

2010 IEEE International Conference on Electro/Information Technology

(EIT 2010)

**Normal, Illinois, USA
20 – 22 May 2010**



**IEEE Catalog Number: CFP10EIT-PRT
ISBN: 978-1-4244-6873-7**

TABLE OF CONTENTS

SESSION 1A – BIOMETRICS AND BIOINFORMATICS, BIOMEDICAL APPLICATIONS

Clinical Decision Support Systems: Medical Knowledge Acquisition and Representation Methods	1
<i>L. Aleksovska-Stojkowska, S. Loskovska</i>	
An Automated Content-Based Segmentation Framework: Application to MR Images of Knee for Osteoarthritis Research	7
<i>S.Y. Ababneh, M.N. Gurcan</i>	
An Efficient Graph-Cut Segmentation for Knee Bone Osteoarthritis Medical Images	11
<i>S.Y. Ababneh, M.N. Gurcan</i>	
S-CAS: Smart Channel Assignment Scheme for Wireless Sensor Networks	15
<i>A. Prajapati, S. Ganesan</i>	

SESSION 1B – SIGNAL/IMAGE AND VIDEO PROCESSING I

HW/SW Co-design Platform for Image and Video Processing Applications on Virtex-5 FPGA Using PICO	21
<i>C. Desmouliers, S. Aslan, E. Oruklu, J. Saniie, F.M. Vallina</i>	
Improving Image Contrast Using Coded Excitation for Ultrasonic Imaging	27
<i>J.R. Sanchez, M. Orescanin, M. Oelze</i>	
Human Face Detection Using Skin Color Information	33
<i>H. Shehadeh, A. Al-Khalaf, M. Al-Khassaweneh</i>	
Efficient Coin Recognition Using a Statistical Approach	38
<i>H.R. Al-Zoubi</i>	

SESSION 1C – INFORMATION SECURITY AND IT SERVICES – PRACTICES AND INNOVATION

A Research on the Establishment of an Information Security Environment for the Finance Industry	43
<i>T. Wu, S. Liu</i>	
Threat-Adaptive Architectures for Trusted Platform Modules in Secure Computing Systems	48
<i>V. Anand, J. Saniie, E. Oruklu</i>	
An e-Business Grid Model Architecture for Small and Medium Scale Enterprises	54
<i>S.A. Bello, O.O. Abiona, A.O. Oluwatope, M.L. Sanni, C.E. Onime, S.I. Eludiora, G.A. Aderounmu, E.R. Adagunodo, L.O. Kehinde</i>	

SESSION 2A – BIOMETRICS AND BIOINFORMATICS, BIOMEDICAL APPLICATIONS

Characterization of Clustered Microcalcifications Using Multiscale Hessian Based Feature Extraction	60
<i>I. Zyout, I. Abdel-Qader</i>	
Integrated Ultrasonic/Interferential Current System for Injured Bones, Muscles, and Nerve Therapy	65
<i>Y. Mohammed, P. Eslami, M. Shaik, R. Akula, I.M. Abdel-Motaleb</i>	
Adaptive Filtering and Target Decision for Ultrasonic Backscattered Signal	72
<i>D. Monroe, I.S. Ahn, Y. Lu</i>	

SESSION 2B – DISTRIBUTED COMPUTING, EMBEDDED SYSTEMS, DESIGN AUTOMATION

Current Trends in Low-power Embedded Computing	78
<i>G.S. Tewolde</i>	
NoC Datapath for Polymorphic Processors in Embedded Systems	84
<i>J. Weber, E. Oruklu, J. Saniie</i>	
New Port Modeling for Analog Circuit Biasing Design	90
<i>R. Hashemian</i>	
A Novel Technique for Mitigation of Voltage Sag-Swell by Dynamic Voltage Restorer (DVR)	95
<i>R.A. Kantaria, S.K. Joshi, K.R. Siddhapura</i>	

SESSION 2C – ELECTROMECHANICAL SYSTEMS, MECHATRONICS, NANOTECHNOLOGY

Scalable Acoustic Imaging Platform Using MEMS Array	99
<i>M. Turqueti, J. Saniie, E. Oruklu</i>	
Development of a Neural Network Based Surface Roughness Prediction System Using Cutting Parameters and an Accelerometer in Turning	103
<i>I. Asilturk, A. Unuvar</i>	
A VCO in 65 nm Technology for Very Accurate Sensing Applications	107
<i>M.R. Andalibizadeh, M.T. Savadkouhi, B. Nasri</i>	
Hygieia- Domestic Online Monitor of Water Pollution	111
<i>G.S. Swaroop, P.R. Reddy, K.R. Teja-M</i>	

SESSION 3A – BIOMETRICS AND BIOINFORMATICS, BIOMEDICAL APPLICATIONS

Multi-Channel Hybrid Active Noise Control System for Infact Incubators	117
<i>K. Beemanpally, K.R. Pottim, S.M. Kuo</i>	
An Augmented Block Code Model for Protein Translation Using Free Energy Based Distance Decoders	125
<i>M. Al Bataineh, L. Huang, A.F. Acedo, g. Atkin, N. Menhart</i>	
Identification of Transcriptional Promoter Sequence Based on Statistical Filter Bank Model	131
<i>L. Huang, M. Al Bataineh, A.F. Acedo, G.E. Atkin, X. Deng, W. Zhang</i>	
Development of Ambulatory Ischemia Detection Decives	136
<i>R. Vishmubhotla, S.M. Kuo</i>	
Intensity Only Microwave Diffraction Tomography Using 802.15.4 Wireless Networks	141
<i>K.P. Hunt, D.R. Andersen</i>	

SESSION 3B – DISTRIBUTED COMPUTING, EMBEDDED SYSTEMS, DESIGN AUTOMATION

Performance Analysis of Divisible Load Scheduling Utilizing Multi-Installment Load Distribution with Varying Sizes of Result Load Fractions	146
<i>P.A. Noel II, S. Ganesan</i>	
Towards Energy Proportionality In Web Systems	152
<i>X. Zheng, Y. Cai</i>	
Implementation of Wideband VoIP Middleware Using Embedded Systems	157
<i>D. Amarandei, M. El-Said</i>	
Memory-efficient Implementation of a Graphics Processor-based Cluster Detection Algorithm for Large Spatial Databases	164
<i>R.J. Thapa, C. Trefftz, G. Wolffe</i>	
Mixture Models for System-Level Communication Analysis at Higher Levels of Abstraction	169
<i>R. Mercado, Z. Cao, D.T. Rover</i>	

SESSION 3C – INTELLIGENT AND MULTI-AGENT CONTROL SYSTEMS

Intelligent Agent based Hotel Search & Booking System	175
<i>C. McTavish, S. Sankaranarayanan</i>	
An Intelligent Search Lifecycle Architecture for Modern Publishing and Newspaper Industries Using SOA	181
<i>N. El-Bathy, G. Azar, P. Chang, R. Abrahiem</i>	
An Optimization Neural Network for Smartphone Data Protection	188
<i>W. Hu, Y. Zuo, N. Kaabouch, L. Chen</i>	

SESSION 4A – POWER SYSTEMS ELECTRONICS AND APPLIED PHYSICS

Circuit Level, Static Power, and Logic Level Power Analyses	194
<i>S. Alipour, B. Hidaji, A.S. Pour</i>	
Heuristic Powertrain Setpoint Determination	198
<i>J.P. Lomonaco, S. Ganesan, K.C. Cheok</i>	

An Experimental Demonstration of Quantum Not Gate: Transition from Classical to Quantum Regime	204
<i>S. Sajeed, A.F.M.Y. Haider</i>	
Symmetrical Pattern and PCA Analysis based Framework for Fault Detection and Classification Framework in Power Systems	209
<i>Q. Alsafasfeh, I. Abdel-Qader, A. Harb</i>	

SESSION 4B – ENERGY, GREEN IT, AND TRANSPORTATION TECHNOLOGIES

Mathematical Analysis for Constant Household Monitor of Water Pollution	214
<i>P.R. Reddy, G.S. Swaroop, K.R. Teja-M</i>	
Electricity Generation - Industrial Waste Management	219
<i>P.R. Reddy, K.R. Teja-M</i>	
Pavement Distress Detection and Classification Using Feature Mapping	223
<i>E. Salari, G. Bao</i>	
Pavement Information System: Detection, Classification and Evaluation	228
<i>L. Hong, E. Salari, E. Chou</i>	
Fault Diagnosis in Vehicle Engines Using Sound Recognition Techniques	233
<i>M. Madain, A. Al-Mosaiden, M. Al-Khassaweneh</i>	

SESSION 4C – MOBILE, WIRELESS COMMUNICATION, AND SENSOR NETWORKS

Development of an Open Source Network Management & Monitoring Platform for Wireless Broadband Service Provider in Rural Areas	237
<i>Y. Cai</i>	
RF Communications in Underwater Wireless Sensor Networks	243
<i>K.P. Hunt, J.J. Niemeier, A. Kruger</i>	
Effect of Variables and their Interactions on RFID Tag Readability on a Conveyor Belt – Factorial Analysis Approach	249
<i>G. Aryal, L. Mapa, S.K. Camsarapalli</i>	
Effect of Nanofluids on the Readability of RFID Tags	255
<i>L. Mapa, G. Aryal, K. Chanda</i>	

SESSION 5A – POWER SYSTEMS ELECTRONICS AND APPLIED PHYSICS

An Approach to Realize a Quantum NOT Gate through Optical Implementation	261
<i>S. Sajeed, Z.H. Mozumder, A. Ahmed, S.M. Ullah, S. Rafique</i>	
An Approach to Realize a Quantum Hadamard Gate through Optical Implementation	267
<i>S. Sajeed, A. Ahmed, S.M. Ullah, Z.H. Mozumder</i>	
Novel CNFET SRAM Cell Design Operating in Sub-threshold Region Using Back-Gate Biasing	272
<i>H. Nan, K.K. Kim, K. Choi</i>	
Low Noise Measurement of Photocurrent From Low Impedance Photodiodes	278
<i>D.W. Cooley, D.R. Andersen</i>	
Novel Curve Fitting Design Methodology for Carbon Nanotube SRAM Cell Optimization	284
<i>W. Wang, K. Choi</i>	

SESSION 5B – ENERGY, GREEN IT, AND TRANSPORTATION TECHNOLOGIES

Optimal Placement of Wind Turbines: A Monte Carlo Approach with Large Historical Data Set	290
<i>P. Sood, V. Winstead, P. Steevens</i>	
Neural Controllers for Electrical Power Steering Systems	295
<i>R. Kenaya, R. Chabaan</i>	
ZigBee Based Multi-Level Parking Vacancy Monitoring System	301
<i>R. Vishnubhotla, P.S. Rao, A. Ladha, S. Kadiyala, A. Narmada, B. Ronanki, S. Illapakurthi</i>	
Ground Vehicle Classification Based on Hierarchical Hidden Markov Model and Gaussian Mixture Model Using Wireless Sensor Networks	305
<i>A. Aljaafreh, L. Dong</i>	
Understanding the Capabilities of a Vehicle Ad-Hoc Network for Highway Systems	309
<i>R.G. Aldunate</i>	

SESSION 5C – MOBILE, WIRELESS COMMUNICATION, AND SENSOR NETWORKS

Characterization of Dense Multipath Effects for Non-Coherent GMSK Wireless Channels in Indoor Environments	314
<i>J. Renner, H. Zollner, T. Bohnke, B. Voß</i>	
SeSCG: Selective Sequential Clock Gating for Ultra-Low-Power Multimedia Mobile Processor Design	320
<i>L. Li, W. Wang, K. Choi, S. Park, M. Chung</i>	
Novel Design and Implementation for Highly Sensitive Baseband Protocol of Class-1 Generation-2 UHF RFID System	326
<i>F. Ge, K. Choi</i>	
Service-Oriented Architecture: On the Suitability for Mobile Robots	331
<i>Y. Alnounou, M. Haidar, M. Paulik, N. Al-Holou</i>	
Energy Efficiency of QoS Routing in Multi-Hop Wireless Networks	336
<i>C. Lee</i>	

SESSION 6A – SOFTWARE, MIDDLE, AND SYSTEM ARCHITECTURE/RESEARCH IN ENGINEERING AND IT EDUCATION

Online Layered File System (OLFS): A Layered and Versioned Filesystem and Performance Analysis	342
<i>J. Kaylor, K. Laufer, G.K. Thiruvathukal</i>	
A Register Allocation Algorithm	351
<i>S. Subha</i>	
Routing's Algorithms and Considerations	354
<i>B. Nasri, J. Rydh, M.T. Savadhouhi, M.R. Andalibizadeh</i>	
Increasing and Broadening Undergraduate Participation in IT - A New Approach	358
<i>K. Machina, A. Gokhale</i>	
An Extensive Survey of Context-Aware Middleware Architectures	362
<i>A. Saeed, T. Waheed</i>	
Exploring Scalability of FIR Filter Realizations on Graphics Processing Units	368
<i>J. Rebacz, E. Oruklu, J. Saniie</i>	
High Performance Reconfigurable Pipelined Matrix Multiplication Module Designer	373
<i>S. Aslan, C. Desmouliers, E. Oruklu, J. Saniie</i>	
Coarse Grain Computation-Communication Overlap for Efficient Application-Level Checkpointing for GPUs	379
<i>L.D. Solano-Quinde, B.M. Bode, A.K. Somani</i>	

ADDITIONAL PAPERS

Feature Extraction and Recognition of Infant Cries	384
<i>K. Kuo</i>	
Efficient Design of University Timetable	389
<i>M.V. Padmini, K. Athre</i>	
Author Index	