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Table of Contents

General Chair's Welcome Message	1
Program Chair's Welcome Message.....	2
Financial Sponsors	3
Committees	4
Keynote Speakers.....	7
Program at a Glance	13
Final Technical Program.....	15
Tutorials	28
Program and Track Committees	36

Abstracts:

Software Foundations

Modeling Redundancy: Quantitative and Qualitative Models	43
<i>Ali Mili.....New Jersey Institute of Technology, USA</i>	
<i>Frederick T Sheldo.....Oak Ridge National Lab, USA</i>	
<i>Lan Wu.....New Jersey Institute of Technology, USA</i>	
<i>Mark Shereshevsky and Jules Desharnais</i>	
Contribution to the Formal Checking of Multi-Agents Systems.....	43
<i>F. Belal.....Université Mentouri de Constantine, Algeria</i>	
<i>A. Boucherit.....Universitaire d' Oum El Bouaghi, Algeria</i>	
Synchronizing Transitions Preemptive Time Petri Nets: A new model towards specifying Multimedia Requirement.....	44
<i>A. Abdelli and N. Badache.....Algiers USTHB Universiy, Algeria</i>	
Adaptive Search in a Semi-structured Peer-to-Peer System.....	44
<i>Christof Squarr, Jens Bruhn, and Guido Wirt.....</i>	
..... <i>Otto-Friedrich-University Bamberg, Germany</i>	
Formal Specification of Design Patterns and Their Instances.....	45
<i>Toufik Taibi.....United Arab Emirates University, UAE</i>	
<i>Fathi Taibi.....University of Tun Abdul Razak, Malaysia</i>	

Networking Quality of Service

QoS Assurance of Handover TCP Flows in a DiffServ-enabled Mobile Wireless Access Network	49
<i>Li Huang and Muhammad Jaseemuddin.....Ryerson University, Canada</i>	
<i>Hesham El-Sayed.....UAE University, Al-Ain, UAE</i>	
QoS Management and Real Time Agreement Protocols for Resource Reservation for Multimedia Mobile Radio Network	50
<i>Sonia Ben Rejeb, Zied Choukair and Sami Tabbane</i>	
<i>.....Ecole Supérieure des Communications de Tunis, Tunisia</i>	
QoS Extensions to Mobile Ad Hoc Routing Supporting Real-Time Applications	51
<i>Károly Farkas, Dirk Budk and Bernhard Plattner</i>	
<i>.....Swiss Federal Institute of Technology Zurich, Switzerland</i>	
<i>Oliver Wellnit and Lars Wolf.....Technische Universität Braunschweig, Germany</i>	
Enhanced Class-based Packet Scheduling Policy for QoS Provisioning in Multimedia Cellular Networks	52
<i>Tarek Bejaoui..... Université Paris Sud, France</i>	
<i>Nidal Nasser..... University of Guelph – Canada</i>	
<i>Véronique Vèque.....Ecole Supérieure des Communications de Tunis, Tunisia</i>	
ATHOMIC: Architecture managing Tcp Handoff Over Mobile Ip Connections	53
<i>Jalel Ben-othman..... Université de Versailles, France</i>	
<i>Lynda Mokdad..... Université de Paris Dauphine, France</i>	
<i>Octavio Ramirez..... Université de Versailles, France</i>	

VLSI Arithmetic

A CAD Tool for Scalable, Variable Architecture Floating-Point Adder Generator	57
<i>A. J. Al-Khalili.....Concordia University, Canada</i>	
High-Speed Redundant Modulo $2n-1$ Adder.....	57
<i>F. Kharbash and G. M. Chaudhry..... University of Missouri-Kansas City, USA</i>	
Low Power Hierarchical Multiplier and Carry Look-Ahead Architecture.....	58
<i>Himanshu Thapliyal, Neela Gopi, K.K Pavan Kumar and M.B Srinivas</i>	
<i>.....International Institute of Information Technology, India</i>	
Pipelining GF (P) Elliptic Curve Cryptography Computation	58
<i>Adnan Abdul-Aziz Gutub, Mohammad K. Ibrahim, and Ahmad Kayali</i>	
<i>..... King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
Novel Reversible Multiplier Architecture Using Novel Reversible TSG Gate.....	59
<i>Himanshu Thapliyal and M.B Srinivas</i>	
<i>.....International Institute of Information Technology, India</i>	

Algorithms I

Parallel Online Ranking of Web Pages	63
<i>Y. Ganji Saffar, K. Sheykh Esmaili, M. Ghodsi, H. Abolhassani</i>	
<i>.....Sharif University of Technology, Iran</i>	
Internet Traffic Modeling Using Integer-Valued Time Series	63
<i>Z. Liu, J. Almhana, V. Choulakian and R. McGorman</i>	
Parallel Implementation of the PML Algorithm for Truncating Finite-Difference Time-Domain Grids	64
<i>Omar Ramadan and Oyku Akaydin.....Eastern Mediterranean University, Turkey</i>	

On Compactly Encoding With Differential Compression.....	64
<i>Fouad B. Chedid and Pauline G. Mouawad.....Notre Dame University, USA</i>	
A Priority-Based MLFQ Scheduler for CPU Power Saving	65
<i>Muhammad Kashif, Tarek Helmy and Emad El-Sebakhy</i>	
<i>.....King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	

Security Image Analysis

Fusion of Thermal and Visual Images for efficient Face Recognition using Gabor Filter	69
<i>Jahanzeb Ahma and Usman Ali</i>	
<i>.....COMSATS Institute of Information Technology, Pakistan</i>	
<i>Rashid Jalal Qureshi..... Université François-Rabelais de Tours, France</i>	
Face and Fingerprint Biometrics Integration Model for Person Identification Using Gabor Filter	69
<i>Iftikhar Ali, Usman Ali, Muhammad Imran Shahzad and Abdul Waheed Malik</i>	
<i>.....COMSATS Institute of Information Technology, Pakistan</i>	
Ragged-Edge Array Coding for Reliable and Efficient Storage Arrays.....	70
<i>Q. M. Malluhi and M. F. Malouhi.....Data Reliability,USA.</i>	
An Experimental and Industrial Experience: Avoiding Denial of Service via Memory Profiling.....	70
<i>Saeed Abu-Nimeh, Suku Nair and Marco Marchetti</i>	
<i>.....Southern Methodist University, USA</i>	
Embedded Vision Module for Robot-soccer	71
<i>Andrzej Sluze and Phung Khoi Duy Minh</i>	
<i>.....Nanyang Technological University, Singapore</i>	

Software Web Services

Regression Testing for Web Services based Applications	75
<i>Abbas Tarhini.....Universite de Reims Champagne-Ardenne, France</i>	
<i>Hacene Foucha.....Universite des Antilles et de Guyan, France</i>	
<i>Nashat Mansour.....Lebanese American University, Lebanon</i>	
A Categorization Scheme for Semantic Web Search Engines	76
<i>Kyumars Sheykh Esmaili and Hassan Abolhassani</i>	
<i>.....Sharif University of Technology, Iran</i>	
Automated Context-Aware Adaptation of Web Service Executions	76
<i>N.C. Narendra and Srinivas Gundugola.....IBM Software Labs India</i>	
DaSIAn: A Tool for Estimating the Impact of Database Schema Modifications on WEB Applications.....	77
<i>S. K. Gardikiotis and N. Malevris</i>	
<i>.....Athens University of Economics and Business, Greece</i>	
Web Service discovery based on Quality of Service.....	78
<i>Yannis Makripoulias, Christos Makris, Yiannis Panagis, Evangelos Sakkopoulos, Poulia Adamopoulou and Athanasios Tsakalidis.....University of Patras, Greece</i>	

Networking Foundations

Restricted Shortest Path Routing with Concave Costs	81
<i>Pejman Khadivi, Shadrokh Samavi and Hossein Saidi</i>	
..... <i>Isfahan University of Technology, Iran</i>	
Loss Rates Bounds for IP Switches in MPLS Networks	82
<i>Hind Castel-Taleb.....GET/INT/SAMOVAR, France</i>	
<i>Lynda Mokdad.....Universit´e Paris Dauphine, France</i>	
<i>Nihal Pekergin.....Universit´e de Versailles, France</i>	
On the Fault Patterns Properties in the Torus Networks	83
<i>M. Hoseiny Farahabady and F. Safaei</i>	
..... <i>Institute for Studies in Theoretical Physics and Mathematics,, Iran</i>	
<i>A. Khonsar.....University of Tehran, Iran</i>	
<i>M. Fathy.....Iran University of Science and Technology, Iran</i>	
Fair Channel Quality-Based Scheduling Scheme for HSDPA System	84
<i>Bader Al-Manthari.....Queen’s University, Canada</i>	
<i>Nidal Nasser.....University of Guelph, Canada</i>	
<i>Hossam Hassanein.....Queen’s University, Canada</i>	
A New MPLS-based Local Failure Recovery for Multicast Communication.....	84
<i>Omar Banimelhem, Anjali Agarwal and J. William Atwood</i>	
..... <i>Concordia University, Canada</i>	

VLSI Reconfigurable Computing

A Reconfigurable Gaissian/Triangular Basis Functions Computation Circuit.....	87
<i>Muhammad Taher Abuelma’ati and Abdullah Shwehneh</i>	
..... <i>King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
Comparison of Multipliers Architectures through Emulation and Handle-C FPGA Implementation.....	87
<i>Mahmoud A. Al-Qutayri, Hassan R. Barada and Ahmed Al-Kindi</i>	
..... <i>Etisalat University College, Sharjah, UAE</i>	
An Optimized Design Approach for Squaring Large Integers Using Embedded Hardwired Multipliers	88
<i>Shuli Gao, Nouredine Chabini, Dhamin Al-Khalili</i>	
..... <i>Royal Military College of Canada, Canada</i>	
<i>Pierre Langlois.....École Polytechnique de Montréal, Canada</i>	
High Speed Hardware Implementation of a Heuristic 2D Rectangle Placement Algorithm.....	88
<i>Amina Y. Maarouf.....Lebanese American University, Lebanon</i>	
<i>Issam W. Damaj.....Hariri Canadian Academy for Sciences and Technology, Lebanon</i>	
Accurate Total Static Leakage Current Estimation in Transistor Stacks	89
<i>Hussam Al-Hertani, Dhamin Al-Khalili and C’ome Rozon</i>	
..... <i>Royal Military College of Canada, Canada</i>	

Bioinformatics

Computational Analysis of Mass Spectrometry Data Using Novel Combinatorial Methods	93
<i>A. Fadiel.....Yale University School of Medicine, USA</i>	
<i>M. A. Langston, X. Peng and A. D. Perkins.....University of Tennessee, USA</i>	
<i>H. S. Taylor, O. Tuncalp, D. Vitello, P. Pevsner and F. Naftolin</i>	
<i>.....Yale University School of Medicine, USA</i>	
A New Recombination Scheme for Diploid Genetic Algorithms	94
<i>Mayada F. Abdul-Halim.....University of Bahrain, Iraq</i>	
<i>Abbas F. Abdul-Kader.....Informatics Institute for Higher Studies, Iraq</i>	
Evaluation of Breast Cancer Tumor Classification with Unconstrained Functional Networks Classifier.....	94
<i>E. El-Sebakhy, K. Faisal, T. Helmy, F. Azzedin and A. Al-Suhaim</i>	
<i>.....King Fahd University of Petroleum & Minerals, Saudi Arab</i>	
Modification of Mammograms for Early Diagnosis of Breast Cancer Using Wavelet and Neural Networks	95
<i>A.R. Zolghadrasli, and Zahra Maghsoodzadeh.....Shiraz University, Iran</i>	
Protein Secondary Structure Reduction Methods Significantly Affect Prediction Accuracy	95
<i>Saad Osman Abdalla Subair..... Al Ghurair University, UAE</i>	

Security Trust

Avoiding Denial of Service via Stress-testing.....	99
<i>Saeed Abu-Nimeh, Suku Nair and Marco Marchetti</i>	
<i>.....Southern Methodist University, USA</i>	
Hidden Field equations Cryptosystem Performances.....	99
<i>Omessaad Hamdi and Ammar Ouallegue.....SYSCOM Laboratory, Tunisia</i>	
<i>Sami Harari.....SIS Laboratory, France</i>	
A Trust Framework for Pervasive Computing Environments.....	100
<i>Steven T. Wolfe and Sheikh I. Ahamed.....Marquette University, USA</i>	
<i>Mohammad Zulkernine.....Queen's University, Canada</i>	
Trust Ontology for Service-Oriented Environment.....	101
<i>Farookh Khadeer Hussain and Elizabeth Chang</i>	
<i>.....Curtin University of Technology, Australia</i>	
<i>Tharam S. Dillon.....University of Technology, Australia</i>	
Secure Mobile Agent System for E-Business Applications	101
<i>A. Kannammal.....Coimbatore Institute of Technology, India</i>	
<i>V. Ramachandran.....Anna University, India</i>	
<i>N.Ch.S.N. Iyengar.....Vellore Institute of Technology, India</i>	

Software Architectures and Models

Software Defect Prediction using Regression via Classification	105
<i>S. Bibi, G. Tsoumaka, I. Stamelos and I. Vlahavas</i>	
<i>.....Aristotle University of Thessaloniki, Greece</i>	
Compositional Specification of Event-Based Software Architectural Styles.....	105
<i>Imen Loulou, Ahmed Hadj Kacem, Mohamed Jmaiel.....University of Sfax, Tunisia</i>	
<i>Khalil Drira.....LAAS-CNRS, France</i>	

Software Product Line Engineering and Dynamic Customization of a Radio Frequency Management System	106
<i>Hassan Gomaa and Mazen Saleh George Mason University, USA</i>	
Comprehensive Software Development Model	106
<i>Muhammad Sibghatullah Siddiqui, Syed Jafar Hussain and. Syed Jamal Hussain Mohammad AliJinnah University, Pakistan</i>	
The Branding Analysis Pattern.....	107
<i>H.A. Sanchez^{and} M.E. Fayad.....San Jose State University, USA</i>	
DEPICT: A High-Level Formal Language for Modelling Constraint Satisfaction Problems.....	107
<i>Abdulwahed Abbas.....University Of Balamand, Lebanon</i>	
<i>Edward Tsang.....University of Essex, UK</i>	
<i>Ahmad Nasri.....American University of Beirut, Lebanon</i>	

Networking Performance Evaluation

Performance Evaluation of Reservation Medium Access Control in IEEE 802.16 Networks.....	111
<i>Ahmed Doha, Hossam Hassanein and Glen Takahara.....Queen's University, Canada</i>	
An Uplink Performance Evaluation for Roaming-Based Multi-Operator WCDMA Cellular Networks	112
<i>Salman Al-Qahtani and Uthman BaroudiKing Fahd University of Petroleum & Minerals, Saudi Arabia</i>	
Architecture and Performance Analysis of the Multicast Balanced Gamma Switch for Broadband Communications	112
<i>Cheng Li, R. Venkatesan and H. M. Heys Memorial University of Newfoundland, Canada</i>	
Access Channel Performance in CDMA2000	113
<i>Mohamed G. El-Tarhuni.....American University of Sharjah, UAE</i>	
Performance Evaluation in Cellular (CDMA) System Using Smart Antenna with Adaptive Sectoring Method	113
<i>A. R. Zolghadrasli, Arif Hussain Baba, Sh. Golbahar Haghighi and Basharat Amin Shah..... Shiraz University, Iran</i>	
System Performance Analysis of Hybrid Direct Sequence Frequency Hopping Spread Spectrum Multiple Access Communication System Using Support Vector Machines	114
<i>Mohammad AR Khan and Dingrong ShaoBeijing University of Aeronautics and Astronautic, China</i>	

VLSI Design & Test

Novel Heuristic and Genetic Algorithms for the VLSI Test Coverage Problem	117
<i>Walid Ibrahim, Amr El-Chouem and Hesham El-Sayed..... UAE University, UAE</i>	
Exciting Stuck-Open faults in CMOS Circuits Using ILP Techniques.....	117
<i>Fadi Aloul and Assim Sagahyroon.....American University of Sharjah- UAE</i>	
<i>Bashar Al Rawi.....American University in Dubai, UAE</i>	
Femto Joule Switching for Nano Electronics	118
<i>Valeriu Beiu.....United Arab Emirates University, UAE</i>	
<i>Jabulani Nyathi..... Washington State University, USA</i>	
<i>Snorre Aunet..... University of Oslo, Norway</i>	
<i>Mawahib Sulieman..... United Arab Emirates University, UAE</i>	
Multiplexing Schemes in Single-Electron Technology	118
<i>Mawahib H. Sulieman and Valeriu Beiu.....United Arab Emirates University, UAE</i>	

Semi-Algorithmic Random Test Pattern Generation.....	119
<i>Hadi Shahriar Shahhoseini.....Iran University of Science and Technology, Iran</i>	
<i>Babak Hosseini Kazerouni..... Shahid Beheshti University Iran</i>	
A Highly Adaptive Acoustic Echo Cancellation Solution for VoIP Conferencing Systems	119
<i>Umar Iqbal Choudhry, JongWon Kim and Hong Kook Kim</i>	
<i>.....Gwangju Institute of Science and Technology, Republic of Korea</i>	

Data Mining I

A Scalable Sequential Pattern Mining Algorithm	123
<i>Jiahong Wang, Yoshiaki Asanuma, Eiichiro Kodama and Toyoo Takata</i>	
<i>.....Iwate Prefectural University, Japan</i>	
A Performance Comparison of Pattern Discovery Methods on Web Log Data.....	124
<i>Murat Ali Bayir, Ismail H. Toroslu and Ahmet Cosar</i>	
<i>..... Middle East Technical University, Turkey</i>	
FastLMFI: An Efficient Approach for Local Maximal Patterns Propagation and Maximal Patterns Superset Checking	124
<i>Shariq Bashir and A. Rauf Baig</i>	
<i>.....National University of Computer and Emerging Sciences, Pakistan</i>	
The N-tree: an Indexing Technique for Nearest-Neighbor Queries	125
<i>Faiza Najjar and Hassenet Slimani.....National School of Computer Science, Tunisia</i>	
Multi-Channel Communication for Wireless Database.....	126
<i>Shane Emmons and Mudasser F. Wyne..... University of Michigan, USA</i>	
An Improved Current Mirror Cell	126
<i>Munir A. Al-Absi.....King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	

Security Foundations

Formal Methods in the Enhancement of the Data Security Protocols of Mobile Agents.....	129
<i>Raja Al-Jaljoui University of New South Wales Australia</i>	
Access Control with Prohibitions and Obligations.....	129
<i>Philippe Balbiani, Fatima Harb and Ali Kaafarani...Universit'e Paul Sabatier, France</i>	
The Best Irreducible Pentanomial For A Mastrovito GF Multiplier.....	130
<i>Mohsen Bahramali and Hadi Shahriar Shahhoseini</i>	
<i>.....Iran University of Science and Technology, Iran</i>	
Predicting the Dynamic Nature of Risk.....	130
<i>Omar Khadeer Hussain , Elizabeth Chang and Farookh Khadeer Hussain</i>	
<i>..... Curtin University of Technology, Australia</i>	
<i>Tharam S. Dillon..... University of Technology, Australia</i>	
<i>Ben Soh La Trobe University, Australia</i>	
Trust Relationships and Reputation Relationships for Service Oriented Environments	131
<i>Farookh Khadeer Hussain and Elizabeth Chang</i>	
<i>..... Curtin University of Technology, Australia</i>	
<i>Tharam S.Dillon..... University of Technology, Australia</i>	
Design of an Embedded System for Surface Roughness Measurement.....	131
<i>Tarik Ozkul.....American University of Sharjah, UAE</i>	

Software Agents

Towards Intentional Agents to Manipulate Belief, Desire and Commitment Degrees	135
<i>Adel Saadi and Zaidi Sahnoun..... Mentouri University, Algeria</i>	
Agent Design Patterns Framework for MaSE/POAD Methodology.....	135
<i>Radziah Mohamad and Safaai Deris..... Universiti Teknologi Malaysia, Malaysia</i>	
<i>Hany H. Ammar..... West Virginia University, USA</i>	
GeneCity: A Multi Agent Simulation Environment for Hereditary Diseases	136
<i>Demetrios G. Eliades, Andreas L. Symeonidis and Pericles A. Mitkas</i>	
<i>.....Aristotle University of Thessaloniki, Greece</i>	
An Innovative Self-Configuration Approach for Networked Systems and Applications	137
<i>Huoping Chen, Salim Hariri and Fahd Rasul..... University of Arizona, USA</i>	
Stable Analysis Patterns	137
<i>Haitham S. Hamza..... University of Nebraska-Lincoln, USA</i>	
<i>Mohamed E. Fayad..... San Jose State University, USA</i>	

Networking Efficiency

Power Efficient Algorithms for Computing Fast Fourier Transform over Wireless Sensor Networks.....	141
<i>Turkmen Canli and Ashfaq Khokhar..... University of Illinois at Chicago, USA</i>	
<i>Ajay Gupta..... Western Michigan University, USA</i>	
Power Allocation and Coding for Image Transmission over Wireless Channels.....	141
<i>Akram Bin Sediq and Mohamed El-Tarhuni..... American University of Sharjah, UAE</i>	
An Energy Efficient MAC Approach for Mobile Wireless Sensor Networks	142
<i>Prasad Raviraj, Hamid Sharif, Michael Hempel and Song Ci</i>	
<i>..... University of Nebraska-Lincoln, USA</i>	
Efficient Service Discovery for Wireless Mobile Ad Hoc Networks.....	143
<i>Yu Yang, Hossam Hassanein and Afzal Mawji..... Queen's University, Canada</i>	
Toward the Mobile Grid: Service Provisioning in a Mobile Dynamic Virtual Organization	143
<i>Martin Waldburger..... Universität Zürich, Switzerland</i>	
<i>Burkhard Stiller..... ETH Zürich, Switzerland</i>	

Data Mining II

Development of Hybrid Classification Methodology for Mining Skewed Data Sets – A Case Study of Indian Customs Data.....	147
<i>Anuj Kumar..... Indian Revenue Services (Customs & Central Excise) India</i>	
<i>Vishnuprasad Nagadevara..... Indian Institute of Management, India</i>	
Mining N-most Interesting Itemsets using Support-Ordered Tries	147
<i>Muhammad Umer Arshad, Muhammad Naeem Ayyaz</i>	
<i>..... University of Engineering and Technology, Pakistan</i>	
Evaluation of Cluster Analysis Algorithms Enhanced by Using R*-Trees.....	148
<i>Jiaxiang Pi, Yong Shi and Zhengxin Chen..... University of Nebraska at Omaha, USA</i>	
Functionally Classifying Genes from Microarray Data Using Linear and Non-linear Data Projection.....	148
<i>J. Shaik and M. Yeasin..... University of Memphis, USA</i>	
Distributed Computing for Formation Flying Missions	149
<i>Abdul-Halim Jallad and Tanya Vladimirova..... University of Surrey, UK</i>	

Algorithms II

A Novel Corner Detector Approach using Sliding Rectangles	153
<i>Asif Masood.....University of Engineering and Technology, Pakistan</i>	
<i>Muhammad Sarfraz.....King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
On Line Learning: Evolving in Real Time a Neural Net Controller of 3D-robot-arm: Track and Evolve.....	153
<i>A. Lehireche.....University Djilali Liabès, Algeria</i>	
<i>A. Rahmoun.....King Faisal University, Saudi Arabia</i>	
The vMatrix: Equi-Ping Game Server Placement For Pre-Arranged First-Person-Shooter Multiplayer Matches.....	154
<i>Amr Awadallah and Mendel Rosenblum..... Stanford University, USA</i>	
Reputation Relationship and Its Inner Relationships for Service Oriented Environments.....	155
<i>Farookh Khadeer Hussain and Elizabeth Chang</i>	
<i>..... Curtin University of Technology, Australia</i>	
<i>Tharam S.Dillon.....University of Technology, Australia</i>	
Topological Properties of Stretched Graphs.....	155
<i>P. Shareghi and H. Sarbazi-Azad</i>	
<i>.....Sharif University of Technology and IPM School of Computer Science, Iran</i>	

Embedded Systems I

An Automated System for Real Time Fault Localization in Optical Networks	159
<i>C. B. Yahya.....University of Sharjah, UAE</i>	
The Indeterministic Behavior of Scoped Memory in Real-Time Java	159
<i>M. Teresa Higuera-Toledano.....Ciudad Universitaria, Spain</i>	
Cache Optimization for Embedded Systems Running H.264/AVC Video Decoder.....	160
<i>Abu Asaduzzaman and Imad Mahgoub.....Florida Atlantic University, USA</i>	
A Probability-Based Instruction Combining Method for Scheduling in VLIW Processors.....	160
<i>R. Iraj and H. Sarbazi-Azad</i>	
<i>.....Sharif University of Technology & IPM School of Computer Science, Iran.</i>	
Serpent Cryptography on Static and Dynamic Reconfigurable Hardware	161
<i>Issam Damaj.....Canadian Academy for Science and Technology, Lebanon</i>	
<i>May Itani, and Hassan Diab.....American University of Beirut, Lebanon</i>	

Software Tools

Refactoring Tools and Complementary Techniques	165
<i>Martin Drozd, Derrick G Kourie, Bruce W Watson and Andrew Boake</i>	
<i>.....University of Pretoria, South Africa</i>	
TOPER: A Tool Using Integrated Knowledge Reporting and Usability Methods	165
<i>Osama Alshara..... HCT, ADWC, UAE</i>	
CoMet: a Tool Using CUMM to Measure Components' Unused Members.....	166
<i>Hamdan Msheik and Alain Abran..... Université du Québec, Canada</i>	
<i>Hamid Mcheick.....Université du Québec à Chicoutimi, Canada</i>	
<i>Dimitrios Touloumis.....Université du Québec, Canada</i>	
<i>Adel Khelifi.....Alhosn Universit, UAE</i>	

Using Change Propagation Probabilities to Assess Quality Attributes of Software Architectures	167
<i>I Shaik, W. Abdelmoez, R. Gunnalan, M. Shereshevsky, A. Zeid and H.H. Ammar</i>	
<i>..... West Virginia University, USA</i>	
<i>A. Mili</i>	<i>New Jersey Institute of Technology, USA</i>
<i>C. Fuhrman</i>	<i>Ecole de technologie supérieure, Canada</i>
Session Management System for Collaborative Applications in Interactive Grid	168
<i>Hui Wang, Hai Jin, Pingpeng Yuan and Liping Pang</i>	
<i>.....Huazhong University of Science and Technology, China</i>	

Networking Cellular

An Adaptive Multi-Guard Channel Scheme for Multi-Class Traffic in Cellular Networks	171
<i>Muhammed Salamah..... Eastern Mediterranean University, Turkey</i>	
An Uplink Admission Control for 3G and Beyond Roaming Based Multi-Operator Cellular Wireless Networks with Multi-Services.....	172
<i>Uthman Baroudi and Salman Al-Qahtani</i>	
<i>..... King Fahd University of Petroleum & Minerals, Saudi Arabia</i>	
A Survey of Advances in Multi-User Detection in DS-CDMA	173
<i>Syed Ismail Shah and Muhammad Naeem.....Iqra University, Pakistan</i>	
<i>Asrar U.H. Sheikh.....KFUPM, Saudi Arabia</i>	
<i>Habibullah Jama.....University of Engineering and Technology, Pakistan</i>	
<i>Jamil Ahmad.....Iqra University, Pakistan</i>	
Throughput of ARQ Protocols Over Nakagami and MIMO Block Fading Channels.....	174
<i>Salam A. Zummo.....King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
Distributed Fault Management Protocol for Heterogeneous Networks	174
<i>G. Deprez, M. Padmara and S. Nair.....Southern Methodist University, USA</i>	

Database and Web Technologies

An Object-Oriented Configurable Framework for Real-time Database Simulation Environment	177
<i>S. Tanwani.....Devi Ahilya University, India</i>	
<i>A.K. Ramani..... King Faisal University, Saudi Arabia</i>	
An Overview of MOA, a Multi-class Overload Architecture for Real-time Database Systems: Framework and Algorithms.....	177
<i>Leila Baccouche..... National Institute of Applied Science and Technology, Tunisia</i>	
Classification Rules for Pre-Analysis Filtering of Web Transactions	178
<i>Omar H. Karam, Ahmad M. Hamad and Wedad H. Riad</i>	
<i>.....Ain Shams University, Egypt</i>	
Towards Ontology-Based Semantic Web from Data-Intensive Web: a Reverse Engineering Approach.....	178
<i>Sidi Mohamed Benslimane, Mimoun Malki and Ahmed Lehirech</i>	
<i>..... University of Sidi Bel Abbes, Algeria</i>	
WAP and Push Technology Integrated into Mobile Commerce Applications	179
<i>Jihad QaddourIllinois State University, USA</i>	

Multimedia Video

Evolutionary Colorization of Grayscale Images	183
<i>Aminna Dahim Aboud and Bara'a Ali Attea..... University of Baghdad, Iraq</i>	
Robust Color Video De-noising	183
<i>Tamer Rabie..... United Arab Emirates University, UAE</i>	
Constructing Precise Geometric Models of Virtual Environments using Image based View Synthesis.....	184
<i>S. Ajith.....KCG College of Technology, India</i>	
<i>Naren Athmaraman.....SSN College of Engineering, India</i>	
Study of Reneging Behavior in Batched Multimedia.....	184
<i>Vrinda Tokekar and Sanjiv Tokekar.....Devi Ahilya University, India</i>	
<i>A.K.Ramani.....King Faisal University, Saudi Arabia</i>	
An Extended Media Framework for Multiparty Collaborative Environments.....	185
<i>Sangwoo Han, Namgon Kim, JaeYoun Kim and JongWon Kim</i>	
<i>.....Gwangju Institute of Science and Technology, Korea</i>	

Embedded Systems II

A Wireless Embedded System for Tracking of Stolen Vehicles	189
<i>Mohammed A. Mustafa, Mohammad Behnam and Mohamed El-Tarhuni</i>	
<i>.....American University of Sharjah, UAE</i>	
Grid Overlay for Remote E-Health Monitoring	190
<i>Wail M. Omar.....Liverpool John Moores University, UK</i>	
<i>Bassam A. Ahmad.....Sohar University, Sultanate of Oman</i>	
<i>A. Taleb-Bendiab.....Liverpool John Moores University, UK</i>	
Formal Development Method of Control Systems using the Event Based B Approach Case Study: A Parcel Sorting Device	191
<i>Olfa Mosbahi Jacques and Jemni Ben Ayed.....University Tunis El Manar II, Tunisia</i>	
<i>Jacque Jaray.....INRIA Lorraine, France</i>	
A System for Web Retrieval of Images and the Corresponding Annotations	192
<i>Hiroshi Idehara.....Osaka University, Japan</i>	
<i>Hiroshi Takeno.....NTT-Resonant, Japan</i>	
<i>Noriyuki Fujimoto and Kenichi Hagihara.....Osaka University, Japan</i>	
A Practical Fair-Exchange E-Payment Protocol with Anonymity Protection.....	193
<i>Q. Zhang, K. Markantonakis and K. Maye..... University of London, UK</i>	

Software Mobile Systems

Allocation and Re-Allocation of Data in a Grid using an Adaptive Genetic Algorithm.....	197
<i>Hamed Siefoddini, Khaled El-Fakih and Jalal Kawash</i>	
<i>.....American University of Sharjah, UAE</i>	
<i>Nashat Mansour.....Lebanese American University, Lebanon</i>	
Towards a Model-Based Unification of Mobile Platforms	197
<i>László Lengyel, Tihamér Levendovszky, Gergely Mezei, Bertalan Forstner and</i>	
<i>Hassan Charaf.....Budapest University of Technology and Economics, Hungary</i>	
A Complex Applications Framework Supporting Tolerant Dynamic Vehicle Dispatching	198
<i>Ilham Benyahia.....Université du Québec en Outaouais, Canada</i>	
<i>Jean-Yves Potvin and Ying Xu Université de Montréal, Canada</i>	

Enhancements of PECOS Embedded Real-Time Component Model for Autonomous Mobile Robot Application	199
<i>Dayang Norhayati Abang Jawawi, Safaai Deris and Rosbi Mamat</i>	
..... <i>Universiti Teknologi Malaysia, Malaysia</i>	
Can Cohesion Predict Fault Density?.....	200
<i>Adam Abubakar, Jarallah AlGhamdi and Moataz Ahmed</i>	
..... <i>King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
The Adoption of eCommerce Communications and Applications Technologies in Small Businesses in New Zealand	200
<i>Nabeel Al-Qirim..... United Arab Emirates University, UAE</i>	

Networking Miscellaneous I

On the Optimal Deployment of Heterogeneous Sensing Devices.....	203
<i>Rabie Ramadan, Khaled Abdelghany and Hesham El-Rewini</i>	
..... <i>Southern Methodist University, USA</i>	
Differentiated Survivability in Ethernet-Based MAN/WAN	203
<i>M. Ali, G. Chiruvolu and A. Ge..... Alcatel Research & Innovation, USA</i>	
<i>M. Padmaraj, S. Nair and M. Marchetti..... Southern Methodist University, USA</i>	
Supporting Disconnected Operations in Mobile Computing	204
<i>J. H. Abawajy..... Deakin University, Australia</i>	
<i>M. Mat deris..... Tun Hussein Onn University of Technology, Malesia</i>	
Performance of MIP over WLAN in Rapid Moving Environments.....	205
<i>Jun Tian and Abdelsalam (Sumi) Helal..... University of Florida, USA</i>	
A Secure Framework for Distributed Agents System	205
<i>Lamia H. Khalid and Sarab M. Hameed..... University of Baghdad, Iraq</i>	
<i>Hilal M. Yousif..... Al-Rafidian University, Iraq</i>	
On the Performance of Directional MAC Protocols in Wireless Ad-Hoc Networks	206
<i>Yuxin Pan, Walaa Hamouda and Ahmed Elhakeem..... Concordia University, Canada</i>	

Database Miscellaneous I

Contextual ECATNets Semantics in Terms of Conditional Rewriting Logic.....	209
<i>N. Zeghib..... Université de Constantine, Algeria</i>	
<i>K. Barkaoui..... Laboratoire CEDRIC, France</i>	
<i>M. Bettaz..... Philadelphia University, Jordan</i>	
Arabic Search Engines Improvement: A New Approach using Search Key Expansion Derived from Arabic Synonyms Structure	209
<i>Hayder K. Al Ameer, Shaikha O. Al Ketbi, Amna A. Al Kaabi, Khadija S. Al Hebli, Naila F. Al Shamsi, Noura H. Al Nuaimi, Shaikha S. Al Muhairi</i>	
..... <i>United Arab Emirates University, UAE</i>	
Crime Hot-Spots Prediction Using Support Vector Machine.....	210
<i>Keivan Kianmehr and Reda Alhajj..... University of Calgary, Canada</i>	
Learning acyclic rules based on Chaining Genetic Programming.....	210
<i>Wing-Ho Shum and Kwong-Sak Leung</i>	
..... <i>Chinese University of Hong Kong, Hong Kong</i>	
<i>Man-Leung Wong..... Lingnan University, Hong Kong</i>	
A Proxy Pre-fetching Scheme for a Consistent SMIL Delivery.....	211
<i>A. Abdelli and N.Badache..... USTHB University, Algeria</i>	
ARAB_TTS: An Arabic Text To Speech Synthesis	211
<i>Zouhir Zemirli..... Institut National d'Informatique, Algeria</i>	

e-Learning

ICE: A System for Identification of Conflicts in Exams.....	215
<i>Hicham Hage and Esma A. Meur..... University of Montreal, Canada</i>	
Building e-Partnership: d-Library Services for eLearning	215
<i>Ahmed Taha United Arab Emirates University, UAE</i>	
On-Line Content Analysis System using e-Learning Time Data	216
<i>Maomi Ueno.....Nagaoka University of Technology, Japan</i>	
<i>Keizo Nagaoka..... Waseda University, Japan</i>	
Authoring Web-Based Learning Scenario Based on the IMS Learning Design: Preliminary Evaluation of the Ask Learning Designer Toolkit.....	217
<i>Demetrios Sampson, Pythagoras Karampiperis and Panayiotis Zervas University of Piraeus, Greece</i>	
Semantically Meaningful Unit – SMU; An Openly Reusable Learning Object for UREKA Learning- Object Taxonomy & Repository Architecture – ULTRA.....	218
<i>Imran Ihsan, Mobin-uddin Ahmed, Mohib-ur-Rehman, Mohammad Abdul Qadir and Nadeem Iftikhar.....Muhammad Ali Jinnah University, Pakistan</i>	
Educational additions to an Open Source Virtual Learning Environment (VLE) for the Greek Schools' Network.....	218
<i>Avgoustos Tsinakos.....T.E.I. of Kavala, Greece</i>	
<i>John Papaioanou..... University of Surrey, UK</i>	

Software Miscellaneous I

Classification of Software and Hardware Bio-inspired Systems.....	221
<i>Djamel Meslati and Labiba Souici..... University of Annaba, Algeria</i>	
<i>Saïd Ghoul.....Philadelphia University, Jordan</i>	
Adapting WordNet to the Medical Domain using Lexicosyntactic Patterns in the Ohsumed Corpus	222
<i>A. Toumouh. and A. Lehireche University Djillali Liabès, Algeria</i>	
<i>D. Widdows²MAYA Design, USA</i>	
<i>M Malki..... University Djillali Liabès, Algeria</i>	
An Experiment in Automatic Conversion of Java to C#.....	223
<i>Mohammad El-Ramly..... University of Leicester, UK.....</i>	
<i>Rihab Eltayeb and Hisham A. Alla Sudan University of Science and Technology, Sudan</i>	
Communicating Requirements for ERP Tendering, the Case of International Organizations	223
<i>Ildemaro Araujo and Iván Araujo..... Canada</i>	
An Aspect-Oriented Approach in Early Requirements Engineering.....	224
<i>Abdelkrim Amirat, Djamel Meslati and M.Tayeb Laskri University of Annaba, Algeria</i>	

Networking Miscellaneous II

MPLS Network Topology Design Using Genetic Algorithms.....	227
<i>El-Sayed M. El-Alfy King Fahd University of Petroleum and Minerals, Saudi Arabia</i>	
A Genetic-Driven Instruction Set for High Speed Network Processors.....	227
<i>Hossein Mohammad and Nasser Yazdani..... University of Tehran, Iran</i>	
Dynamic Adapting of Scalable TCP Congestion Control Parameters	228
<i>Mohamed Tekala and Robert SzaboBudapest University of Technology and Economics, Hungary</i>	

An Efficient Intra Prediction Mode Decision Algorithm for H.263 to H.264 Transcoding.....	229
<i>Mehdi Jafari.....Bahonar University of Kerman, Iran</i>	
<i>Shohreh Kasaei.....Sharif University of Technology, Iran</i>	
A Discrete Optimal Broadcasting Protocol in an IP Network.....	229
<i>Achraf Gazdar and Abdelfettah Belghith Université de la Manouba, Tunisia</i>	

Pervasive Computing

An Architecture for a Context-aware Service Broker in Ubiquitous Computing Environments.....	233
<i>Yasser Ganji Saffar, Hassan Abolhassani and Rasool Jalili</i>	
<i>.....Sharif University of Technology, Iran</i>	
Available Trust and Security in Wireless Networks	233
<i>S. Daskapan, J. J. Van Bergen and M. Kaart</i>	
<i>.....Delft University of Technology, The Netherlands</i>	
An Ontology-based Model for Mobile Agents Adaptation in Pervasive Environments	234
<i>Nejla Amara-Hachmi..... Université Paris 13 – CNRS UMR, France</i>	
A Privacy Preferences Architecture for Context Aware Applications	234
<i>Amr Ali Eldin and Rene Wagenaar....Delft University of Technology, The Netherlands</i>	
Interoperability and Security Issues of Grid Services for Ubiquitous Computing.....	235
<i>Debasish Jana.....Anshin Software, India</i>	
<i>Amritava Chaudhuri, Abhijit Datta and Bijan Bihari Bhaumik</i>	
<i>.....Jadavpur University, India</i>	

Software Miscellaneous II

Parallel I/O Scheduling in the Presence of Data Duplication on Multiprogrammed Cluster Computing Systems.....	239
<i>J.H. Abawajy.....Deakin University, Australia</i>	
FuFaIR: a Fuzzy Farsi Information Retrieval System.....	239
<i>Amir Nayyeri.....University. of Tehran, Iran</i>	
<i>Farhad Oroumchian..... University of Wollongong in Dubai, UAE</i>	
Extending UML to Guide Design Pattern Reuse.....	240
<i>Nadia Bouassida and Hanène Ben-Abdallah.....Université de Sfax, Tunisie</i>	
Productivity and Stability with Application Service Software.....	241
<i>Erick K. Ahrens, Hans Nehme, Michael O. Pulliam</i>	
Requirements for Evaluating Architectural Stability.....	241
<i>Rami Bahsoon.....Aston University, UK</i>	
<i>Wolfgang Emmerich..... University College London, UK</i>	

Software Applications

Defining Patterns Using UML Profiles.....	245
<i>N. C. Debnath..... Winona State University, USA</i>	
<i>A. Garis, D. Riesco and G. Montejano..... Universidad Nacional de San Luis, Argentina</i>	
Supporting the SPEM with a UML Extended Workflow Metamodel	246
<i>Narayan Debnath..... Winona State University, USA</i>	
<i>Daniel Riesco and German Montejano....Universidad Nacional de San Luis, Argentina</i>	
<i>Manuel Perez Cota, J. Baltasar García Perez-Schofield.....Universidad de Vigo, Spain</i>	
<i>Daniel Romero and Marcelo Uva.....Universidad Nacional de Rio Cuarto, Argentina</i>	

A Comparative Analysis of Maintainability Approaches for Web Applications	247
<i>Emad Ghosheh, Jihad Qaddour, Matthew Kuofie and Sue Black</i>	
Improving Software Quality through Requirements Traceability Models	247
<i>Ahmed M. Salem..... California State University, USA</i>	

Database and Mobile Communications

Role Based Approach to Data Access in Adhoc Networks	251
<i>Qurban A. Memon and M. Shakeel Laghari.....United Emirates University, UAE</i>	
Games over Bluetooth	251
<i>Aqib Mumtaz and Faisal Tehseen Shah.....Pakistan</i>	
Primitive Operations of Hyper-Graph Data Model for Distributed Database Integration.....	252
<i>Srikrishnan Sundaresan and Gongzhu Hu.....Central Michigan University, USA</i>	
Embedding Rules in a Pre-Hospital Mobile Database	253
<i>Nada Hashmi, Dan Corwin, Dan Myung, Mark Gaynor, Valmeek Kudesia and Will Tollefsen.....10Blade, USA</i>	
<i>Shankaranarayanan Ganesan.....Boston University School of Management, USA</i>	
<i>Steve Moulton.....10Blade, USA</i>	
Hierarchical Approach to Select Feature Vectors for Classification of Text Documents	253
<i>Nagesh Kapalavayi, S.N.Jayaram Murthy and Gongzhu Hu</i>	
<i>.....Central Michigan University, USA</i>	

AICCSA 2006 is pleased to announce that it will be Under the Patronage and With the Attendance of His Highness Dr. Sheikh Sultan Bin Mohammed Al Qassimi, Ruler of Sharjah, Supreme Council Member, and President of the American University of Sharjah

AICCSA 2006 General Chair's Welcome Message

It is my pleasure to welcome you to Sharjah, UAE on March 8-11, 2006 for The 4th IEEE/ACS International Conference on Computer Systems and Applications (AICCSA 2006). We are very fortunate to have so many talented and well recognized people involved in the process of submitting papers, chairing tracks, workshops, and reviewing papers. We also feel grateful for the support we received from the IEEE Computer Society financial and technical sponsorships. Above all, we are very delighted and thankful that His Highness Sheikh Dr. Sultan Bin Mohammed Al Qassimi, Ruler of Sharjah and Dr. Winfred Thompson, AUS Chancellor, will participate with us the first day during the opening session of the conference.

We had an overwhelming number of paper submissions this year. This was attributed to the very strong technical committee that worked so hard to make the conference advertisement reach so many people. Also the strong commitment of many of the track chairs was outstanding. After the submission deadline, they worked so hard with their TPC members to turn around a very high standard review that led to the strong technical program before you.

We are very proud of the technical program we have and assure you that you will find it very stimulating, informative and inspiring. In addition to the great technical sessions, we have 7 Tutorials and 4 high-profile keynote speakers. I invite you to attend and interact with the keynote speakers as they are all distinguished in their fields.

Last but not least, I would like to extend my sincere thanks and appreciation to the exceptional work rendered by all track organizers as well as the workshop chairs and their TPC members who made a high quality review under a tight schedule. A list of all of those involved is given in the next few pages. Special thanks to The American University of Sharjah (AUS), Dubai Silicon Oasis (DSO) and Lucent Technologies in UAE for their financial sponsorship. Special thanks also go to the program chair, Dr. Mike Langston; the Registration Chair, Dr. Sherif Yehia, the local chairs, Dr. Abdulrahman Al-Ali and Dr. Eesa Bastaki; the Tutorial chairs, Dr. Kassem Saleh and Dr. Nidal Nasser; the Poster Chair, Dr. Hossam Hassanein; all Track and Workshop Chairs; Publicity Chairs; the Conference Coordinator, Ms. Suzanne Baktash; and the conference webmaster, Mr. Bobby Maisnam.

I invite all of you to join us and interact with experts in the computer systems and applications field from all around the world. This will be a memorable experience you will never forget.

**Mohsen Guizani, General Chair, AICCSA 2006
Western Michigan University, USA
January, 2006**

AICCSA 2006 Program Chair's Welcome Message

It is a privilege to serve as Program Chair for AICCSA 2006. The scope of this meeting is truly international. Contributing authors this year hail from the following 48 countries: Algeria, Australia, Bangladesh, Brazil, Canada, China, Cyprus, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Iran, Iraq, Italy, Japan, Jordan, Korea, Kuwait, Lebanon, Malaysia, Mexico, Morocco, the Netherlands, Norway, Oman, Pakistan, Palestine, Portugal, Qatar, Russia, Saudi Arabia, Singapore, Slovenia, South Africa, Spain, Switzerland, Taiwan, Tehran, Tunisia, Turkey, the UAE, UK, Ukraine, and the USA.

Papers were solicited in the following technical areas: Algorithms and Bioinformatics, Database and Data Mining, Embedded Systems, e-Learning, Multimedia, Networking and Wireless Technology, Security and Information Assurance, Software Engineering and Applications, and VLSI Circuits, Systems Applications and Signal Processing. A total of 405 submissions were received. From these, 150 were selected as regular papers. Another 50 were accepted as short papers. Authors represent a variety of academic, industrial and governmental organizations. Thanks go to all those who contributed their work.

Thanks also go to the General Chair, Mohsen Guizani, and to the Track Chairs: Abdul-Rahman Al-Ali, Mike Atallah, Kamel Barkaoui, Mohamed A Imam, Marco Marchetti, Jianping Pan, Ghassan Qadah, Surong Zeng and Imran Zuolkernan. Their leadership has been instrumental in making AICCSA 2006 a success. Thanks go as well to the Program Committee Members and other reviewers who have made it possible to craft the final slate of high-quality technical papers. It is only through their tireless efforts that conferences such as this are possible.

Finally, special thanks go to Suzanne Baktash and Bobby Maisnam. Suzanne has been the consummate Conference Coordinator. Her skill in seamlessly managing diverse requirements has been indispensable, and has made my job so much easier. Bobby has been the ideal Conference Webmaster. His technical ability has kept the automated system responsive to user needs, and ensured that the reviewing machinery has run smoothly and continuously.

Michael A. Langston
Program Chair, AICCSA 2006
The University of Tennessee, USA
January, 2006

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The Organizers and Steering Committee of AICCSA 2006 highly appreciates the financial and moral support of The American University of Sharjah (AUS), the Dubai Silicon Oasis (DSO) and Lucent Technologies UAE.



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AICCSA 2006 Keynote Speakers

Keynote Speaker 1: Wednesday, March 8

Professor Khaled B. Letaief, IEEE Fellow

Editor-in-Chief, IEEE Transactions on Wireless Communications

The Hong Kong University of Science & Technology

Ubiquitous Broadband Communications: *The Next Frontier*

Abstract

The information communications technology has undergone revolutionary changes, which have recently led to the exponential growth of wireless and mobile services. The communication landscape will undoubtedly continue to experience spectacular developments due to the emergence of new interactive multimedia applications and highly integrated systems driven by the rapid growth in information services and microelectronic devices. So far, most of the current mobile systems are mainly targeted to voice communications with low transmission rates. In the near future, however, broadband data access at high transmission rates will be needed to provide users packet-based connectivity to a plethora of services. It is also almost certain that the neXt Generation (XG) wireless systems will consist of complementary systems with a set of different standards and technologies along with different requirements and client platforms as well as complementary capabilities that will offer users ubiquitous wireless connectivity between mobile and desktop computers, machines, game systems, cellular phones, consumer electronic products, and other hand-held devices. A key requirement in future wireless systems is their ability to provide broadband connectivity with end-to-end QoS along with a high network capacity and throughput at a low cost per bit of data services. To support the above services, a host of new issues and problems have to be addressed. This talk will discuss the challenges facing the XG ubiquitous broadband systems and then describe some of the leading enabling technologies for increasing system capacity and spectral efficiency while meeting the stringent requirements of future networks.

Speaker Biography

Professor Letaief received the Ph.D. Degrees in Electrical Engineering from Purdue University, USA in 1990. From 1990 to 1993, he was a faculty member at the University of Melbourne, Australia. Since 1993, he has been with HKUST where he is a Chair Professor and Head of the Electrical and Electronic Engineering Department. He is also the Director of the Hong Kong Telecom Institute of Information Technology as well as the Director of the Center for Wireless Information Technology.

Dr. Letaief is an acknowledged authority in the area of wireless and mobile communications including broadband wireless data access, wideband CDMA, MIMO systems, OFDM, Cross-layer design, and beyond 3G systems. In these areas, he has published over 280 journal and conference papers and given invited and keynote talks as well as courses all over the world. He served as consultants for different organizations and is currently the Editor-in-Chief of the prestigious *IEEE Transactions on Wireless Communications*. He also served on the editorial board of other journals including the

IEEE Journal on Selected Areas In Communications (as Editor-in-Chief). Professor Letaief has been involved in organizing a number of major international conferences and events. He also served as the Chair of the IEEE Communications Society Technical Committee on Personal Communications as well as a member of the IEEE ComSoc Technical Activity Council. In addition to his active research activities, Professor Letaief has also been a dedicated teacher committed to excellence in teaching and scholarship. He received the *Mangoon Teaching Award* from Purdue University in 1990; the Teaching Excellence Appreciation Award by the School of Engineering at HKUST (4 times); and the Michael G. Gale Medal for Distinguished Teaching (Highest university-wide teaching award).

He is a *Fellow* of IEEE, an elected member of the IEEE Communications Society Board of Governors, and an IEEE Distinguished lecturer.

Keynote Speaker 2: Wednesday, March 8
Mr. Hamid Breik, Lucent Technologies, UAE

Wireless and Mobile Technologies at Lucent

Abstract

This keynote will highlight the state of the art of wireless and mobile technologies at Lucent.

Speaker Biography

Mr. Hamdi Breik is currently working for Lucent Technologies and responsible for Mobility solutions for Middle East and Africa region. Mr. Breik has obtained his MSC degree in digital electronics since 1981. Mr. Breik has been working with Lucent Technologies for the past 10 years where he took several key positions in deploying GSM and 3G solutions. Prior to his work with Lucent, Mr. Breik worked for a couple of operators in Kuwait and Australia. His involvement in mobility started in 1985 and covered all mobility generations 1G, 2G and 3G.

Keynote Speaker 3: Thursday, March 9

Professor Hesham El-Rewini, Ph.D., P.E.

Department of Computer Science and Engineering, SMU

Parallelism Challenges: Rewind and Fast Forward

Abstract

Parallel processing has gone through several phases over the past few decades. From the early pessimism of Amdahl's law, going through the proliferation of parallel systems in the late 1980s and early 1990s, to the collapse of the parallel computing industry soon after, and finally with its recent resurrection, parallel processing has experienced several ups and downs. In this lecture, we will rewind the parallel processing tape to identify critical challenges in parallel processing and discuss the factors that have driven its fluctuating change. We will also examine the role that parallel processing is playing in today's computing platforms and offer an outlook to the future.

Speaker Biography

Dr. El-Rewini is Full Professor and Chairman of the Department of Computer Science and Engineering at SMU. El-Rewini's research interests include the areas of parallel and distributed processing, mobile computing, scheduling algorithms, and software tools. He is the co-author of five books in Computer architecture published by Wiley (2004 and 2005); parallel and distributed computing published by Prentice-Hall and Manning (1992 and 1998); and task scheduling published by Prentice Hall (1994). He is also the editor or co-editor of many conference proceeding books published by the IEEE Computer Society. His research work has resulted in numerous publications in prestigious journals and conference proceedings. Other professional activities include chairing several international conferences, participation in the editorial board of *IEEE Concurrency*, participation in several international program and steering committees, acting as an NSF panelist, and as a referee for *IEEE Computer*, *IEEE Concurrency*, *IEEE Software*, *IEEE Transactions on Parallel and Distributed Systems*, *Journal of Parallel and Distributed Computing*, *Journal of Parallel Computing*, and several other journals and conferences. Dr. El-Rewini is also a registered engineer in the state of Texas.

Keynote Speaker 4: Saturday, March 11

Professor Mounir Hamdi, Ph.D.

Director of the Computer Engineering Program

Hong Kong University of Science and Technology

Next Generation Internet: Opportunities and Challenges

Abstract

Broadband access technologies, such as DSL, cable modems, gigabit Ethernet, and WLANs are providing affordable and flexible high-speed access to the Internet from the home and the enterprise. On the other hand advances in fiber optic bandwidth has created huge supply of wide-area network bandwidth. The net result of this trend is the constant growth of Internet traffic and the associated applications. This, in turn, is requiring the design of high-performance core routers with high-speed interfaces (e.g., OC-192 or OC-768) and large switching capacity (e.g., a few tens of terabit/s). In addition, it is putting a big burden on network service providers to provide a scalable easy-to-use service differentiation. In this talk, we first address the evolution of Internet access in terms of equipment as well as protocols standards adopted. We will survey the big industry players in this area as well as current academic research efforts. Then, we detail the key challenges of building core routers that can scale with this huge Internet traffic, such as memory speed constraint, packet arbitration bottleneck, and interconnection complexity. We then present the current (as well as future) router architectures and its building blocks, including those in the line cards such as network processors for IP route lookup and packet classification, and the switch fabric. Several switch architectures of commercial core routers and switch chip sets are surveyed, including the most recent CRS-1 from Cisco with 46 Terabit/s switching capacity and the T-640 from Juniper. We then describe the recent push for IP-over-MPLS as a "best" solution to provide scalable service differentiation in the Internet and its underlying technology. At the end, we outline several challenging issues that remain to be researched for the next generation Internet and how they relate to the design of routers/switches and their protocols.

Speaker Biography

Mounir Hamdi received the B.S. degree in Computer Engineering (with distinction) from the University of Louisiana in 1985, and the MS and the PhD degrees in Electrical Engineering from the University of Pittsburgh in 1987 and 1991, respectively. From 1985 to 1991, he was a teaching/research fellow at the Department of Electrical Engineering, University of Pittsburgh where he was involved in major research projects as well as teaching undergraduate courses.

He has been a faculty member in the Department of Computer Science at the Hong Kong University of Science and Technology since 1991, where he is now Full Professor of Computer Science, Director of the Computer Engineering Program that has around 350 undergraduate students, and Director of the Computer Engineering and Networking Lab. In 1999 to 2000 he held visiting professor positions at Stanford University, USA, and the Swiss Federal Institute of Technology, Lausanne, Switzerland. His general areas of research is in high-speed wired/wireless networking in which he has published more than 200 research publications, received numerous research grants, and graduated more 20

postgraduate students. In addition, he has frequently consulted for companies in the USA, Europe and Asia on high-performance Internet routers and switches as well as high-speed wireless LANs. Currently, he is working on the design, analysis, scheduling, and management of high-performance Internet switches/routers, algorithm/architecture co-design, wavelength division multiplexing (WDM) networks/switches, and high-speed wireless networks. In particular, he is leading a research team at the Hong Kong University of Science and Technology that is designing one of the highest capacity chip sets for Terabit switches/routers in the world. This chip set is targeted towards a 256 x 256 OC-192 Internet switches, and includes a crossbar fabric chip, a scheduler/arbitrator chip, and a traffic management chip.

Dr. Hamdi is/was on the Editorial Board of IEEE Transactions on Communications, IEEE Communication Magazine, Computer Networks, Wireless Communications and Mobile Computing, and Parallel Computing, and has been on the program committees of more than 70 international conferences and workshops. He was a guest editor of IEEE Communications Magazine, guest editor-in-chief of two special issues of IEEE Journal on Selected Areas of Communications, and a guest editor of Optical Networks Magazine, and has chaired more than 5 international conferences and workshops including the IEEE GLOBECOM/ICC Optical networking workshop, the IEEE ICC High-speed Access Workshop, and the IEEE IPSS HiNets Workshop. He is/was the Chair of IEEE Communications Society Technical Committee on Transmissions, Access and Optical Systems, and Vice-Chair of the Optical Networking Technical Committee, as well as member of the ComSoc technical activities council. He is/was on the technical program committees of more than 100 international conferences and workshops. He received the best paper award at the International Conference on Information and Networking in 1998 out of 152 papers. He also supervised the best PhD paper award amongst all universities in Hong Kong. In addition to his commitment to research and professional service, he is also a dedicated teacher. He received the best 10 lecturers award (through university-wide student voting for all university faculty held once a year), the distinguished engineering teaching appreciation award from the Hong Kong University of Science and Technology, and various grants targeted towards the improvement of teaching methodologies, delivery and technology. He is a member of IEEE and ACM.

Banquet Keynote Speaker: Thursday Night, March 9

Professor Dr. Rafic Makki, Ph.D.

Dean, College of Information Technology

UAE University, UAE

iDDT-The Heartbeat of an Integrated Circuit Chip

Abstract

This talk presents advancements in the area of testing VLSI circuits by deploying the dynamic power supply current iDDT. The iDDT provides direct observability over the switching characteristics of the circuit, thereby providing useful insight during the test process. The results of simulation studies as well as physical experimentation show a dramatic increase in fault coverage and reductions in test time.

Speaker Biography

Rafic Makki is currently serving as Dean of the College of Information Technology at UAE University. Dr. Makki has over 20 years of experience in IC design and test. His most significant accomplishments include the development of the iDDT pulse test method which has gained considerable attention and widely cited. Dr. Makki has directed research projects as PI or co-PI in the areas of: Integrated Circuits Design and Test (developed new methods for testing integrated circuits, testability tools, new design for testability methods, and logic synthesis for testability tools); Computer Integrated Manufacturing (scheduling tools for the IBM Charlotte plant); Biomedical Instrumentation (development of a device that can be implanted in the human body and can monitor parameters such as strain on orthopedic implants).

Dr. Makki has received research funding from the US National Science Foundation, DARPA, IBM, Solectron, Intel, Lucent, Carolinas Medical Center, and the Microelectronics Center of North Carolina.

Dr. Makki is the recipient of several awards including the 2005 IBM Faculty Research Award (first in the Middle-East), the 2002 First Citizen Research Scholar Medal, and the ALCOA Outstanding Graduate Faculty Award. He has served as President of the Faculty at the University of North Carolina at Charlotte, and served as CEO of Horizon Technologies.

Dr. Makki received a PhD in Electrical Engineering in 1983 from Tennessee Tech University.

Luncheon Keynote Speaker: Thursday Luncheon, March 9

Professor Yacine Atif, Ph.D.

Senior Lecturer

Massey University, New Zealand

Trends and Prospects of Corporate and Higher-Education E-learning Global Infrastructures in the Semantic Web Age

Abstract

The Semantic Web is the emerging landscape shaping the future World Wide Web, aiming at the provision of distributed information with well-defined meaning and services that would be understandable and reusable by both humans and machines. E-learning software on the other hand, are intended not only to deliver but also to build job-transferable knowledge and skills, linked to individual learning contexts as well as organizational performance. The confluence of the Semantic Web and E-learning is expected to lead to synergistic effects and opportunities for sharing and reusing instructional resources globally in an open learning environment. Several technical standards are paving the way towards interoperating knowledge repositories in order to nurture a pervasive learning environment and to prescribe personalized learning models for incremental knowledge construction. This presentation shows the potentials and prospects of this intense standardization work in building Semantic Web-based e-learning architectures in high-education and corporate training contexts.

Speaker Biography

Dr. Yacine Atif received the PhD degree in Computer Science from Hong Kong University of Science and Technology (HKUST) in 1996. After graduation, he worked at Purdue University in the USA as a Post-Doc and then joined a faculty position at Nanyang Technological University (NTU) in Singapore. From 1999 to 2005, he was with the UAE University as faculty, then Program Chair and then Assistant-Dean for Academic Affairs at the College of Information Technology. Currently, he is a Senior Lecturer at Massey University in New Zealand since June 2005.

Dr. Atif has made a number of research contributions particularly in the area of Internet Computing and related applications such as the transfer of Educational Media and Resources. His teaching, scholarship and academic excellence have been acknowledged by several awards including Best Teaching Award, Best Funded Project Award in the area of e-learning and Excellence in Academic Services Award from the UAE University.

AICCSA-06 Program at a Glance

Session	A	B	C	D	E
1	Software Foundations	Networking Quality of Service	VLSI Arithmetic	Algorithms I	Security Image Analysis
2	Software Web Services	Networking Foundations	VLSI Reconfigurable Computing	Bioinformatics	Security Trust
3	Software Architectures and Models	Networking Performance Evaluation	VLSI Design & Test	Data Mining I	Security Foundations
4	Software Agents	Networking Efficiency	Data Mining II	Algorithms II	Embedded Systems I
5	Software Tools	Networking Cellular	Database and Web Technologies	Multimedia Video	Embedded Systems II
6	Software Mobile Systems	Networking Miscellaneous I	Database Miscellaneous I	e-Learning	
7	Software Miscellaneous I	Networking Miscellaneous II	Pervasive Computing		
8	Software Miscellaneous II	Software Applications	Database and Mobile Communications		

Wednesday, Session 1, Four Regular Papers and One Short Paper Per Room					
Time	1A	1B	1C	1D	1E
13:30-13:50	456	465	462	495	380
13:50-14:10	214	560	605	298	460
14:10-14:30	256	197	589	351	131
14:30-14:50	153	601	527	161	622
14:50-15:05	196	600	562	582	185

Wednesday, Session 2, Four Regular Papers and One Short Paper per Room					
Time	2A	2B	2C	2D	2E
15:30-15:50	434	372	108	629	623
15:50-16:10	534	528	252	284	173
16:10-16:30	128	509	141	461	620
16:30-16:50	376	598	348	147	524
16:50-17:05	155	616	291	222	575

Thursday, Session 3, Four Regular and Two Short Papers per Room					
Time	3A	3B	3C	3D	3E
09:30-09:50	550	270	606	375	438
09:50-10:10	387	365	607	559	143
10:10-10:30	457	458	209	515	593
10:30-10:50	426	240	578	443	470
10:50-11:05	446	114	588	472	523
11:05-11:20	333	313	332	112	557

Thursday, Session 4, Four Regular Papers and One Short Paper per Room					
Time	4A	4B	4C	4D	4E
13:00-13:20	272	627	248	577	362
13:20-13:40	296	429	232	150	455
13:40-14:00	266	471	292	475	268
14:00-14:20	633	208	615	521	512
14:20-14:35	165	378	625	545	216

Thursday, Session 5, Four Regular Papers and One Short Paper per Room					
Time	5A	5B	5C	5D	5E
15:00-15:20	538	364	485	526	326
15:20-15:40	325	331	587	183	346
15:40-16:00	543	344	277	539	449
16:00-16:20	468	247	279	483	463
16:20-16:35	367	306	1035	242	295*

Saturday, Session 6, Four Regular and Two Short Papers per Room				
Time	6A	6B	6C	6D
09:30-09:50	345	590	621	218
09:50-10:10	318	194	612	355
10:10-10:30	467	595	220	498
10:30-10:50	323	431	561	504
10:50-11:05	353	476	255*	571*
11:05-11:20	352	1022	381	1059

Saturday, Session 7, Four Regular Papers and One Short Paper			
Time	7A	7B	7C
13:00-13:20	445	149	1029
13:20-13:40	263	569	1031
13:40-14:00	479	280	1032
14:00-14:20	565	555	1033
14:20-14:35	494	369*	1034

Saturday, Session 8, Four Regular Papers and One Short Paper			
Time	8A	8B	8C
15:00-15:20	107	1017	1023
15:20-15:40	260	1019	1024
15:40-16:00	574	1053	1025
16:00-16:20	1056	1060	1027
16:20-16:35	1057		1028

* Regular paper in short paper slot. Session chair, please give an extra five minutes.

Final Technical Program for AICCSA 2006
Millennium Hotel, Sharjah, UAE
March 8-11, 2006

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Wednesday, March 8
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*Under the Patronage and With the Attendance of His Highness
Dr. Sheikh Sultan Bin Mohammed Al Qassimi, Ruler of Sharjah,
Supreme Council Member, and President of the American University of Sharjah*

**7:00am to 7:45 am: BUSES WILL TRANSPORT ATTENDEES FROM HOTEL TO
AMERICAN UNIVERSITY OF SHARJAH (AUS) MAIN CAMPUS**

REGISTRATION (08:00—17:00)—Room: Main Building, AUS

BREAKFASTRECEPTION (7:45—8:15)

INTRODUCTIONS (8:15—8:30) –Mohsen Guizani, General Chair

8:30—9:30

Keynote Speaker: Prof. Khaled B. Letaief, Hong Kong University of Science and Technology, HK

Keynote Title: Ubiquitous Broadband Communications: *The Next Frontier*

COFFEE BREAK: 9:30—10:00

OFFICIAL CONFERENCE OPENING (10:00—10:45)

Room: Auditorium, Main Building, American University of Sharjah

Welcome and Opening Remarks

Dr. Sheikh Sultan Bin Mohammed Al Qassimi, Ruler of Sharjah and President of AUS

Dr. Winfred Thompson, Chancellor of American University of Sharjah, UAE

Dr. Yousef Assaf, Interim Dean, School of Engineering, American University of Sharjah, UAE

Dr. Mohsen Guizani, AICCSA General Chair, Western Michigan University, USA

Dr. Eesa Bastaki, AICCSA Local Chair, UAEU and Dubai Silicon Oasis, UAE

Dr. Mike Langston, AICCSA program Chair, University of Tennessee, Knoxville, USA

Short BREAK: 10:45—11:00

11:00—11:30: LUCENT KEYNOTE

Lucent Keynote: Mr. Hamid Breik, Lucent Technologies, UAE

Keynote Title - What does the future hold for Wireless Networks

**11:30 to 12:30: BUSES WILL TRANSPORT ATTENDEES FROM AMERICAN
UNIVERSITY OF SHARJAH (AUS) MAIN CAMPUS BACK TO THE HOTEL**

LUNCH (12:30—13:30)

SESSION 1A (13:30—15:05)

Room: A

Software Foundations

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Armin Eberlein, AUS, UAE

Session Co-Chair: Toufik Taibi, UAEU, UAE

456: Modeling Redundancy: Quantitative and Qualitative Models

214: Contribution to the Formal Checking of Multi-Agents Systems

256: GeneCity: A Multi Agent Simulation Environment for Hereditary Diseases

153: Adaptive search in a semi-structured Peer-to-Peer System
196: Formal Specification of Design Patterns and Their Instances

SESSION 1B (13:30—15:05)

Room: B

Networking Quality of Service

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Nidal Nasser, University of Guelph, Canada

Session Co-Chair: Jihad Qaddour, Illinois State University, USA

465: QoS Assurance of Handover TCP Flows in a DiffServ-enabled Mobile Wireless Access Network
560: Modeling End-to-End QoS Management and Real Time Agreement Protocols for Resource Reservation for x Mobile Radio Network
197: QoS Extensions to Mobile Ad Hoc Routing Supporting Real-Time Applications
601: Enhanced Class-based Packet Scheduling Policy for QoS Provisioning in Multimedia Cellular Networks
600: ATHOMIC: Architecture managing Tcp Handoff Over Mobile Ip Connections

SESSION 1C (13:30—15:05)

Room: C

VLSI Arithmetics

Track Chair: Mohamed A. Imam, Dubai Silicon Oasis, UAE

Session Chair: Valeriu Beiu, UAEU, UAE

Session Co-Chair: Adnan Gutub, KFUPM, Saudi Arabia

462: A CAD tool for scalable, variable architecture floating-point adder generator
605: High-Speed Redundant Modulo $2n-1$ Adder
589: Low Power Hierarchical Multiplier and Carry Look-Ahead Architecture
527: Pipelining GF(P) Elliptic Curve Cryptography Computation
562: Novel Reversible Multiplier Architecture Using Novel Reversible TSG Gate

SESSION 1D (13:30—15:05)

Room: D

Algorithms I

Track Chair: Mikhail Atallah, Purdue University, USA

Session Chair: M. Abounaaj, Ajman University, UAE

Session Co-Chair: Tarek Helmy, KFUPM, Saudi Arabia

495: Parallel Online Ranking of Web Pages
298: Internet Traffic Modeling Using Integer-Valued Time Series
351: Parallel Implementation of the PML Algorithm for Truncating Finite-Difference Time-Domain Grids
161: On Compactly Encoding With Differential Compression
582: A Priority-Based MLFQ Scheduler for CPU Power Saving

SESSION 1E (13:30—15:05)

Room: E

Security Image Analysis

Track Chair: Marco Marchetti, SMU, USA

Session Chair: Q. Malluhi, Qatar University, Qatar

Session Co-Chair: Suku Nair, SMU, Dallas, USA

380: Fusion of Thermal and Visual Images for efficient Face Recognition using Gabor Filter
460: Face and Fingerprint biometrics Integration Model for Person Identification Using Gabor Filter
131: Ragged-Edge Array Coding for Reliable and Efficient Storage Arrays
622: An Experimental and Industrial Experience: Avoiding Denial of Service via Memory Profiling
185: Embedded Vision Module for Robot-soccer

COFFEE BREAK (15:05—15:30)

SESSION 2A (15:30—17:05)

Room: A

Software Web Services

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Tarik Ozkul, AUS, UAE

Session Co-Chair: Nashat Mansour, Lebanese American University, Lebanon

434: Regression Testing for Web Services based Applications
534: A Categorization Scheme for Semantic Web Search Engines
128: Automated Context-Aware Adaptation of Web Service Executions
376: DaSIAn: A Tool for Estimating the Impact of Database Schema Modifications on WEB Applications
155: Web Service discovery based on Quality of Service

SESSION 2B (15:30—17:05)

Room: B

Networking Foundations

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Tamer Shanableh, AUS, UAE

Session Co-Chair: Taha Landolsi, UAE

372: Restricted Shortest Path Routing with Concave Costs
528: Loss rates bounds for IP switches in MPLS networks
509: On the Fault Patterns Properties in the Torus Networks
598: Fair Channel Quality-Based Scheduling Scheme for HSDPA System
616: A New MPLS-based Local Failure Recovery for Multicast Communication

SESSION 2C (15:30—17:05)

Room: C

VLSI Reconfigurable Computing

Track Chair: Mohamed A. Imam, Dubai Silicon Oasis, UAE

Session Chair: Assim Sagahyroon, AUS, UAE

Session Co-Chair: Hassan Barada, Etisalat University College, UAE

108: A Reconfigurable Gaussian/Triangular Basis Functions Computation Circuit
252: Comparison of Multipliers Architectures through Emulation and Handle-C FPGA Implementation
141: An Optimized Design Approach for Squaring Large Integers Using Embedded Hardwired Multipliers
348: High Speed Hardware Implementation of Heuristic 2D Rectangle Placement
291: Accurate Total Static Leakage Current Estimation in Transistor Stacks

SESSION 2D (15:30—17:05)

Room: D

Bioinformatics

Track Chair: Mikhail Atallah, Purdue University, USA

Session Chair: Walid Ibrahim, UAEU, UAE

Session Co-Chair: Gerassimos Barlas, AUS, UAE

629: Computational Analysis of Mass Spectrometry Data Using Novel Combinatorial Methods
284: A New Recombination Scheme
461: Evaluation of Breast Cancer Tumor Classification with Unconstrained Functional Networks Classifier
147: Modification of Mammography Slides (Mammograms) For Detection and Early Diagnosis of Breast Cancer Using Wavelet Techniques and Neural Networks
222: Protein Secondary Structure Reduction Methods Significantly Affect Prediction Accuracy

SESSION 2E (15:30—17:05)

Room: E

Security Trust

Track Chair: Marco Marchetti, SMU, USA

Session Chair: Hesham El-Sayed, UAEU, UAE

Session Co-Chair: Boutheina Tlili, AUD, UAE

623: Avoiding Denial of Service via Stress-testing
173: Hidden Field equations Cryptosystem Performances
620: Contextual ECATNets Semantics in Terms of Conditional Rewriting Logic
524: Trust and Reputation Modeling Language
575: Secure Mobile Agent System for E-Business Applications

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Thursday, March 9
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REGISTRATION (08:00—17:00)—Room: Foyer

8:00—9:00

Keynote Speaker: Prof. Hesham El-Rewini, SMU, Dallas, USA

Keynote Title: Parallelism Challenges: *Rewind and Fast Forward*

COFFEE BREAK: 9:00—9:30

SESSION 3A (9:30—11:20)

Room: A

Software Architectures and Models

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Narayan Debnath, Winona State University, USA

Session Co-Chair: Hassan Gomaa, George Mason University, USA

550: Software Defect Prediction using Regression via Classification

387: Compositional specification of event-based software architectural styles

457: Software Product Line Engineering and Dynamic Customization of a Radio Frequency Management System

426: Comprehensive Software Development Mode

446: The Branding Analysis Pattern

333: DEPICT: A High-Level Formal Language For Modelling Constraint Satisfaction Problems

SESSION 3B (9:30—11:20)

Room: B

Networking Performance Evaluation

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Chedly Ben Yahya, University of Sharjah, UAE

Session Co-Chair: Boutheina Tlili, AUD, UAE

270: Performance Evaluation of Reservation Medium Access Control in IEEE 802.16 Networks365: An

Uplink Performance Evaluation for Roaming-Based Multi-Operator WCDMA Cellular Networks458:

Architecture and Performance Analysis of the Multicast Balanced Gamma Switch for Broadband Communications

240: Access Channel Performance in CDMA2000

114: Performance Evaluation in Cellular (CDMA) System Using Smart Antenna with Adaptive Sectoring Method

313: System Performance Analysis of Hybrid Direct Sequence Frequency Hopping Spread Spectrum

Multiple Access Communication System Using Support Vector Machines

SESSION 3C (9:30—11:20)

Room: C

VLSI Design and Test

Track Chair: Mohamed A. Imam, Dubai Silicon Oasis, UAE

Session Chair: Ahmed Barbour, UAEU, UAE

Session Co-Chair: Jihad Mohaidat, DOS, UAE

606: Novel Heuristic and Genetic Algorithms for the VLSI Test Coverage Problem

607: Exciting Stuck-Open faults in CMOS Circuits Using ILP Techniques

209: Femto Joule Switching for Nano Architectures

578: Multiplexing Schemes in Single-Electron Technology

588: Semi-Algorithmic Random Test Pattern Generation

332: A Highly Adaptive Acoustic Echo Cancellation Solution for VoIP Conferencing Systems

SESSION 3D (9:30—11:20)

Room: D

Data Mining I

Track Chair: Ghassan Qadah, AUS, UAE

Session Chair: Quatibah Malluhi, Qatar University, Qatar

Session Co-Chair: Ibrahim Kamel, University of Sharjah, Sharjah, UAE

375: A Scalable Sequential Pattern Mining Algorithm

559: A Performance Comparison of Pattern Discovery Methods on Web Log Data

515: FastLMFI: An Efficient Approach for Local Maximal Patterns Propagation and Maximal Patterns Superset Checking

443: The N-tree: an Indexing Technique for Nearest-Neighbor Queries

472: Multi-Channel Communication for Wireless Database

112: An Improved current Mirror cell

SESSION 3E (9:30—11:20)

Room: E

Security Foundations

Track Chair: Marco Marchetti, SMU, USA

Session Chair: Fadi Aloul, AUS, UAE

Session Co-Chair: Hesham El-Sayed, UAEU, UAE

438: Formal Methods in the Enhancement of the Data Security Protocols of Mobile Agents
143: Access control with prohibitions and obligations

593: The Best Irreducible Pentanomials For A Mastrovito GF Multiplier

470: A Methodology for Risk Measurement in e-Transactions

523: Reputation Ontology for Reputation Systems

557: Design of an embedded system for surface roughness measurement

Luncheon Keynote Speaker: Prof. Yacine Atif, Massey University, New Zealand

Keynote Title: Trends and Prospects of Corporate and Higher-Education E-learning Global Infrastructures in the Semantic Web Age

LUNCH (11:30—13:00)

SESSION 4A (13:00—14:35)

Room: A

Software Agents

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Hany Ammar, West Virginia University, USA

Session Co-Chair: Armin Eberlein, AUS, UAE

272: Towards Intentional Agents to Manipulate Belief, Desire and Commitment Degrees

296: Agent Design Patterns Framework for MaSE/POAD Methodology

266: GeneCity: A Multi Agent Simulation Environment for Hereditary Diseases

633: An Innovative Self-Configuration Approach for Networked Systems and Applications

165: Stable Analysis Patterns

SESSION 4B (13:00—14:35)

Room: B

Networking Efficiency

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Ra'ed Awdeh, University of Sharjah, UAE

Session Co-Chair: M. Hassan, AUS, UAE

627: Power Efficient Algorithms for Computing Fast Fourier Transform over Wireless Sensor Networks

429: Power Allocation and Coding for Image Transmission over Wireless Channels

471: An Energy Efficient MAC Approach for Mobile Wireless Sensor Networks

208: Efficient Service Discovery for Wireless Mobile Ad Hoc Networks

378: Toward the Mobile Grid: Service Provisioning in a Mobile Dynamic Virtual Organization

SESSION 4C (13:00—14:35)

Room: C

Data Mining II

Track Chair: Ghassan Qadah, AUS, UAE

Session Chair: Joachim Diederich, AUS, UAE

Session Co-Chair: Ahmed Hasnah, Qatar University, Qatar

248: Development of Hybrid Classification Methodology for Mining Skewed Data Sets – A Case Study of Indian Customs Data

232: Mining N-most Interesting Itemsets using Support-Ordered Tries

292: Evaluation of Cluster Analysis Algorithms Enhanced by Using R*-Trees

615: Functionally Classifying Genes from Microarray Data Using Linear and Non-linear Data Projection,

625: Distributed Computing for Formation Flying Missions

SESSION 4D (13:00—14:35)

Room: D

Algorithms II

Track Chair: Mikhail Atallah, Purdue University, USA

Session Chair: Gerassimos Barlas, AUS, UAE

Session Co-Chair: Muhammad Sarfraz, KFUPM, Saudi Arabia

577: A Novel Corner Detector Approach using Sliding Rectangles

150: Online Learning: Evolving in Real Time: A Neural Net Controller of 3D- Robot Arm Track and Evolve,

475: The vMatrix: Equi-Ping Game Server Placement for Pre-Arranged First-Person-Shooter Multiplayer Matches

521: Reputation Relationship and Its Inner Relationships for Service Oriented Environments

545: Topological Properties of Stretched Graphs

SESSION 4E (13:00—14:35)

Room: E

Embedded Systems I

Track Chair: Abdul-Rahman Al-Ali, AUS, UAE

Session Chair: Nabile Bastaki, UAEU, UAE

Session Co-Chair: Rached Dhaouadi, AUS, UAE

362: An Automated System for Real Time Fault Localization in Optical Networks

455: The Indeterministic Behavior of Scoped Memory in Real-Time Java

268: Using Change Propagation Probabilities to Assess Quality Attributes of Software Architectures

512: A Probability-Based Instruction Combining Method for Scheduling in VLIW Processors

216: Serpent Cryptography on Static and Dynamic Reconfigurable Hardware

COFFEE BREAK (14:35—15:00)

SESSION 5A (15:00—16:35)

Room: A

Software Tools

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Mohamed Fayad, SJSU, USA

Session Co-Chair: Adel Khelifi, ALHOSN University, Abu Dhabi, UAE

538: Refactoring Tools and Complementary Techniques

325: TOPER: A Tool Using Integrated Knowledge Reporting and Usability Methods,

543: CoMet: a Tool Using CUMM to Measure Components' Unused Members

468: Using Change Propagation Probabilities to Assess Quality Attributes of Software Architectures

367: Session Management System for Collaborative Applications in Interactive Grid

SESSION 5B (15:00—16:35)

Room: B

Networking Cellular

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Ridha Hmila, Etisalat University College, UAE

Session Co-Chair: Muhammed Salamah, *Eastern Mediterranean University, Cyprus*

364: An Adaptive Multi-Guard Channel Scheme for Multi-Class Traffic in Cellular Networks
331: An Uplink Admission Control for 3G and Beyond Roaming Based Multi-Operator Cellular Wireless Networks with Multi-Services

344: A Survey of Advances in Multi-User Detection in DS-CDMA

247: Throughput of ARQ Protocols over Nakagami and MIMO Block Fading Channels

306: Distributed fault management protocol for Heterogeneous Networks

SESSION 5C (15:00—16:35)

Room: C

Database and Web Technologies

Track Chair: Ghassan Qadah, AUS, UAE

Session Chair: J. Qaddour, Illinois State University, USA

Session Co-Chair: M. Hassan, AUS, UAE

485: An Object-Oriented Configurable Framework for Real-time Database Simulation Environment

587: An overview of MOA, a multi-class overload architecture for real-time database systems: framework and algorithms

277: Classification Rules for Pre-Analysis Filtering of Web Transactions

279: Towards ontology-based semantic web from data-intensive web: a reverse engineering approach

1035: WAP and Push Technology Integrated into Mobile Commerce Applications

SESSION 5D (15:00—16:35)

Room: D

Multimedia Video

Track Chair: Jianping Pan, University of Victoria, British Columbia, Canada

Session Chair: Hesham Kamel, UAEU, UAE

Session Co-Chair: Tamer Rabie, UAEU, UAE

526: Evolutionary Colorization of Grayscale Images

183: Robust Color Video Denoising, Tamer Rabie

539: Constructing Precise Geometric Models of Virtual Environments using Image based View Synthesis,

483: Study of Reneging Behavior in Batched Multimedia Service

242: Extended Media Framework for Multiparty Collaborative Environments

SESSION 5E (15:00—16:35)

Room: E

Embedded Systems II

Track Chair: Abdul-Rahman Al-Ali, AUS, UAE

Session Chair: M. Jarrah, AUS, UAE

Session Co-Chair: Tarik Ozkul, AUS, UAE

326: A Wireless Embedded System for Tracking of Stolen Vehicules

346: Grid Overlay for Remote E-Health Monitoring

449: Formal development method of control systems using the event based B approach Case Study: A parcel sorting device

463: A System for Web Retrieval of Images and the Corresponding Annotations

295: A Practical Fair-Exchange E-Payment Protocol with Anonymity Protection

Banquet Keynote Speaker: Prof. Rafic Makki, UAE University, UAE

Keynote Title: iDDT-The Heartbeat of an Integrated Circuit Chip

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Friday, March 10

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REGISTRATION (08:00—17:00)—Room: Foyer

ALL DAY TUTORIALS SCHEDULE

Friday March 10, 2006				
Time/Room	1	2	3	4
8:00 am – 9:30 am	Tutorial-1 Pascal Lorenz IP-Oriented QoS in the Next Generation Networks: Application to Wireless Networks	Tutorial-3 Aris M. Ouksel Sensor Networks: Applications, Architectures, and Communication Protocols	Tutorial-5 Sajal Das Smart Environments – Technology, Protocols and Applications	Tutorial-7 Mohamed E. Fayad Architectures on Demand for Any Domain Using Stable Software Patterns
9:30 am – 10:00 am	Coffee Break			
10:00 am – 11:30 am	Tutorial-1 (Cont.)	Tutorial-3 (Cont.)	Tutorial-5 (Cont.)	Tutorial-7 (Cont.)
11:30 pm – 1:30 pm	Lunch			
1:30 pm – 3:00 pm	Tutorial-2 Mohamed Eltoweissy Sensor and Actor Networks: Perspectives, Challenges and Research Directions	Tutorial-4 Rainer Leupers Design of Application Specific Processor Architectures	Tutorial-6 Hassan Gomaa Designing Software Product Lines with UML 2.0: From Use Cases to Pattern-Based Software Architectures	Tutorial-7 (Cont.) Mohamed E. Fayad Architectures on Demand for Any Domain Using Stable Software Patterns
3:00 pm – 3:30 pm	Coffee Break			
3:30 pm – 5:00 pm	Tutorial-2 (Cont.)	Tutorial-4 (Cont.)	Tutorial-6 (Cont.)	Tutorial-7 (Cont.)

Lucent Workshop: Session 1 - What does the future hold for Wireless Networks

Third Generation (3G) mobile technology is set to transform the worldwide communications industry: new multimedia services promise to widen the range of applications beyond voice telephony. New technology with increased bandwidth plus increased spectrum allocation and spectral efficiency will allow mobile operators to capture an increasing proportion of traffic. Today, worldwide there are more wireless users than wire line users.

In coming years, technology evolution will continue at even faster pace towards IMS and full IP-networks that will continue to enrich Triple play applications (voice, data and video).

This session addresses the following topics:

1. Evolution of wireless generations
2. Evolution of 3G standards for both CDMA2000 and UMTS.
 - EV-DO evolution to Release A and B
 - UMTS evolution to Rel 5 (HSDPA , and EUCH) and Rel 6 (MIMO)
 - Improvements in throughput, latency and spectral efficiency
3. Developments in other wireless technologies
 - WiFi/WiMAX and integration with 3G
 - Convergence and IMS
 - Evolution to 4G

Lucent Workshop: Session 2–Switching platform for Inter working legacy 2G and 3G networks–Evolution to IMS

To succeed in the wireless communications market and maximize profitability, service providers need to capitalize on the existing infrastructure and in parallel evolve it to allow offering new enhanced (voice over IP, data and video) services which are IP-based. Which is in fact the driving force pushing for the introduction of IP-Based core network which will eventually lead to the introduction of the IP Multimedia System (IMS).

The presented 3G-MSC is an IP-Based switch built to meet 3GPP Release standards. This switching platform concurrently support legacy GSM and UMTS networks. This platform will enable operators cap investments in conventional circuit switching, grow using IP-based switching and evolve towards IMS. It allows operators to protect GSM & UMTS assets as technology evolves. This platform is seen as a first step in packetizing the core network evolving towards 3GPP Release 5 and Release 6.

With IMS, voice calls and multimedia applications are processed in the packet core domain, which requires new network elements such as call session control functions, media resource functions, media gateway controllers, and breakout gateway control functions. The 3G-MSC media gateways and Softswitch are designed to take on the role of these new IMS network elements without massive hardware overlays.

This session addresses the following topics:

1. Why Convergence and IMS
 - Market and technology drivers
2. IMS.....
 - Value added to Service providers, users and suppliers
 - Impact of convergence in introduction of new applications
3. 3G-MSC supporting concurrent legacy GSM networks UMTS networks
 - Packet-Based platform
 - Supporting cap - grow and evolve strategy
 - Architectural and product descriptions

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Saturday, March 11
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REGISTRATION (08:00—17:00)—Room: Foyer

8:00—9:00

Keynote Speaker: Prof. Mounir Hamdi, Hong Kong University of Science and Technology, HK

Keynote Title: Next Generation Internet: *Opportunities and Challenges*

COFFEE BREAK: 9:00—9:30

SESSION 6A (9:30—11:20)

Room: A

Software Mobile Systems

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Khaled El-Fakih, AUS, UAE

Session Co-Chair: Nabeel Al-Qirim, UAEU, UAE

345: Allocation and Re-Allocation of Data in a Grid using an Adaptive Genetic Algorithm

318: Towards a Model-Based Unification of Mobile Platforms

467: A Complex Applications Framework Supporting Tolerant Dynamic Vehicle Dispatching

323: Enhancements of PECOS Embedded Real-Time Component Model for Autonomous Mobile Robot Application

353: Can Cohesion Predict Fault Density

352: The Adoption of eCommerce Communications and Applications Technologies in Small Businesses in New Zealand

SESSION 6B (9:30—11:20)

Room: B

Networking Miscellaneous I

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Walaa Hamouda, Concordia University, Canada

Session Co-Chair: Mohamed El Tarhuni, AUS, UAE

590: On the Optimal Deployment of Heterogeneous Sensing Devices

194: Differentiated Survivability in Ethernet-Based MAN/WAN

595: Supporting Disconnected Operations in Mobile Computing

431: Performance of MIP over WLAN in Rapid Moving Environments

476: A Secure Framework for Distributed Agents System

1022: On The Performance of Directional MAC Protocols in Wireless Ad-Hoc Networks

SESSION 6C (9:30—11:20)

Room: C

Database Miscellaneous I

Track Chair: Ghassan Qadah, AUS, UAE

Session Chair: Hayder K. Al Ameen, UAEU, UAE

Session Co-Chair: Mudassir Wyne, University of Michigan—Flint, USA

621: Contextual ECATNets Semantics in Terms of Conditional Rewriting Logic

612: Arabic Search Engines Improvement: A New Approach using Search Key Expansion Derived from Arabic Synonyms Structure

220: Crime Hot-Spots Prediction Using Support Vector Machine

561: Learning acyclic rules based on Genetic Programming

255: A proxy prefetch scheme for consistent SMIL delivery

381: Arab TTS: An Arabic Text to Speech Synthesis

SESSION 6D (9:30—11:20)

Room: D

e-Learning

Track Chair: Imran Zualkernan, AUS, UAE

Session Chair: Ahmed Taha, UAEU Libraries Deanship, UAE

Session Co-Chair: Demetrios Sampson, University of Piraeus, Greece

218: ICE: A System for Identification of Conflicts in Exams

355: Building e-Partnership: d-Library Services for eLearning

498: On-Line Content Analysis System using e-Learning Time Data

504: Web-Based Learning Scenarios Authoring Environment based on IMS Learning Design

571: Semantically Meaningful Unit – SMU; An Openly Reusable Learning Object for UREKA Learning-Object Taxonomy & Repository Architecture – ULTRA

1059: "Educational additions to an Open Source Virtual Learning Environment for the Greek Schools' Network"

LUNCH (11:30—13:00)

SESSION 7A (13:00—14:35)

Room: A

Software Miscellaneous I

Track Chair: Kamel Barkaoui, CNAM/CEDRIC, France

Session Chair: Rana Ahmed, AUS, UAE

Session Co-Chair: Narayan Debnath, Winona State University, USA

445: Classification of Software and Hardware Bio-inspired Systems

263: Adapting WordNet to the Medical Domain using Lexicosyntactic Patterns in the Ohsumed Corpus

479: An Experiment in Automatic Conversion of Java to C#

565: Communicating requirements for ERP tendering, the case of international organizations

494: An Aspect-Oriented Approach in Early Requirements Engineering

SESSION 7B (13:00—14:35)

Room: B

Networking Miscellaneous II

Track Chair: Surong Zeng, Motorola, USA

Session Chair: Mohammed Boulmalf, UAEU, UAE

Session Co-Chair: El-Sayed M. El-Alfy, KFUPM, Saudi Arabia

149: MPLS Network Topology Design Using Genetic Algorithms

569: A Genetic-Driven Instruction Set for High Speed Network Processors

280: Dynamic adapting of Scalable TCP congestion control parameters

555: An Efficient Intra Prediction Mode Decision Algorithm for H.263 to H.264 Transcoding

369: A Discrete Optimal Broadcasting Protocol in an IP Network

SESSION 7C (13:00—14:35)

Room: C

Pervasive Computing

Workshop Chairs: S. I. Ahamed, Marquette University, USA and M. Zulkernine, Queens University, Canada

Session Chair: Walaa Hamouda, Concordia University, Canada

Session Co-Chair: Khaled Shuaib, UAE University

1029: An Architecture for a Context-aware Service Broker in Ubiquitous Computing Environments
1031: Pervasive trust and security in wireless networks
1032: An Ontology-based Model for Mobile Agents Adaptation in Pervasive Environments
1033: A Privacy Preferences Architecture for Context Aware Applications
1034: Interoperability and Security Issues of Grid Services for Ubiquitous Computing

COFFEE BREAK (14:35—15:00)

SESSION 8A (15:00—16:35)

Room: A

Software Miscellaneous II

Workshop Chairs: M. E. Fayad, San Jose State University, USA, I. Zualkernan, American University of Sharjah, Sharjah, UAE, H. S. Hamza, University of Nebraska-Lincoln, USA

Session Chair: Ahmed M. Salem, California State University, Sacramento, USA

Session Co-Chair: I. Zualkernan, AUS, UAE

107: Parallel I/O Scheduling in the Presence of Data Duplication on Multiprogrammed Cluster Computing Systems
260: FuFaIR: a Fuzzy Farsi Information Retrieval System
574: Extending UML to Guide Design Pattern Reuse
1056: Productivity and Stability with Application Service Software.
1057: Requirements for Evaluating Architectural Stability

SESSION 8B (15:00—16:35)

Room: B

Software Applications

Special Session Chairs: Narayan Debnath, Winona State University, USA and K. Barkaoui, CNAM/CEDRIC, France

Session Chair: Qurban A. Memon, UAEU, UAE

Session Co-Chair: J. Qaddour, Illinois State University, USA

1017: Defining Patterns Using UML Profiles
1019: Supporting the SPEM with a UML Extended Workflow Metamodel
1053: A Comparative Analysis of Maintainability Approaches for Web Applications
1060: Improving Software Quality through Requirements Traceability Models
576: Authentication of Digital Images in an Insecure Transmission Environment

SESSION 8C (15:00—16:35)

Room: C

Database and Mobile Communications

Workshop Chairs: S. Akhtar, UAE University, UAE and M. Wyne, University of Michigan-Flint, USA

Session Chair: Hossam Hassanein, Queens University, Canada

Session Co-Chair: Jayaram Murthy, Central Michigan University, USA

1023: Role Based Approach to Databases for Adhoc Networks
1024: GAMES OVER BLUETOOTH
1025: Primitive Operations of Hyper-Graph Data Model for Distributed Database Integration
1027: Embedding Rules in a Pre-Hospital Mobile Database
1028: HIERARCHICAL APPROACH TO SELECT FEATURE VECTORS FOR CLASSIFICATION OF TEXT DOCUMENTS

POSTER SESSION

Poster papers will be available for show and informal discussions during one of the Coffee Breaks. The list of accepted poster papers is given below:

1043: Hardware Development of the Extended Tiny Encryption Algorithm
Wael El-Ghazzawi, Randa Saraeb, and Issam Damaj
saraebrh@harircanadian.edu.lb

1044: Compositional adaptation in CBR Construction of composite solutions
Rim BENTEBIBE and Sylvie DESPRES
rim.bentebibel@math-info.univ-paris5.fr

1046: AN AUTOMATED FUZZY ACTIVE DATABASE FOR EMPLOYEE PERFORMANCE EVALUATION
USING ORACLE
Cyrus Azarbod1 (250), Hamed Salam, Jafar Ali
cyrus.azarbod@mnsu.edu

1048: Reducing cache energy in embedded processors
Kashif Ali, Mokhtar Aboelaze, Suprakash Datta
aboelaze@cs.yorku.ca
: An Ontology-based Framework for Context-aware Mobile Agents
Nejla Amara-Hachmi
Nejla.Amara@lipn.univ-paris13.fr

1051: A Data Distribution System Certifying Freshness and Originality of Census Data
Yasuyuki Kikyo and Hideki Nishimoto
nisimoto@nisimoto.ne.jp

105: Mobility-aware Routing Protocol for Wireless Sensor Networks
Nidal Nasser, Liliana Arboleda and Yunfeng Chen
nasser@cis.uoguelph.ca

AICCSA 2006 Tutorials

T1: IP-Oriented QoS in the Next Generation Networks: Application to Wireless Networks

Instructor: Pascal Lorenz, University of Haute Alsace, France.

Abstract

Emerging Internet Quality of Service (QoS) mechanisms are expected to enable wide spread use of real time services such as VoIP and videoconferencing. The "best effort" Internet delivery cannot be used for the new multimedia applications. New technologies and new standards are necessary to offer Quality of Service (QoS) for these multimedia applications. Therefore new communication architectures integrate mechanisms allowing guaranteed QoS services as well as high rate communications. The service level agreement with a mobile Internet user is hard to satisfy, since there may not be enough resources available in some parts of the network the mobile user is moving into. The emerging Internet QoS architectures, differentiated services and integrated services, do not consider user mobility. QoS mechanisms enforce a differentiated sharing of bandwidth among services and users. Thus, there must be mechanisms available to identify traffic flows with different QoS parameters, and to make it possible to charge the users based on requested quality. The integration of fixed and mobile wireless access into IP networks presents a cost effective and efficient way to provide seamless end-to-end connectivity and ubiquitous access in a market where the demand for mobile Internet services has grown rapidly and predicted to generate billions of dollars in revenue. This tutorial covers to the issues of QoS provisioning in heterogeneous networks and Internet access over future wireless networks as well as ATM, MPLS, DiffServ, IntServ frameworks. It discusses the characteristics of the Internet, mobility and QoS provisioning in wireless and mobile IP networks. This tutorial also covers routing, security, baseline architecture of the inter-networking protocols and end to end traffic management issues.

Biography

Pascal Lorenz (lorenz@ieee.org) received a PhD degree from the University of Nancy, France. Between 1990 and 1995 he was a research engineer at WorldFIP Europe and at Alcatel-Alsthom. He is a professor at the University of Haute-Alsace and responsible of the Network and Telecommunication Research Group. His research interests include QoS, wireless networks and high-speed networks. He was the Program and Organizing Chair of the IEEE [ICATM'98](#), [ICATM'99](#), [ECUMN'00](#), [ICN'01](#), [ECUMN'02](#) and [ICT'03](#), [ICN'04](#) conferences and co-program chair of [ICC'04](#). Since 2000, he is a Technical Editor of the IEEE Communications Magazine Editorial Board. He is the secretary of the IEEE ComSoc Communications Systems Integration and Modelling Technical Committee. He is senior member of the IEEE, member of many international program committees and he has served as a guest editor for a number of journals including Telecommunications Systems, IEEE Communications Magazine and LNCS. He has

organized and chaired several technical sessions and gave tutorials at major international conferences. He is the author of 3 books and 135 international publications in journals and conferences.

T2: Sensor and Actor Networks: Perspectives, Challenges and Research Directions

Instructor: Mohamed Eltoweissy, Virginia Tech, USA

Abstract

Sensor and Actor NETWORKS (SANETs) are emerging as a vital technology for a wide variety of next generation pervasive applications ranging from healthcare to homeland security and emergency response. SANETs are heterogeneous networks having widely differing sensor and actor node characteristics; while sensor nodes are small, inexpensive devices with limited computation, communication and energy resources, actor nodes are resource-rich. Also, the number of sensor nodes deployed may be in the order of hundreds or thousands. In contrast, actor nodes are smaller in number due to the different coverage requirements and physical interaction methods of actuation. Typically, a deployed SANET is expected to operate autonomously in unattended environments. Operational requirements of SANETs may vary according to a network's mission defined over a multi-dimensional context, such as field of deployment (e.g., hostile versus friendly), type of application (e.g., monitoring, tracking, intrusion detection and mitigation), mode of operation (e.g., normal, exception, post-event recovery), and time. In SANETs, depending on the application, there may be a need to rapidly respond to sensor input. Moreover, so as to provide right actions, sensor data must still be valid at the time of acting. The objective of this tutorial is to provide an understanding of SANETs and to identify and motivate key research areas. Also to be discussed are some fundamental research contributions that may enable SANETs to realize their potential. The tutorial will be divided into three modules: (1) background (including applications) of SANETs; (2) challenges and research map; and (3) open discussion. Also, an extensive list of recommended readings will be provided.

Biography

Mohamed Eltoweissy is an associate professor in The Bradley Department of Electrical and Computer Engineering at Virginia Tech. He also holds a courtesy appointment in the Department of Computer Science. Eltoweissy is founder and director of the Center for Cyber Assurance and Trust (CyCare). Eltoweissy has over 85 publications in archival journals and respected books and conference proceedings. Among Eltoweissy's research contributions are novel combinatorial-based survivable key management schemes for sensor and ad hoc networks, service-oriented architecture for sensor networks, and stochastic models for the optimization of security protocols. Eltoweissy is the guest editor of the Special Issue of Elsevier's Journal of Computer Communications on Sensor-Actuator Networks (SANETs). He also is active in serving on program committees and NSF panels, in journal editorials and organization of professional meetings. Eltoweissy is a senior member of IEEE, and a member of ACM, ACM SIGBED, and ACM SIGSAC.

In 2003, Eltoweissy was nominated for the Virginia SCHEV outstanding faculty awards; the highest honor for faculty in Virginia.

T3: Sensor Networks: Applications, Architectures, and Communication Protocols

Instructor: Aris M. Ouksel, The University of Illinois-Chicago, USA

Abstract

This half-day tutorial is intended for researchers, students and engineers to gain an overall understanding of the current challenging issues in wireless sensor networks. The miniaturization of computing devices and advances in wireless communication and sensor technology have been pushing computing from the stationary desktop to the mobile outdoor. It is now possible to build radios and exceptionally small devices that can be deployed in a network of nodes to sense fields and forces in the physical world providing dense monitoring of physical phenomena, processing and communicating collected information, and coordinating with other nodes. Combining these capabilities with the Internet will advance many sophisticated scientific and technological pursuits while supporting improvements in various areas of application, such as manufacturing, agriculture, construction, and transportation, and organizational workflows in general.

Biography

Aris M. Ouksel is currently a professor at the University of Illinois at Chicago. He holds positions at both the Information and Decision Sciences Department and the Computer Science Department. He obtained his PhD and MS degrees from Northwestern University. His current research interests are in Mobile Ad-hoc and Sensor Networks, Emergent Semantics in Heterogeneous Information Systems, Self-Organizing Data Structures in Peer-to-Peer Architectures, and Information Economics. He has received grants from the National Science Foundation, various state and city agencies, as well as several major corporations. He is currently of following journals: International Journal of E-Business Research, Idea Group (2003---), Journal of Parallel and Distributed Syst, Kluwer Inc. (2000----). He was editor of the Journal of Knowledge and Info. Syst., Springer-Verlag. (1998-2003).

T4: Design of Application Specific Processor Architectures

Instructor: Rainer Leupers, RWTH Aachen University, Germany.

Abstract

Application-specific instruction set processors (ASIPs) are a key implementation technology in today's embedded SoC designs. By means of a dedicated architecture and instruction set, optimized for a given application domain, they offer the necessary compromise between energy-efficiency and flexibility. Further benefits of ASIPs include better product differentiation, reduced royalty fees, and support for IP reuse in platform-

based system-on-chip (SoC) designs. Consequently, ASIPs have already become an industrial reality in many important areas like DSP, multimedia, and networking. In telecommunications, network processors (NPU) have become a new architecture paradigm, since e.g. encryption as in IPv6/IPsec has very specific processing requirements. In high data rate wireless communication applications, like for instance 3G cell phones, specific parts of the digital signal processing cannot be implemented energy-efficiently on a standard processor. On the other hand, hardwired solutions (ASICs) are not flexible enough. Here, ASIPs are the optimal solution. So far, the large amount of man-power required for ASIP architecture and software tool design as well as SoC integration has been a major obstacle. However, recent developments in EDA technology now permit a highly automated ASIP design methodology, which enables efficient ASIP-based design with limited manpower and overcomes traditional HW/SW integration bottlenecks. Simultaneously, new generations of configurable processors, employing a user-extensible base architecture, are continuously appearing on the IP market. The purpose of this tutorial is to provide the audience with an introduction to this important area and to outline the state of the art in ASIP architectures, design methodology, and tools.

Biography

Rainer Leupers received the Diploma and Ph.D. degrees in Computer Science with honors from the University of Dortmund, Germany, in 1992 and 1997. From 1997-2001 he was the chief engineer at the Embedded Systems group at the University of Dortmund. During 1999-2001 he was also a project manager at ICD, where he headed industrial compiler and processor simulator tool projects. In 2002, Dr. Leupers joined RWTH Aachen University as a professor for Software for Systems on Silicon. His research and teaching activities revolve around software development tools, processor architectures, and electronic design automation for embedded systems, with emphasis on compilers for application specific processors. He authored several books and more than 100 technical papers on design tools for embedded processors, and he served in the program committees of leading EDA and compiler conferences, including DAC, DATE, and ICCAD. Dr. Leupers received several scientific awards, including Best Paper Awards at DATE 2000 and DAC 2002. He has been a co-founder of LISATek, an EDA tool provider for embedded processor design (acquired by CoWare Inc. in 2003).

T5: Smart Environments – Technology, Protocols and Applications

Instructor: Sajal Das, The University of Texas-Arlington, USA.

Abstract

This tutorial is about smart environments. Smart environments link computers to everyday settings and commonplace tasks. The desire to create smart environments has existed for decades, and recent advances in such areas as mobile and pervasive computing, wireless and sensor networks, machine learning, middleware and agent based technologies now allow this dream to become reality. A definition of “smart” or “intelligent” is “the ability to acquire and apply knowledge”, while “environment” refers

to our surroundings. We therefore define a smart environment as *one that is able to acquire and apply knowledge about an environment and its inhabitants in order to improve their experience in that environment*. The type of experience that individuals wish from their environment varies with the individual and the type of environment. They may wish the environment to ensure the safety of its inhabitants, they may want to reduce the cost or overhead of maintaining the environment, or they may want to automate tasks that are typically performed in the environment. The expectations of such environments have evolved with the history of the field. The objective of this interdisciplinary tutorial is to provide a practical foundation for designing smart environments, introduce the necessary technologies and supporting algorithms and protocols to build smart environments, as well as describe successful smart environment projects realized in a variety of settings.

Biography

Sajal K. Das received B.S. degree in 1983 from Calcutta University, M.S. degree in 1984 from Indian Institute of Science at Bangalore, and Ph.D. degree in 1988 from the University of Central Florida at Orlando, all in Computer Science. He is a Professor of Computer Science and Engineering and also the Founding Director of the Center for Research in Wireless Mobility and Networking (CRWMan) at the University of Texas at Arlington (UTA). Prior to 1999, he was a professor of Computer Science at the University of North Texas (UNT), Denton where he founded the Center for Research in Wireless Computing (CRW) in 1997, and also served as the Director of the Center for Research in Parallel and Distributed Computing (CRPDC) during 1995-97. Dr. Das is a recipient of the UNT Student Association's Honor Professor Award in 1991 and 1997 for best teaching and scholarly research; UNT's Developing Scholars Award in 1996 for outstanding research; UTA's Outstanding Faculty Research Award in Computer Science in 2001 and 2003; UTA's College of Engineering Research Excellence Award in 2003; and the University Award for Distinguished Record of Research in 2005. Dr. Das has visited numerous universities, government and industry research labs worldwide for collaborative research and invited seminar talks. He is also frequently invited as a keynote speaker at international conferences and symposia. He is the coauthor of the book *Smart Environments: Technology, Protocols and Applications*, published by John Wiley in 2005. Dr. Das' current research interests include design and development of smart environments, resource and mobility management in wireless networks, mobile and pervasive computing, wireless multimedia, ad hoc and sensor networks, mobile internet architectures and protocols, distributed and grid computing, performance modeling and simulation. He has published over 350 research papers in these areas in international journals and conferences, directed numerous industry and government funded research projects, and holds five US patents in wireless mobile networks. He received Best Paper Awards in the 5th Annual ACM International Conference on Mobile Computing and Networking (MobiCom'99), 16th International Conference on Information Networking (ICOIN'01), 3rd ACM International Workshop on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM'00), and 11th ACM/IEEE International Workshop on Parallel and Distributed Simulation (PADS'97). Dr. Das serves as the Editor in Chief of the *Pervasive and Mobile Computing* (PMC) journal and also as an Associate Editor of *IEEE Transactions on Mobile Computing*, *IEEE Transactions on*

Parallel and Distributed Systems, ACM/Springer Wireless Networks, Parallel Processing Letters, and Journal of Parallel, Distributed and Emerging Systems. He served as General Chair of IEEE WoWMoM'05, IEEE PerCom'04, IWDC'04, IEEE MASCOTS'02, ACM WoWMoM'00-02; General Vice Chair of IEEE PerCom'03, ACM MobiCom'00, IEEE HiPC'00-01; Program Chair of IWDC'02, WoWMoM'98-99; TPC Vice Chair of ICPADS'02; and as TPC member of numerous IEEE and ACM conferences. He is the Vice Chair of the IEEE Computer Society's TCPP and TCCC Executive Committees and on the Advisory Boards of several cutting-edge companies.

T6: Designing Software Product Lines with UML 2.0: From Use Cases to Pattern-Based Software Architectures

Instructor: Hassan Gomaa, George Mason University, USA.

Abstract

This half-day tutorial addresses how to develop object-oriented requirements, analysis, and design models of software product lines using the Unified Modeling Language (UML) 2.0 notation. During requirements modeling, the tutorial covers how to develop kernel, optional and alternative use cases for defining the software functional requirements of the system. The tutorial also describes the feature model for capturing product line requirements and how it relates to the use case model. During analysis, the tutorial covers how to develop static models for defining kernel, optional, and variant classes and their relationships. It goes on to describe how to create dynamic models in which state charts define the state dependent aspects of the product line and interaction models describe the dynamic interaction between the objects that participate in each kernel, optional, and alternative use case. The tutorial then covers how to develop the OO software architecture for the product line, in which the system is structured into component-based subsystems. The tutorial gives an overview of the structural architecture patterns and communication patterns that can be used in designing component based distributed product lines. The tutorial is illustrated by means of several examples. The tutorial is based on a book by the author, "Designing Software Product Lines with UML: From Use Cases to Pattern-Based Software Architectures", Addison Wesley Object-Oriented Technology Series, 2005.

Biography

Hassan Gomaa is Chair and Full Professor in the Department of Information and Software Engineering at George Mason University, Fairfax, Virginia. He received a B.Sc. (Eng.) in Electrical Engineering from University College, London University, and the DIC and Ph.D. in Computer Science from Imperial College of Science and Technology, London University. He has worked in both industry and academia, and has published over 130 technical papers and three textbooks. His book, "Software Design Methods for Concurrent and Real-Time Systems", was published by Addison Wesley in 1993 and was translated into Chinese in 2003. His second book, entitled "Designing Concurrent, Distributed, and Real-Time Applications with UML", was published by Addison Wesley in 2000 and was translated into Chinese in 2004. His latest textbook entitled "Designing

Software Product Lines with UML” was published by Addison Wesley in July 2004. He has considerable experience in teaching courses and tutorials on software design. He has made conference and tutorial presentations at many international software engineering conferences. He was a keynote speaker at the Asia-Pacific Software Engineering Conference in December 2004. He has taught several in-depth industrial courses on software design in North America, Europe, Japan, and Korea. He also consults in both the technical and management aspects of software engineering. His current research interests include object-oriented analysis and design for concurrent, real-time, and distributed systems, software product lines, component-based software architecture, software reuse, software performance engineering, intelligent software agents, software engineering environments, and software process models. His research has been funded by several organizations including the National Science Foundation, NASA and DARPA.

T7: Architectures on Demand for Any Domain Using Stable Software Patterns

Instructor: Mohamed E. Fayad, San José State University, USA.

Abstract

The rapid growth of technology coupled with the tightened development time and production cost constraints have imposed a tremendous pressure and desire for software enterprises to create new and innovative designs to respond to a rapidly changing business environment. Enterprises must invest in building stable architectures that can be ready to be adapted in many different ways to meet the new challenges. These kinds of architectures are called *architectures on demand* as they can be adapted accordingly to meet the future requirements and changes in the system. The primary focus of this tutorial is to show how software stability concepts with UML are used to develop on-demand architectures. The tutorial focuses on three key aspects: (1) Enduring Business Themes (EBTs) or business goals and transformations which we call stable analysis patterns, (2) Business Objects (BOs) or business process design which we call stable design patterns, and (3) Industrial Objects (IOs) or application objects. Both EBTs and BOs form a stable core, and hence, provide architectures on demand for any domain. We call these architectures, stable architectural patterns.

Biography

Mohamed Fayad is a Full Professor of Computer Engineering at San Jose State University from 2002 to present. He was a J.D. Edwards Professor, Computer Science & Engineering, at the University of Nebraska, Lincoln, from 1999 to 2002, and an associate professor at the computer science and computer engineering faculty at the University of Nevada, from 1995 - 1999. He has 15+ years of industrial experience. Dr. Fayad is a Senior Member of the *IEEE*, a Senior Member of the *IEEE Computer Society*, a Member of the *ACM*, an *IEEE Distinguished Speaker*, an Associate Editor, Editorial Advisor, and a Columnist for *The Communications of the ACM* and his column is *Thinking Objectively*, and a columnist for *Al-Ahram Egyptians Newspaper* (2 million subscribers), an Editor-In-Chief for *IEEE Computer Society Press - Computer Science and*

Engineering Practice Press (1995-1997), IASTED Technical Committee member on Software Engineering (2001-2004), a general chair of IEEE/Arab Computer Society International Conference on Computer Systems and Applications (AICCSA 2001), Beirut, Lebanon, June 26-29, 2001, and he is the president of *Arab Computer Society (ACS)* from April 04 to present. Dr. Fayad was a guest editor on nine theme issues: *CACM's OO Experiences*, Oct. 1995, *IEEE Computer's Managing OO Software Development Projects*, Sept. 1996, *CACM's Software Patterns*, Oct. 1996, *CACM's OO Application Frameworks*, Oct. 1997, *ACM Computing Surveys – OO Application Frameworks*, March 2000, *IEEE Software - Software Engineering in-the-small*, Sept./Oct. 2000, and *International Journal on Software Practice and Experiences*, July 2001, *IEEE Transaction on Robotics and Automation -- Object-Oriented Methods for Distributed Control Architecture*, October 2002, and *Annals of Software Engineering Journal – OO Web-Based Software Engineering*, October 2002. He has published articles in many journals and magazines, such as *IEEE Software*, *IEEE Computer*, *JOOP*, *ACM Computing Surveys* and *CACM* on OO software engineering methods, experiences, aspect-oriented programming, internet & web applications, enterprise and application frameworks, design patterns, and management. He has given tutorials and seminars on OO Technologies and Experiences at many conferences and he has presented various seminars in USA and several countries, such as Hong Kong (April 96), Canada (10 times), Bahrain, Saudi Arabia, Egypt (15 times), Portugal (Oct. 96, July 99), Finland (July 99), Mexico (Oct. 98), Argentina (3 times), Chile (00), Peru (02), and Spain (02), Brazil (04), UK (05). Dr. Fayad received an MS and a Ph.D. in computer science, from the University of Minnesota at Minneapolis. His research topic was *OO Software Engineering: Problems & Perspectives*. He is the lead author of several Wiley books: *Transition to OO Software Development*, August 1998, *Building Application Frameworks*, Sept., 1999, *Implementing Application Frameworks*, Sept., 1999, *Domain-Specific Application Frameworks*, Oct., 1999, and 3 new books in Progress: *Stable Analysis Patterns*, *Stable Design Patterns*, *Stable Patterns in Action*.

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