## General Chair's Message

xvii

## Reviewers

xviii

### SESSION MA I: Information Assurance and Security I

**Chairs: Ajith Abraham and Johnson Thomas**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jigsaw-Based Secure Data Transfer over Computer Networks</td>
<td>R. Vasudevan, S. Sanyal, A. Abraham, and D. Agrawal</td>
</tr>
<tr>
<td>Semi-Fragile Watermarking Scheme for Authentication of JPEG Images</td>
<td>C. Ho and C.-T. Li</td>
</tr>
<tr>
<td>Mitigating the Untrusted Terminal Problem Using Conditional Signatures</td>
<td>I. Berta, L. Buttyan, and I. Vajda</td>
</tr>
<tr>
<td>Arcanum: A Secure and Efficient Key Exchange Protocol for the Internet</td>
<td>A. Mian and A. Masood</td>
</tr>
</tbody>
</table>

### SESSION MA II: Information Assurance and Security II

**Chairs: Ajith Abraham and Johnson Thomas**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancing Anonymity via Market Competition</td>
<td>S. Xu, W. Nelson, and R. Sandhu</td>
</tr>
<tr>
<td>A Secure Account-Based Mobile Payment Protocol</td>
<td>S. Kungpisdan, B. Srinivasan, and P. Le</td>
</tr>
<tr>
<td>Accountability Logic for Mobile Payment Protocols</td>
<td>S. Kungpisdan, B. Srinivasan, and P. Le</td>
</tr>
<tr>
<td>Face Recognition Using Interpolated Bezier Curve Based Representation</td>
<td>S. Pal, P. Biswas, and A. Abraham</td>
</tr>
<tr>
<td>Run-Time Detection of Buffer Overflow Attacks without Explicit Sensor Data Objects</td>
<td>C. Pyo, T. Kim, B. Bae, and G. Lee</td>
</tr>
</tbody>
</table>
SESSION MA III: Information Assurance and Security III

Chairs: Ajith Abraham and Johnson Thomas

Achieving Distributed Trusted Services

O. Bamasak and N. Zhang

Performance Evaluation of Data Integrity Mechanisms for Mobile Agents

V. Gunupudi and S. Tate

Adaptive Neuro-Fuzzy Intrusion Detection Systems

S. Chavan, K. Shah, N. Dave, S. Mukherjee, A. Abraham, and S. Sanyal

Cryptographic Protocol Analysis Using Goal Extraction

J. Edmonds and M. Papa

ProtoMon: Embedded Monitors for Cryptographic Protocol Intrusion Detection and Prevention

S. Joglekar and S. Tate

SESSION MA IV: Information Assurance and Security IV

Chairs: Ajith Abraham and Johnson Thomas

Web Server Attack Categorization Based on Root Causes and Their Locations

J. Seo, H.-S. Kim, S. Cho, and S. Cha

A Fast Pattern-Match Engine for Network Processor-Based Network Intrusion Detection System


A Modified Optical Image Reconstruction Model with Information Feedback

C. Zhang and Y. Zhang

Threshold and Identity-Based Key Management and Authentication for Wireless Ad Hoc Networks

H. Deng, A. Mukherjee, and D. Agrawal

An Extensible Framework for Practical Secure Component Composition in a Ubiquitous Computing Environment

D. Llewellyn-Jones, M. Merabti, Q. Shi, and B. Askwith

Distributed Knowledge Networks: Towards a New paradigm for Delivering Knowledge

A. Cuzzocrea and F. Bellas

Identity-Based Threshold Signature Scheme from the Bilinear Pairings

J. Baek and Y. Zheng

HORSE: An Extension of an r-Time Signature Scheme with Fast Signing and Verification

W. Neumann
SESSION MB I: IT Education, Curriculum & Assessment I  
Chairs: Emma Regentova and Douglas Dechow

Recurrent Exercises for Introductory Human Computer Interaction Courses ........................................ 136  
R. Turban

A New Approach to Learning Algorithms ............................................................... 141  
T. Müldner and E. Shakshuki

Computer Skills Training to (Middle-Aged) Adults: Problems and Program .................................................. 146  
A. Martínez-Ballesté, F. Sebé, and J. Domingo-Ferrer

Dependency Theory E-Learning Tool ................................................................. 151  
P. Douglas and S. Barker

A Web-Service Oriented Framework for Building SCORM Compatible Learning Management Systems .................................................. 156  
C.-P. Chu, C.-P. Chang, C.-W. Yeh, and Y.-F. Yeh

SESSION MB II: IT Education, Curriculum & Assessment II  
Chairs: Emma Regentova and Paul Douglas

Games and Animation: Collaborations between the Arts and Computer Science ........................................ 164  
J. Parker

Web-based Mathematics Education: MeML Design and Implementation .................................................. 169  
P. Wang, Y. Zhou, and X. Zou

K. Schramm and C. Paar

An Instructor’s Environment for Automatic Generation of Problem Sequences ........................................ 181  
P. Azalov and F. Zlatarova

The Development of a Philosophy for an Applied Web Programming Curriculum ........................................ 186  
J. Courte

SESSION MB III: IT Education, Curriculum & Assessment III  
Chairs: Emma Regentova and Jim Parker

Assessing Distance Learning Student’s Performance: A Natural Language Processing Approach to Analyzing Class Discussion Messages ........................................ 192  
Y. Wu and X. Chen

Auxiliar: A Case-Based System to Assist Online Courses .................................................. 197  
D. Piva, R. de Freitas, M. Miskulin, G. Nakamiti, and C. Tobar
Building an Effective Groupware System

M. Razek, C. Frasson, and M. Kaltenbach

A Standard Visual Courseware Authoring Tool Based on Content Packaging Specification

Y. Zongkai, Z. Gang, W. Di, and H. Jianhua

GAME: A Generic Automated Marking Environment for Programming Assessment

M. Blumenstein, S. Green, A. Nguyen, and V. Muthukumarasamy

SESSION MB IV: E-Commerce/Education

Chair: Y. Alp Aslandogan

A Novel Approach for New E-Commerce Product Positioning and To-Go/Not-To Go with Rapid Prototype Experience

S. Ahamed

Dynamic Identification of Correspondence Assertions for Electronic Commerce Data Integration

C. Adiele and S. Ehikioya

A Topology Viewer for Distributed Brokering Systems

A. Dharurkar, S. Pallickara, and G. Fox

The Impacts of Professions in Systems Development

A. Johansson

Automatic Estimation of Stock Market Forecasting and Generating the Corresponding Natural Language Expression

Q. Liu, X. Lu, F. Ren, and S. Kuroiwa

Special Technique for Optimizing Teaching-Learning Process in CBT Software

R. Dharaskar

Extending the Undergraduate Computer Science Curriculum to Include Data Mining

N. Goharian, D. Grossman, and N. Raju

Extending the Wiki Paradigm for Use in the Classroom

C.-M. Wang and D. Turner

SESSION MC I: Web & IR Technologies I

Chair: Amanda Spink

Information Retrieval with Principal Components

A. Hoang

Financial Activity Mining from Online Multilingual News

P.-S. Cheung, R. Huang, and W. Lam
SESSION MC II: Web & IR Technologies II
Chair: Amanda Spink

Refined Extended Preorder Index with Path Information ................................................................. 304
G. Xing and D. Zhang

Multitasking Web Search on Alta Vista ................................................................................................. 309
A. Spink, M. Park, B. Jansen, and J. Pedersen

Extracting New Topic Contents from Hidden Web Sites ........................................................................ 314
T. Mouri and H. Kitagawa

Enhancing Usability of Flight and Fare Search Functions for Airline and Travel Web Sites .................. 320
C. Chariton and M.-H. Choi

A Hybrid Classifier Approach for Web Retrieved Documents Classification ........................................ 326
R. Bot, Y.-f. Wu, X. Chen, and Q. Li

SESSION MC III: Web & IR Technologies III
Chair: Amanda Spink

Web Page Fragmentation for Personalized Portal Construction ............................................................... 332
C. Bouras, V. Kapoulas, and I. Misedakis

TIN: An Interactive Image Navigator Providing Ubiquitous Access to Distributed Geo-spatial data ........ 337
B. Vélez, A. Cabarcas, and L. Malavé

Exploring Similarity among Web Pages Using the Hyperlink Structure ................................................. 344
S.-H. Huang, C. Molina-Rodriguez, J. Quevedo-Torrero, and M. Fonseca-Lozada

Anxiously Seeking Answers: How Attitude Affects Search Performance .............................................. 349
W. Lucas and H. Topi
SESSION MC IV: Modern Web and Grid Systems

Chair: Mario Cannataro

Matching Techniques for Resource Discovery in Distributed Systems Using Heterogeneous Ontology Descriptions
S. Castano, A. Ferrara, S. Montanelli, and G. Racca

Application Service Provision through the Grid: Business Models and Architectures
B. Vassiliadis, K. Giotopoulos, K. Votis, S. Sioutas, N. Bogonikolos, and S. Likothanassis

The GReIC Library: A Basic Pillar in the Grid Relational Catalog Architecture
G. Aloisio, M. Cafaro, S. Fiore, and M. Mirto

Content-Addressable IBP — Rationale, Design and Performance
R. Collins and J. Plank

The LAG Grammar for Authoring the Adaptive Web
A. Cristea and M. Verschoor

Adaptation and Reuse in Designing Web Information Systems
F. Frasincar, P. Barna, G.-J. Houben, and Z. Fiala

On-line Generation of Suggestions for Web Users
F. Silvestri, R. Baraglia, P. Palmerini, and M. Serrano

Reinforcement Learning Architecture for Web Recommendations
N. Golovin and E. Rahm

SESSION TA I: Information Assurance and Security V

Chairs: Ajith Abraham
Co-Chair: Johnson Thomas

Protocol Analysis in Intrusion Detection Using Decision Tree
T. Abbes, A. Bouhoula, and M. Rusinowitch

Security Protection and Checking in Embedded System Integration against Buffer Overflow Attacks
Z. Shao, C. Xue, Q. Zhuge, E. Sha, and B. Xiao

Low-Intrusive Consistent Disk Checkpointing: A Tool for Digital Forensics
S. Sitaraman and S. Venkatesan

Dynamic Control of Worm Propagation
R. Dantu, J. Cangussu, and A. Yelimeli
Towards Framework Selection Criteria and Suitability for an Application Framework

S. Ahamed, A. Pezewski, and A. Pezewski

SESSION TA II: Information Assurance and Security VI

Chairs: Ajith Abraham and Johnson Thomas

Robust Partner Selection Scheme for Information Quality Assurance despite Uncertainty in Open Multi-Agent Systems

K. Barber and J. Park

A System for Ensuring Data Integrity in Grid Environments

A. Gilbert, A. Abraham, and M. Paprzycki

Defeating the Current Steganalysis Techniques (Robust Steganography)

A. Sung, G. Tadiparthi, and S. Mukkamala

Risk Management using Behavior based Attack Graphs

R. Dantu, K. Loper, and P. Kolan

A Model for Team-Based Access Control (TMAC 2004)

F. Alotaiby and J. Chen

SESSION TA III: Data Mining I

Chairs: Ray Hashemi and Johnson Thomas

An Object-Based Approach for Digital Video Retrieval

M. Smith and A. Khotanzad

A Mathematical Model of Similarity and Clustering

F.-S. Sun and C.-H. Tzeng

Mining Association Rules from Relations on a Parallel NCR Teradata Database System

S. Chung and M. Mangamuri

A New Reparation Method for Incomplete Data in the Context of Supervised Learning

M. Magnani and D. Montesi

Adaptive Web Document Classification with MCRDR

Y. Kim, S. Park, E. Deards, and B. Kang
SESSION TA IV: Special Session

Physically Locating Wireless Intruders ................................................................. 482
  F. Adelstein, P. Alla, R. Joyce, and G. Richard

SESSION TB I: Database Technology I

Chairs: Moses Garuba and Legend Burge

Replicate Relational and XML Databases for Internet Computing .......................... 492
  J. Fong and H. Wong

Modeling Long Duration Transactions with Time Constraints in Active Database .......... 497
  D. Yadav, R. Agrawal, D. Chauhan, R. Sarswat, and A. Majumdar

Accessing Temporal Data Objects in Mobile Computing Environments ....................... 502
  A. Wong, V. Lee, and K.-W. Lam

Fuzzy Inclusion Dependencies in Fuzzy Relational Databases .................................. 507
  A. Sharma, A. Goswami, and D. Gupta

Server-Side Broadcast Transaction in Mobile Computing Environments ....................... 511
  B. Poon, K.-W. Lam, and V. Lee

SESSION TB II: Database Technology II

Chair: Moses Garuba

Survivability and Applicability in Database Constraints: Temporal Boundary
to Data Integrity Scenarios ................................................................................. 518
  L. Camolesi

Protecting Federated Databases Using a Practical Implementation of
a Formal RBAC Policy ......................................................................................... 523
  S. Barker and P. Douglas

A Model for Multiple-Query Processing Based upon Strong Factoring ....................... 528
  J. Alsabbagh and V. Raghavan

Component Based Embedded Database for Mobile Embedded Systems ..................... 534
  S. Ahamed and S. Vallecha

Mapping Methods and Query for Aggregation and Association in Object-Relational
Database Using Collection ................................................................................. 539
  E. Pardede, J. Rahayu, and D. Taniar
SESSION TB III: Database Technology III

Chair: Moses Garuba

Community, Context, and Distance Education.................................................................546
   J. Rothfork

A Constraint-Based Query Modification Engine for Retrofitting COTS DBMS’s................551
   M. Garuba, R. Langrin, and L. Burge

The Design and Implementation of the MESSENGER Trajectory Database......................557
   J. Gill, L. Burge, and M. Garuba

Pedagogical Issues in Programming Languages.............................................................562
   J. Minor and L. Gewali

Performance Study of a MLS/DBMS Implemented as a Kernelized Architecture................566
   M. Garuba, E. Appiah, and L Burge

SESSION TB IV: Architecture

Chair: Pradip K. Srimani

A Systolic Memory Architecture for Fast Codebook Design Based on MMPDCL Algorithm ......................................................................................................................572
   K. Sano, C. Takagi, R. Egawa, K. Suzuki, and T. Nakamura

Semi-Parallel Reconfigurable Architectures for Real-Time LDPC Decoding......................579
   M. Karkooti and J. Cavallaro

An Object-Oriented Database-Based Architecture for Mobile Enterprise Applications........586
   R. Steele, Y. Ventsov, and T. Dillon

A Formal Approach to Software Architecture of Agent-Base Systems............................591
   H. Reza and E. Grant

SESSION TC I: Image Processing I

Chair: Shantaram Vasikarla

Minimization of Boundary Artifacts on Scalable Image Compression Using Symmetric-Extended Wavelet Transform .................................................................598
   W. Cai and M. Adjouadi

Arbitrary Trajectories Tracking using Multiple Model Based Particle Filtering in Infrared Image Sequence ..............................................................................603
   M. Zaveri, S. Merchant, and U. Desai

Effect of Initial HMM Choices in Multiple Sequence Training for Gesture Recognition ..........608
   N. Liu, R. Davis, B. Lovell, and P. Kootsookos
Resampling Based Method for Pixel-wise Correspondence between 3D Faces ........................................... 614
C. Gu, B. Yin, Y. Hu and S. Cheng

Recognizing Non-rigid Human Actions Using Joints Tracking in Space-Time .............................................. 620
X. Lu, Q. Liu, and S. Oe

SESSION TC II: Image Processing II
Chair: Shantaram Vasikarla

Robust Segmentation Using Parametric and Nonparametric Local Spatial Posteriors ........................................ 626
E. Bak and K. Najariana

A Robust Face Recognition System for Real Time Surveillance ................................................................. 631
M. Seow, R. Gottumukkal, D. Valaparla, and K. Asari

A Fuzzy Approach to Texture Segmentation .................................................................................................. 636
M. Hanmandlu, V. Madasu, and S. Vasikarla

Spherical Parameterization for 3D Surface Analysis in Volumetric Images .................................................... 643
L. Shen and F. Makedon

Factors that Affect the Performance of the DCT-Block Based Image Watermarking Algorithms .................. 650
M. Eyadat

SESSION TC III: Image Processing III
Chair: Shantaram Vasikarla

Design of an Efficient Architecture for Real-Time Image Enhancement Based on a Luma-Dependent Nonlinear Approach .......................................................... 656
H. Ngo, L. Tao, and V. Asari

Determination of Pose Angle of Face Using Dynamic Space Warping (DSW) ................................................. 661
B. Yegnanarayana, A. Sao, B. Kumar, and M. Savvides

Fuzzy Edge Detector Using Entropy Optimization ......................................................................................... 665
M. Hanmandlu, J. See, and S. Vasikarla

Digital Watermarking on Still Images Using Wavelet Transform .................................................................. 671
R. Safabakhsh, S. Zaboli, and A. Tabibiazar

Feature Weighting Methods for Abstract Features Applicable to Motion Based Video Indexing .................... 676
A. Rahman, M. Murshed, and L. Dooley
SE S S S S T C IV: Multimedia Applications
Chair: Vladimir Uskov

National Science Foundation Project on Advanced Online Education in Information Technology................................................................. 682
  V. Uskov and A. Uskov

Visual XML Schemas Based on Reserved Graph Grammars ................................................................. 687
  G. Song and K. Zhang

User Interface Augmentation: Vision and Sound................................................................. 692
  J. Parker and M. Baumback

Combining the Product of Interactive Multimedia Creator with MPEG4 Technology..................................................... 698
  Z. Xiang, Z. Bing-Feng, F. Xi-Feng, S. Jin-Wen, and S. Duan-Feng

SESSION TD I: IT Education, Curriculum & Assessment IV
Chair: Emma Regentova

Experience in Teaching Object-Oriented Concepts to First Year Students with Diverse Backgrounds................................................................. 704
  M. Blumenstein

Web-Based Mathematics Education with MathChat................................................................. 709
  D. Chiu

Adaptive Course Creation for All................................................................. 718
  A. Cristea

Improving Retention of Minority Freshmen in Engineering by Applying the Six Sigma Methodology ................................................................. 723
  L. Burge III, M. Garuba, and C. Brent

Implementing Directed Lines of Reasoning in an Intelligent Tutoring System Using the Atlas Planning Environment ................................................................. 729
  B. Mills, M. Evens, and R. Freedman

SESSION TD II: Coding Applications
Chair: Pradip Srimani

A Fast Computation Scheme of Partial Distortion Entropy Updating................................................................. 736
  H. Takizawa and H. Kobayashi

Design and Evaluation of Intermediate Retransmission and Packet Loss Detection Schemes for MPEG4 Transmission ................................................................. 742
  M. Nithish, J. Ramkumar, C. Ramakrishna, and P. Lakshmi
SESSION TD III: Coding /Fault Tolerance
Chair: Wolf Bein

An Integrated Approach for Database Security and Fault Tolerance
C. Zhang and H. Zhong

Towards New Algorithms for Data Compression Using Adaptive Codes
D. Trincà

On Gossip Codes and Traceability Schemes
R. Veerubhotla, A. Saxena, V. Gulati, and A. Pujari

Data Redundancy and Compression Methods for a Disk-Based Network Backup System
Y. Chen, Z. Qu, Z. Zhang, and B.-L. Yeo

Equivalence of Punctured Convolutional Codes from Shift Equivalent Puncturing Patterns
L. Shen, P. Lu, X. Luo, and Y. Zou

SESSION TD IV: Internet and Applications
Chair: Y. Alp Aslandogan

A High Performance Parallel IP Lookup Technique Using Distributed Memory Organization
K. Venkatesh, S. Aravin, R. Ganapath, and T. Srinivasan

Content Description Servers for Networked Video Surveillance
J. Boyd, M. Sayles, L. Olsen, and P. Tarjan

J-Honeypot: A Java-Based Network Deception Tool with Monitoring and Intrusion Detection
Y. Mai, R. Upadrashta and X. Su

The Effective Buffer Architecture for Data Link Layer of PCI Express
E. Hyun and K.-S. Seong

Author Index