2015 IEEE International Conference on Grey Systems and Intelligent Services (GSIS 2015)

Leicester, United Kingdom 18-20 August 2015



IEEE Catalog Number: ISBN:

CFP15GSI-POD 978-1-4799-8376-6

Table of Contents

Contributed Papers

	On the New Model System and Framework of Grey System Theory	1
	Sifeng Liu, Liangyan Tao, Naiming Xie, Yingjie Yang	
	50 Shades of Partial Information	12
	Alan Pearman	
	The Hybrid Intelligent Systems Design Using Grey Systems Theory	19
	Emil Scarlat	
	A Fuzzy Grey Cognitive Maps-based Intelligent Security System	29
	Jose L. Salmeron	
A	Grey Numbers	
	Some Kinds of Nonlinear Strengthening Operators for Predicting the Output Value of China's Marine Electric Power Industry	33
	Yuhong Wang, Zhengxin Wang Algorithm Rules and Sorting Method of Interval Grey Numbers Based on Different "Kernel" and The Degree of	
	Greyness of Grey Numbers	38
	Sandang Guo, Sifeng Liu, Zhigeng Fang	
	Fractional Order Grey Reducing Generation Operator and Its Properties	43
	Wei Meng, Bo Zeng, Sifeng Liu, Zhigeng Fang	
	Graph Model for Conflict Resolution Analysis Based on Interval Grey Number Preference	49
	Fan Yang, Yeqing Guan,	
	Graph Model for Conflict Resolution with Grey Information and Application	54
	Yong Liu	
	Study on Expansion and Properties of Grey Accumulating Generation Operator	61
	Wei Meng, Bo Zeng, Sifeng Liu, Zhigeng Fang	
	A Study on Innovation Contest Based on Grey Degree of Solvers' Knowledge	66
	Wenping Wang, Yichuan Chen, Xianghong Lai, Hui Shu	
	Variable Weight Buffer Operator of Geometric Average Growth Rate and Its Properties	73
	Chenyu Fan, Xuemei Hu	
	Forecasting China's SO2 Emissions by the Nonlinear Grey Bernoulli Self-memory Model (NGBSM)	80
	Xiaojun Guo, Sifeng Liu	
	Comparison of Interval Grey Numbers Based on Monte Carlo Method	86
	Xinhai Kong	
	Solution of Programming Problem with Interval Grey Parameters	91
	Shuhua Mao, Min Zhu	
	Research on Prediction of Regional Grain Logistics Demand Based on Grey-regression Model	97
	Ye Li, Shan Lu	
	Research on Grey AMSAA-ELP Model on the Basis of Discovery Learning Driven Reliability Growth of Complex Equipment Na Zhang, Hongquan Wang, Xiaqing Liu, Zhigeng Fang	102

B Grey Relation Analysis

Grey Relational Analysis and Natural language Processing	107
Arjab Singh Khuman, Yingjie Yang, Sifeng Liu	
Average Wage, Money Supply and Inflation—Empirical Analysis Based on the Grey Incidence's Degree and the State Space Model	113
Xiaoyan Chen, Zhiguo Su, Yong Liu	
Energy Consumption Index of China's Manufacturing based on Grey Change-poin—from the perspective of policy	117
Wei Sun, Shuangshuang Ji, Zaiwu Gong, Qianqian Chen	
Grey Incidence Analysis on Relationship between China's OFDI Industry Layout and Industrial Structure Optimization	122
Ying Wang, Qi Liu, Ran Bi	
Grey Incidence Decision-making Method of Grey Hesitant Fuzzy Sets Based on Kernel and Grey Degree	127
Qingsheng Li, Ni Zhao, Sifeng Liu	
Grey Relational Analysis between Social Media Engagement and Users' Decisions	134
Camelia Delcea, Emil Scarlat	
Identification of Overlapping Community Structure with Grey Relational Analysis in Social Networks	139
Ling Wu, Qishan Zhang	
Multiple Attribute Group Decision Making Method Based on WGA Operator and Grey Incidence Analysis	145
Qiuping Wang, Fan Tang, Guoqiang Xiong	
Parallel Overlapping Community Discovery based on Grey Relational Analysis	151
Qishan Zhang, Qirong Qiu, Kun Guo	
Analysis of Tianjin Basketball Comprehensive Based on Grey Incidence Analysis from 2012-2013CBA	157
Qinglei Zhang, Yimin Huang	
The Equivalence Classes of Similarity Incidence Degree and Properties of Incidence Degree in the Quotient Space	162
Yong Wei, Kefang Zeng	
The Optimization Grey Incidence Analysis Models	167
Dang Luo, Baolei Wei, Yuwen Li	
Credit Scoring with an Improved Fuzzy Support Vector Machine Based on Grey Incidence Analysis	173
Baiheng Yi, Jianjun Zhu	
The Optimization Degree of Provincial Industrial Ecosystem and EKC of China—Based on the Grey Correlation Analysis	179
Wenping Wang, Zhoumu Yang, Bin Zhang, Yun Lu, Yuli Shi	
Comparative Research on the IOT Industry Competitiveness of Eastern, Central and Western China—A Comprehensive Evaluation Based on TOPSIS and GRA	187
Xiaozhong Li, Yueli Gao, Hailei Zhao	107
Image Segmentation Algorithm Based on Improved Genetic Algorithms and Grey Relational Degree Analysis	194
Yufeng Gui, Peng Su, Xianqiao Chen	
A Ranking Model According to Grey Analysis Theory Based on Cross-evaluation Strategy	199
Juan Zhang, Yaoguo Dang	
Healthcare Risks Incidence on Patients Wellbeing	203
Camelia Delcea, Ioana Bradea, Liviu Cotfas, Emil Scarlat	
The Grey Correlation Analysis between Technology Readiness Level and Performance in Civil Aircraft	208
The Grey Correlation randry site octive in recamining y readiness herei and refrontiance in Civil America	200

Iianlino	Wano	Lei Xiang

Grey Relational Analysis of Executive Compensation and Firm Performance in Chinese Port and Shipping Listed Companies

Jiajia Chen, Bin Liu

C Grey Prediction

A Modeling Method for GM(1,1) and Its Application Based on A Particular Data Feature	220
Jun Liu, Xinping Xiao ,Shuhua Mao	
A Novel Modeling Method of Grey Verhulst Model Based on Optimizing Initial Condition	225
Hui Shu, Wenping Wang , Pingping Xiong	
Service of Macau Cruise Ships based on GM(0,N) Model	231
Qing Li	
Forecast of the Informatization Index of China from 2011 to 2015 Using the Grey Forecasting Model	235
Yancai Zhang	
Grey Discrete Time-Varying Model and Its Application	242
Liyun Wu, Yingjian Qi, Zhengpeng Wu	
Grey Forecasting and Incidence Analysis of Labor Demand for Modern Services in China	247
XiaoLi Qu	
Grey Prediction of China Grain Production with TEI@I Methodology	253
Qiting Chen, Chao Zhang	
Grey Wave Forecasting with Qualified Unequal-Interval Contour Lines and Its Application in Metal Prices Prediction	261
Yanhui Chen, Yingchao Zou, Shanshan Wang	
Multivariate Discrete Grey Model Base on Dummy Drivers	266
Ke Zhang, Pinpin Qu	
Non-equidistant GM(1,1) Model based on GCHM_WBO and Its Application to Corrosion Rate Prediction	272
Yuanjie Zhi, Dongmei Fu, Hanling Wang	
Novel grey model for predicting casualties of strong earthquakes erupting in high population density areas	277
Jie Cui, Daming Shan, Sifeng Liu	
Research and Application on Electric Quantity Forecast Method Based On The Usage Electrical Characteristics of Different Industry and Grey System Linhao Ye	f 281
Research on Heterogeneity of Chinese Regional Technological Innovation Efficiency Based on Meta-frontier and Grey System Theory	285
Qi Huang, Jianjun Miao	
Applying Grey System Theory to Evaluate the Relationship between Industrial Characteristics and Innovation Capabilities within Chinese High-tech Industries	1 290
Wuwei Li, Yueru Wei	
Analysis and Research on the Influencing Factors of Road Transportation Network Vulnerability Based on the Interpretative Structural Modeling	296
Yaqing Liu, Xu Wu	201
Inflation Prediction for China Based on the Grey Markov Model	301
Xiaoyan Chen ,Keshen Jiang, Yong Liu	

	Research on the GM(1,1)-MARKOV Chain Model of Highway Freight Volume Forecasting	307
	Wei Liu, Chunyang Gao, Shaocheng Zhang	
	Development Cost Estimation of Civil Aircraft Based on Combination Model of GM (1, N) and MLP Neural Network	312
	Songming Yin, Naiming Xie, Chuanzhen Hu	
	An Analysis on Gap of Funds Supply and Demand of Region A Based on GM(1,1) Model	318
	Keshen Jiang, Julong Wu	
D	Grey Decision-making	
	A Novel Grey Clustering Group Decision-making Model and Application	327
	Huanhuan Zhao, Lirong Jian, Yong Liu	
	An Uncertain Pure Linguistic Approach on Evaluation of Enterprise Credit Based on Grey Information	333
	Zhenzhen Ma , Jianjun Zhu	
	Consensus Models at Minimum Quadratic Cost and its Economic Interpretation	339
	Zaiwu Gong, Huanhuan Zhang, Chao Xu, Xiaoxia Xu	
	Dynamic Grey Target Decision Making Method with Three-parameter Grey Numbers	346
	Shuli Yan, Sifeng Liu, Xiaqing Liu	
	Grey Fixed Weight Cluster Model of Interval Grey Numbers Based on Central-point Triangular Whitenization Weight Function Jing Ye, Yaoguo Dang, Baoqin Zhang	352
	Grey Target Decision Model with Interval Number Based on a New Distance Measure	358
	Mingli Hu	330
	Multi-Agent Simulation Model of China's Real Estate Market Based on Bayesian Network Decision Making	363
	Yang Shen, Yongchen Guo, Zhigeng Fang	300
	Network Public Opinion Evaluation Based on Grey Target Decision with the Positive and Negative Bull's-eyes	369
	Qian Li	307
	Storage Reliability Evaluation Model Based on Grey Target Theory Combined with Prospect Theory	374
	Jiefang Liu, Sifeng Liu, Zhigeng Fang	317
	A Decision Tree Applied to the Grass-roots Staffs' Turnover Problem—Take C-R Group as an Example	378
	XiaoLi Qu	370
	The Intelligent Grey Target Decision Method of Evaluating Commercial Insurance Institutions to Undertake Serious Illness Insurance Service	383
	Xu Lan, Zhigeng Fang	
	Grey Intuitionistic Fuzzy Decision Making Method Based on Grey Incidence Analysis and Case-Based Reasoning Peng Li	387
	A Dynamic Three-Dimensional Correlation Space Model for Multi-attribute Decision Problems	391
	Beiyou Li , Jinjin Wei, Ruiling Bian	
E	Grey Evaluation	
	Construction of the Evaluation System for Regional Road Traffic Safety and Application Based on a Grey Integrated Evaluation Model Binru Cao, Yong Liu, Wuyong Qian, Yuhong Wang	395
	Passarch and Evaluation for Municipal Poad Low Carbon Transportation - Reced on Multi-hierarchical Gray Evaluation	

	Method	404
	Hao Wu, Xianglian Zhao	
	Research on Risk Assessment and Control Decision-making of Collaborative R&D Between Main Manufacturer and Suppliers for Aviation Complex Products	409
	Hongzhuan Chen, Shuai Ma, Xuesong Zhuang, Ting Li	
	The Evaluation of Tourism Exploitation Potentiality of Intangible Cultural Heritage Based On Two Stages Grey Synthetic Model	415
	Huibin Zhan, Ziyun Zhao, Sifeng Liu	
	Research on the Innovation Evaluation of Industry-University- Research Cooperation Based on the Grey Clustering Analysis	420
	Gang Li, Peng Guo	
	Study On Grey Comprehensive Evaluation and Comparison of China's National Independent Innovation Ability	425
	Hongqi Liu, Chaoqing Yuan, Na Zhang, Ding Chen	
	Taxonomic Approach to Competencies in the Succession Process of Family Firms with the use of Grey Clustering Analysis	432
	Ewa WIĘCEK-JANKA, Rafał MIERZWIAK, Joanna KIJEWSKA	
F	Logistics and Supply Chain	
	A Case-Based Distance Approach to Agricultural Product's Vendor Evaluation in E-Commerce	439
	Wangquan Sun, Ye Chen, Hai Yan Xu	
	An Analysis of Logistics and Supply Chain Restructuring Based on Big Data and Mobile Internet—A Case Study of Warehouse-type Supermarkets Lin Ma, Fengying Nie, Qian Lu	446
	Comparative Analysis on Social Network of Korea-invested Enterprises in Jiangsu Province: Implications for Regional Development	452
	Haiying Xu, Guangxiong Mao, Chunmei Zhang	
	Equilibrium Analysis of Retailing Modes of High Timeliness Merchandise	459
	Qian Wu, Fenyi Dong,Rong Zhang, Bin Liu	
	Performance Evaluation System of Logistics Engineering Practical Teaching Course in Application Oriented Undergraduate Based on Rough Set Theory	465
	Liguo Zhang	
	Study Of Affecting Factors of the Third Party Logistics Satisfaction Based on PCA	469
	Qiuxiang Yi, Aifeng Yang	
	The Analysis of Influence Factors in XinJiang's Logistics Industry Based on the Perspective of the Silk Road Economic Zone	473
	Lei Zhou, Qingming Dong	
	Product Quality Dynamics in Closed-loop Supply Chains and Its Sensitivity Analysis	479
	Chong Li, Xiaodong Xiang, Yuling Qu	
G	Service Systems	
	Accelerated HMAX Model Based on Improved SIFT Feature Points	485
	Ruigang Fu, Biao Li, Yinghui Gao, Ping Wang	
	Design of Video Surveillance Platform Based on Softswitch Technology	490
	Shaicheng Pi, Huimin You	
	Mean-Shift Moving Target Tracking Algorithm Based on Weighted Sub-Block	494

	Xingmei Wang, Hongbin Dong, Xue Yang, Lin Li	
	Ship Detection at the Dork Using a Polygon Approximation Method	500
	Huimin You, Shaicheng Pi	
	The Analysis of Patents Transformation Efficiency Based on Stochastic Frontier Approach: About China's High-tech Industry	505
	Bin Wang, Qingmei Tan	
	The Self-organizing Evolutionary Model of Micro-blogging Big Data Ecological System and Empirical Research	509
	Jing Ma ,Tong Xue, Chuanmin Mi, Chi Li	
Н	Uncertain Systems	
	Multi-Response Robust Design Based On Improved Desirability Function	515
	Shengnan Zhou, Jianjun Wang	
	Study on Auto Parts Suppliers Combination Selection Based on Adaptive Genetic Algorithm	521
	Shan Li, Zhao Yan, Lirong Jian, Jingwen Xu	
	The Optimization Method of Markov Chain Usage Model Based on Three-parameter Interval Number	528
	Yang Zhao	
I	Management Science	
	Evolution Mechanism of R&D Network Based on University-industry Cross-organizational knowledge Integration	531
	Lirong Jian, Yu Zhang, Sifeng Liu	
	Practice and Discussion of Collaborative Innovation Model to Ethnic Medical Technology, Education and Industry	539
	Genhua Zhu, Yaokun Xiong, Zhihong Yan, Zhiyong Liu, Xiang Zhou, Fei Li	
	Predicting the Chloride Penetration of Mineral Admixture Concrete Exposure at Salt Lake Site	544
	Liming Zhang, Hongfa Yu	
	Product Requirement Analysis Based On the Improved House of Quality	547
	Yanfeng Chu, Hongchang Ren	
	Regularity of Market Price Signals, Price Expectations and Producer's Decision—The Case of Cotton Planting Acreage Changes in China	551
	Xuemei Hu, Chenyu Fan	
	Research on Combined POL Consumption Forecast Based on Bayes Adaptive Weighing	557
	Bixin Li, Heng Li, Yongdong Su, Jin Huang	
	Research on Coupling Coordination Level of Sci-tech Finance and Technology Innovation in Jiangsu Province	562
	Dongfang Qiu, Huayang Shao	
	Research on the Competing Evolution Model and Empirical Analysis of Complex Network	568
	Shouwei Li, Zuogong Wang	
	Using Weighted Partial Least Squares to Estimate the Development Cost of Complex Equipment at Early Design Stage	574
	Lifeng Wu, Sifeng Liu, Dejin Song	
	Board Governance, Ultimate Controller Corporate Social Responsibility Disclosures Paper	579
	Tao Jiang, Huaiming Wang	
	Research on the Structure and Operation of Industrial Innovation Platform of Civil-military Integration	584
	Qingmei Tan, Dandan Li	

	Failure Modes and Effects Analysis Based on Fuzzy TOPSIS	588
	Fenglin Zhang, Wenjun Zhang	
	A Supplier Quality Control Model for Large Passenger Aircraft Under the Asymmetric Information	594
	Chuanmin Mi, Jing Ma, Zhenzhen Ma, Yuan Qiang, Peng Peng	
	FPGA Software Testing Process Management	600
	Wang Li, Zhou Hao	
J	Finance and Risk Management	
	Research on Evaluating and Measuring Operational Risk in Commercial Banks Based on Internal Control	604
	Baobao Li, Yanfeng Wang	
	Empirical Research on Financial Governance Efficiency of Rural Commercial Banks in China	611
	Yizhou E, Chengxuan Geng, Hairong Wang	
	Stock Data Analysis Based on Hilbert-Huang Transform	618
	Xuan Luo, Guozhong Cui, Fulong Le	
	The Robustness Risk and Selection Optimization of R&D Project Portfolio Under Uncertainty	622
	Jingmei Wang, Peng Guo	
	The Study of Financial Efficiency of New Material Industry in China Based on DEA Method	628
	Heng Ma, Ruoyu Zhang	
	Credit Expansion and Concentration in China Based on GMCR	635
	Jie Li, Wenyu Han, Haiyan Xu	
	A Study on Information Transfer of International Crude Oil Futures Price Base on VAR-GARCH-BEKK Model	640
	Longjie Xiao	
	A Study on Choosing Network Lending Platforms by the Grey Clustering Method Based on the Sight of Investors	647
	Lingjuan Xu, Yuan Liu	
K	Grey Control and Other	
	System State Assessment of a Grey Immune Mechanism-based Organic Manufacturing System	654
	Qixiang Cai, Haihua Zhu, Dunbing Tang, Tengxiao Huang	
	The Self-defense for Financial Crisis Based on Grey System Control Theory	658
	Huan Guo, Jeffrey Forrest	
	Study on Exterior Power to Promote Strategic New Industries Based on Incremental Probabilities Equation	663
	Hongxing Shi, Bing Yan	