# TABLE OF CONTENTS

## ALGORITHM

**Tools for Cis-element Recognition and Phylogenetic Tree Construction Based on Conserved Patterns**
  (New Mexico State University, USA)

**Low Power Implementation of AES (RIJNDAEL) Algorithm**
- Parimal Patel and Chirag Parikh (University of Texas at San Antonio, USA)

**An Empirical Study on Many-Particle Collision Algorithms**
- Hung-Chi Su, Hai Jiang, and Bin Zhang (Arkansas State University, USA)

**Speech Processing on FPGA**
- R. Sotudeh, J. Xu and A. Ariyaeinia (University of Hertfordshire, UK)

**Parameter Optimized, Vertical, Nearest-Neighbor-Vote and Boundary-Based Classification**
- Amal Perera and William Perrizo (North Dakota State University, USA)

**Simulated Evolution based Hybrids for Genetic Algorithm and Tabu Search**
- Sadiq M. Sait, Mohammed Faheemuddin, Mustafa I. Ali, and Syed Sanuallah
  (King Fahd University of Petroleum and Minerals, Saudi Arabia)

**Computing Lowest Common Ancestors in Directed Acyclic Graphs**
- Yiije Han (University of Missouri at Kansas City, USA)

**Static Scheduling for Synchronous Data Flow Graphs**
- Samer F. Khasawneh, Michael E. Richter, and Timothy W. O'Neil (The University of Akron, USA)

## ARCHITECTURE

**Fine-grained Matrix Multiply-Add on a Torus Array Processor**
- Ahmed S. Zekri and Stanislav G. Sedukhin (The University of Aizu, Japan)

**A Novel Gather/Scatter Hardware Support and FFT Case Study**
- Anderson Kuei-An Ku, Hossam ElGindy, and Jenny Yi-Chun Kuo (The University of New South Wales, Australia)

**An FPGA Implementation of 2D Discrete Wavelet Transform**
- Yinru Hou, David Jeff Jackson and Xiuyu Song (The University of Alabama, USA)

**Preserving Global Consistency for Dynamic Reconfiguration**
- Zhikun Zhao and Wei Li (Central Queensland University, Australia)

**Designing Combinational Circuits for Scattered Pattern Matching**
- Walter Dosch (University of Lübeck, Germany)
Transformational Design of an Asynchronous Distributor Component .................................. 81
   Walter Dosch (University of Lübeck, Germany) and Wenying Feng (Trent University, Canada)

Architecture Based Reliability Analysis of Concurrent Software Applications .................. 89
   Rehab A. El Kharboutly, Reda Ammar, and Swapna S. Gokhale (University of Connecticut, USA)

ARTIFICIAL INTELLIGENCE

Weighing Evidence in Decision Support Systems .................................................................. 95
   D. L. Hudson, M. E. Cohen (University of California, San Francisco, USA)

A New Framework for Inference in Distributed Bayesian Networks for Multi-Agent Sensor Interpretation ................................................................. 101
   Norman Carver (Southern Illinois University, Carbondale, USA)

Adaptive Fuzzy Inference for Edge Detection Using Componder Functions ..................... 107
   Gordon K. Lee (San Diego State University, USA) and Edward Grant (North Carolina State University, USA)

Handwritten Signature Verification System using Morphological Image Analysis .......... 112
   Samir Kumar Bandyopadhyay (University of Calcutta, India), Debnath Bhattacharyya and Poulami Das (Heritage Institute of Technology, India)

A Self-Adaptive Evolutionary Algorithm Applied to Bayesian Networks ...................... 118
   Ashraf M. Abdelbar and Manar I. Hosny (American University in Cairo, Egypt)

Skew Correction for Complex Document Images ................................................................. 123
   Toma I. Hentea (Purdue University Calumet, USA)

A Learning Algorithm and Simulations for Dendritic Neural Nets ................................. 128
   Tzusheng Pei (Jackson State University, USA)

BIOINFORMATICS

Modelling Diffusional Neighbourhoods of Cancer Cell Migration .................................. 134
   Marc Colangelo, Miroslav Lovric, Delsworth G. Harnish, and Jon Stone (McMaster University, Canada)

Generalized Stochastic Models for Biological Patterns ...................................................... 139
   Michael J. Gielen and Gautam B. Singh (Oakland University, USA)

Application of Non Compact Trie Structure in Plant Taxonomy .................................. 145
   Pritimoy Sanyal and Samir Kumar Bandyopadhyay (West Bengal University of Technology, India)

COMPUTING PRACTICE and APPLICATIONS

Computer Modeling of Forced Convection in a Channel Saturated with a Non-Newtonian Fluid ............................................................... 151
   Asad A. Salem (Texas A&M University-Corpus Christi, USA)

The Computer-Brain Interface (CBI) .................................................................................. 157
   Morteza Ansari Dogheh (Organization for Educational Research and Planning, Iran) and Mohammad Eshghi (Shahid Beheshti University, Iran)
The Multi-Purpose Watermarking for Halftone Image .......................................................... 163
Ching-Tang Hsieh, Yi-Chih Yeh, and Yeh-Kuang Wu (TamKang University, Taiwan)

Battery Embedded Distributed Sensing & Control .............................................................. 169
Adnan Anbuky (AUT University, New Zealand), Darren Lim (University of Canterbury, New Zealand), and Phillip Pascoe (Eaton Power Quality Company, New Zealand)

Development of Unsupervised and Supervised Learning Systems for Multilingual Text Categorization .......................................................... 177
Chung-Hong Lee (National Kaohsiung University of Applied Sciences, Taiwan) and Hsin-Chang Yang (National University of Kaohsiung, Taiwan)

Application of Wavelet Denoising Techniques to Ultrasonic Railroad Track Inspection .......................................................... 183
Mohd. Osama Saeed Kahn (New York, USA), Howard Sholl, Reda Ammar, Ian Greenshields (University of Connecticut, USA)

Faster Computation and Display of Dotplots using Graphics Hardware .......................................................... 189
Michael Wainer and Fil Schroeder (Southern Illinois University at Carbondale, USA)

Improvements in SCADA and DCS Systems Security .......................................................... 194
James H. Graham (University of Louisville, USA), Mostafa S. Mostafa (Western Kentucky University, USA), Benjamin Arazi, Ashraf Tantawy, Jeffrey Hieb, Patricia Ralston (University of Louisville, USA), and Sandip C. Patel (Morgan State University, USA)

Three-Dimensional Finite Element Modeling of the Effects of Residual Stresses on a Rockwell Hardness Test of 7050 T-7451 Aluminum .......................................................... 201
Hormoz Zareh, William Carter, Chien Wern (Portland State University, USA), Matt Carter and James Koenig (The Boeing Corporation, USA)

Automated Counting of Water Droplets in Cloud Chamber Images .......................................................... 207
John M. Weiss, James Devine and Andrew Detwiler (South Dakota School of Mines and Technology, USA)

Main Research Issues for the Deployment of Full Autonomous Surface Mining Operations .......................................................... 213
Eduardo M. Nebot (University of Sydney, Australia) and Julio J. Gonzalez (SUNY at New Paltz, USA)

DATABASE

Towards Owl Ontologies from Relational Databases: An HTML-Form Driven Approach .......................................................... 219
Sidi Mohamed Benslimane, Djamel Benslimane, Seksun Suwanmannee (University of Lyon, France), Zakaria Maamar (Zayed University, UAE), and Hamadou Saliah-Hassane (Teluq University, Canada)

An Accuracy Model for Relational Databases .......................................................... 225
Les Miller, Jing Ding, and Sarah Nusser (Iowa State University, USA)

About the Choice of Data Type in a Fuzzy Relational Database .......................................................... 231
Mohamed Ali Ben Hassine, Amel Grissa Touzi, and Habib Ounelli (National School of Engineers of Tunis, Tunisia)
Removing Data Redundancies in High Level Normal Forms by Considering Functional Independency
Tennyson X. Chen, Sean Shuangquan Liu, and Martin D. Meyer (RTI International, USA) .......................................................... 239

Visualizations of High-Dimensional Space
M. P. Canton and W. Perrizo (North Dakota State University, USA) .......................................................... 243

Spatial Proximity of Structural Attributes in Analyzing Remotely Sensed Imagery
M. P. Canton and W. Perrizo (North Dakota State University, USA) .......................................................... 249

NETWORKS

A Replica Allocation Scheme with One-Hop Time Constraint in Ad Hoc Wireless Networks
Xiao Chen (Texas State University, USA) .......................................................... 255

Intruder Identification and Response Framework for Mobile Ad Hoc Networks
S. P. Alampalayam, Anup Kumar, J. H. Graham, and S. Srinivasan (University of Louisville, USA) .......................................................... 260

Detecting TCP Port Scans Generated by NMAP using Reconfigurable Hardware
Parimal Patel and Ashok Kumar Tummala (University of Texas at San Antonio, USA) .......................................................... 266

Cell-Phone Accuracy Tests: Data-Collection Techniques
Bruce Beyeler and David C. Pheanis (Arizona State University, USA) .......................................................... 271

Relative Clock Drift based Secure Time Synchronization for Sensor Networks
Jae Sung Choi, Yonghe Liu, and Ramez Elmasri (University of Texas at Arlington, USA) .......................................................... 277

Localization in Sensor Networks through MALD Algorithm
Masomeh Azimzadeh (Iran Telecommunication Research Center, Iran) and Masoud Sabaei (Amir Kabir University of Technology, Iran) .......................................................... 283

Modeling and Verification of the Physical Layer of PCI Express
Mohamed Mahmoud and Behnam S. Arad (California State University, Sacramento, USA) .......................................................... 289

Wireless Sensor Payload Design for Sounding Rocket
Sachin Shetty, Min Song, Robert Ash, Ersin Ancel, and Kenneth Bone (Old Dominion University, USA) .......................................................... 295

OPERATING SYSTEMS

Agent-based Progressive Knowledge Extraction in Distributed Systems
Jiang B. Liu (Bradley University, USA) .......................................................... 301

Fault Tolerance of Tasks Scheduling on Multiprocessing Systems
Abdelmageed Elsadek Abdelrazek and Abdullah S. Almalaise (College of Business Administration, Saudi Arabia) .......................................................... 307

A New Efficient Recovery Algorithm for Cluster Federations
B. Gupta, S. Rahimi, and R. Chirra (Southern Illinois University, USA) .......................................................... 313
Finding k-Centers in Asynchronous Distributed Systems ........................................... 319
Sanket Chimalwar, Tarun Pasrija, and Shrisha Rao (International Institute of
Information Technology, India)

Modelling Restricted Processor Sharing in a Computer System with Non-
Exponential Service Times ................................................................. 325
Feng Zhang and Lester Lipsky (University of Connecticut, USA)

Multi-Stage Scheduling Problem with Time Windows ............................................. 331
Shaya Sheikh (Azad University, Iran)

A Domino-Effect Free Checkpointing / Recovery Mechanism for Cluster
Federations ......................................................................................... 337
B. Gupta, S. Rahimi, and P. Sunke (Southern Illinois University, USA)

SOFTWARE ENGINEERING

A Practical Identity Management Reference Implementation ......................... 343
Kalman C. Toth (Portland State University, USA)

Verbs/Verb Phrases Driven Class Identification ........................................... 349
Tzusheng Pei and Hyunju Kim (Jackson State University, USA)

Consistency Analysis between Numeric Ratings and Comments in Surveys ......... 355
Gongzhu Hu and Xiaohui Huang (Central Michigan University, USA)

ReMoTe: A Software Process Management Tool ........................................ 361
Arturo I. Concepcion, Darrion DeMelo, and David Hollingsworth (California State
University, San Bernardino, USA)

A Lightweight Approach to Interoperable Health Information Exchange .......... 367
Anthony W. Wallace and Rex E. Gantenbein (University of Wyoming, USA)

A Logic for Flow Event Structures .......................................................... 373
Jinzhao Wu (University of Electronic Science and Technology and Chinese
Academy of Sciences, China) and Wei Yan (Chinese Academy of Sciences,
China)

On the Design and Analysis of Real-time Systems ......................................... 380
Chadlia Jerad (LSTS-ENIT, Tunisia), Kamei Barkaoui (CEDRIC-CNAM, France),
and Amel Grissa Touzi (LSTS-ENIT, Tunisia)

SPECIAL SESSION on SENSOR NETWORKS

D. Manjunath (Indian Institute of Science, India)

Energy Efficiency and Innovative Time Reduction Communication Protocol on
Underwater Acoustic Sensor Network ..................................................... 395
Donghoon Kim (Florida State University, USA), Yong-Man Cho, Changhwa Kim,
Sangkyung Kim, and Tae-Won Kang (Kangnung National University, Korea)

A Packet Authentication Scheme for Wireless Sensor Networks ................... 401
R. Akbani, T. Korkmaz, and G. V. S. Raju (University of Texas, San Antonio, USA)
SPECIAL SESSION on SOFTWARE ENGINEERING and APPLICATIONS

A Prototype Validation Experiment on Software Metrics using an Automated Tool
Narayan Debnath, Nripendra Rai, Joyati Debnath (Winona State University, USA)
and Mark Burgin (University of California-Los Angeles, USA)

Correctness in a Computational Process
M. Burgin (University of California-Los Angeles, USA) and N. Debnath (Winona State University, USA)

Software Project Management: Including Configuration Management in PMBOK
R. Uzal (Universidad Nacional de San Luis and Universidad de Buenos Aires, Argentina),
G. Montejano, D. Riesco (Universidad Nacional de San Luis, Argentina), and N. C. Debnath (Winona State University, USA)

Author Index