2012 IEEE International Conference on Automation and Logistics

(ICAL 2012)

Zhengzhou, China
15 – 17 August 2012

IEEE Catalog Number: CFP12CAL-PRT
ISBN: 978-1-4673-0362-0

ICAL2012 Table of Content

Session WA1: Control Application

Zhang Fractals Yielded Via Solving Nonlinear Equations By Discrete-Time Complex-Valued ZD 1
Huarong Wu, Fen Li, Zhan Li and Yunong Zhang

Electromechanical Roller Conveyor Model with Enhanced Consideration of Roller-Belt Interaction 7
Dominique Melot de Beauregard, Alexander Conradi, Burkhard Benthaus and Leslaw Golebiowski

Federated Filter for Multi-Sensor Data Fusion of Dynamic Positioning Ship 13
Xiaocheng Shi, Xingyan Sun, Mingyu Fu, Youzhen Chen and Wenbo Xie

Stabilization of Singular Fractional-Order Systems : A Linear Matrix Inequality Approach 19
Xiaona Song, Leipo Liu and Zhen Wang

A Support Vector Machine Discriminator for Tobacco Growing Areas Based on Near-Infrared Spectrum 24
Lin Xie, Wenjie Pan and Simon X. Yang

Session WA2: Intelligent Control

Adaptive Inversion Control of the Missile based on Neural Network and Particle Swarm Optimization 30
Shuzhong Song, Kun Liang, Jianwei Ma and Danfeng Yang

Guaranteed Cost Fault-tolerant Control for Uncertain Networked Control System with Packet Dropouts 35
Dexiao Xie, Gang Chen and Dengfeng Zhang

A Variable Structural Control of a Damped Sandwich Beam 41
Xuezhang Hou

The Comparisons of Four Methods for Financial Forecast 45
Anmin Zhu and Xin Yi

Session WA3: Supply Chain Management

Research on supply chain versus supply chain competition with product quality and price dependent demand 51
Bing Xu and Fan Zhou

A Kind of Online Power Materials Supermarket System 57
Jiachen Hou, Gang Xiong, Xiwei Liu, Dong Fan and Shen Liu

Design and Development of Material Management System for Power Enterprise Group 63
Gang Xiong, Jiachen Hou, Dong Fan, Xisong Dong, Yanjie Yao and Xiuqin Shang

The Study of Automobile Enterprise Logistics Supply Chain Integrated Performance Evaluation Method 69
Dapeng Zhang, Fengzhong Wang, Feng Zhu and Xiaoping Kuang

Available-to-promise Model for a Multi-site Supply Chain 73
Wen Yang and Richard Y.K. Fung

Session WP1: Logistics

Selection of Logistics Mode for Business to Customer E-commerce Based on AHP and DEA 79

Shuming Xu

Design and Analysis of Optimal Incentive Contracts between Fourth-party and Third-party Logistics Providers 84
Qin Zhu and Richard Y.K. Fung

Pedestrian Transfer Time Optimization of Urban Rail Transit based on ACP Approach 90
Xubin Sun, Yue Zhang, GaoYou Qin, Hairong Dong and Fu Guan

Scientific Decision Research of Logistics Enterprises 96
Yuan Zhang, Zhouyuan Cui and Qi Qian

Patterns Support for Automatic Service Composition 101
Guangjun Cai, Lingfei Liang, Xuhui Zhao and Ruijuan Zheng

Session WP2: Intelligent Control II
Positive Realness and Optimality Problems for Linear Systems via Dynamic Compensation 105
Lei Liu, Ying Yang and Guoshan Zhang

A Novel Elevator Group Control Scheduling Algorithm based on Pseudo Differential Feedback 111
Sheng Wu and Guifang Wu

Research of CO2 Welding Inverter Power Source Under Current Waveform Control 116
Shanzhong Liu and Yunhao Wang

Application of Internal Model Control in the production of PVC 122
Shufen Qi, Huihui Wang and Yilin Zhou

Study on Military Vehicle Equipment Grading Method Based on Clustering Analysis and Fisher Discriminant Analysis 127
Dapeng Zhang, Fengzhong Wang, Liang Wang and Feng Zhu

Session WP3: Instrumentation Systems I
Active Piezoelectric Energy Harvester Based on Impedance Matching 131
Liwei Zhang, Guoqiang Zheng and Jishun Li

Modeling of Piezoelectric Actuator Based on Genetic Neural Network 136
Qiang Wei, Chao Zhang, Dong Zhang, Shunwei Wu and Xueliang Zhao

The Star Sensor Layout Based on Geometric Position Analysis 141
Lin Zhao, Zhonghua Su and Yong Hao

Estimations of Bounds for Brushless Direct Current Motor System and Its Application in Chaos Synchronization 145
Jigui Jian and Yanjun Shen

A Simplified SVPWM Algorithm Research Based on the Neutral-Point Voltage Balance for NPC Three-level Inverter 150
Bo Fan, Weigang Zhao, Wei Yang and Ruiqiang Li

Session WE1: Control and System
Vision-Based Adaptive Grasping of a Humanoid Robot Arm 155
Kai-Tai Song and Shih-Cheng Tsai

Integrated Design and Experiment Study of Switched Reluctance Starter/Alternator System 161

Hao Chen, Xiaoshu Zan and Jiangyang Fan

Robust H∞ Fault Detection Filter for Networked Control System with Network-induced Uncertainties 167
Xiaomei Qi and Chengjin Zhang

A Remote Sensing Map Based Solution to Path Planning Problem 173
Liang Liu, Huan Qi and Weimin Wu

Associative Classification Using an Immune Optimization Algorithm 179
Lei Zhang, Lingrui Meng and Chunjie Hou

Session WE2: Intelligent Control III
An Improved HLLE Algorithm Based on the Midpoint-Nearest Neighborhood Selection 185
Sumin Zhang, Shuaibin Lian, Qiuli Kong and Zhengming Ma

Short-Term Prediction of Wind Power Combining GM(1,1) Model with Cloud Model 191
Xiaojuan Han, Fangyuan meng, Zhihui Song and Xiangjun Li

Motor Rotor Resistance Identification based on Elman Neural Network 196
Bo Fan, Xing Li, Guanghui Shi and Weigang Zhao

Parameters Optimization of Controlled Anti-rolling Tank Based on Multi-Objective Optimal Method 201
Songtao Zhang, Lihua Liang, Xiaoliang Sheng and Na Wang

Course Keeping of an Air Cushion Vehicle Based on Switching Control 207
Chenglong Wang, Mingyu FU, Hongyu Zhang and Lina Zhang

Weights and Structure Determination of Pruning-While-Growing Type for 3-Input Power-Activation Feed-Forward Neuronet 212
Yunong Zhang, Wenchao Lao, Yonghua Yin, Lin Xiao and Jinhao Chen

Session WE3: Instrumentation Systems II
Design of Electronic Hydraulic Brake System for the Hybrid Passenger vehicle 218
Lihua Tao, Shoutao Li, Xinglong Pei, Yongxue Ma, Wenbo Zhang, Ce Ji and Wei Xiao

Multi-objective Scheduling of Electric Car Charging Jobs Based on Fuzzy Goal Programming 222
Longsheng Cai, Xuecong Zeng and Tomohiro Murata

Design of Engine Electronic Controller Detection System Based On PXI Bus 228
Shufen Qi and Ning Liu

DC Network Connecting of Switched Reluctance Generator System 233
Xiaoshu Zan, Chao Liu, Hao Chen and J.J. Gu

Design of Personnel Position System of Mine Based on The Average Of RSSI 239
Xue Wang, Shuzhong Song and Meng Li

Design and Implementation of Power Supply for DC Fused Quartz Furnace 243
Shuzhong Song, Danfeng Yang, Jianwei Ma and Kun Liang

Session TA1: Automatic Control I
Short-term Photovoltaic Power Forecasting with Weighted Support Vector Machine 248
Ruidong Xu, Hao Chen and Xiaoyan Sun

Trajectory Tacking Control of a Quad-rotor Based on Active Disturbance Rejection Control 254

Xun Gong, Yue Bai, Changjun Zhao and Yantao Tian

A Synchronization Motion Control Algorithm for Multiple Dynamic Positioning Vessels 260
Mingyu Fu, Jianfang Jiao, Aihua Zhang and Yuanhui Wang

Adaptive Dynamic Surface Tracking Control for Dynamic Positioning Cable Laying Vessel 266
Mingyu Fu, Aihua Zhang, Jinlong Xu and Jianfang Jiao

3D Guidance for Vertical Impact on Non-Stationary Targets 272
Jinpeng Zhang, Youliang Cao, Xiaona Song, Minglian Zhang and Gongzhang Shen

Session TA2: Biomedical Instrumentation and Applications
3D Reconstruction of GI Tract Texture Surface Using Capsule Endoscopy Images 277
Qian Zhao and Max Q.-H. Meng

The Construction of Concept System in TCM Syndrome Ontology 283
Jianjing Shen, Chuxiang Chen, Xiaofeng Guo, Nan Lin and Shanming Wu

A Powered Ankle-Foot Orthoses for Ankle Rehabilitation 288
Yang Bai, Fangxing Li, Jun Zhao, Jingyi Li, Fei Jin and Xueshan Gao

Removal of Non-informative Frames for Wireless Capsule Endoscopy Video Segmentation 294
Zhe Sun, Baopu Li, Ran Zhou, Huimin Zheng and Max Q.-H Meng

3-D Shape Recovery of Luminal Wall from WCE Image 300
Yanan Fu, David W. Zhang, Haiying Liu and Max Q.-H. Meng

Session TA3: Network-based System I
Vehicle Information Monitoring System Based on Mobile Phone 304
Airong Huang, Juan Bao, Jingling Zhang and Tao Zhang

A Broadcast Path Choice Algorithm Based on Simulated Annealing For Wireless Sensor Network 310
Haitao Zhang, Ge Bai and Cuiping Liu

A Verifiable Dynamic Threshold Key Management Scheme Based on Bilinear Pairing without a Trusted Party in Mobile Ad Hoc Network 315
Xianyong Meng and Yangmin Li

SO-RTI: A New RTI Based on Web Services 321
Xiaofeng Guo, Jianjing Shen, Zuwei Yin and Shanming Wu

Research and Application of a New Rectangle Intersection Algorithm 327
Chenghui Zhao, Feng Xu and Xuan Liu

Session TP1: Automatic Control II
Adaptive Exponential Synchronization of Chaotic Recurrent Neural Networks with Stochastic Perturbation 332
Leipo Liu, Xiaona Song and Xiaoqiang Li

Research on the Intelligent Protection System of Coal Conveyor Belt 337
Yingxi Xu, Xiaojing Hou and Chuanfeng Li

Laser Cutting Quality Prediction Based on Pareto Genetic Algorithm 343
Huijuan Hao, Jiyong Xu and Taibo Huang

Research on Nonlinear Model Predictive Control Technology for Ship Dynamic Positioning System 348
Yuanhui Wang, Yufeng Sui, Jing Wu and Jianfang Jiao

Indoor Scene Recognition via Probabilistic Semantic Map 352
Kun Li and Max Q.-H. Meng

Session TP2: Computer Vision

SAR and Panchromatic Image Fusion Based on Region Features in Nonsubsampled Contourlet Transform Domain 358
Chuanqi Ye, Liwen Zhang and Zhiyong Zhang

Detecting for the Aerial Small Target in Infrared Image Based on the Correlation Coefficients of Nonsubsampled Contourlet Transform 363
Gang Liu, Qianqian Zhang, Tao Huang and Dan Zhang

A Geometric Correction Approach for Chassis Images with Non-uniform Speed by Linear CCD Camera 368
Yan Cheng, Lingfei Liang and Jiexin Pu

Texture Segmentation Using Window Empirical Mode Decomposition 373
Lingfei Liang, Jiexin Pu and Ziliang Ping

Motion Blur Removal for Humanoid Robots 378
Teng Li, David W. Zhang, Yanan Fu and Max Q.-H. Meng

Session TP3: Network-based System II

A Novel Design of Profibus-DP Communication Interface Card for the Intelligent Instruments of Field Network 382
Linlin Xia, Chao Qiu, Zhaolong Fu and Xuying Pan

A Review of Wireless Sensor Networks and Its Applications 386
Shiwei Zhang and Haitao Zhang

RFID Technology in Victory Judgement of Military Exercises 390
Chao Zhang, Jianjing Shen, Zhenyu Zhou and Chuxiang Chen

Deploying and Researching Hadoop in Virtual Machines 395
Guanghui Xu, Feng Xu and Hongxu Ma

Research and Application of Migrating Legacy Systems to the Private Cloud Platform with CloudStack 400
Bin Cai, Feng Xu, Feng Ye and Wenhuan Zhou

Session TE1: Automatic Control III

Comparative Analysis of a 2-DOF Micro-stage with Two Different Types of Hinges Based on Level Amplified Principle 405
Zhigang Wu, Yangmin Li and Xinhua Zhao

An ArcObjects-Based Approach to Rapid Application Development of GIS 411
Xiaolian Tang, Yue Shen and Jianjing Shen

Modeling and Experiments of IPMC Actuators for the Position Precision of Underwater Legged Microrobots 415
Liwei Shi, Shuxiang Guo and Kinji Asaka

A Novel Linear Switch Reluctance Generator System 421
Yi Pu, Shijie Zhou, Jason Gu, Hao Chen and Chenjin Zhang

Adaptive Controller Design of Piezo-stage Base on Neural Networks 428
Dong Zhang, Chengjing Zhang, Zhen Qin, Qiang Wei, Suzhen Wang and Limin Quan

Session TE2: Automation
Methodology of Location Selection for Biofuel Refinery Based on Fuzzy TOPSIS 431
Shun Zhou, Yong Zhang and Xiangtai Bao

Rotor Flux Estimation Method of Bearingless Induction Motor Based on Stator Current Vector Orientation 437
Wenshao Bu, Shaojie Wang, Conglin Zu and Lili Zhai

Stabilization and H-infinite Control of a Class of Nonlinear Hamiltonian Descriptor Systems with Actuator Saturation 442
Wenqing Song, Liying Sun and Kang Li

Research on the Frequency Automatic Tracking in Ultrasonic Power Supply based on Fuzzy -DDS 448
Bingyi Li and Zhe Ding

Research and Application of e-p Analysis for Energy Consumption in Cement Production 452
Na Liu, Shaohong Jing and Xiaohong Wang

Session TE3: Network-based System III
Study of PID Temperature Control for Reactor Based on RBF Network 456
Yilin Zhou and Qichen Ding

Study on Cluster-based Dynamic Routing Algorithm in Power Line Communication Network 461
Chenchen Huang and Yonghai Ning

Optimal Design of Double-precision Chaotic Signal Generators Based on IEEE-754 Standard 466
Xi Chen, Fei Xiang and Lili Zhang

SAML-Based Single Sign-On for Legacy System 470
Fengming Nie, Feng Xu and Rongzhi Qi

A Simplified Document Flow System 474
Qiaoying Tang and Chenghui Zhao

Session FA1: Modeling, Identification and Simulation I
Preference based Recommendation Method by SOM aided AHP and a Case Study of Smartphone 478
Xuecong Zeng, Longsheng Cai and Tomohiro Murata

The Research of Aircraft Fuel System Fault Simulation Training System 484
Yilin Zhou and Wenhao Zhang

Study on a Microgrid System Based on Wind Powered SRG 489
Dongsheng Yu, Zhijun Fang and Hao Chen

Graphical BCDM Based on Entity-Relationship Methods 495
Chunlei Yang and Xiangluo Wang

A Contour Extraction Algorithm of Palmprints based on Corner Point Features 501
Guifang Wu, Haitao Zhang, Yan Li and Baosheng Zhang

Session FA2: Transportation Systems
Study on Gravitation between International Inland-port and Harbor 506
Chennan Gou, Yuzhe Liu and Cheng Ding

A Gravitational Facility Location Problem Based on Prize-Collecting Traveling Salesman Problem 511
Yunfeng Ma, Lu Li and Jun Yang

Petri Net Modeling of Information Flow in the Online Train Ticket Booking System 517
Ci Song and Weimin Wu

Transportation State Comprehensive Monitoring Recorder System Design 523
Yi Gao, Guangyu Ou and Xing Pan

Session FA3: Robotics I
A Novel Neural Sliding Mode Control for Multi-link Robots 528
Xiaojiang Mu and Li Ge

An FCM-based Method to Recognize and Extract Ripe Tomato for Harvesting Robotic Systems 533
Anmin Zhu, Liu Yang and Yanming Chen

A Model of Collision-Detection for Maxillofacial Multi-arm Surgery Robot 539
Xiangyu Zhu, Xingguang Duan, Chao Chen, Tianbo Liu, Qingbo Guo

Experimental Research on the Ultrasound-guided Positioning System of Microwave Ablation Surgical Robot 545
Xingguang Duan,Qingbo Guo, Tianbo Liu, Xiangyu Zhu, Chao Chen, Yang Yang

Active Disturbance Rejection Control of Underwater High-Speed Vehicle 550
Yuntao Han and Ruiguang Geng

Session FP1: Modeling, Identification and Simulation II
Application of Improved HU Moments in Object Recognition 554
Lei Zhang, Fei Xiang, Jiexin Pu and Zhiyong Zhang

The Implementation of Encoder and Decoder of LT Codes based on DSP 559
Junhong Hu, Hongfeng Gao and Shi Ge

Research of Heat Exchanger Fouling Ultrasonic Testing Signal Analysis Method Based on Inverse Filtering and High Order Cumulant MUSIC Spectrum Estimation 563
Ming Yang, Xia Li, Lingfang Sun and Xin Zhao

Numerical study of the drag coefficient of air cushion craft's bow skirt based on Virtual Experiment 567
Mingyu Fu, Lina Zhang, Chenglong Wang and Dacheng Song

On The Magnetic Field of a Current Coil and Its Localization 573
Jianmeng Bao, Chao Hu, Weixing Lin and Wenhu Wang

Research on Energy Management and Optimization for PHEV 578
Zhumu Fu, Junya Xiao and Aiyun Gao

Session FP2: Evaluation and Optimization
Automatic Parking Path Optimization Based on Bezier Curve Fitting 583
Zhao Liang, Guoqiang Zheng and Jishun Li

Detection of Transient Power Quality Disturbances based EMD Combined with Choi-Williams Distribution 588
Wei Liu and Xiaoting Guo

True Random Bit Generator Based on Cell Phone Recording and Chaotic Encryption 592
Fei Xiang, Lei Zhang, Zhiyong Zhang and Lili Zhang

Design and Application of Real-Time Attitude Estimation System for Unstable Object 596
Huiqin Li, Jianwei Li and Jianhai Han

Stochastic H∞ Filtering for Pantograph Systems with State-dependent Noise 601
Yulin Huang, Zhiguo Yan and Hongyun Zheng

Global Path Planning of AUV Based on Improved Ant Colony Optimization Algorithm 606
Guanglei Zhang and Heming Jia

Session FP3: Robotics II

Design of the Virtual Reality based Robotic Catheter System for Minimally Invasive Surgery Training 611
Baofeng Gao, Shuxiang Guo, Nan Xiao and Jin Guo

Miniature Detection Robotic System with Rapid Deployment Mode 617
Liancun Zhang, Qiang Huang, Liying Wu, Junyao Gao and Yue Li

An Improved PSO-based Algorithm for Extracting Week Coupling AC Signal in Electromagnetic Localization System 623
Wenhu Wang, Chao Hu, Weixing Lin and Jianmeng Bao

Analysis of Nonholonomic Constraints about a Variable Structure Bicycle Robot 628
Xiangjun Meng, Lei Guo and Qizheng Liao

Internet-based Robotic Catheter Surgery System --System Design and Performance Evaluation 634
Nan Xiao, Shuxiang Guo, Baofeng Gao, Xu Ma, Takashi Tamiya and Masahiko Kawanishi

A two-agent single-machine scheduling problem with a time-based learning effect 641
Peng Liu, Nan Rong and Na Yi

Grasp Planning of 3D Objects Using Genetic Algorithm 646
Zichen Zhang, Jason Gu