

# **2011 Second International Conference on Emerging Applications of Information Technology**

**(EAIT 2011)**

**Kolkata, India  
19 – 20 February 2011**



**IEEE Catalog Number: CFP1172M-PRT  
ISBN: 978-1-4244-9683-9**

# 2011 Second International Conference on Emerging Applications of Information Technology

## EAIT 2011

### Table of Contents

Preface.....	xiii
Committee Lists.....	xvi
Program Committee.....	xviii
Additional Reviewers.....	xxi
Conference Organizer and Sponsors.....	xxii

---

#### Plenary Talk

Blurring Boundaries: Creativity in the Intersections of Art and Technology .....	3
<i>Reynaldo Thompson</i>	

#### Analytics and Business Intelligence

A Framework to Convert XML Schema to ROLAP .....	11
<i>Sarbani Dasgupta, Soumya Sen, and Nabendu Chaki</i>	
A Fuzzy Ordered Weighted Average (OWA) Approach to Result Merging for Metasearch Using the Analytical Network Process .....	17
<i>Arijit De and Elizabeth D. Diaz</i>	
An Association Rule Mining Based Stock Market Recommender System .....	21
<i>Preeti Paranjape-Voditel and Umesh Deshpande</i>	
Collective Intelligence Applications—Algorithms and Visualization .....	25
<i>A. Nagalakshmi and Sunil Joglekar</i>	
Online Learning Algorithms for Dynamic Scheduling Problems .....	31
<i>Himanshu Sharma and Satbir Jain</i>	

## Artificial Intelligence

A Novel Approach: Using Bayesian Belief Networks in Product Recommendation .....	37
<i>S.S. Thakur, Anirban Kundu, and J.K. Sing</i>	
Application of Recurrent Neural Network for Generating Grayscale Digital Half-Tone Images .....	41
<i>Arpitam Chatterjee, Kanai Ch. Paul, and Bipan Tudu</i>	
Intelligent Tutoring of School Level Geometry Using Automatic Text to Diagram Conversion Utility .....	45
<i>Anirban Mukherjee and Utpal Garain</i>	
Speech/Music Classification Using Empirical Mode Decomposition .....	49
<i>Arijit Ghosal, Bibhas Chandra Dhara, and Sanjoy Kumar Saha</i>	
Using Negative Information in Search .....	53
<i>Sauparna Palchowdhury, Sukomal Pal, and Mandar Mitra</i>	
Web Text Classification Using a Neural Network .....	57
<i>Diganta Saha</i>	

## Biomedical Applications

A Derivative-Based Approach for QT-Segment Feature Extraction in Digitized ECG Record .....	63
<i>R. Gupta, M. Mitra, K. Mondal, and S. Bhowmick</i>	
An ECG Data Compression Method via Standard Deviation and ASCII Character Encoding .....	67
<i>S.K. Mukhopadhyay, M. Mitra, and S. Mitra</i>	
Determination of Stability of Dental Implant from Impedance Studies Using Resonance Frequency Analysis .....	71
<i>Sanghamitra Ghosal, Bhaswati Goswami, Ratna Ghosh, and Paramita Banerjee</i>	
Study of Electrical Equivalent Model of the PMMA Coated Probe Dipped in Milk and Milk Adulterated with Urea .....	75
<i>Siuli Das, M. Sivaramakrishna, B. Goswami, and Karabi Biswas</i>	
Study of Proper Tuning of Prosthetic Limb Control System with Paraplegia and Fatigue Condition .....	79
<i>Biswarup Neogi, Rajkumar Darbar, Subrata Mondal, Baidyanath Gorai, Sinchan Ghosh, Achintya Das, and D.N. Tibarewala</i>	
Wireless Fetal Heartbeat Monitoring System Using ZigBee and IEEE 802.15.4 Standard .....	83
<i>Goutam Motika and Abinash Prusty</i>	

## Computer Vision

A Fast Method for Iris Localization .....	89
<i>R. Meenakshi Sundaram, Bibhas Chandra Dhara, and Bhabatosh Chanda</i>	
Color Image Enhancement Using Multiscale Retinex with Modified Color Restoration Technique .....	93
<i>M.C. Hanumantharaju, M. Ravishankar, D.R. Rameshbabu, and S. Ramachandran</i>	
Extraction of Region Contour in SEM Fractographs .....	98
<i>Siddhartha Banerjee, Kaustav Basu, Pravash Chandra Chakraborti, and Sanjoy Kumar Saha</i>	
Face Recognition by Fusing Local and Global Discriminant Features .....	102
<i>Shiladitya Chowdhury, Jamuna Kanta Sing, Dipak Kumar Basu, and Mita Nasipuri</i>	
FACET: A Fast Approximate Circularity Estimation Technique .....	106
<i>Shyamosree Pal, Partha Bhowmick, and Arindam Biswas</i>	
Segmentation of Inflected Top Portions of Kannada Characters Using Gabor Filters .....	110
<i>Siddhaling Urolagin, K.V. Prema, R. Jaya Krishna, and N.V. Subba Reddy</i>	

## Data Mining and Knowledge Discovery

A Novel Pruning Approach Using Expert Knowledge for Intelligent Inexact Classification .....	117
<i>Ali Mirza Mahmood and Mrithyumjaya Rao Kuppa</i>	
An Automated System to Diagnose the Severity of Adult Depression .....	121
<i>Subhagata Chattopadhyay, Preetisha Kaur, Fethi Rabhi, and Rajendra Acharya U.</i>	
Automatic Keyphrase Extraction from Bengali Documents: A Preliminary Study .....	125
<i>Kamal Sarkar</i>	
Detection of Verbatim or Partial Duplication from Multiple Source Documents Using Data Mining Techniques and Case-Based Reasoning Methodologies .....	129
<i>Chitrita Chaudhuri and Atal Chaudhuri</i>	
Modeling Arsenic Accumulation in Plants .....	133
<i>Abul Mandal, Dan Lundh, Noor Nahar, Hoda Bentol, Abdul Bari, Sheila Johnson-Brousseau, and Sibdas Ghosh</i>	
Taste Recognizer by Multi Sensor Electronic Tongue: A Case Study with Tea Quality Classification .....	138
<i>Subrata Sarkar, Nabarun Bhattacharyya, and Vamshi Krishna Palakurthi</i>	

## **Distributed Computing**

A Methodology for E-quiz Content Production for E-learning .....	145
<i>Vimal Rarh and Anita Goel</i>	
A New Secure Protocol for Multi-attribute Multi-round E-reverse Auction Using Online Trusted Third Party .....	149
<i>T.R. Srinath, Samrat Kella, and Mamata Jenamani</i>	
An Adaptive Server Side Software Authentication Framework Based on User's Activity Pattern .....	153
<i>Ayan Chakraborty, Shiladitya Munshi, and Anirban Kundu</i>	
Importance Levels of QoS Elements in Selection of Information Delivery Web Services .....	157
<i>Manish Godse and Shrikant Mulik</i>	
RELIEF-DISC: An Extended RELIEF Algorithm Using Discretization Approach for Continuous Features .....	161
<i>E. Chandra Blessie and E. Karthikeyan</i>	
Towards a Dynamic On-demand Service Grid Based on P2P Network .....	165
<i>Sujoy Mistry, Arijit Mukherjee, and Nandini Mukherjee</i>	

## **Image Processing**

A Modified Weighted Based Filter for Removal of Random Impulse Noise (MWB) .....	173
<i>J.K. Mandal and Aparna Sarkar</i>	
A Novel Image Secret Sharing Scheme .....	177
<i>Prabir Kr. Naskar, Ayan Chaudhuri, Debarati Basu, and Atal Chaudhuri</i>	
A Novel Iterative Blind Deconvolution Using Morphology .....	181
<i>Lopamudra Kundu and Bhabatosh Chanda</i>	
Isolated Handwritten Devnagri Numeral Recognition Using HMM .....	185
<i>Sandeep B. Patil, G.R. Sinha, and Vaishali S. Patil</i>	
Spread Spectrum Embedding of Colluder Traceable Codeword in Multimedia .....	190
<i>Monjul Saikia and Swanirbhar Majumder</i>	
Zone Identification for Gujarati Handwritten Word .....	194
<i>Chhaya Patel and Apurva Desai</i>	
A Novel Approach for Securing Forensic Documents Using Rectangular Region-of-Interest (RROI) .....	198
<i>Nivedita Yadav, Nisha Pahal, Prem Kalra, Brejesh Lall, and Santanu Chaudhury</i>	
A Novel Neural Network Based Meteorological Image Prediction from a Given Sequence of Images .....	202
<i>Amitava Mukhopadhyay, Bipasha Paul Shukla, Diptiprasad Mukherjee, and Bhabatosh Chanda</i>	

A Simple and Fast Algorithm to Detect the Fovea Region in Fundus Retinal Image .....	206
<i>Soumitra Samanta, Sanjoy Kumar Saha, and Bhabatosh Chanda</i>	
Combinatorial Construction of the Orthogonal Concavity Tree of a Digital Object .....	210
<i>Arindam Biswas, Aisharjya Sarkar, Partha Bhowmick, and Bhargab B. Bhattacharya</i>	
Constitutional and Spatial Characterization of Bainitic MicroStructure by Image Analysis .....	214
<i>Ramanath Datta, Sekhar Mandal, and Partha Pratim Chattopadhyay</i>	
Image Encryption Based on AES Key Expansion .....	217
<i>B. Subramanyan, Vivek M. Chhabria, and T.G. Sankar Babu</i>	

## Mobile Computing

A Distributed Algorithm for Self-Controlled Mobile Ad-hoc Network .....	223
<i>Mrinal Ch. Debnath, Purna Borah, J. Mehedi, and M.K. Naskar</i>	
A Scalable Energy Efficient and Delay Bounded Data Gathering Framework for Large Scale Sensor Network .....	227
<i>Biswanath Dey and Sukumar Nandi</i>	
Dynamic Response Based Odour Classification Using MOS Gas Sensors .....	231
<i>N. Dutta and M. Bhuyan</i>	
GNDA: Detecting Good Neighbor Nodes in Adhoc Routing Protocol .....	235
<i>Umang Singh, B.V.R. Reddy, and M.N. Hoda</i>	
Interoperation of Bluetooth and Wi-Fi Using OSGi .....	239
<i>Souvik Maiti and Subhajit Dutta</i>	
Mobility Assisted Efficient Coverage Control in Cluster Based Sensor Networks .....	243
<i>Biswanath Dey, Sukumar Nandi, and Gautam Das</i>	

## Pattern Recognition

A Novel Clustering Algorithm for Biological Data .....	249
<i>Azad Naik, Damodar Reddy, and Prasanta K. Jana</i>	
An Outlier Detection Method Based on Clustering .....	253
<i>Rajendra Pamula, Jatindra Kumar Deka, and Sukumar Nandi</i>	
Determination of Feature Hierarchy from Gabor and SIFT Features for Face Recognition .....	257
<i>Suparna Parua, Apurba Das, Debasis Mazumdar, and Soma Mitra</i>	
Enhancing the K-means Clustering Algorithm by Using a $O(n \log n)$ Heuristic Method for Finding Better Initial Centroids .....	261
<i>K.A. Abdul Nazeer, S.D. Madhu Kumar, and M.P. Sebastian</i>	
Recognition of Bengali Handwritten Characters Using Skeletal Convexity and Dynamic Programming .....	265
<i>Soumen Bag, Partha Bhowmick, and Gaurav Harit</i>	

Spectral Clustering on Neighborhood Kernels with Modified Symmetry for Remote Homology Detection .....	269
<i>Anasua Sarkar, Macha Nikolski, and Ujjwal Maulik</i>	

## **Security and Privacy**

A Cellular Automata Based Network Security Model .....	275
<i>Shiladitya Munshi and Satyabrata Maity</i>	
A Methodology for Conversion of Enterprise-Level Information Security Policies to Implementation-Level Policies/Rule .....	280
<i>Anirban Sengupta, Chandan Mazumdar, and Aditya Bagchi</i>	
Controlled Data Hiding Technique for Color Image Authentication in Frequency Domain (CDHTCIAFD) .....	284
<i>Nabin Ghoshal and J.K. Mandal</i>	
Online Voting System Powered by Biometric Security Using Steganography .....	288
<i>Shivendra Katiyar, Kullai Reddy Meka, Ferdous A. Barbhuiya, and Sukumar Nandi</i>	
Performance Analysis under the Influence of Jamming for WiMAX System .....	292
<i>Rakesh Kumar Jha, Suresh V. Limkar, and Upena D. Dalal</i>	
Steganographic Technique Based on Minimum Deviation of Fidelity (STMDF) .....	298
<i>J.K. Mandal and Madhumita Sengupta</i>	

## **Soft Computing**

A Fuzzy Based Strategy for Improved Search Coverage of an Airborne Seeker .....	305
<i>Partha Sarathi Pal, Abhik Mukherjee, Subhamay Das, and S.K. Chaudhuri</i>	
A Three Dimensional Bi-directional Self-Organizing Neural Network (3-DBDSONN) Architecture for Three Dimensional Object Extraction from a Noisy Perspective .....	309
<i>Kousik Dasgupta, Siddhartha Bhattacharyya, Paramartha Dutta, and Jyotsna Kumar Mandal</i>	
Agriculture Intelligence: An Emerging Technology for Farmer Community .....	313
<i>Tejas Ghadiyali, Kalpesh Lad, and Bankim Patel</i>	
Fuzzy Discretization for Rough Set Based Gene Selection Algorithm .....	317
<i>Sushmita Paul and Pradipta Maji</i>	
On Development and Evaluation of a Chunker for Bangla .....	321
<i>Sankar De, Arnab Dhar, Suchismita Biswas, and Utpal Garain</i>	
Synthesis of Passive RFID from Backscatter Using Soft-Computing Techniques .....	325
<i>Goutam Chakraborty, Somnath Mukherjee, and Kohei Chiba</i>	

## Software Engineering

A Novel Approach to Manage IT Application Maintenance Projects .....	331
<i>Jagadish Kundu and Abhik Mukherjee</i>	
Efficient Traversal in Data Warehouse Based on Concept Hierarchy Using Galois Connections .....	335
<i>Soumya Sen and Nabendu Chaki</i>	
Influence of Routing Protocols in Performance of Wireless Mobile Adhoc Network .....	340
<i>I. Vijaya, Pinak Bhusan Mishra, Amiya Kumar Rath, and Amulya Ratna Dash</i>	
Test Case Generation and Prioritization from UML Models .....	345
<i>Amitranjan Gantait</i>	
Towards a Valid Metric for Class Cohesion at Design Level .....	351
<i>Kuljit Kaur and Hardeep Singh</i>	

## Swarm Intelligence and Genetic Algorithms

Determination of Number of Clusters Using VAT Images and Genetic Algorithms .....	357
<i>Malay K. Pakhira and Amrita Dutta</i>	
GA Based Winner Determination in Combinatorial Reverse Auction .....	361
<i>Prateek Patodi, Arun Kumar Ray, and Mamata Jenamani</i>	
Linear Antenna Array Synthesis Using Improved Particle Swarm Optimization .....	365
<i>D. Mandal, A.K. Bhattacharjee, and S.P. Ghoshal</i>	
Swarm Intelligence Based Synthesis of Concentric Circular Antenna Array for Broadside Radiation .....	369
<i>D. Mandal, A.K. Bhattacharjee, and S.P. Ghoshal</i>	

## VLSI and Embedded Systems

A Timing Driven Congestion Aware Global Router .....	375
<i>A.I. Erzin, V.V. Zalyubovskiy, Y.V. Shamardin, I.I. Takhonov, Radhamanjari Samanta, and Soumyendu Raha</i>	
An Efficient Dynamic Power Estimation Method for On-chip VLSI Interconnects .....	379
<i>Susmita Sahoo, Madhumanti Datta, and Rajib Kar</i>	
An Application Mapping Technique for Butterfly-Fat-Tree Network-on-Chip .....	383
<i>Pradip Kumar Sahu, Nisarg Shah, Kanchan Manna, and Santanu Chattopadhyay</i>	
Overloading and Conflict Resolution at the Design Unit Level in HDLs .....	387
<i>Ramanuj Bhattacharyya</i>	
Spread Spectrum Pattern and PN Sequence Retrieval in Wireless Ad Hoc Network: Design Approach .....	391
<i>Harish Laxmichand Sharma, Atul R. Deshmukh, and N.G. Bawane</i>	



Uncompressed Video Authentication through a Chip Based Watermarking Scheme .....	395
<i>Soumik Das, Pradosh Bandyopadhyay, Monalisa Banerjee, and Atal Chaudhuri</i>	
<b>Author Index</b> .....	<b>399</b>