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Recent Advances on Data Networks, Communications, Computers

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Proceedings of the 8th WSEAS International Conference on
DATA NETWORKS, COMMUNICATIONS, COMPUTERS
(DNCOCO '09)

Baltimore, USA, November 7-9, 2009

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Preface

This year the 8th WSEAS International Conference on DATA NETWORKS, COMMUNICATIONS, COMPUTERS (DNCOCO '09) was held in the Morgan State University, Baltimore, USA, November 7-9, 2009. The conference remains faithful to its original idea of providing a platform to discuss network architecture & design, synchronous networks, fiber design and fabrication, modelling and simulation of networks, interworking, narrow band and broad band networks, mobile networks and mobile services, wireless communications, microwave theory and techniques, lightwave technology, applied electromagnetics, mathematical methods and computational techniques for microwaves, antennas and radars, military communications, programming languages, supercomputing, e-commerce, digital signal processing and pattern recognition, software design and development, image, video and internet technologies, law aspects related to informatics etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Adaptive Approach to Management of the Multi-path Wireless Solutions

Professor Tomas Zelinka
Czech Technical University in Prague
Technical Cybernetics
CZECH REPUBLIC
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Abstract: This paper presents adaptive management of the multi-path and multi-technology technology wireless communications solutions. Such approach represents response on transport processes management requirements to provide complex seamless communication services between vehicle and infrastructure as well as vehicle and vehicle in the selection of different service quality classes. ISO TC204, WG16.1 “Communications Air-interface for Long and Medium range” (CALM) represent relevant data routing/switching with vertical RM OSI compatible communications architecture, however, with horizontal hierarchical management structure. Introduced decision processes based on Bayes statistics are alternative solution to the Policy-Based Management (PBM) traditionally and widely applied within the IP based networks. Adaptive classification algorithm processes combination of filtered measured data with relevant deterministic parameters like the services economy, company policy etc. Self-training process applies parameters vectors time line extended by assignment to the best possible class/path with aim to identify/precise setting of the appropriate internal management system parameters.

Brief Biography of the Speaker:
The Czech Technical University in Prague in “Technical Cybernetics”, PhD in experimental (geo-) physics at the Czech Academy of Sciences, Prof. (assoc.) in Informatics at Faculty of Transport Sciences of the CTU in Prague.
2005 - Czech Technical University in Prague
-Lectures: telecommunications sciences, legal issues of telecommunications regulation, new technology trends, telecommunications in ITS, business management, strategy planning, ...
-R&D: new telecommunications trends and solutions within Intelligent Transport Systems
1993 – 2005 Communications business
-Development of new products, Strategy planning, Business development e.g.of alternative global voice and data communications in the Czech Republic and other countries of the CEE region – namely in Global One (Sprint Int., France Telecom, Deutsche Telekom)
1976 – 1994 Academy of Sciences
-Experimental laboratory and observatory methods in Geophysics - studies of the variations and drift of the Earth magnetic field, Data communication solutions within international and national observatory system
-Computer modeling of magnetic material structures with on-line experimental identification – studies done on the artificial samples with well defined magnetic particles structure. Laboratory measurement of the magnetic properties of rocks
1972 – 1976 Industrial R&D
-Automatic control systems for the technological processes - Computer Numerical Control (CNC)
-Data communications and computer based control within technological processes.

Plenary Lecture 2

Design Framework for Heterogeneous Chip Multiprocessing Targeting Dynamic Reconfiguration

Professor Sotirios G. Ziavras
ECE Department
New Jersey Institute of Technology
USA
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Abstract: Heterogeneous chip multiprocessors form powerful computing platforms. For high-performance or real-time applications, their design should also rely on acceptable energy budgets. The inclusion of reconfigurable hardware can enhance these platforms even further. This talk first presents a very versatile family of reconfigurable chip multiprocessors that can support the run-time reconfiguration of resources in efforts to match target applications for better performance and/or lower energy consumption. This talk then introduces another family of reconfigurable chip multiprocessors where the hardware can be customized to speed up the execution of time-consuming application kernels. Hardware reconfiguration can then facilitate various customized kernels as execution proceeds. This approach greatly reduces the space and energy requirements, attributes that appeal to high-performance embedded designs. The kernel execution should be prudently scheduled considering the reconfiguration overheads. Suitable task scheduling and resource reconfiguration policies are presented for these families of chip multiprocessors and benchmarks are enlisted as well to showcase their success.

Brief Biography of the Speaker:
Dr. Sotirios G. Ziavras received the Diploma in Electrical Engineering from the National Technical University of Athens, Greece, the M.Sc. in Computer Engineering from Ohio University, and the Ph.D. in Computer Science from George Washington University (GWU). He was a Distinguished Graduate Teaching Assistant and Research Assistant at GWU, and also received the Richard Merwin Ph.D. Fellowship. He was with the Center for Automation Research at the University of Maryland, College Park, from 1988 to 1989, focusing on supercomputing. He was a visiting Professor at George Mason University in Spring 1990. He joined in Fall 1990 the ECE Department at NJIT as an Assistant Professor. He is currently a Professor as well as the Director of the Computer Architecture and Parallel Processing Laboratory (CAPPL). He served as the Associate Chair for Graduate Studies for four years.
He received the National Science Foundation (NSF) Research Initiation Award in 1991. In 1996 he lead an NSF/DARPA/NASA-funded New Millennium Computing Point Design project for Petaflops computing. He has received research grants in excess of $2.5M. He has served as an Associate Editor of the Pattern Recognition journal and serves regularly as a member of Conference Program Committees. He is the author of about 140 scientific papers. He is listed, among others, in Who's Who in Science and Engineering, Who's Who in America, Who's Who in the World, and Who's Who in the East. His main research interests are reconfigurable and high-performance computing, computer architecture and embedded systems.

Plenary Lecture 3

Mathematical Theory of Information Technology

Professor Mark Burgin
Visiting Scholar
UCLA, USA
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Abstract: It is possible to consider computation, communication and networking on three levels. The first level indicates what is done in a computational/communication process or in a process in a network. From this perspective, processes are represented as sequences of events or actions. The mathematical theory that studies processes on this level is process algebra.
The second level tells us not only what is done in a computational/communication process or in a process in a network but also how it is done. From this perspective, processes are represented by algorithms, programs, and scenarios. The major mathematical theory that studies processes on this level is the theory of algorithms.
The third level of process description explains us not only what is done in a process and how it is done but also with what means everything is performed in the process. From this perspective, processes are represented by technologies. The major mathematical theory that studies processes on this level is the mathematical theory of technology. This theory has developed a general mathematical model of technology and technological processes, as well as a relevant mathematical apparatus and exact methods for an investigation and design of various technologies (in computation, computer and network industry, management, information processing, education, and so on).
The mathematical theory of technology utilizes new mathematical disciplines such as theory of named sets, fuzzy set theory, and theory of structured multidimensional models of systems and processes as well as traditional fields such as algebra, theory of probabilities, and theory of algorithms.
In the mathematical theory of information technology such problems as reliability, equivalence, stability, constructibility, and realizability of information technologies are studied. The aim is the development of efficient methods and algorithms of the computer aided design of information technologies. In the lecture, elements of the mathematical theory of technology will be exposed and it will be demonstrated how this theory can help in solving problems of information technology.

Brief Biography of the Speaker:
Dr. Mark Burgin received his M.A. and Ph.D. in mathematics from Moscow State University and Doctor of Science in logic and philosophy from the National Academy of Sciences of Ukraine. He is currently a Visiting Scholar at UCLA, USA. Previously he was a Professor at Institute of Education, Kiev; at International Solomon University, Kiev; at Kiev State University, Ukraine; and Director of the Assessment Laboratory in the Research Center of Science at the National Academy of Sciences of Ukraine. Dr. Burgin is a member of New York Academy of Sciences and an Honorary Professor of the Aerospace Academy of Ukraine. He is a Chief Editor of the journal Integration and Associate Editor of the International Journal on Computers and their Applications. Dr. Burgin is a member of the Science Advisory Committee at Science of Information Institute, Washington. He was a member of organizing and program committees of more than 30 conferences. He also organized and directed several ongoing research seminars in mathematics and computer science, such as Theoretical Computer Science (UCLA), Foundations of Mathematics and Information Sciences (National Academy of Sciences of Ukraine) and Creativity in Education (Ministry of Education of Ukraine). Dr. Burgin is doing research, has publications, and taught courses in mathematics, computer science, information sciences, system theory, artificial intelligence, software engineering, logic, psychology, education, social sciences, and methodology of science. He originated such theories as the mathematical theory of technology, system theory of time, general information theory, theory of named sets, and neoclassical analysis (in mathematics) and made essential contributions to such fields as foundations of mathematics, theory of algorithms, theory of knowledge, theory of intellectual activity, and complexity studies. His practical experience includes design of operating systems for supercomputers, CAD systems for electrical engineering and problem oriented languages for such systems, databases for biological information, and general expert systems, as well as mathematical modeling databases and expert systems. Dr. Burgin has authorized and co-authorized more than 500 papers and 17 books, including “Neoclassical Analysis: Calculus Closer to the Real World” (2008), “Super-recursive Algorithms” (2005), “On the Nature and Essence of Mathematics” (1998), “Intellectual Components of Creativity” (1998), “Fundamental

Structures of Knowledge and Information" (1997), "Introduction to the Modern Exact Methodology of Science" (1994), "The Structure-Nominative Analysis of Theoretical Knowledge (1992), and "The World of Theories and Power of Mind" (1992).

Plenary Lecture 4

Using Some Web Content Mining Techniques to Extract Arabic Text from the Web Documents

Assistant Professor Zakaria Suliman Zubi
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Serit Post Office, P. O. Box 727
Serit, Libya
E-mail: zszubi@yahoo.com

Abstract: With the massive collection of huge volumes of information that are available on the World Wide Web these days and the immanent need for new tools and techniques to analyze these information and transform it into useful knowledge has been a strong revival of web mining research. Web mining is one of the most important issues in data mining as well as other information process techniques to the World Wide Web to discover useful patterns. People can take benefits of these patterns to access the World Wide Web more efficiently. Web mining in particular are divided into three main categories such as content mining, usage mining, and structure mining.
In this paper we are going to apply web content mining to extract non-English language knowledge from the Web. It requires some investigation and evaluation on all possible methods in which web mining systems have to deal with issues in language-specific text processing. We will use an Arabic language-independent algorithm as a machine learning system. The algorithm will use a set of features as a vector of keywords for the learning process to apply text classification and clustering for the system. However, the algorithms usually depend on some phrase segmentation and extraction programs to generate a set of features or keywords to represent web documents. We will indicate some general aspects for mining the Arabic text on the web documents as well.

Brief Biography of the Speaker:
Zakaria Suliman Zubi was born in Benghazi Libya, in 1969. He received his Ph.D. in Computer Science in 2002 from Debrecen University in Hungary, before that he received his M.Sc. in Computer Science (Artificial Intelligent), in 1998. He started his academic journey with a B.Sc. Degree in Computer science in1993. He joined the Department of Computer Science, Faculty of Science, Altahadi University, in 2003, where he became an Assistant Professor since 2006. Dr. Zubi, served the university under various administrative positions including the Head of Computer Science Department 2003-2005, the postgraduate study coordinator in Computer Science Department till now and the postgraduate study coordinator for the Faculty of Science for one academic year 2004-2005. He is also an undergraduate and postgraduate lecturer in the computer science department.
He is a reviewer of many scientific local journals in Libya, a member of the Association for Computing Machinery society (ACM), a member of the Word Scientific and Engineering Academy and Society (WSEAS), a member of the Libyan Artificial Intelligent Association (LAIA), a member of the Libyan Quality Assurance in Higher Education (LQAHE) and in the Benchmark team. He is also an external and internal member of many postgraduate examination committee boards in Libyan universities, and an official member of the main committee board of the lecturer promotions at his University. His area of research includes: Distributed Database, Web mining, Distributed Database mining, Knowledge Discovery on Remote Databases, Remote Query Optimization, Queue Strategies on Local Network, Operating System, Deadlocks in Operating Systems, and Network and Distributed Database Security. He published as authors and coauthors many researches and technical reports in local and international journals and conference proceedings. His hobbies are playing chess, swimming, and listening to music.

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