

15th International Conference on Advanced Computing and Communications

(ADCOM 2007)

**Guwahati, India
18-21 December 2007**



**IEEE Catalog Number: CFP07ADC-PRT
ISBN: 978-1-4244-3117-5**

TABLE OF CONTENTS

VOLUME 1

SESSION 1A: TESTABILITY AND CRYPTOANALYSIS

| | |
|--|-----------|
| A New Approach for Test Pattern Generation for Digital Cores in Mixed Signal Circuits | 1 |
| <i>M. Rajaneesh, R. Bhattacharya, S. Biswas, S. Mukhopadhyay, A. Patra</i> | |
| Scheduling of Cores for Power Constrained System-on-Chip Testing | 7 |
| <i>R. Chakraborty, D.R. Chowdhury</i> | |
| Preventing the Side-channel Leakage of Masked AES S-Box | 13 |
| <i>S. Ghoush, M. Alam, K. Kumar, D. Mukhopadhyay, D.R. Chowdhury</i> | |
| An Efficient Approach to Develop Secure Scan Tree for Crypto-hardware | 19 |
| <i>G. Sengar, D. Mukhopadhyay, D.R. Chowdhury</i> | |
| A Modification to Circular-scan Architecture to Improve Test Data Compression | 25 |
| <i>M. Azimipour, M. Eshghi, A. Khademzadeh</i> | |

SESSION 1B: SOFTWARE ENGINEERING

| | |
|--|-----------|
| Applying Aspect-oriented Programming for Instance Adaptation in Object-oriented Databases | 30 |
| <i>S. Kuppuswami, K. Palanivel, V. Amouda</i> | |
| An Agile Technique for Agent Based Goal Refinement to Elicit Soft Goals in Goal Oriented Requirements Engineering | 36 |
| <i>A.M. Sen, S.K. Jain</i> | |
| Static Analysis Based Application Specific Dispatch Table Compaction | 43 |
| <i>S.S. Chakraborty, R. Kumar</i> | |
| DTM: A Macro Level Tool and Measure for Message Passing Libraries | 49 |
| <i>N. Pandey, D. Samanta</i> | |
| Automatic Test Case Generation from UML Sequence Diagrams | 55 |
| <i>M. Sarma, D. Kundu, R. Mall</i> | |

SESSION 1C: SOFT COMPUTING

| | |
|---|-----------|
| A Genetic Algorithm with Characteristic Amplification through Multiple Geographically Isolated Populations and Varied Fitness Landscapes | 61 |
| <i>K.G. Srinivasa, P. Srichand, B. Anuj, K.R. Venugopal, L.M. Patnaik</i> | |
| Memetic NSGA- A Multi-Objective Genetic Algorithm for Classification of Microarray Data | 67 |
| <i>K. Praveen Kumar, S. Sharath, G. Rio D'Souza, K. Chandra</i> | |

| | |
|--|-----------|
| A New Particle Swarm Optimization with Quadratic Crossover | 73 |
| <i>M. Pant, R. Thangaraj</i> | |
| Use of Genetic Algorithm for Software Maintainability Metrics' Conditioning | 79 |
| <i>S.S. Dahiya, J.K. Chhabra, S. Kumar</i> | |
| Using Multimedia Annotation Tool for the Instructional Cues and Explanations..... | 85 |
| <i>J. Hsu, Y. Lai, P. Yu</i> | |

INVITED TALK

| | |
|---|-----------|
| Advances in Telemedicine and its Usage in India..... | 91 |
| <i>A.K. Majumdar</i> | |

SESSION 2A: NETWORK PERFORMANCE ANALYSIS

| | |
|--|------------|
| Analysis and Control of Bifurcation and Chaos in TCP-like Internet Congestion Control Model..... | 99 |
| <i>B. Rezaie, M.R. Jahed Motlagh, S. Khorsandi, M. Analoui</i> | |
| A New Approach of Performance Improvement for Server Selection in Reliable Server Pooling Systems | 105 |
| <i>X. Zhou, T. Dreibholz, E.P. Rathgeb</i> | |
| A Dynamic Distributed Diagnosis Algorithm for an Arbitrary Network Topology with Unreliable Nodes and Links | 113 |
| <i>P.M. Khilar, S. Mahapatra</i> | |
| Traffic Flow Optimization in Networks with Combined OSPF/MPLS Routing | 119 |
| <i>M. Zagozdzon, M. Dzida, M. Pioro</i> | |
| Agent-based VPN Architecture: A Framework and the Optimal User Connectivity Problem (Static Case) | 126 |
| <i>D. Medhi, B.Y. Choi, C. Scoglio, S. Song, S. Dispensa</i> | |
| Modified Smith Predictor Controller for Network Congestion Control | 132 |
| <i>P. Baburaj, S. Majhi, C. Reddy</i> | |

SESSION 2B: MEDICAL INFORMATICS

| | |
|--|------------|
| VHDL Based Electro-oculogram Signal Classification..... | 138 |
| <i>T. Gandhi, M. Trikha, J. Santosh, S. Anand</i> | |
| A Bio-inspired Interpolation Kernel for Medical Image Processing Implemented on DSP Processor | 144 |
| <i>S. Sarkar, K. Ghosh, K. Bhaumik</i> | |
| Wavelet-based ECG and PCG Signals Compression Technique for Mobile Telemedicine..... | 149 |
| <i>M.S. Manikandan, S. Dandapat</i> | |
| PDA Based Telemedicine System in a Web Based Environment..... | 155 |
| <i>S. Paul, B. Majumdar, J. Mukhopadhyay, A.K. Majumdar, A.K. Maji</i> | |
| Fractal Model of the Blood Vessel in Cardiovascular System..... | 160 |
| <i>G. Jayalalitha, V.S. Deviha, R. Uthayakumar</i> | |

| | |
|---|-----|
| Rules for Synthesizing Quantum Boolean Circuits using Minimized Nearest-neighbor Templates | 168 |
| <i>A. Chakrabarti, S. Sur-Kolay</i> | |

SESSION 2C: ENGINEERING HARDWARE TECHNOLOGY

| | |
|--|-----|
| Quick Addition of Decimals using Reversible Conservative Logic | 174 |
| <i>Rekha K. James, T.K. Shahana, K. Poulouse Jacob, Sreela Sasi</i> | |
| Corroborating the Subjective Classification of Ultrasound Images of Normal and Fatty Human Livers by the Radiologist through Texture Analysis and SOM | 180 |
| <i>S. Mukherjee, A. Chakravorty, K. Ghosh, M. Roy, A. Adhikari, S. Mazumdar</i> | |
| RFID Circuit Design with Optimized CMOS Inductor for Monitoring Biomedical Signals | 186 |
| <i>Genemala Haobijam, Manikumar K, Roy Paily</i> | |
| Comparative Analysis of Low Power High Performance Flip-Flops in the 0.13um Technology | 192 |
| <i>S. Agarwal, P. Ramanathan, P.T. Vanathi</i> | |
| Optimum Quaternary Galois Field Circuit Design through Carbon Nano Tube Technology | 197 |
| <i>P. Keshavarzian, K. Navi</i> | |
| Leakage Reduction by Modified Stacking and Optimum ISO Input Loading in CMOS Devices | 203 |
| <i>K. Sathyaki, R. Paily</i> | |

INVITED TALK

| | |
|---|-----|
| Fair Routing and Related Optimization Problems | 209 |
| <i>M. Pioro</i> | |

SESSION 3A: WIRELESS NETWORKS I

| | |
|---|-----|
| C2WSN: A Two-tier Chord Overlay Serving for Efficient Queries in Large-scale Wireless Sensor Networks | 215 |
| <i>J. Yu, W. Liu, J. Song</i> | |
| Calculation of Channel Capacity and Rician Factor in the Presence of Vegetation in Higher Altitude Platforms Communication Systems | 221 |
| <i>S.K. Agrawal, P. Garg</i> | |
| A Two-layer Architecture of Mobile Sinks and Static Sensors | 227 |
| <i>N. Meghanathan, G.W. Skelton</i> | |
| Hop-by-hop Versus End-to-end Congestion Control in Wireless Multi-hop UWB Networks | 233 |
| <i>P. Reena, L. Jacob</i> | |
| An Energy Aware Routing Protocol for Mobile Ad-hoc Networks | 240 |
| <i>A. Chattopadhyay, M. Thomas, A. Gupta</i> | |
| A Mobile System for Detecting and Notifying Vehicle Rollover Events | 246 |
| <i>D. Acharya, V. Kumar, G.M. Gaddis</i> | |

SESSION 3B: WEB ENGINEERING

| | |
|--|-----|
| Engineering and Autonomic Container for WSRF-based Web Services | 252 |
| <i>C. Reich, M. Banholzer, R. Buyya, K. Bubendorfer</i> | |
| Towards Self-organizing Web Sites | 258 |
| <i>P. Bedi, S. Jain, R. Gupta, R. Sharma, A. Singhal</i> | |
| Pattern Mining as Abduction from Snapshots to Spatio-temporal Patterns | 264 |
| <i>S.M. Hazarika</i> | |
| Text Mining for Finding Acronym-definition Pairs from Biomedical Text using Pattern Matching Method with Space Reduction Heuristics | 270 |
| <i>P.C. Rafeeqe, K.A. Abdul Nazeer</i> | |
| WebLab: A Generic Architecture for Remote Laboratories | 276 |
| <i>A. Agrawal, S. Srivastava</i> | |
| Biclustering Expression Data using Node Addition Algorithm | 282 |
| <i>B. Borah, D.K. Bhattacharyya</i> | |

SESSION 3C: HARDWARE ARCHITECTURE I

| | |
|--|-----|
| Verification of Data-path and Controller Generation Phase of High-level Synthesis | 288 |
| <i>C. Karfa, D. Sarkar, C. Mandal</i> | |
| Hardware-efficient Architecture for Generalized Voronoi Diagram Construction using a Prediction-correction Approach | 294 |
| <i>L. Vachhani, K. Sridharan</i> | |
| A Prototype for Tiger Hash Primitive Hardware Architecture | 300 |
| <i>T.S.B. Sudarshan, K. Rakesh, K.K. Satish</i> | |
| A New Generalized Reconfigurable Architecture for Digital Signal Processor | 306 |
| <i>J. Basu, M. Sahidullah, A. Sinha</i> | |
| LLRU: Late LRU Replacement Strategy for Power Efficient Embedded Cache | 312 |
| <i>B.K. Raveendran, T.S.B. Sudarshan, P.D. Kumar, P. Tangudu, S. Gurunarayanan</i> | |
| A Branch Target Instruction Prefetching Technique for Improved Performance | 318 |
| <i>P.R. Gade, R. Paily, Y. Ha</i> | |

SESSION 3D: PATTERN RECOGNITION 1

| | |
|--|-----|
| A New Cluster Validity Index Based on Fuzzy Granulation-degranulation Criterion | 324 |
| <i>S. Saha, S. Bandyopadhyay</i> | |
| Cleavage Site Detection in Broken 3D Objects | 330 |
| <i>V.D. Kaushik, A.K. Singh, J. Varshney</i> | |
| A Genetic Clustering Technique using a New Line Symmetry Based Distance Measure | 336 |
| <i>S. Saha, S. Bandyopadhyay</i> | |
| Intrinsic Cluster Detection using Adaptive Grids | 342 |
| <i>S. Sarmah, R. Das, D.K. Bhattacharyya</i> | |
| Frequency Count Based Filter for Dimensionality Reduction | 348 |
| <i>B. Nath, D.K. Bhattacharyya, A. Ghosh</i> | |
| An Efficient Approach for Pupil Detection in Iris Images | 353 |
| <i>S. Dey, D. Samanta</i> | |

SESSION 4A: WIRELESS NETWORKS II

| | |
|---|-----|
| Time-Domain Equalization Technique for Intercarrier Interference Suppression in OFDM Systems | 359 |
| <i>R. Kumar, S. Malarvizhi</i> | |

VOLUME 2

| | |
|---|-----|
| Indirect Path Setup: A New Approach for Handoff in HAWAII | 365 |
| <i>F.M. Abduljalil, S.K. Bodhe</i> | |
| Analytical Model for Multi Agent- Call Admission in Wireless Networks | 371 |
| <i>N. Giri, S. Bodhe</i> | |
| FHMS: Fuzzy Logic-based Handoff Management Scheme for Wireless Network | 376 |
| <i>S. Saha, M. Mukherjee, S. Neogy</i> | |
| Fuzzy Based Trusted Ad hoc On-demand Distance Vector Routing Protocol for MANET | 382 |
| <i>J.M.L. Manickam, S. Shanmugavel</i> | |
| Mathematical Modelling and Simulation of a Buffered Fault Tolerant Double Tree Network | 390 |
| <i>S. Kumar</i> | |

SESSION 4B: INFORMATION SECURITY

| | |
|---|-----|
| Privacy Preserving Cooperative Clustering Service | 400 |
| <i>A.S. Das, K. Srinathan</i> | |
| Accurate ICMP Traceback Model under DoS/DDoS Attack | 406 |
| <i>A. Izaddoost, M. Othman, M.F.A. Rasid</i> | |
| An Improved Efficient Multisignature Scheme in Group Communication Systems | 412 |
| <i>D. Giri, P.D. Srivastava</i> | |
| Trust Aware Routing with Load Balancing in Ad Hoc Network using Mobile Agent | 419 |
| <i>N. Nehra, R.B. Patel, V.K. Bhat</i> | |
| A Game Theoretical Approach for Efficient Deployment of Intrusion Detection System in Mobile Ad Hoc Networks | 425 |
| <i>N. Marchang, R. Tripathi</i> | |
| Some New Multi-protocol Attacks | 430 |
| <i>A. Mathuria, A.R. Singh, P.V. Sharavan, R. Kirtankar</i> | |

SESSION 4C: HARDWARE ARCHITECTURE II

| | |
|---|-----|
| Parameterized Module Scheduling Algorithm for Reconfigurable Computing Systems | 436 |
| <i>S.R. Kota, C. Shekhar, A. Kokkula, D. Toshniwal, M.V. Kartikeyan, R.C. Joshi</i> | |
| Memory Design and Exploration for Low-power Embedded Applications: A Case Study on Hash Algorithms | 442 |
| <i>D. Bhattacharya, A. Saha</i> | |
| Technology Driven High-level Synthesis | 448 |
| <i>M. Joseph, N.B. Bhat, K.C. Sekaran</i> | |
| Design and Implementation of RS (32, 28) Encoder and Decoder using Cellular Automata | 454 |
| <i>J. Bhaumik, D.R. Chowdhury, I. Chakrabarti</i> | |
| Hardware Controlled and Software Independent Fault Tolerant FPGA Architecture | 460 |
| <i>N. Goel, K. Paul</i> | |
| A Genetic Algorithm Based Input State Assignment Technique for Leakage Power Minimization During Combinational Logic Synthesis | 466 |
| <i>S. Chaudhury, A. Prusty, S. Chattopadhyay</i> | |

SESSION 4D: PATTERN RECOGNITION II

| | |
|---|-----|
| Unbalanced Data Classification using Extreme Outlier Elimination and Sampling Techniques for Fraud Detection | 472 |
| <i>T.M. Padmaja, N. Dhulipalla, R.S. Bapi, P.R. Krishna</i> | |
| Solving Planted-motif Problem- A New Approach | 478 |
| <i>P. Agarwal, S.K. Yadav, A.P. Shukla</i> | |
| A New Algorithm for Ordering of Points to Identify Clustering Structure Based on Perimeter of Triangle: OPTICS(BOPT) | 484 |
| <i>H.K. Kalita, D.K. Bhattacharyya, A. Kar</i> | |
| Enhanced Shape Context for Object Recognition | 490 |
| <i>L.B. Singh, S.M. Hazarika</i> | |
| A Novel Approach for Face Recognition using DCT Coefficients Re-scaling for Illumination Normalization | 496 |
| <i>V.P. Vishwakarma, S. Pandey, M.N. Gupta</i> | |
| An Efficient Feature Set for Handwritten Digit Recognition | 501 |
| <i>N.K. Garg, S. Jindal</i> | |

INVITED TALK

| | |
|--|-----|
| Cryptography & Security- Future Challenges and Issues | 506 |
| <i>S. Burman</i> | |

SESSION 5A: DISTRIBUTED SYSTEMS I

| | |
|--|-----|
| Load Balancing on Dynamic Network using Mobile Process Groups | 510 |
| <i>A. Bedi, P. Bedi</i> | |
| Three-tier Architecture for Resource Selection in Grid | 516 |
| <i>P. Varalakshmi, S. Thamarai Selvi, A.J. Ashraf, K. Karthick, S. Baby Aarthy</i> | |

| | |
|---|-----|
| Implementation of a Resource Broker for Efficient Resource Management in Grid Environment | 524 |
| <i>S. Roy, M. Sarkar, N. Mukherjee</i> | |
| Soft-reconfiguration Management for Operating Systems with Multiprocessor Architecture | 530 |
| <i>J.N. Tripathi, G. Somani, K. Mundra, S.S. Verma, H. Joshi</i> | |
| Intelligent Transport Route Planning using Parallel Genetic Algorithms and MPI in High Performance Computing Cluster | 535 |
| <i>J. Arunadevi, A. Johnsanjeevkumar, N. Sujatha</i> | |
| Performance Evaluation of Satellite Image Resampling Service on Distributed Operating System | 541 |
| <i>N. Dube, R. Ramakrishnan, K.S. Dasgupta</i> | |

SESSION 5B: NETWORK PROTOCOLS

| | |
|---|-----|
| Priority Based Fairness Provisioning QoS-Aware MAC Protocol | 547 |
| <i>M. Jims, N. Sarma, S. Nandi</i> | |
| Mathematical Modeling of Hierarchical Mobile IPv6 Based Network Architecture in Search of Optimal Performance | 553 |
| <i>N. Dutta, I.S. Misra</i> | |
| A New Algorithm for Measuring Available Bandwidth in a Wide Area Network | 560 |
| <i>H.K. Kalita, M.K. Nambiar, D. Mishra</i> | |
| Multimedia Ready Handoff Technique for 802.11 Networks | 566 |
| <i>G. Singh, A.P.S. Atwal, B.S. Sohi</i> | |
| Adaptive Flow Control: An Extension to Delayed Fast Recovery | 574 |
| <i>N.J. Kothari, B.M. Gambhava, K.S. Dasgupta</i> | |
| Adaptive Granularity Algorithm for Effective Distributed Load Balancing and Implementation in Multiprotocol Label Switching Networks | 580 |
| <i>G. Murugesan, J. Jebarani, A.M. Natarajan</i> | |

SESSION 5C: SIGNAL PROCESSING I

| | |
|---|-----|
| Toward Optimal Pixel Decimation Patterns for Block Matching in Motion Estimation | 586 |
| <i>A. Saha</i> | |
| Collusion Secure Scalable Video Fingerprinting Scheme | 592 |
| <i>D. Shashanka, P.K. Bora</i> | |
| Video Authentication using Temporal Wavelet Transform | 599 |
| <i>N. Saikia, P.K. Bora</i> | |
| New Approaches for Video Transcoding in the Compressed Domain | 605 |
| <i>T. Tuithung, S.K. Ghosh, J. Mukhopadhyay</i> | |
| Transformation of Speaker Characteristics in Speech using Support Vector Machines | 611 |
| <i>K.S. Rao, S.G. Koolagudi</i> | |
| Auditory-based Wavelet Packet Filterbank for Speech Recognition using Neural Network | 617 |
| <i>R. Gandhirah, P.S. Sathidevi</i> | |

SESSION 6A: DISTRIBUTED SYSTEMS II

| | |
|--|-----|
| VIHARI: An Ontology Service Driven Multi-agent System for Air Ticket Booking | 623 |
| <i>J.P. Lakshmi, T.L. Chirthra</i> | |
| QoS-Aware Resource Discovery in Grids | 629 |
| <i>U.S. Grover, P. Varma, S. Chaudhary</i> | |
| A 3-Tier Hierarchical Peer-to-Peer System with Fair Incentive Scheme to Avoid Free Riders | 636 |
| <i>B.K. Shrivastava, G.B. Kuamr, G. Khataniar, D. Goswami</i> | |
| Checkpointing Based Fault Tolerance Patterns for Systems with Arbitrary Deadlines | 642 |
| <i>S. Agrawal, R.S. Yadav, N. Das</i> | |
| A Low Overhead Checkpointing Scheme for Mobile Computing Systems | 648 |
| <i>S. Biswas, S. Neogy</i> | |
| Design and Implementation of a Network Management System for Water Distribution Networks | 654 |
| <i>V.C. Raghavendran, T.A. Gonsalves, U. Rani, S.M. Kumar, S. Narasiimhan</i> | |

SESSION 6B: OPTICAL NETWORKS

| | |
|--|-----|
| Reducing Data Loss in Optical Burst-switched Networks using Adaptive Burst Cloning | 660 |
| <i>N. Sreenath, N. Devendra, B. Palanisamy</i> | |
| Analysis of a CSMA/CA Optical Network with Application of Optical Buffers (FDLs) for Online Routing | 666 |
| <i>R. Kundu, V.K. Chaubey</i> | |
| Enhanced Burst Assembly Mechanism with Hybrid Signaling Scheme for Optical Burst Switched Networks | 672 |
| <i>R. Nakkeeran, C. Balaji, N. Gujju, K. Balakumaran, M.K. Sasidharan</i> | |
| WDM Network Topologies- A Probabilistic Model | 678 |
| <i>V.S. Shekhawat, D.K. Tyagi, V.K. Chaubey</i> | |
| A Neural Network Approach to Dynamic Frequency Scaling | 683 |
| <i>A. Lahiri, N. Bussa, P. Saraswat</i> | |
| Managing Delegation in Access Control Models | 689 |
| <i>M.B. Ghorbel-Talbi, F. Cuppens, N. Cuppens-Boulahia, A. Bouhoula</i> | |

SESSION 6C: SIGNAL PROCESSING II

| | |
|---|-----|
| A Novel Approach of Synthesizing Low Power VLSI Architecture | 696 |
| <i>R. Maity, D. Samanta</i> | |
| An Efficient Multi-algorithmic Fusion System Based on Palmprint for Personnel Identification | 702 |
| <i>G.S. Badrinath, P. Gupta</i> | |
| LSB Steganalysis to Detect the Embedded Message Length using Pixel Pair Threshold | 708 |
| <i>K.B. Raja, L. Rohitha, S. Rekha, P.V. Swetha, K.R. Venugopal, L.M. Patnaik</i> | |
| A SDS Based Steganographic Scheme for Reducing Embedding Noise | 714 |
| <i>A. Sur P. Goel, J. Mukhopadhyay</i> | |
| Adaptive Shrinkage Function Optimization by Differential Evolution | 719 |
| <i>K.K. Gupta, R. Gupta</i> | |

Content Based Image Retrieval using Color, Texture and Shape Features723
P.S. Hiremath, J. Pujari

Author Index