algorithm of micro-course system is proposed. The algorithm decomposes the characteristics of the micro-course system module based on the linear limit histogram. The decomposed modules are fused and mapped with hue mapping algorithms to complete the visual construction of the micro-course system. Experimental results show that the algorithm can fully understand the course structure, effectively solve the problems of slow operation and poor mapping effect, and has high feasibility.

Keywords: Visualization Section, Algorithm Fusion, Micro-Course System

ID: IEM2009

Adaptive Genetic Optimization Solves the Problem of Genetic Algorithm Optimization

C.G. Ren, J.G. Zhao, L.P. Chen

Abstract

At present, large-scale logistics supply chain information is quickly dispatched, too many constraints are existed. Therefore, a fast information scheduling algorithm for large-scale logistics supply chain based on adaptive genetic optimization is proposed in this paper. The genetic algorithm is used to get the solution and the adaptive technology is brought to solve the congestion problem of genetic algorithm. Experiments show that the proposed algorithm can effectively improve the efficiency of scheduling and solve the existing problems.

Keywords: Genetic Algorithms, Efficiency Gains, Constraints, Large-Scale Logistics

ID: IEM2010

Genetic Algorithms Combined with Mining Algorithms to Solve Network Attack Data Research

J.H. Song, H. Xie, Y. Feng

Abstract:

Current risk data generated by network attack data is lack of predictability, in this paper, a fast association rule mining algorithm for network attack data is proposed. Based on the related data, the fuzzy theory is used to introduce the frequency of network attack events into the association rules, and based on the genetic algorithm, the concept of interest degree and approximation are introduced to improve the membership function which can establish the network attack data association rules to achieve rapid data mining. The experimental results showed that the proposed algorithm has certain accuracy and efficiency advantages.

Keywords: Data Prediction, Cyber Attack, Data Mining, Fast Correlation Algorithm

ID: IEM2017

Application of Iterative Computation in Similarity Measurement and Ontology Mapping of Multidisciplinary Ontology

Y. Li, Y.J. Li, X. Yang, and W. Gao

Abstract:

In the field of information retrieval, ontologies play an important role in searching for information that has a high semantic resemblance to the concept of the original query and returning the results to the user. The main purpose of the ontropia algorithm is to obtain the function of similarity between computational concepts. One of the learning techniques for ontology application is to find the ontology function F:V, map each vertex to a real number, and determine their similarity from the difference between the real numbers of the two concepts. Ontology similarity metrics and ontology mapping sparse vector learning algorithms based on gradient descent and iterative calculations have been proposed. The corporal punishment items in the optimization model are redescribed using an even norm to achieve a smooth approximation. The main process of the algorithm is iterative computation based on gradient descent techniques. The results of the simulations showed that the algorithm has high efficiency and accuracy in similarity metering and body mapping.

Keywords: Information Retrieval, Ontology Function, Vector Learning, Ontology Mapping, Algorithm Optimization

ID: IEM2019

Privacy-Preserving Data Publishing based on Data Mining

R.T. Chen

Abstract:

With the computerization of information technology and the development of Internet applications, people's personal information is widely collected and shared on a large scale. Invasion of privacy has become a serious information security issue. In the field of data disclosure, private data is completely public and can be used by anyone. As an effective means of data sharing, data disclosure provides a strong and solid support for data exchange and sharing. However, with the development of data disclosure technology and the popularization of daily life and work, the problem of invading personal privacy is also becoming more and more serious. Protecting personal information in data disclosure from malicious attacks by attackers and enabling data recipients to flexibly use it in investigations and scientific research has become an urgent issue. This paper proposes a privacy data disclosure (PPDP) model based on data mining, which quantitatively evaluates the possibility of its implementation and the risk of privacy invasion.

Keywords: Data Sharing, Private Data, Privacy Protection, Data Mining

ID: IEM2022

An Empirical Study of Behavioral Intention Models Using e-Learning Systems: Learning and Teaching Styles as Individual Differences

Lu Hsin-Ke, L. P. Chun *and Alexander N. Chen

Abstract:

Today, e-Learning continues to receive a lot of attention from companies and universities. With the increased use of e-Learning systems in higher education, it has become critical for researchers to evaluate the performance of these systems. Among the trends in web-based learning systems, behavioral intention models (e.g., TAM, TPB, TAM2, UTAUT) appear to be more helpful in investigating whether and why people use e-learning technologies. Some of the factors that can influence e-learning adoption; however are confirmed by a large number of studies, many of which have examined the moderating role of individual differences. Previous research has demonstrated different perspectives on individual differences, focusing on demographic variables such as age, gender, education, and personal experience. However, the theoretical model in this study focuses on cognitively oriented individual differences to integrate relevant characteristics of users and systems. The current study includes cognitively oriented individual differences (e.g., learning and teaching styles) extending the TAM model to propose a novel theoretical framework for better understanding behavioral intentions. Using actual surveys and statistical analyses, the researchers empirically investigated the influence of learning and teaching styles on the behavior of using e-learning systems.

Keywords: Teaching styles, Individual differences, Behavioral intentions, e-learning systems.

ID: IEM2028

An Efficient Algorithm for Globally Solving a Class of Multiplicative Optimization Problems

J.T. Wang*, J.B. Yin

Abstract:

This paper presents an efficient algorithm for globally solving a class of multiplicative optimization problems (P) that has a wide range of applications in the engineering design and stability analysis of nonlinear systems. By using the equivalent transformation technique and a new linearization method, the initial multiplicative optimization problem (P) can be reduced to a series of linear relaxation planning problems. Subsequently, the feasible region is divided and the proposed algorithm converges to the optimal solution of the initial problem (P). Finally, numerical experimental results are given to demonstrate the feasibility and effectiveness of the proposed method.

Keywords: Multiplicative optimization problem, Global optimization, Efficient computational algorithm, Equivalent transformation technique.

ID: IEM2030

Exploring the Impact of International Oil Price Fluctuations on China's Price Level-Based on VAR Model

D.T. Zhou*, H.Y. Yu, Z.G. Li

Abstract:

The article investigates the mechanism of the impact of international oil prices on Chinese prices from the perspective of empirical quantitative analysis, and concludes that international oil price fluctuations affect Chinese prices through raw materials, fuel and raw material purchase prices by building a vector autoregressive model. However, with the extension of the industrial chain, its impact on PPI and CPI will gradually diminish. Through the empirical analysis of specific eight categories of CPI indices, it is concluded that the category with the greatest impact of international oil prices on consumer prices is transportation and communication, followed by tobacco, alcohol and consumables, clothing, health care and personal products, and housing, then household equipment supplies and maintenance services, food, entertainment, education and cultural goods, and services. The article puts forward corresponding countermeasures and suggestions based on this.

Keywords: international oil price, Chinese oil price, price index, VAR model.

ID: IEM2033

Research on Special Drug Distribution Path Optimization-Based on Improved Ant Colony Algorithm

T. Fei*, L.Y. Zhang and W. Zhang

Abstract:

With the rapid development of medical business, special drugs and transportation issues are of great concern. The transportation of special drugs requires "efficiency first and efficiency at the same time". Once again, in this environment, economic efficiency and time requirements should be taken into account. To solve the problem of transportation of special drugs, fundamentally, it is necessary to reduce the cost of physical delivery of drugs to patients. In this paper, based on the analysis of the characteristics of special drug transportation, a chaotic ant colony optimization model is established to minimize the cost of special drug delivery path. The simulation results show that the chaotic ant colony optimization algorithm is effective for fitting the model.

Keywords: CACO (Chaotic Ant Colony Optimization), Special drugs, Path optimization.

ID: IEM2034

Design and Development of a Person Overboard Alarm Rescue Terminal

P.F Huang, Z.X Du*, C.F Cheng and J.H. Chen

Abstract:

To improve the safety and security of people at sea, this study designs and implements a rescue terminal based on Beidou short messages. The terminal uses STM32F103RBT6 as the control and processing unit to obtain the latest information of people in distress through the BeiDou SMS module GN51, then converts the original information into AIS information and BeiDou SMS information, and finally sends distress information, spectrum and BeiDou satellite through a VHF water cell phone. The terminal enables the shore-based control center to locate the person in distress at the first time, effectively saving the rescue golden time and greatly improving the search and rescue efficiency.

Keywords: Person in distress, Beidou, alarm, Search and rescue efficiency.

ID: IEM2049

The Problems of Exponential Stability for a Class of the Uncertain Singular Stochastic Systems with Discrete and Distributed Delays

Y.Q. Chen

Abstract:

The problems of exponential stability for a class of the uncertain singular stochastic systems with discrete and distributed delays are studied. By using a Lyapunov–Krasovskii functional approach and terms of linear matrix inequalities (LMIs) and the Leibniz–Newton formula, mean square exponential stability criteria ensuring robust stability of the uncertain singular stochastic systems with discrete and distributed delays are established. New mean square exponential stable criteria for the certain singular stochastic systems with discrete and distributed delays are also obtained. Finally, an example is given to verify the effectiveness of the results.

Keywords: Stochastic systems, Singular systems, Lyapunov–Krasovskii functional approach, Discrete and distributed delays

ID: IEM2051

Development of Fashion Model Simulator (FMS) Application based on Augmented Reality as A Tool in Batik SME Exhibition

Muhammad A. F. R.[1], Denny N., S.T.[2], M.T dan Bapak Yusuf Widharto, S.T., M.Eng[3]

Abstract:

Batik is one of the world's recognized cultural heritages in Indonesia. In promoting batik products, batik SMEs carry out various marketing methods including exhibition activities. In its implementation, there are several obstacles. Some of the obstacles include space limitations, the exhibition time is quite short, the preparation process is quite troublesome, and the amount of furniture used is also limited. Limited space causes SMEs to display products in ineffective ways. Due to the Covid-19 pandemic, exhibition activities also cannot be carried out properly. The application of technology then carried out to overcome this problem. In this study, an augmented reality-based android application named Fashion Model Simulator (FMS) was developed. This application can show batik motifs to consumers in 3D models to solve the obstacles with or without consumers in the retails. This research will use the adaptive system development life cycle method. FMS development will begin with collecting and analyzing requirements using the requirements engineering method by distributing questionnaires to consumers and interviews with SMEs and experts. Requirement will divided into 6 classification. These classifications are information, visualization, interaction, usability, reliability, and performance. There were 24 lists of needs which were then classified into MDI and TOE categories. The development continues with use case modeling, activity diagrams, and scenarios based on the requirements and activities of consumers during the exhibition. The results of the modeling are then formed into an application framework design that will be validated by consumers using questionnaires, and SMEs by interviewing. The results of the application framework design will be the basis for developing FMS. FMS will be made using Unity Engine and other supporting design application such as Blender, Corel Draw, and Others. The final result is an augmented reality application that can be installed on Android Operation System with requirement Android version 8 or above.

Keywords: Batik, Exhibition, Application Development, Augmented Reality, Adaptive Development Life Cycle, Requirement Engineering.

ID: IEM2060

A Multi-objective Optimization Model of Flight Path

F.R. Sun;Y.X. Fu

Abstract:

Because of the increasing number of trans-oceanic and intercontinental flights, obtaining the optimal flight path planning in the space of free flight is becoming an important issue for airline operation. In this paper, the expected flight path is defined as linear potential field. By calculating the gravitational force of the potential field to which the aircraft is subjected, the trajectory of the aircraft at any spatial position is studied, and a trajectory equation is established to determine the maximum likelihood flight direction. By analyzing the effect of high-altitude winds on flight heading, vector synthesis of wind speed and flight speed, and consideration of flight performance constraints, the distance cost of the planned flight trajectory can be defined at any location. Finally, a multi-objective track optimization model with distance cost and path simplicity as the optimization goals is established. An ant colony algorithm is proposed to search for the optimal flight path. Experimental results verify the effectiveness of the proposed method.

Keywords: Flight path; Maximum likelihood flight direction; Ant colony algorithm;

ID: IEM2065

Cloud Computing System based on Genetic Algorithm and Artificial Immune Algorithm

Y.C. Wang*, G.Wu

Abstract:

Task scheduling, as the key technology of cloud computing system, is one of the hot issues in academic research. In order to shorten the total task completion time in the cloud computing environment, a hybrid algorithm based on genetic algorithm and artificial immune algorithm is proposed to solve the problem of adaptive adjustment of cross probability. The mutation operator adopts the inverse mutation method, and whether the result of the mutation operator is accepted or not is determined by the Metropolis acceptance criterion of simulated annealing. Finally, the population generated by genetic algorithm is inoculated with immune algorithm. Immune algorithm makes up for the slow convergence speed of genetic algorithm, keeps the diversity of population, shortens the total time to complete tasks, and improves the working efficiency of cloud computing system. The simulation experiment on CloudSim platform shows that immune genetic algorithm has better performance than standard genetic algorithm and DPSO algorithm.

Key words: cloud computing, genetic algorithm, artificial immune algorithm

ID: IEM2066

Enterprise Information Security Assessment under Internet Algorithm

G. Sun

Abstract:

With the rapid development and popularity of global information technology, the amount of data has surged, leading us into the Internet era. In the Internet age, information security has become one of the important issues in the development and operation of enterprises, and the requirements for enterprise information security are getting higher and higher. Put forward higher requirements. Therefore, the research on comprehensive evaluation of Internet security has important theoretical and practical significance for enterprises to know their own information security situation. Analyze the composition of enterprise information security in the Internet, and form a set of pre-selected information security indicators. Then, the weight of each evaluation index is determined by AHP, and the fuzzy evaluation value of each index is determined by fuzzy comprehensive evaluation method, so that the comprehensive evaluation value of the comprehensive evaluation system is obtained, and the comprehensive evaluation model of Internet information security is established.

Key words: internet age, information security, comprehensive evaluation model

ID: IEM2067

Establishment of technical and tactical decision support system based on collected tennis match data

C. Zhao*,

Abstract:

In recent years, tennis has developed rapidly. In competitive tennis matches, skills and tactics are the key factors that affect the outcome of the match. Tennis tactics are complicated and changeable. Therefore, it is an urgent problem to study the technical and tactical rules of tennis and make accurate and scientific decisions. Therefore, the theory and method of data mining are studied. According to the collected tennis match data, a tennis match technical and tactical decision support system is established. Aiming at the single-attribute and multi-attribute research of tennis skills and tactics, this paper probes into the theory and technology of data collection from two aspects of correlation analysis and rough set. This is helpful for people to explore the techniques and tactics of tennis matches, improve the rationality of decision-making, and provide scientific support for the daily technical and tactical training and decision-making of competitive tennis.

Keywords: tennis tactics, data collection, decision

ID: IEM2069

Analysis and Prospect Based on Optimization Theory

X. Zhang

Abstract:

Abstract: The optimization theory mainly uses mathematical methods to study the optimization methods and solution methods of various systems, and provides scientific decision-making basis for decision-makers to solve practical problems. It has the optimal choice feature for discussing decision problems. It is an important branch of multi-objective optimization planning and has a wide range of applications in engineering design, economic planning, project management and other fields. The multi-objective optimization problems in real life and two algorithms for solving multi-objective optimization problems are introduced, and the advantages and disadvantages of each algorithm are analyzed. Then, the dynamic programming algorithm to solve the optimization theory in the segmentation process is discussed. The optimization decision problems that have appeared in various fields in recent years are listed, and finally the future development of the optimization theory decision problem algorithm is prospected.

Keywords: optimization theory, multi-objective optimization, scientific decision-making

ID: IEM2070

Building a Bidding and Quoting Decision Support System Based on Data Mining

F. Liu*

Abstract:

With the widespread use of management systems and the rapid development of big data, enterprises accumulate more and more data. Existing database systems can efficiently implement functions such as data input, query, statistics and modification, but cannot identify the laws and relationships between data, and cannot predict future trends based on existing data. This paper discusses the data analysis technology and its application in computer-aided decision-making, studies the bidding decision theory, the construction and analysis method of the bidding decision support system model, and designs a bidding decision support system based on data analysis. Finally, a case is used as an experiment, and the results of this method are analyzed.

Key words: decision support system, tendering; data analysis

ID: IEM2071

Analysis and Optimization of Logistics Supply Chain Scheduling by Genetic Algorithm

M. T. Linh

Abstract: The globalization of supply chain has led to the booming of logistics industry. However, there are still some enterprises do not pay attention to logistics scheduling under the supply chain, so that the efficiency of logistics scheduling under the supply chain is low and the cost of enterprises increases. This thesis establishes an optimization model of supply chain scheduling based on the basic theory of supply chain, and takes into account the limited resources of supply centers, the different requirements of consumers on product costs and the impact of time urgency on logistics operations. It also solves the model with genetic algorithm, using overall spatial search and implicit parallelism. In addition, during the solution process, the thesis designs a genetic algorithm suitable for solving the model, which is implemented by the MATLAB Genetic Algorithm Toolbox. Finally, the validity and rationality of the model and the solution algorithm established in the thesis are verified through the analysis of examples.

Keywords: supply chain, logistics scheduling, genetic algorithm

ID: IEM2073

Linear difference based coding and decoding algorithm to improve image compression rate

Y. Zhang*, X.G. Li, Y. Fu

Abstract:

A linear difference-based coding and decoding algorithm is proposed based on the analysis and research of the distribution law of pixel values in X-ray images of steel cord conveyor belt. In this algorithm, the difference value between adjacent pixels in each row in the X-ray image of steel cord conveyor belt is calculated first, then JPEG compression coding is performed on the difference value, then JPEG decoding is calculated, and then differential decoding is performed to get the final value. The JPEG encoding algorithm based on linear difference is implemented on the TMS320VC5509DSP, which is the core chip of the X-ray detector. The compressed data stream is transferred to the host computer, where the linear differential JPEG decoding algorithm is implemented in C language. Through this experiment, it can be shown that this algorithm effectively reduces the correlation of X-ray images of steel cord conveyor belt in the same line and improves the image compression rate, while ensuring the image quality. And it can codify and decode 13 grayscale images of 960512 pixels per second, which can meet the requirements when inspecting the steel cord conveyor belt online

Keywords: linear difference, coding and decoding, image compression rate

ID: IEM2074

Automatic Video Moving Object Detection Method Based on Time-Space Information Fusion for Detecting and Tracking Swimmers

J. Z. Liang*

Abstract:

In swimming competition events, athletes move flexibly and quickly. How to locate the position of athletes during swimming is an important problem. Solving this problem can provide technical support for the training and competition of swimmers. In order to achieve the detection and tracking of swimmers during the competition, this paper will study how to correctly detect the position of moving objects (swimmers) in the image from the video stream. Combining digital image processing technology and video analysis technology, this paper integrates image segmentation technology and temporal recursive filtering difference method based on the research of currently used moving target detection algorithms, and proposes an automatic video moving object detection method based on the fusion of space-time domain information, and the moving object detection algorithm based on difference method is synthesized and compared with the method in this paper. The method in this paper greatly reduces the complexity of movement and operation time, and effectively locates the position of athletes during swimming competitions.

Keywords: moving object localization, image segmentation technique, time-recursive filtering difference method

ID: IEM2076

An Efficient Interaction Algorithm for Resource Sharing

T. L. Wang*

Abstract:

In this paper, an efficient interaction algorithm for multi-threaded data under a resource sharing platform is proposed. In this algorithm, an allocation condition control for multi-threaded data transmission is proposed. And based on this, the efficient interaction of multithreaded data under the resource sharing platform is achieved by effectively coding the combination of packets lost during multithreaded data transmission, so that multiple virtual machine terminals can access the packets transmitted for multiple switches in multicast or broadcast transmission in priority. The experimental results show that the proposed algorithm can improve transmission interaction efficiency and throughput, reduce packet loss rate, and have good interaction performance.

Keywords: resource sharing platform, multi-threaded data

ID: IEM2077

Investigating Bidirectional Associative Memory Neural Network Algorithms to Predict Network Latency

C. M. Wu*

Abstract:

In this paper, we propose a delay prediction algorithm based on a bidirectional associative memory neural network. The algorithm first uses RTT similarity to define and establish the delay function for router processing. Then, random coefficients and uncertainty parameters such as network congestion rate and network delay are calculated to build a network delay prediction model. Then, the two-way associative memory neural network algorithm is combined with the normal distribution, and the obtained model is input to obtain the network delay law. The experimental results show that the proposed algorithm can predict the network delay more accurately and is a feasible prediction algorithm.

Keywords: associative memory neural network, delay prediction, research

ID: IEM2078

Research on Intelligent Modulation Algorithm for Communication Channels Based on Direct Sequence Spread Spectrum

H. J. Xu*

Abstract:

This paper presents an intelligent modulation algorithm for WMSN communication channels based on direct sequence spread spectrum. During the preliminary analysis of the WMSN communication channel, the causes of channel distortion are summarized. Based on the calculation results of the amplitude response and frequency response at the receiver, a communication channel model is established and the equilibrium control equation of WMSN channel modulation is obtained by using the direct sequence spread spectrum algorithm. The experimental results show that the proposed algorithm has obvious advantages over other algorithms, which improves the efficiency and stability of channel data transmission and reduces the packet loss rate

Keywords: communication channel, intelligent modulation

ID: IEM2079

Building Dynamic Networks to Investigate New Algorithms for Detecting Anomalous Intrusion Data

F. Yuan*, H. Guo

Abstract:

A new algorithm for detecting anomalous intrusion data in complex dynamic networks based on ultrasonic TDOA is proposed to address the problem of low localization efficiency when using the minimum information criterion to locate anomalous intrusion data. In this process, the intrusion detection region of the network is constructed, and the root intrusion matrix is obtained by graph theory and adjacency matrix. Ultrasonic TDOA is used to measure the distance between nodes to locate the intrusion nodes, and a 3D center-of-mass localization method is used to quickly locate the intrusion nodes in combination with the network intrusion data. Experiments show that the algorithm can localize the intrusion data in real time and improve the stability of intrusion detection.

Keywords: dynamic network, intrusion detection

ID: IEM2080

An Intelligent Noise Reduction Algorithm for Unbalanced Noise-Containing Blurred Images

X.X Yuan*, D.Y Chen

Abstract:

This paper proposes an intelligent noise reduction algorithm for unbalanced noise blurred images. First, the segmentation algorithm based on the maximization of variance between classes is used to divide the image into two categories: background and target, and the threshold is determined; then adaptive noise reduction is performed according to local changes to achieve the purpose of intelligent noise reduction. The experimental results show that the algorithm outperforms other algorithms in terms of denoising effect. Edge details are preserved and visual effects are improved.

Key words: unbalanced noise, blurry images, intelligent noise reduction

ID: IEM2081

SFLA Fuzzy Clustering Data Mining Algorithm Based on Selection and Mutation Mechanism

H. Zhang*, Q.F. Zhang

Abstract:

Current data mining methods have poor mining accuracy. Therefore, this paper proposes a SFLA fuzzy clustering data mining algorithm based on selection and mutation mechanism. The algorithm first collects intrusion data and extracts its features. Then use the fuzzy clustering SFLA algorithm to complete the research on the data mining algorithm of high-risk intrusion. The experimental results show that the algorithm improves the accuracy of data mining

Keywords: data mining, data clustering

ID: IEM2082

Fast Retrieval Algorithm of Database Feature Information Based on Naive Bayes

J. Zhang*

Abstract:

In order to improve the accuracy of database retrieval, this paper proposes a fast retrieval algorithm for database feature information based on Naive Bayes. First, the data structure of the database is analyzed, and the feature extraction algorithm of semantic correlation is designed. The feature extraction results are clustered, and the interference data is denoised and filtered to achieve fast information retrieval. Experimental results show that the proposed algorithm has high accuracy in database retrieval.

Keywords: database, feature information, fast retrieval algorithm

ID: IEM2083

Online Interactive English Speech Segment Sequential Recognition Algorithm Based on Artificial Bee Colony Algorithm

D. Zhao*

Abstract:

This paper proposes an online interactive English speech fragment sequential recognition algorithm based on artificial bee colony algorithm. First, the speech signal is pre-weighted, framed, windowed and endpoint detected, and strong MFCC feature parameters are selected. Artificial swarm algorithm is used to achieve continuous recognition of speech fragments. The results show that the algorithm is a good parameter optimization method. It can not only overcome the local optimal solution, but also improve the recognition rate.

Keywords: Online interactive English, continuous recognition, artificial bee colony algorithm

ID: IEM2084

Computer-aided Reliability Control Algorithm for Wind-induced Vibration Response of High-altitude Structures

Q. M. Zhao*

Abstract:

In this paper, a computer-aided reliability control algorithm for wind-induced vibration response of high-altitude structures is proposed. Based on the modeling parameters and the high-rise structure model established by ANSYS, the power spectral density of the equation of motion and the structural displacement response under random wind loads in the frequency domain were calculated, the relationship between wind speed and wind pressure and the influence of wind on the structure were calculated. And the model is analyzed with different change modes. The reliability of the simulation results is analyzed through experiments. The computer simulation results show that the simulation results are in good agreement with the actual situation and have strong reliability.

Keywords: high-rise structures, computer simulation

ID: IEM2086

Handwriting Recognition System of Input Method Based on Neural Network Technology

S.LI

Abstract:

The offline handwritten character recognition technology is still immature and is still in the laboratory research stage. As an important part of character recognition. In the process of offline handwritten character recognition, only two-dimensional character point images are processed, and there are problems such as difficult image recognition, too many types of characters, complex font structure and large deformation. In this paper, we try to combine neural network technology with character recognition technology and propose an effective new method for recognizing handwritten characters. According to the overall construction logic of multilayer recognition system, this paper introduces image pre-processing, feature extraction, neural network and optimization. Finally, the performance of the recognition system is compared and discussed based on the experimental results and some considerations for the construction of the recognition system are proposed.

Keywords: graphics recognition; signal processing; machine learning; neural network.

ID: IEM2088

Evaluation of Improving the Accuracy of Polygraph Instruments Based on Machine Learning

Y. WEI

Abstract:

The brain emits electrophysiological signals of different forms and characteristics, which makes it very complicated to extract and identify its characteristic information. In order to further improve the discrimination accuracy of polygraph technology, this paper proposes a new polygraph algorithm with K-SUM classifier based on the basic principles of SVM algorithm, K-nearest neighbor algorithm and Logistic Regression. After verification of historical crime data and simulated crime, the classification accuracy of K-SUM algorithm is significantly higher than that of single SVM algorithm. The algorithm improves the accuracy and accuracy of the polygraph, helping to maintain public safety and social order.

Key words: polygraph algorithm, social order, public safety, polygraph instrument.

ID: IEM2091

Analysis and Prediction of Specific Athlete Behavior Using Covariance and Image Recognition

Z. LIN

Abstract:

Due to the fast movement speed of athletes in basketball game videos, low resolution of head images and cluttered video background, it affects the subsequent analysis of game videos by athletes. Therefore, this paper proposes a new method for predicting the behavior of specific athletes in basketball game videos. In this paper, covariance descriptors and combined with enhanced head image recognition are used to determine the field of view for head pose classification. The covariance descriptors are mapped to the tangent space, and the player information from the artificial potential field (APF) is used to predict their shooting, passing and dribbling behaviors based on the distribution of all players within the field of view of the ball carrier. The method has been tested practically on basketball game videos and proved its effectiveness.

Keywords: covariance, image recognition, behavior analysis, artificial potential field.

ID: IEM2093

Quantifying Ambiguity in Interface Assessment from a Cognitive Psychophysiological Perspective

J. Tao, C.Q. XUE

Abstract: In this paper, we quantified the ambiguity problem in interface usability evaluation based on this interface usability evaluation method and rough sets from the perspective of cognitive psychophysiology by combining task deconstruction and behavioral performance tests, and established an interface usability evaluation model, and proved the effectiveness of the new evaluation method through brain electrophysiology experiments.

Keywords: cognitive psychophysiology, rough set, usability evaluation, model.

ID: IEM2095

Demonstrating the Effectiveness of SAR Image Denoising Techniques

F. Y. WU

Abstract:

In order to optimize the clarity and visibility of remote sensing images, this study conducts an in-depth and systematic research on the denoising technique of SAR images, the key technique of remote sensing image processing, mainly based on the multiscale geometric transformation commonly used at present. The experimental results are also analyzed to verify the effectiveness of the technique. Since its image formation mechanism is quite different from that of visible images, it is especially important to study the processing algorithm for the characteristics of such graphics.

Key words: remote sensing image image, SAR image technology, denoising technique, algorithm.

ID: IEM2096

Better Preservation of Image Edge Characteristics by Gradient Correction Algorithm

R. Gao*

Abstract:

In this paper, a new image scaling model based on fractional-order partial differential equations is obtained by deriving the Euler-Lagrange equation through a gradient correction algorithm. The efficiency of the proposed model and algorithm is verified through numerical experiments, and it is demonstrated that the new model preserves the edge properties of the image better than the fourth-order partial differential equation model.

Keywords: algorithm, fourth-order partial differential equation, Euler-Lagrange equation, image model.

ID: IEM2100

Text Slicing and Character Recognition Methods

Ming Li*

Abstract:

The traditional projection segmentation method is improved and the text segmentation in Manchu character recognition process is discussed to improve the segmentation accuracy of Manchu. Three Manchu recognition methods, nearest neighbor and support vector machine, Bayesian, are combined with the characteristics of Manchu language, and a printed Manchu recognition system based on multi-classifier fusion decision is designed to realize image pre-processing and Manchu character recognition. The experimental results show that the system achieves good results in Manchu language recognition.

Keywords: text segmentation, text recognition, image processing, SVM

THEME 5

Electrical & Electronic

ID: IEM2001

Direct Extended Measurement and Control Interference Signal Control Algorithm Based on Compression Perception

Q. Zhou

Abstract:

The traditional interference signal control algorithm has the problem of poor control performance caused by direct extended measurement and control signal sampling, and this paper proposes a direct extended measurement and control interference signal control algorithm based on compression perception. According to the characteristics of the directly unfolded measurement and control signal, the algorithm constructs the corresponding sparse base, analyzes the normalized residual and change law of the directly unfolded measurement and control signal and the interference signal under the sparse base, directly expands the measurement and control signal through the sparse coefficient reconstruction, and realizes the adaptive control of the algorithm in combination with the normalized residual change rate. Experimental results show that the algorithm can effectively control the interference signal, the detection probability is high, and the error effect is excellent.

Keywords: Mechatronics, adaptive control, control algorithm

ID: IEM2024

Development of Remote Monitoring System for Electricity

H.R. Wang *, R.F. Ma and Angel Square

Abstract:

Currently, electricity supply systems are evolving rapidly and previous communication protocols are not performing as well as they should. It is imperative that we find solutions to address this situation. We investigated an information model, security mechanisms and communication protocols for remote monitoring of power supplies. The basic unit of monitoring information is the monitored object, and a monitored object has 6 attributes. We designed a monitoring information base, abbreviated as MIL, to organize and store the monitored objects. MIL is tree-like, each branch represents a group of monitored objects, and each leaf represents a monitored object. In the application layer of the communication protocol, we designed a proprietary protocol called PSRMP. The PSRMP protocol messages consist of three fields and operate in four modes. PSRMP messages are represented by ASN.1 (Abstract Syntax Notation One) and are encoded for transmission using the TLV (Type, Length, Value) method. We propose a security mechanism, its frame format and its working rules. We use ARM7 as the processor of the RTU. MIL and PSRMP are implemented on top of μC/OSII. We have developed a program for MIL and PSRMP. The program runs in PHILIPS LPC2132 and occupies about 940 bytes of ROM space and about 730 bytes of RAM space.

Keywords: power remote monitoring, information model, security mechanism

ID: IEM2038

Structure form arrangement and installation design of vehicle-mounted optical mast

Z.B. Chen, N. Chen, K. Shi, X.Y. Zhuang

Abstract:

This study provides a theoretical design for the general arrangement and installation of the vehicle-mounted optical mast. According to the specific requirements of the photovoltaic mast set up respectively the choice of car and shelter form, discussed the specific form of the photovoltaic installation mast, analyzed the matching photoelectric mast with its matching photoelectric detection system installation, and finally completed the overall layout of the car type optical mast design installation photoelectric detection.

Keywords: Optical Mast, Mast Layout, Photoelectric Detection

THEME 6

Automation & Control Systems

ID: IEM2000

Research on the Prediction Method of Fault Speed of Inverter Drive Asynchronous Motor

Y.Q. Yao

Abstract:

The first-order incremental prediction currently used is simply to use the motor speed increment to predict the speed of the motor at the next moment. Aiming at the problem that the prediction error of nonlinear speed changes with time, a new method for predicting the speed of variable frequency drive induction motor based on second-order increment is proposed. The second-order increment of the speed is used to predict the future speed of the frequency conversion drive asynchronous motor failure operation. Compared with the first order, the future speed prediction is closer to the future operating speed of the faulty motor, and the n-stage increase can be carried out. Experimental results show that the method realizes the prediction and control of motor speed, and achieves the effect of reducing the amount of calculation and improving the accuracy of speed prediction under the condition that the interference error is small.

Keywords: frequency conversion drive induction motor, fault operation, speed, prediction method

ID: IEM2047

Design and Application of Optimal Path COM Component Based on STL

Q.Wang, R.P. Hu *

Abstract:

The optimal path analysis is extended from the shortest path and is the most basic network analysis in GIS. It can provide a perfect solution for the actual problems such as logistics transportation, traffic planning, traffic analysis, bus transfer and GPS navigation. The Dijkstra algorithm is the publicly considered as a better algorithm at home and abroad in the shortest path solution. Improved from Djikstra algorithm, this paper introduces the adjacent point and adjacent edge structure to represent a diagram and regards the weight as the trigger of the heuristic search based on the excellent computing performance of STL (Standard Template Library) and efficient memory management mechanism to complete automatic determination and extraction of the optimal path. Finally, according to the structure of the adjacent point and adjacent edge, using the programming tool of VC++ 6.0, the COM component of the optimal path is designed and implemented, and is applied in the electronic map of Tianjin to search the optimal path more quickly and efficiently.

Keywords: STL, COM, Optimal path, Adjacent point, Adjacent edge, Weight factor.

ID: IEM2090

Sufficient and Necessary Conditions for the Discrete Nature of the Differential Operator

X.Y. TANG

Abstract:

The spectral theory of differential operators based on quantum physics provides a unified theoretical framework and solution for differential equation problems. In this paper, we study a class of symmetric differential operators with logarithmic coefficients. Since the discrete speed of logarithmic functions is slower than that of exponential functions, and the powers and integrals of some logarithmic functions cannot be expressed in terms of primary functions, this paper adopts the method of operator decomposition and quadratic comparison. By means of several inequalities and lower bound estimates for the convergence of logarithmic functions to the corresponding quadratic forms, it is concluded that under certain conditions, sufficient and necessary conditions for the dispersion of such differential operators are the spectrum of all self-intersecting extensions.

Keywords: symmetric differential operators, spectral theory, quadratic comparison analysis, operator decomposition.

ID: IEM2101

Automatic Transmission Troubleshooting and Handling-Taking Two-speed AMT as an Example

J. J. Hu*, J.Z. Li

Abstract:

The normal operation of the sensor is the key to complete the shift accurately and reliably. During the shifting process of the automatic transmission in this paper, the position of the synchronizer sleeve is reflected by the output signal of the angular displacement sensor. Therefore, in order to improve the fault tolerance of the two-speed AMT of electric vehicles, this paper analyzes the working principle and shifting process of the shift actuator of the two-speed AMT. On this basis, a signal correction strategy and vehicle failure mode are proposed for sensor signal drift and sensor failure, respectively. Finally, a test platform based on dSPACE real-time simulation is established for the two-speed AMT, and the sensor fault diagnosis and processing strategies are verified by experiments. Experimental results show that the proposed strategy can improve the shift reliability of AMT under simulated sensor signal drift and sensor failure conditions.

Key words: automatic transmission, two-speed AMT, sensors, vehicle failure.

Organizer

Co-organizer

IAMSET®
艾 慕 赛 特