

The 17th International Conference on Automation and Computing

(ICAC 2011)

**Huddersfield, United Kingdom
10 September 2011**



**IEEE Catalog Number: CFP1160R-PRT
ISBN: 978-1-4673-0000-1**

Table of Contents

Key notes:

Opportunities and Challenges of Developing Equipment Manufacturing Industry in Western China,xii

Professor Ziqin Wang, Guizhou University, Guizhou Province, PR China

Virtual Manufacturing – Current Advances and Industrial Applicationsxiii

Professor Bernard Hon, University of Liverpool, UK

Theme 1: Computing and Network

An Intelligent Cloud Computing Architecture Supporting e-Governance 1

Rajkumar Sharma, Vikram University, India

Priyesh Kanungo, Patel College of Sc. & Technology, India

Toward Optimal Multi-Objective Models of Network Security: Survey 6

Valentina Viduto, Wei Huang, Carsten Maple, University of Bedfordshire, UK

A Complete Planner Design of Microstrip Patch Antenna for a Passive UHF RFID Tag 12

Tashi, Royal University of Bhutan, Rinchending, Phuentsholing, Bhutan & Staffordshire University, UK

Mohammad S. Hasan, Hongnain Yu, Staffordshire University, Becondside, UK

A fast and effective way to improve the merging accuracy of multi-view point cloud data 18

Feng Li, Andrew Longstaff, Simon Fletcher, Alan Myers, Huddersfield University, UK

Representing the Process of Machine Tool Calibration in First-order Logic 22

S. Parkinson, A .P. Longstaff, A. Crampton, S. Fletcher, G. Allen, A. Myers, University of Huddersfield, UK

Localisation Algorithm in Wireless Sensor Networks 28

Shuang Gu, Yong Yue, Carsten Maple, University of Bedfordshire, UK

Chengdong Wu, Northeastern University, China

User-defined gesture sets using a mobile device for people with communication difficulties 34

Yong Hee Jung, Shengeng Qin, Brunel University, , UK

The Effect of Depth of Cut on the Molecular Dynamics (MD) Simulation of Multi-Pass Nanometric Machining..... 40

A.O. Oluwajobi and X. Chen, University of Huddersfield, UK

Mobile Motion Gesture Design for Deaf People 46

Haoyun Xue, Shengfeng Qin, Brunel University, UK

An Efficient and Secure Authentication Protocol for RFID Systems 51

Md. Monzur Morshed, Anthony Atkins, Hongnian Yu, Staffordshire University, UK

Design of Interference Aware ZigBee Building Monitoring Network..... 57

Fang Yao and Shuang-HuaYang, Loughborough University, UK

Species area relations and information rich modelling of plant species variation 63

James Furze, Quan Min Zhu, Jennifer Hill, University of the West of England, UK

Feng Qiao, Shenyang Jianzhu University, China

Theme 2: Advanced Control & Applications

Study of a Multivariable Coordinate Control for a Supercritical Power Plant Process 69

Omar Mohamed, University of Birmingham, UK

Jihong Wang, University of Warwick, UK

Bushra Al-Duri, University of Birmingham, UK

Grid Roadmap based Real time Path Planning 75

M. R. B. Bahar, H. B. Bahar & F. Hashemzadeh , Tabriz University, Iran

A New Method for Estimating the Maximum Allowable Delay in Networked Control of Bounded Nonlinear Systems..... 80

Ashraf F. Khalil, University of Birmingham, UK

Jihong Wang, University of Warwick, Coventry,UK

Saliency Investigation of PM Brushless AC Motors for High-Frequency Carrier Signal Injection-Based Sensorless Control 86

Liming Gong and Z. Q. Zhu, University of Sheffield, UK

H_∞ filter design of networked systems with uncertain accessing probabilities and quantisation..... 92

Hongbo Song, Li Yu, Zhejiang University of Technology, China

Guo-ping Liu, University of Glamorgan, UK

Sliding Mode Control for a miniature helicopter..... 98

Jian Fu, Qing-xian Wu, Nanjing University of Aeronautics and Astronautics, China

Wen-hua Chen, Loughborough University, UK

Real-Time Implementation of a Burst Error Compensator for Wireless Control Systems 104

Michael Short, Usama Abrar, Ian French and Fathi Abugchem, Teesside University, UK

Neural Generalized Predictive Controller and Internal Model Principle..... 110

Hesham Abdel-Ghaffar, Invensys Engineering & Service, Egypt

Sherif Hammad, Hazem Abbas, Mentor Graphics Corporate, Egypt

A.Z. Badr, Ahmed Hassan, Ain Shams University, Egypt

Zero Overshoot and Fast Transient Response Using a Fuzzy Logic Controller 116

Bakhtiar I. Saeed & Bruce Mehrdadi, University of Huddersfield, UK

Trajectory Generation for Autonomous Soaring UAS..... 121

J. H. A. Clarke and W-H. Chen, Loughborough University, UK

Multi-objective Optimization of Constrained Parallel Hybrid Electric Vehicles..... 127

Shaobo Li, Jinglei Qu, Ministry of Education, Guiyang, China

Guanci Yang, Chinese Academy of Sciences, Chengdu, China

Theme 3: Intelligent Manufacturing

Morphological Filters Based on Motif Combination for Functional Surface Evaluation..... 133

Shan Lou, Xiangqian Jiang, Paul J. Scott, University of Huddersfield, UK

| | |
|--|-----|
| Data Mining for Gearbox Condition Monitoring | 138 |
| <i>M. Baqqar, M.Ahmed , F. Gu, The University of Huddersfield, UK</i> | |
| Process Monitoring and Metrology for Single Grit Grinding Test Performance | 143 |
| <i>Tahsin Tecelli Öpöz and Xun Chen, University of Huddersfield, UK</i> | |
| Improving Control Panel Consistency of Wizard-of-Oz Design and Evaluation Studies | 149 |
| <i>Andol X. LI and John V. H. BONNER, University of Huddersfield, UK</i> | |
| Assessing customized product design using virtual human and imposed motion | 155 |
| <i>Shengfeng Qin, George Panayiotou, Brunel University, UK</i> | |
| <i>Pin Zhang, Nankai University, China</i> | |
| Volume Deformation Based on Model-Fitting Surface Extraction | 161 |
| <i>Qian Xu, Duke Gledbill, Zhijie Xu, University of Huddersfield, UK</i> | |
| Numerical Simulation of Natural Frequencies in the Design of Micro Air Vehicle structures | 167 |
| <i>Yanan Yu, Xiangjun Wang, Tianjin University, China</i> | |
| <i>Carlo Ferri, Qingping Yang, Brunel University, UK</i> | |
| Finite Element Investigation of Nano-indentation of coated Stainless Steel | 172 |
| <i>Qiang Xu, Chulin Jiang, Dezheng Liu, Yongxin Pang, Simon Hodgson, Teesside University, UK</i> | |
| The development and Validation of Multi-axial Creep Damage Constitutive Equations for P91 | 177 |
| <i>Qiang Xu, Mark Wright, Qihua Xu, Teesside University, UK</i> | |

Theme 4: Computational intelligence

| | |
|---|-----|
| Short-Term Load Forecasting System Using Data Mining | 183 |
| <i>Liu Jin, Yu Jilai, Harbin Institute of Technology, China</i> | |

| | |
|---|-----|
| Applying the Design of Experiment (DoF) to Optimise the NN Architecture in the Car Body Design System | 189 |
|---|-----|

Sugiono, Mian Hong Wu, Ilias Oraifige, University of Derby, UK

| | |
|--|-----|
| Multiobjective Design of Evolutionary Hybrid Neural Networks | 195 |
|--|-----|

Lavinia Ferariu and Bogdan Burlacu, "Gheorghe Asachi" Technical University of Iasi, Romania

| | |
|---|-----|
| A regressive schema theory based tool for GP evolved nonlinear models | 201 |
|---|-----|

Alina Patelli, Lavinia Ferariu, "Gheorghe Asachi" Technical University of Iasi, Romania

| | |
|--|-----|
| Vehicle Windscreen Wiper Mathematical Model Development and Optimisation for Model Based Hardware-in-the-Loop Simulation and Control | 207 |
|--|-----|

Jianlin Wei, Jihong Wang, Hao Sun, University of Warwick, UK

Alexandros Mouzakitis, University of Warwick, UK

| | |
|---|-----|
| Fault Classification of Reciprocating Compressor Based on Neural Networks and Support Vector Machines | 213 |
|---|-----|

M. Ahmed, S. Abdusslam, M. Baqqar, F. Gu, A.D. Ball, University of Huddersfield, UK

| | |
|--|-----|
| Reinforcement Learning based Radio Resource Scheduling in LTE-Advanced | 219 |
|--|-----|

Ioan S. Comşa, Mehmet Aydın, Sijing Zhang, University of Bedfordshire, UK

Pierre Kuonen, Jean-Frédéric Wagen, University of Applied Sciences of Western Switzerland, Switzerland

Theme 5: Advanced Sensor & Measurement Techniques

| | |
|---|-----|
| The extraction of characteristic quantity of shallow defects in pulsed magnetic flux leakage signal | 225 |
|---|-----|

Junbiao Fei, Xianzhang Zuo, Tao Zhang, Ordnance Engineering College, China

Yunze He, Guiyun Tian, Newcastle University, UK

| | |
|---|-----|
| Detection technology to identify money based on pulsed eddy current technique | 230 |
|---|-----|

Sumin Qian, Xianzhang Zuo, Ordnance Engineering College, China

Yunze He, Guiyun Tian, Hong Zhang, Newcastle University, UK

| | |
|---|-----|
| Infrared Thermography Study of Thermal Plume | 234 |
| <i>Jafar Ali, Abdullah Abuhabaya and John Fieldhouse, University of Huddersfield, UK</i> | |
| A Wireless Sensor Network based Structural Health Monitoring System for an Airplane | 240 |
| <i>Jasleen. K. Notay, Ghazanfar. A. Safdar, University of Bedfordshire, UK</i> | |
| Modelling and experimental investigation of ferromagnetic material for angular defect detection ... | 246 |
| <i>Dong Chang, Xianzhang Zuo, Ordnance Engineering College, China</i> | |
| <i>University of Newcastle upon Tyne, UK</i> | |
| Defect depth effects in Pulsed Eddy Current thermography | 251 |
| <i>Hong Zhang, Guiyun Tian, Yunze He, Newcastle upon, UK</i> | |
| <i>Xianzhang Zuo, Ordnance Engineering College, Shijiazhuang, China</i> | |
| Parameters Influence in Steel Corrosion Evaluation Using PEC Thermography | 255 |
| <i>Yunze He, Guiyun Tian, Liang Cheng, Hong Zhang, Newcastle University, UK</i> | |
| <i>Paul Jackson, International Paint Ltd. Gateshead, Tyne and Wear,UK</i> | |
| The Effect of Metallic Substance on the Read Range of UHF Passive RFID System | 261 |
| <i>Chencho, Royal University of Bhutan, Bhutan</i> | |
| <i>Chencho, Dr. Justin Champion, and Prof. Hongnian Yu, Staffordshire University,UK</i> | |
| Electromagnetic NDT and Condition Monitoring – A Personal View | 266 |
| <i>Xiandong Ma, Lancaster University,UK</i> | |

Theme 6: Intelligent Systems

| | |
|---|-----|
| A Constraint-based Design Risk Management Tool for Design Collaboration | 272 |
| <i>Jian Ruan, Sheng Feng Qin, Brunel University,UK</i> | |
| Mixed integer linear programming models for scheduling the LED planting operation on PCBs | 277 |

Jiaxiang Luo, South China University of Technology, China

Jiaxiang Luo, Jiyin Liu, Loughborough University, UK

A NOVEL APPROACH TO MODELLING AND SIMULATION OF THE DYNAMIC BEHAVIOUR
OF THE WHEEL-RAIL INTERFACE 283

Arthur Anyakwo, Crinela Pislaru, Andrew Ball, Fengshou Gu, University of Huddersfield, UK

Time Encoded Signal Processing and Recognition of Incipient Bearing Faults 289

S. Abduslam, M. Ahmed, P. Raharjo, F. Gu, A. D. Ball, University of Huddersfield, UK

Reviewing DSTATCOM for Smart Distribution Grid Applications in Solving Power Quality Problems
..... 294

Bala Boyi Bukata and Yun Li, University of Glasgow, UK

Analysis of interrelationships between Suppliers configuration and performance within the supply
network: A simulation approach 300

Maria Aina, Dr. Yang Dai, Professor Dobrila Petrovic, Coventry University, UK

Theme 7: Energy Conversion and Powertrain

Review Electromagnetic Field Ignition System for Internal Combustion Engine 306

Lutz-Christoph Schöning and Yun Li, University of Glasgow, UK

The Optimisation of Bio-diesel Production from Sunflower Oil using RSM and its Effect on Engine
Performance and Emissions..... 310

*Abdullah Abuhabaya, Jafar Ali, John Fieldhouse, Rob Brown and Eko Andrijanto, University of
Huddersfield, UK*

Homogeneous Charge Compression Ignition engine: A Technical Review..... 315

Hammad Iqbal Sherazi and Yun Li, University of Glasgow, UK