Preface

It is a great pleasure for us to declare the opening of the Ninth International Symposium on Management Engineering that started in Kitakyushu since March 2004. We wish you will have a wonderful time here.

The objective of the symposium is to promote the researches in the field of Management Engineering in various fields of management from private companies to public organizations. It places stress on the methodologies employed in the management engineering, that include not only operational research and management science but also theoretical and methodological research works such as soft computing methods. The symposium covers wide ranges of management and methodologies as you will find in the program.

We have the two keynote speeches on

Dr. Kashi R. Balachandran, Distinguished Professor, G. D. Goenka World Institute, Delhi, India and Prof. Emeritus, New York University, USA will give a talk on "The Valuation and Reporting of Organizational Capability in Carbon Emissions Management."

Dr. Jeng-Shyang Pan, Professor in the Department of Electronic Engineering, National Kaohsiung University of Applied Sciences, Taiwan talks on "Overview of Swarm Intelligence."

Also we provide the four tutorial given by

Dr. Jaeseok Choi (Gyeongsang National University, Korea on "Probabilistic Reliability and Production Cost Evaluations of Power Systems Including Renewable Energy Generators," Hisao Shiizuka (Kogakuin University, Japan) on "Scale-Free Network in a Super-Aging Society," Dr. Long Thanh Ngo (Le Quy Don University, Viet Nam) on "CTIN-based General Type-2 Fuzzy Logic Systems," and Dr. Gwo-Hshiung Tzeng (Kainan University, Taiwan) on "A New concepts and trends of Hybrid MCDM Model for Problems-Improvement."

We received papers from different regions such as Australia, China, Hungary, India, Japan, Korea, Mexico, Taiwan and USA. We are welcoming all participants to join the discussion of recent advanced results from the perspective of management engineering, optimization, MCDM, supply chains and e-Commerce as well as methodological research studies including soft computing and DNA computation.

We wish the symposium space can enable us to accelerate the research works in management engineering further.

We express the thanks to the International Society of Management Engineers, Waseda University, the City of Kitakyushu, West Japan Industry and Trade Convention Association that have fully supported the organization of the symposium and also appreciate the support of other institutes. Also we express many thanks for ICIC international support the ISME2012 to organize issues for IJICIC and ICIC express letters as well as JACIII as the post-symposium publication.

We hope that the symposium will play a pivotal role in the research progress of management engineering, industrial management and other related fields. At the end, we would like to inform you the 10th anniversary of the symposium will be held at an old capital, Hangzhou, China in October, 2013. We welcome you to join the symposium again in China.

Executive President of ISME
Junzo Watada,
Professor, Waseda University

Contents

Part I
Keynotes and Tutorials

The Valuation and Reporting of Organizational Capability in Carbon Emissions Management

Kashi R. Balachandran

Abstract Under various carbon emissions trading schemes proposed around the world (including the United States), organizations will need to implement carbon management schemes to meet carbon ration targets, earn revenue and reduce costs. Emission Trading Schemes will impact the accounting profession significantly; however, discussions on how to report these transactions are in the very formative stages. So far the accounting literature has focused on the reporting of current carbon assets and liabilities in the balance sheet and the timing effects of carbon releases in the income statement. However, there has been little or no discussion as to how to value and report the underlying non-current assets (and liabilities) that produce or use carbon allowances on the balance sheet. This paper proposes a model for valuing an organizationfs non-current carbon sequestration and emission capabilities. A new metric, Environmental Capability Enhancing Asset (ECEA), is introduced as the underpinning for the conversion of non-monetary CO2 emission and sequestration measures to monetary values.

Biodgraphy:

Bala K. R. Balachandran is a professor emeritus of accounting and operations management at New York University Stern School of Business, Editor in Chief of Journal of Accounting Auditing and Finance. He is currently Distinguished Institute Professor of G.D. Goenka World Institute where he advises the management on strategic development of the institute. He is also a Chair Professor of Accounting at Tunghai University in Taiwan. He is an organizing member of the Taiwan- Italy Internship Program in its second year of operation and the China- Italy Internship program, for students from Taiwan and China to serve in Italian companies as interns.

Professor Balachandran joined Stern in 1979. His primary areas of research include optimal operation of service systems, incentive contracts and mechanisms, transfer pricing determinations, conceptualization of unused capacities and their optimal utilization, warranty contracts, quality enhancement programs and reporting, activity based costing systems, business measurement systems and optimal performance evaluations. In addition, he has contributed to sustainable business development, global warming research and management educational process. Professor Balachandran has written and published more than 75 articles in leading academic journals of economics, accounting, operations research and management science. He is the editor-in-chief of the Journal of Accounting Auditing and Finance and the Senior Consulting Editor of Journal of Applied Management Accounting. In addition to serving on the editorial boards of several journals, he has refereed for numerous journals and research funding agencies. He has organized numerous conferences and symposiums for JAAF in New York and Europe. As the organizer of the annual KPMG/JAAF conference in New York, he coordinates with KPMG on their funding for the conference. He is on the staff of Ross Institute of Accounting Research at New York University that develops liaison with Industry.

Before joining Stern, Professor Balachandran taught at the University of Wisconsin, the Georgia Institute of Technology and University of Kentucky, and has been a frequent visiting professor of management control and performance measurement at SDA Bocconi University, Italy, visiting professor at University of Rome-Tor Vergata and International University of Japan. He is also a Chair Professor at Tunghai University and a regular participating professor for the Italian Summer School for doctoral students from around the world. He has served as the associate director of the Ross Institute of Accounting Research and doctoral program director of accounting at New York University and a member of the Wisconsin Governorfs Commission on Education. He has lectured internationally in the United States, Europe and Asia in several conferences and universities. He served as a member of the Asian American Advisory Council to the Governorfs office in New Jersey and is a member of the International Advisory Board of the Indian Institute of Finance Business School in India. He has given executive seminars at the Stern School of Business and internationally on Information Analysis for Managerial Decision Making and related topics.

Professor Balachandran earned his Bachelor of Engineering (with honors) in Mechanical Engineering from University of Madras, India; Master of Science in industrial engineering and Doctor of Philosophy in operations research from the University of California, Berkeley and his certificate in management accounting from the Institute of Management Accountants.

Overview of Swarm Intelligence

Jeng-Shyang Pan

Abstract Swarm intelligence (SI) is based on collective behavior of self-organized systems. Typical swarm intelligence schemes include particle swarm optimization (PSO), ant colony system (ACS), stochastic diffusion search (SDS), bacteria foraging (BF), the bees algorithm, swarm robotics, etc. Besides the applications to conventional optimization problems, SI can be used in controlling robots and unmanned vehicles, predicting social behaviors, enhancing the telecommunication and computer networks, etc. Indeed, the use of swarm optimization can be applied to a variety of fields in engineering and social sciences. This talk reviews some popular algorithms in the field of swarm intelligence for problems of optimization. The detail overview and experiments of Particle and Cat Swarm Optimization, Ant Colony System (ACS) and Artificial Bee Colony are given.

Biodgraphy:

Jeng-Shyang Pan received the B. S. degree in Electronic Engineering from the National Taiwan University of Science and Technology in 1986, the M. S. degree in Communication Engineering from the National Chiao Tung University, Taiwan in 1988, and the Ph.D. degree in Electrical Engineering from the University of Edinburgh, U.K. in 1996. Currently, he is the Doctoral advisor both in Harbin Institute of Technology and Professor in the Department of Electronic Engineering, National Kaohsiung University of Applied Sciences, Taiwan. He has published more than 400 papers in which 110 papers are indexed by SCI. He is the IET Fellow, UK and the TainanChapter Chair of IEEE Signal Processing Society. He was Awarded Gold Prize in the International Micro Mechanisms Contest held in Tokyo, Japan in 2010. He was also awarded Gold Medal in the Pittsburgh Invention & New Product Exposition (INPEX) in 2010, Gold Medal in the International Exhibition of Geneva Inventions in 2011 and Gold Medal of the IENA, "International - Ideas - Inventions" New productsg, Nuremberg, Germany. He was offered Thousand-Elite-Project in China. He is on the editorial board of International Journal of Innovative Computing, Information and Control, LNCS Transactions on Data Hiding and Multimedia Security, and Journal of Information Hiding and Multimedia Signal Processing. His current research interests include soft computing, robot vision and signal processing.

CTIN-based General Type-2 Fuzzy Logic Systems

Long Thanh Ngo

Abstract Triangulated irregular network (TIN) has been used for representing general type-2 fuzzy sets and gained some results of reducing computational complexity. In general, TIN-based algorithms are still complex and dif?culty to deploy in applications. So, an approach based on re?nement constraint TIN (CTIN) for representing general type-2 fuzzy set is proposed. The paper deals with the use CTIN in general type-2 fuzzy logic systems (GT2FLS). Operations are developed for general type-2 fuzzy sets. A T2FLS is designed and implemented in comparing previous approaches under an application of robot navigation.

Probabilistic Reliability and Production Cost Evaluations of Power Systems Including Renewable Energy Generators

Jaeseok Choi

Abstract The utilization of renewable resources such as wind and solar to generate electric power has been receiving considerable attention in recent years as a result of being environmental friendly. Therefore, Probabilistic production cost and reliability evaluations are very important for grid expansion planning and operation modes when WTGs(wind turbine generators) and SCG(solar cell generators) are penetrated in power system. Probabilistic reliability evaluation and production simulation model in the composite power system which considers grid constraint, are not easy. Specially, the WTGs and SCGs can not be handled as two-state model but multi state model for their resource uncertainties. In this tutorial, methodologies for grid constrained probabilistic reliability and production cost evaluations of power systems including wind turbine generator and solar cell generators are introduced. And also, this tutorial describes a detail computation process of the method through a case study with two buses sample test system in order for attendances to identify the reliability concept easily. Finally, case study using smart grid test bed on Jeju island power system in South Korea will be introduced.

Scale-Free Network in a Super-Aging Society

Hisao Shiizuka

Abstract In this paper, we focus on social isolation among elderly people to better understand the reality of their lives, and analyze the relationship between the factors behind changes in the family structures of the elderly and their social isolation, and changes in modern communities. We also investigate new forms of communication aimed at improving the quality of life in a longevity society. Methodologically, we propose and examine a basic means to enhance local community networks, based on a scale-free network as a foundation for local community formation.

A New concepts and trends of Hybrid MCDM Model for Problems-Improvement,

Gwo-Hshiung Tzeng, Kua-Hsin Peng

Abstract A typical multiple attribute decision making (MCDM) is a scientific analytical model for evaluating and improving a set of alternatives based on the consideration of multiple criteria to determine a priority ranking and how improvement for alternative implementation to achieve aspiration level in all dimensions and criteria. However, we find that the traditional MCDM ignored some important new concepts and have some assumptions limit/defects for solving real-world problems. First, the traditional model assumes that the criteria are independent and hierarchical in structure; however, criteria are often interdependent in real-world problems. Second, the relative good solution from the existing alternatives is replaced by the aspiration levels to avoid "Choose the best among inferior choices/options/alternatives", i.e., avoid "Pick the best apple among a barrel of rotten apples". Third, the trends have shifted from how to carry out the "ranking" or "selection" of the most preferable alternatives, to how to "improve" their performances. Fourth, information fusion/aggregation such as fuzzy integrals, basically, a non-additive/super-additive model, has been developed to aggregate the performances. Therefore, in order to overcome the defects of conventional MCDM method, we have focused on developing a series of new Hybrid Dynamic Multiple Criteria Decision Making (HDM-CDM) method for solving the complication dynamic problem in real world and applying to various fields. Finally some empirical real cases are illustrated to demonstrate effectiveness of the proposed new hybrid MCDM methods. From those real cases, the best performance improvement strategies can be devised to provide the most suitable/reasonable effective and efficient strategies for improving the gaps to reach the aspiration level.

Part II
Scientific Papers

A Game Approach to Competitive Decision Making in Logistics

Thisana Waripan, Rosarin Durongdej, Junzo Watada

Abstract This paper considers the optimal solutions under cooperative decisions of the two-echelon modelamong logistic service providers (LSPs) under Stackelberg structure. Assuming condition as Duopolistic shippers and Oligopolistic forwarders, the shippersperform as a leader declare their service to both forwarders to set price and quantity independently under shipper's scheme. The paper analyzes the optimal solutions of the three rival game behaviors-Stackelberg, Collusion and Cournot- on the optimal decisions for the shipper and the oligopolistic forwarders.Thus, proposes the two-echelon profit model to study the action of the logistics players' decisions.Numerical examples are conducted to show the maximum profit decision among three behaviors for each logistic playerin case by case.The result of this proposed method would be use as decision supports for LSPs make a pricing decision under their competitive and unclear information situation for optimal benefit. The result indicate that: (i) among three scenarios, the duopolistic forwarders' action is Stackelberg behavior can carry out the maximum profit (ii) Collusion game can achieve the maximum profit for Shippers.

A Game Theoretical Framework for Low Carbon Growth Partnership

Mayuko Miyata, Takashi Tsubota, and Shao-Chin Sung

Abstract East Asia low carbon growth partnership is a concept advocated last year by Japanese Prime Minister Noda as a measure against global warming, which is a supplier-client relationship of sharing advanced low-carbon technologies between countries. We show that the problem for nding an optimal partnership is NP-hard, and we propose a game theoretical framework for building such a partnership.

A Genetic Type-2 Fuzzy C-Means Clustering Approach to M-Fish Segmentation

Dzung Dinh Nguyen, Long Thanh Ngo, Junzo Watada

Abstract Multiplex Fluorescent In Situ Hybridization (MFISH) is a multi-channel chromosome image generating technique that allows to distinguish colors of the human chromosomes. In this technique, all chromosomes are labeled with 5 flours and a fluorescent DNA stain called DAPI (4 in, 6-Diamidino-2-phenylindole) that attaches to DNA and labels all chromosomes. Therefore, M-FISH image consists of six images and each image is the response of the chromosome to the particular flour. In this paper, we present a genetic interval type-2 fuzzy c-mean (GIT2FCM) algorithm which is developed and applied to segmentation and classification of M-FISH images. Chromosome pixels from DAPI channel are segmented by GIT2FCM into two clusters, and use this chromosome pixels as a mask for the remaining five channels. Then GIT2FCM algorithm is applied to classify the chromosome pixels into 24 classes corresponding to 22 pairs of homologous chromosomes and two sex chromosomes. The experiments are done based on M-FISH dataset with the statistics show that the algorithm generates good quality of clusters.

A Linguistic Random Variable Approach to Regression Model

Shinya Imai and Junzo Watada

Abstract The objective of this paper is to build a model for the linguist random regression model as a vehicle to solve linguistic assessment given by experts. The difficulty in the direct measurement of certain characteristics makes their estimation highly impressive and this situation results in the use of fuzzy sets. In this sense, the linguistic treatment of assessments becomes essential when fully reflecting the subjectivity of the judgment process. When we know the attributes assessment, the linguistic regression model get the total assessment.

Application the Clustering Based on Self-Organizing Map to Select the Project Management Methodology

Yu-Yun Chang, Junzo Watada, Ikno Kim, Meng-Jong Kuan, Gwo-Hshiung Tzeng

Abstract In the project management field, people develop many different types of project management guideline systems, such Traditional, Agile, Adaptive, Extreme, Emertxe and so on. Each of these systems is called single project management methodology in order to efficiently save time and reduce organizational costs. Since our technologies rapidly have been changed, the project manager is not able to apply traditional models to new type of projects. In this paper, the main purpose is to combine cluster method with Self-organizing map (SOM), because SOM can be handled in projects. Further, according to goal and solution as baseline, the clustering can cluster the given data into clusters. SOM is an achievement in artificial neural network feasibility and solving engineering and other application problems. To utilize the neuron has great store of information capability and let multi-dimension mapping into two-dimension and between two layers to reaction. Hence, we expect to have a selection of the suitable results in project management.

Applying Fuzzy Preference Relation and Grey Relation Analysis in the Assessment of Railway Grade Separation Construction Projects

Hsin-Hsien Liu, Ming-Shan Yeh, Yung-Hui Chou, Gwo-Hshiung Tzeng

Abstract This study aims to assess the appropriateness of railway grade separation (construction) projects, and then ranks the projects in the feasibility study and comprehensive planning phases. Combining with Grey Relational Analysis (GRA) and Fuzzy Preference Relation (FPR) was used to obtain the weights and relational degrees between projects and ideal values. As question items of previous AHP questionnaire surveys were considerably complex, and may easily result in inconsistencies in the preferences of respondents, FPR was used to simplify questionnaire items to ensure the consistency of expert preferences. With Taiwan's railway grade separation construction projects as the assessment subjects, this study assessed the projects on the feasibility study phase, including the Chiayi, Fongshan, and Yilan projects, as well as the projects at the comprehensive planning phase, including the Taichung, Yuanlin, and Zuoying projects. The assessment results suggested that, in terms of weight, the transportation, economic, and financial factors are the key points, and project assessment results are not consistent with the actual sequence as adopted by the government, which is mainly due to the inconsistency of project application time. Hence, it is suggested that a unified and comprehensive evaluation method should be adopted in the future to enhance the profitability and efficiency of all railway grade separation construction projects.

Brand Innovation and Luxury Brand Construction in a Competitive Market - Case Study of Bally and Tod's Japan -

Zhiqing Jiang and Shin'ya Nagasawa

Abstract The purpose of this study is to describe and analyze how brand innovation influences luxury brand construction in a competitive market. This study is performed as a case study of two luxury fashion brands- Bally and Tod?s and conducted in a deductive way, where the method used is both descriptive and exploratory. Interviews and questionnaires are utilized to gather data about the brand image and innovation of Bally and Tod?s in Japan. The results indicate that the innovative products can enhance brand image and conduce to brand construction; meanwhile, retail stores and PR are of great importance for communication as well as increasing brand awareness.

Color Texture classification using DLBP

Mrs. G. Tamil Pavai and S. Tamil Selvi

Abstract This paper proposes a new approach for color texture classification using DLBP. This method extract color texture features from texture image for texture classification. The problem of texture classification exists in several areas such as computer vision, image analysis, medical images, Remote sensing and engineering design. The proposed features are robust to image rotation, noise. The Support Vector Machine (SVM) classifier and K-nearest neighbor (KNN) classifier were used for the classification of the texture images. It comprises of two sets of features called Dominant Local Binary Pattern (DLBP) and Gabor filters. Using this developed approach several testing have been done. For testing purpose Outex, Brodatz, Real Medical images have been used. This method has been compared with six published texture features were combined, improving the classification yield for the six classes, for the KNN classifier to 96% and for the SVM classifier to 99% in the testing.

Consistent Conjectural Variations Equilibrium Part 1

Nataliya I. Kalashnykova, Vyacheslav V. Kalashnikov, and Felipe J. Castillo Perez

Abstract In this paper, we consider a model of partially mixed duopoly and oligopoly with conjectured variations equilibrium (CVE). The agentsf conjectures concern the price variations depending upon their production output, increase or decrease. We establish existence and uniqueness results for the conjectured variations equilibrium (called an exterior equilibrium) for any set of feasible conjectures. To introduce the notion of an interior equilibrium, we develop a consistency criterion for the conjectures (referred to as influence coefficients) and prove the existence theorem for the interior equilibrium (understood as a CVE with consistent conjectures). To prepare the base for the extension of our results to the case of non-differentiable demand functions, we also investigate the behavior of the consistent conjectures in dependence upon a parameter representing the demand functionfs derivative with respect to the market price.

Consistent Conjectural Variations Equilibrium in Partially Mixed Duopoly and Oligopoly. Part 2

Nataliya I. Kalashnykova, Vyacheslav V. Kalashnikov, and Felipe J. Castillo Perez

Constructing optimal railway time-table using fuzzy fitness function in bacterial memetic algorithm

Zsolt Danyadi, Peter Foldesi, Janos Botzheim

Abstract In many management decision cases there are constraints that have different importance concerning the final solution. In our paper we propose an option in which the heuristic search is not restricted to the feasible, valid solutions. All individuals are kept in the population even if they encode an invalid solution, and fuzzy membership functions are applied to evaluate the grade of belonging to the valid set. In order to compare the crisp approach to the fuzzy one with respect to handling the different constraints of a railway time-table optimization task, we used the results obtained from a number of test runs to show the general efficiency and the contrast between the crisp and fuzzy fitness functions.

Convergence of Meta-Controlled Double Layered Neural Network

Junzo Watada

Abstract In this paper, meta controlled Boltzmann machine; the double-layered Boltzmann machine consisting of upper (Hopfield network) and lower (Boltzmann network) layers, is efficiently applied to solve mean-variance problem using mathematical programming with two objectives: the minimization of risk and the maximization of expected return. It is demonstrated that the proposed structural learning method has various advantages in a way such as an investment for a power system. As a result, it was shown that the structural learning can provide an alternative solution for decision makers to select the best solution from their respective point of view, as a numerical example shows.

Determining operating information of financial statement using a hybrid approach of rough sets and artificial neural networks

You-Shyang Chen, Da-Ren Chen , Ching-Hsue Cheng, Yan-Yu Chen,

Abstract For seeking for a suitable model applied to the Asian banking industry, this study presents various hybrid approaches to provide an alternate method for classifying credit ratings for interested parties. The variously proposed hybrid approaches are differently constituted by the following seven components: expert knowledge, Global discretization, reduct and core methods, rough sets, artificial neural networks, rule induction, and rule filter. The proposed hybrid approaches are illustrated in practice by examining an experimental dataset from the well-known BankScope database from the Bureau Van Dijk, a leading publisher of electronic business and company information. The experimental results of internal and external comparisons reveal that the proposed hybrid model has better performance than the listed methods in term of accuracy rate. Furthermore, the study generates valuable information applied in knowledge-based investment systems for investors. The analytical results provide useful operating information of financial statement of Asian banks for both academics and practitioners for subsequent research and could be applicable to other datasets or to other country banks.

Electrically Controlled Two-dimentional Cell Migration and Transport of Plastic Microspheres Using Paramecium bursaria as Bio-micromachines.

Kohei Otsuka and Tomonori Kawano

Abstract Some researchers have described the cells of Paramecium species as ”swimming sensory cells” or ”swimming neurons” applicable to micro-biorobotics or BioMEMS (biological micro-electro-mechanical systems). Cells of Paramecium species including those of green paramecia (P. bursaria) actively migrate towards an anodic electrode when exposed to electric field. This type of cellular movement is known as galvanotaxis. Since the ideal micromachines required for microparticle transport must have a capacity for certain numbers of particles to be loaded, P. bursaria was chosen as a model organism. In the present study, we demonstrated that movement of cells with/without loading of microspheres (, 9.75 m) can be controlled on the two-dimentional plane under strict electrical controls.

Emotional Value Communication Strategy - Case of the Swiss Watch Industry

Kana Sugimoto, Shinichiro Terasaki and Shin'ya Nagasawa

Abstract This study focuses on the communication strategies used for the manifestation of emotional value as against the creation of emotional value, which is more commonly examined in conventional studies. Products that invoke emotional value imply craftsmanship, history, and endorsements of personalities who define such items. We cannot commercialize these emotions sustainably regardless of the delivery of emotional value through a combination of various media such as newspapers, magazines, and the Internet. In this study, the analysis of the communication strategy in the luxury watch industry in Switzerland suggested the flow of emotional value delivery that induces sustainable profits for manufacturing companies. The case analysis helps to develop a communication model of emotional value that will be applicable to many manufacturing companies.

Fuzzy Assessment of the Risk Rate with Confidence Interval in Software Development

Huey-Ming Lee, Lily Lin , Jin-Shieh Su

Abstract In this study, we propose the fuzzy sense of statistical confidence interval instead of the point estimate or interval value to do the assessment of aggregated risk rate and apply the centroid method to defuzzify the data. As a result, the proposed fuzzy assessment analysis method with statistical confidence interval estimation can reflect the interviewee's incomplete and uncertain thoughts.

Image Segmentation Method Based on Automatic Clustering Weighting Fuzzy C-Means Algorithm

Yujie Li, Huimin Lu, Bolong Chen, Lifeng Zhang, Akira Yamawaki, Shiyuan Yang and Seiichi Serikawa

Abstract Image segmentation is an important research topic in the field of computer vision. Recently, the fuzzy C-Means (FCM) algorithm is one of the most frequently used clustering algorithms. Although a FCM algorithm is a clustering without supervising, the FCM arithmetic should be given the transcendent information of prototype parameter; otherwise, the arithmetic will be wrong. This limits its application in image segmentation. In this paper, we develop a new theoretical approach to automatically selecting the weighting exponent in the FCM algorithm to segment the blood cell images, which is called Automatic Clustering Weighting Fuzzy C-Means Segmentation (ACWFCM). This method can reduce the disturbance of noise; get the segmentation numbers more accurately. The experimental results illustrate the effectiveness of the proposed method. Keywords:

Knowledge Retrieval for Project Management

Shinji Mochida

Abstract To solve several types of project management problems, efficient project management is being demanded. Success or failure of the project hangs to the skill of project manager. If the knowledge is considered to be a kind of judgment for the effective action, first of all the registration of manager's action and experience is needed. Group of low-level information and data is called knowledge in this paper. It is necessary to register the knowledge easily. But it is difficult to find the timing to register the knowledge. It is difficult to find the time that information should be registered on. This paper describes the method of finding the best timing to have to register the knowledge. I tried to take into the change in progress of the project in order to get the knowledge in addition to the EVM method. EVM (Earned Value Management) is one of the methods for scientific managing the progress of the project. On the other hand, the time that progress changes seem the best timing of registration. As the result, it has been understood that there is a possibility that the knowledge can be registered automatically.

Luxury Fashion Brand Image Building: the Role of Store Design in Bally and Tod's Japan

Zhiqing Jiang and Shin'ya Nagasawa

Abstract The aim of this paper is to reveal how store design influences luxury brand image in a competitive market in the form of case study of two luxury fashion brands- Bally and Tod's. Quantitative (questionnaires) and qualitative (interview) approaches are both utilized in this research. Positioning maps of brand and store image are drawn and the distance between managers and consumers are also calculated; meanwhile, brands, advertising, location and store atmosphere are analyzed through interviews to brand managers and secondary data analysis. The results illustrate that location of a flagship store or boutique reflects the position of a brand; while the store atmosphere contributes to luxury brand image building through non-verbal communication.

Multiplicative Evaluation Model for Alternative-Fuel Buses Selection

Jiun-Yi Shiu, Shih-Tong Lu, Cheng-Wei Lin

Abstract The emissions from motorcycles, private vehicles, and buses seriously affect air quality in urban area. Therefore, the promotion of alternative fuels for vehicles would be an effective measure to reduce air pollution for improving air quality. The key weakness in EVs is the time needed to recharge the batteries. In addition, disadvantages such as a short cruising distance (usually less than 200 km) and lack of support infrastructure significantly reduce their convenience. The bus systems can overcome these disadvantages, so research on finding the best alternative-fuel mode for public transportation is of high interest. In this study, multiple criteria evaluation method was applied to evaluate the alternative-fuel buses to make this evaluation more objective. AHP applied in MADM problems assumes that the criteria are the independent each other; however, the criteria are to be interdependence or feedback in real world. In this current research, factor analysis is combined with the fuzzy integral to construct a hierarchical evaluation model which releasing the assumption of AHP; at the same time, the information requirement of fuzzy integral is reduced. An empirical case for evaluating the alternative-fuel buses is illustrated to demonstrate the proposed method in this research is workable. The results reveal that the pure electric buses (including rechargeable batteries or OCEV) and fuel-cell buses are the two best alternatives among all the other alternative-fuel buses.

New Thinking of Multi-Objective Programming with Changeable Space - In Search of Excellence

Jih-Jeng Huanga, Gwo-Hshiung Tzeng

Abstract Multi-objective programming (MOP) is a branch of mathematical programming and has been widely used to deal with various practical problems. With the introductions of new technologies and business models, a paradigm shift of optimization problems is gradually changed from fixed optimization to flexible optimization. For example, many organizations use outsourcing or business process reengineering (BPR) to improve or upgrade their objective and technological coefficients to achieve better performance. Hence, traditional MOP models should be extended from the concept of fixed parameters to changeable parameters, called changeable space, including decision space and objective space. In this paper, we proposed three kinds of MOP models with changeable parameters to help the decision-makers to achieve the desired point (aspiration level), which is better than the ideal point.

Primitive Optical Computing Model with Films: Boolean Conjunction of the Square Matrix-Arrayed Color Codes

Tomonori Kawano

Abstract Color is one of the most useful and attractive characteristics of light applicable to the optical science and related industries. In recent decades, a number of studies focusing on the use of lights as key components of computation attracted the attentions by researchers and engineers since these studies are potentially applicable to the signal processing through optical interconnections between electronic devices. Such studies include the optical parallel logic gates proposed by a Japanese group allowing spontaneous and parallel computing with spatial coding using lights, simply by overlaying a pair of shadowgram images. For computational handling of the colors visible to human eyes, Commission Internationale de l'Eclairge has defined CIE 1976 color space (CIELAB). The author has been engaged to development of CIELAB-based printable and computable color codes possibly used for novel optical logic gate system as one of natural computing approaches. In the present study, by employing the pairs of CIELAB-coded-printed transparent films overlaid, a Boolean operation for crossing (conjugations) of 2-by-2 color matrices based on scanning of CIELAB values was demonstrated. This approach is still primitive but might be a significant step for manifesting the array-based processing of colors representing the print-preserved and digitalized information.

Probabilistic Reliability Evaluation for the 5th Long-Term Electricity Supply Planning in South Korea

Taegon Oh and Jintaek Lim, Jaeseok Choi, and Donghoon Jeon

Abstract In recent, the importance and necessity of some studies on reliability evaluation of transmission system comes from the recent black-out accidents occurred in the world. This paper evaluates the probabilistic reliability of transmission system which is reflected in the 5th basic plan of long-term electricity supply and demand in Korea. Furthermore, the causes of contingency lead to a load loss are analyzed to target a specific year. In order to evaluate the transmission system reliability, Transmission Reliability Evaluation for Large-Scale Systems (TRELSS) is used in this paper.

Run-Length Encoding (RLE) Graphic Rules, Molecular Biologically Editable Designs, and Steganographical On-Image Numeric Data Embedment for DNA-based Cryptographical Coding System

Tomonori Kawano

Abstract There have been a wide variety of approaches for handling the pieces of DNA as the tools for digital information storage and processing, including a series of studies applied to the security-related area, such as DNA-based digital barcodes, water marks, and cryptography. In the present article, numerically and biochemically combined protocols for ciphering the given keywords and/or numbers using DNA sequences are proposed. The keywords of interest were decomposed into single letters and translated into the font image codes on the separate DNA chains with both the coding regions in which the images are encoded based on the novel run-length encoding rule, and the non-coding regions designed for biochemical editing and remodeling processes revealing the hidden orientation of letters composing the original keywords. The latter processes require the molecular biological tools for digestion and ligation of the fragmented DNA at the polymerase chain reaction-engineered termini of the chains. Lastly, additional protocols for steganographical overwriting of the numeric data of interests over the image-coding DNA are also discussed.

Solar Radiation Estimation using Artificial Neural Network- Case Studies In Korea

Fengming Zhang, Kyeonghee Cho and Jaeseok Choi

Abstract Development and use of renewable energy are particularly important in recent. Renewable energy resources such as wind, wave, solar, micro hydro, tidal and biomass etc. are growing in the world. Solar energy is one of the fastest growing sources of renewable energy for the production of electrical energy. The solar cell generator depends on the amount of solar radiation. As the solar radiation(SR) has uncertainty, prediction of SR is very important for successful operation of solar cell generator in power system. This paper proposes to use the twolayered artificial neural networks for predicting the actual solar radiation from the previous values of the same variable. Even if the proposed method uses conventional ANN, the prediction may be acceptable for actual prediction. Case studies in South Korea are presented in this paper.

Solving a Consumer Behavior Classification Problem Based on Molecular and Fuzzy Similarity Methods

Ikno Kim and Junzo Watada

Abstract To ensure that consumers or consumer groups are satisfied with their products and services, enterprises constantly seek to improve and refresh their products and services portfolio. The introduction of new products and services helps sustain enterprise growth and satisfy changing consumer demands and preferences. In the field of consumer behavior, classifying the consumers into specific consumer groups is one way of analyzing consumer behavior. In this article, molecular and fuzzy similarity methods are proposed and used together to classify the consumers into groups.

The Evaluation Criteria for Recruiting Local Staffs by Taiwanese Enterprise in China

Shih-Tong Lu, Cheng-Wei Lin, Dong-Shang Chang

Abstract Taiwanese enterprises are facing the competitor's challenge in domestic and international market and under the huge pressure of economic change currently. And, must be intense in this environment to find a suitable place to invest for the business extension, usually the first priority of investment location is mainland China. Because the culture and language are resemblance, it is easier to integrate resources between headquarter in Taiwan and the subsidiaries in China. Therefore, the employment of local staffs in China should be very important to the success of the business operation. This article review the literatures of multinational enterprises staffing selection factors should be considered, categorize them into four dimensions and 20 sub-factors. The use of fuzzy linguistic preference relations (FLPR), by 20 executives interview and questionnaires collections of several Taiwanese enterprises in China to assess the recruitment of local staffs for the importance of the extent of the factors. By this way, help managers to reduce the risk of inappropriate local staffs employment and enhance management effectiveness.

The Modified Economic Manufacturing Quantity Model Based on Inspection Error, Quality Loss, and Shortage

Chung-Ho Chen and Chiung-Hui Tsai

Abstract In 1996, Pulak and Al-Sultan presented the problem of determining the optimum process mean for a product with the one-sided specification limit under the rectifying inspection plan. However, they didn't consider the quality loss within the specification limit. The inspection is perfect and the non-conforming items of the accepted lot aren't eliminated or replaced by the conforming ones in their model. Traditional economic manufacturing quantity (EMQ) model addressed that the perfect production for product. However, there possibly exists the defective product in the manufacturing process. Hence, it is necessary to consider the quality loss of product in the modified EMQ model. In this study, the author integrates the modified Pulak and Al-Sultan's model with inspection error and quality loss into the Cardenas-Barron's production lot model with shortage for determining the economic manufacturing quantity, shortage and optimum process mean.

Three Methods of Defuzzification of Fuzzy Number on Inventory

Kung-Han Yang, Yung-Cheng Wang, and San-Chyi Chang

Abstract There are some methods of defuzzification of fuzzy number, saying, the centroid method, the method proposed by Carlsson and Fuller and the method proposed by Fortemps and distance based on central point of interval by Yao and Wu. In this paper, we introduce the new method, which is better than above mention methods, especially, when the considered fuzzy number is triangular fuzzy number. Also, we discuss some applications on inventory.

Time Aggregation Effect on Regression Models

Rong Jea, Teng-San Shih and Huey-Ming Lee

Abstract A time aggregation effect is reported in the recent financial and economic literature. This paper considers the multiplicative variable that series consist of products of the n one-period variables. For fundamental and practical reasons this paper investigates the time interval effect when one is a multiplicative variable and the other is a stock variable. This also demonstrates the importance of analyzing the time interval effect on the regression coefficients in finance.

Transmission System Expansion Planning Considering Outage Cost and Probabilistic Reliability Constraint

Jintaek Lim, Jaeseok Choi, and Donghoon Jeon

Abstract This paper proposes a new method for choosing the best transmission system expansion plan considering annual outage cost and a probabilistic transmission system reliability criterion. The objective method minimizes a total cost which consist of an investment budget for constructing new transmission lines and an annual outage cost, subject to the probabilistic transmission system reliability criterion. This proposed model considers the uncertainties of power system facilities. The proposed method bases on model of the transmission system expansion problem formulated as an integer programming problem. It solves the optimal strategy using a probabilistic branch and bound method that utilizes a network flow approach and the maximum flow-minimum cut set theorem. Test results on an existing 21-bus system are included in the paper.

Use of Colored Reflectors for Negation or Highlighting of Scanned Color Information on Film-based CIELAB-coded Optical Logic Gate Models

Kiyoshi Moritaka and Tomonori Kawano

Abstract In recent two decades, a number of researchers have been engaged in the study of natural computing systems which employ physical, chemical and biological phenomena as the direct media for manifesting the computation. Among such attempts, the studies focusing on the use of lights as key components of computation attracted the attentions by researchers and engineers since these studies are potentially applicable to the signal processing through optical interconnections between electronic devices. The team of the authors has been recently engaged in the study on the novel color-based natural computing model. Our recent works include the use of CIELAB-coded colors for Boolean conjunction (AND operations) after printing the color codes on papers. Here, we employed the transparent films as the media to print the color codes on. In addition, by employing the aluminum-coated reflectors with and/or without background colors on which the color-printed films are laid on, Boolean operations based on CIELAB-coded colors were tested for negation or highlighting of color codes printed on the films. This type of color computing may allow a wide range of applications of CIELAB color codes in various area including security controls or access controls to the systems of interest. Such applications may include the matching of the paired color keys on which the arrays of color codes to be optically computed are printed.

Using hybrid fuzzy MCDM to improve accreditation performance

Kua-Hsin Peng, Gwo-Hshiung Tzeng, Hao-Lin Tseng

Abstract Few studies have explored strategies for improving institutional accreditation performance in higher education, and preventing decision makers from obtaining valuable cues for making accurate decisions to improve institutional accreditation performance to increase the logical thinking, reasoning ability and work competitiveness of graduate students in response by natural language. Therefore, the purpose of this study used a new hybrid fuzzy MCDM model combined with FDANP (fuzzy DEMATEL-based ANP) to explore strategies for improving institutional accreditation performance. An empirical case was to demonstrate the effectiveness of the proposed model for evaluating institutional accreditation performance to identify institutional performance gaps and explore strategies for improving accreditation based on the influential relation map. Decision makers should improve the priority of the cause criteria priority, to successfully increase institutional accreditation performance to achieve the aspiration levels and increase competeveness of students.