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TECHNICAL PROGRAM CHAIRS MESSAGE

Foreword

The 14th International Conference on Software, Telecommunications and Computer Networks SoftCOM 2006 will be held from September 29 to October 1, 2006 in the pleasant ambience of the cruising ship "Dubrovnik" on the attractive route Split - Dubrovnik. The Conference is organized by the University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture under the auspices of the Ministry of Science, Education and Sports, and the Ministry of the Sea, Tourism, Transport and Development with the principal patron T - Croatian Telecom. The Conference is technically co-sponsored by the IEEE Communications Society (ComSoc).

Researchers and experts from industry, research institutes and universities from more than 35 countries all around the world have submitted in total 130 papers for presentation at SoftCOM'06. Submitted papers have been reviewed by more than 170 scientists from universities, institutes and ICT companies all over the world. All accepted papers have been carefully selected based on their contribution, relevance, conceptual clearness and overall quality. Nearly 60% of submitted papers have been recommended for presentation within the technical program.

The conference program features two symposia dedicated to the most actual topics in the area of mobile and wireless communications. One special session and seventeen general conference sessions, a poster session and a professional workshop dedicated to the wide spectra of topics in ICT will be held too. In addition two half day tutorials will be held by worldwide recognized experts.

In conjunction with the SoftCOM'06 conference a Business Forum has been organized featuring invited talks, round tables, presentations with participation of managers, executives, experts, government and institutions representatives who will discuss and exchange opinions and experiences on a number of hot topics in contemporary and future ICT industry and market including business, technological and social aspects.

On behalf of the Program committee we would like to thank and credit the authors for their excellent contributions. Particular thanks to the reviewers for their great job as well as to the IEEE Communications Society (ComSoc) Technical Committee of Communication Software for the support. The fruitful collaboration with the universities from Ancona, Lecce, Bari, Zagreb, and London has contributed to the quality of the Program significantly.

*Program Committee Co-chairs
Nikola Rozic, Dinko Begusic*

SoftCOM 2006 COMMITTEES

TECHNICAL PROGRAM COMMITTEE

Nikola Rozic, University of Split, Croatia
rozic@fesb.hr (Co - Chair)

Dinko Begusic, University of Split, Croatia
begusic@fesb.hr (Co - Chair)

Sergio Benedetto, Politecnico di Torino, Italy

Horst Besier, Deutsche Telekom, Germany

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Yumin Lee, Chinese Inst of Elec. Eng, China

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Ignac Lovrek, University of Zagreb, Croatia

Gottfried Luderer, Arizona State University, USA

Andrej Ljolje, AT&T, USA

Hiroshi Masuyama, Tottori University, Japan

Dean Marusic, Ericsson - Nikola Tesla, Croatia

Ivan Mijacika, T-HT, Croatia

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Branko Soucek, Iris, Italy

Krzysztof Wesolowski, University of Poznan, Poland

Heather Yu, Telcordia Technologies, USA

SoftCOM 2006 General Secretary

Mladen Russo, University of Split, softcom@fesb.hr

UNIVERSITY OF SPLIT

**FACULTY OF ELECTRICAL ENGINEERING,
MECHANICAL ENGINEERING AND NAVAL
ARCHITECTURE - FESB SPLIT**

**COMMUNICATIONS AND INFORMATION
SOCIETY, CROATIA (CCIS)**

Under the auspices of:

**MINISTRY OF SCIENCE, EDUCATION AND
SPORTS
REPUBLIC OF CROATIA**

Technically co-sponsored by:

**IEEE COMMUNICATIONS SOCIETY
(COMSOC)**

**MINISTRY OF THE SEA, TOURISM,
TRANSPORT AND DEVELOPMENT
REPUBLIC OF CROATIA**

CROATIAN ACADEMY OF ENGINEERING

**CROATIAN ACADEMY OF SCIENCES
AND ARTS**

IEEE CONTACT

A. Pakstas, London Metropolitan University, UK, UK
(a.pakstas@ieee.org)

<http://www.fesb.hr/SoftCOM>

SoftCOM 2006 FINAL PROGRAM OUTLINE

Friday, September 29, 2006 (location: Split, hotel Marjan)

08.00 - 15.00 Registration

09:00 – 17.30 Technical sessions, Symposia sessions, COST 290 7th MCM

18.00 – 21.30 Social program: guided tour and evening in Split

Saturday, September 30, 2006 (location: hotel Marjan / ship "Dubrovnik")

08.00 - 13.00 Registration

09.00 - 10.30 Technical sessions, COST 290 7th MCM, Exhibitions

10.30 - 12.00 **Opening ceremony & Plenary talks**

12.00 - 13.30 **Conference luncheon**

14.00 Departure to Dubrovnik

14.30 - 18.00 Technical sessions, Symposia sessions, BF sessions, Exhibitions

20.00 Arrival in Dubrovnik harbor

21.00 – 22.30 Social program: evening in Dubrovnik

Sunday, October 01, 2006 (location: ship "Dubrovnik")

08.30 - 09.30 Invited talks, BF sessions, Exhibitions

09.30 - 11.30 Guided tour in Dubrovnik

12.00 Departure to Split

14.00 - 17.30 Tutorials, GRID round table, BF sessions, Exhibitions

17.30 – 18.00 Conference awards

18.00 Arrival in Split harbor

Nim K. Cheung*President, IEEE Communications Society***TOWARDS THE ERA OF UBIQUITOUS NETWORKS**

This talk traces the evolution of mobile networking technologies from the early personal communications systems of the 1980's to the present day voice over IP and wireless broadband multimedia services. The speaker will compare some of the parallel developments of wireless and wireline broadband networks and examine the extent of their convergence. Future trends in ubiquitous network technologies and some of the potential applications will also be discussed.

Dr. Nim Cheung is the 18th President of the IEEE Communications Society, a global professional organization with 50,000 members in 170 chapters around the world. He has held numerous leadership positions in the Communications Society: Vice President of Technical Activities (1996-97), Vice President of Society Relations (2004), Strategic Planning Committee Chair (1998-99), Fellow Evaluation Committee (2002-04), Distinguished Lecturer (1998-2005), and Senior Editor of the IEEE Journal on Selected Areas in Communications (1989-2005). Dr. Cheung has been a consulting professor of electrical engineering at Stanford University since 2004.

Gordana Kovačević*President of Ericsson Nikola Tesla***ERICSSON NIKOLA TESLA: FOLLOWING TESLA'S VISION**

The rich scientific heritage bestowed to humanity by Nikola Tesla (1856 - 1943) has been incorporated in our daily lives in so many ways that we use it hundreds of times a day without even being aware of it. This year is the Year of Nikola Tesla, the year in which we remember and appreciate this great man, his discoveries and inventions.

Today, Ericsson Nikola Tesla is a provider of total ICT solutions and member of the Ericsson group. The company's activities incorporate the entrepreneurship of Lars Magnus Ericsson and the visionary spirit of Nikola Tesla. Its name reminds the community of these two great men who contributed to the foundation of the new communications era. This described powerful combination has brought value to Croatia and to Ericsson as well as to our customers who will substantially benefit from that combination.

Effective January 1, 2005 Gordana Kovačević has been appointed new President and CEO of the company Ericsson Nikola Tesla. Simultaneously, she is Vice President of the Market Unit Central Europe comprising seven European countries (Croatia, Slovenia, Bosnia and Herzegovina, Hungary, Poland, Czech Republic, Slovakia, Austria)

Andreas Kassler

Associate Professor at Karlstad University, Sweden



OPTIMIZING SIP SERVICE PROVISIONING IN INTERNET CONNECTED MANETs

Mobile Ad-hoc Networks (MANETs) have gained a lot of attraction because they are flexible, self-configurable and fast to deploy. Systems beyond 4G are likely to consist of a combination of heterogeneous wireless technologies and naturally might comprise MANETs as one component. In order to provide multimedia services such as Voice over IP in such environment, support for Session Initiation Protocol (SIP) is essential. In this paper we explore the limitations of using the standard SIP architecture when MANETs are connected to the internet. We present performance simulation results for the standard solution where SIP servers are located in the Access Network (AN) and MANET nodes

register with them. We also propose an alternative approach where gateways provide limited SIP proxy functionalities thus improving SIP service scalability in internet connected MANETs.

Dr. Andreas Kassler is an Associate Professor at Karlstad University, Sweden. His research interests include Ad-hoc networks, multimedia networking, and Quality of Service Management. He has authored or coauthored over 50 research articles, and is named as co-inventor on 3 european and international patents. He is a project manager for european research projects and is actively participating in several IETF working groups. Dr. Kassler is a member of the IEEE, Communications Society and of the Technical Committee of Telecommunications of the IASTED.

Fatih Alagöz

Associate Professor at Bogazici University, Istanbul, Turkiye



QUALITY OF SERVICE IN MESH MODE IEEE 802.16 NETWORKS

While IEEE 802.16 uses point-to-multipoint (PMP) topology in the main operating mode, an optional Mesh operating mode is introduced with the standardization of IEEE 802.16a. This optional mode has received more attention with the recent development of IEEE 802.16e, which introduced mobility support to IEEE 802.16 networks. A connection-based Quality of Service (QoS) mechanism is also described in the original standard. However, this mechanism applies only to PMP operation mode of IEEE 802.16. In this paper, we describe two QoS methods for Mesh operating mode of IEEE 802.16. The first method is based on the well known DiffServ mechanism. As the second method, we enhanced the QoS mechanism in the original standard to work in Mesh mode. We have analyzed the

performance of both methods and provided simulation results based on these two solution.

Dr. Fatih Alagöz is an Associate Professor with the Department of Computer Engineering, Bogazici University, Istanbul, Turkiye. His research interest is in design, development, integration, deployment, simulation, analysis and optimization of wireless/mobile and satellite networks. Special interest is on managing real-time multimedia satellite networks. His current research interests include QoS in satellite networks , UWB communications, Ad-hoc and sensor networks, and digital watermarking.

Dragan Poljak

University of Split, University of Split, Croatia



ASSESSMENT OF HUMAN EXPOSURE TO POWER SUBSTATION ELECTRIC FIELD

Dragan Poljak received his BSc in 1990, his MSc in 1994 and PhD in 1996 from the University of Split, Croatia. He is the Full Professor at the Department of Electronics at the University of Split, and he is also Adjunct Professor at Wessex Institute of Technology, UK. His research interests include frequency and time domain computational methods in electromagnetics, particularly in the numerical modeling of wire antenna structures, and recently numerical modeling applied to environmental aspects of electromagnetic fields. To date Professor Poljak has published more than 180 journal and conference papers in the area of computational electromagnetics, four authored books and one edited book, by WIT Press, Southampton-Boston. Professor Poljak is a member of IEEE, a member of the Editorial Board of the journal *Engineering Analysis with Boundary Elements*, and co-chairman of the WIT International Conference on Computational Methods in Electrical Engineering and Electromagnetics, and International Conference on Environmental Electromagnetics. He is also editor of the WIT Press Series *Advances in Electrical Engineering and Electromagnetics*. Recently, professor Poljak was awarded by the National Prize for Science.

Prof. David Larrabee

East Stroudsburg University, United States, Senior Member of the IEEE



ELECTROMAGNETIC EFFECTS ON TRANSMISSION LINES

Dr. Larrabee is a Senior Member of the IEEE. He earned his B.S. in Applied and Engineering Physics from Cornell University in 1976. He subsequently earned his M.S. in Applied physics (1978) and Ph.D. in Applied Physics (1980) both from Cornell University. He did Post-Doctoral work in 1979 and became a member of the research staff at Princeton University Plasma Physics Laboratory where he worked until 1984. He left to pursue an interest in Microprocessor based electrical instrumentation. He worked primarily in the Aerospace industry and became a Chief Electrical Engineer. He obtained his Masters of Business Administration from Philadelphia College of Textiles and Science in 1993. He decided to pursue an interest in teaching and explore research interests in Electromagnetic Compatibility. After working for a while as an Adjunct Professor he joined the faculty at East Stroudsburg University in 1995 where he now holds the rank of Professor.

Giovanni Giambene*Università degli Studi di Siena, Italy***T1 - CROSS-LAYER AIR INTERFACE DESIGN AND QOS ISSUES IN WIRELESS SYSTEMS**

Abstract: The first part of this tutorial will address cross-layer interactions of layer 2 with other protocol layers to achieve QoS support and efficient utilization of radio resources. Moreover, different techniques will be surveyed to implement the cross-layer exchange of information; in particular: (i) use of packet headers; (ii) adoption of Internet Control Message Protocol (ICMP) signaling to create holes in the layers of the protocol stack so that messages can be propagated across layers. Finally, the ETSI protocol stack (made by the ETSI Broadband Satellite Multimedia group) for satellite networks will be described.

The second part of this tutorial will present some case studies on Medium Access Control (MAC) protocols and scheduling techniques that employ cross-layer information to provide QoS support in managing different traffic flows in wireless communication systems: IEEE 802.11e; HSDPA air interface (3G+ systems); DVB-RCS for

interactive satellite networks.

Biography: Giovanni Giambene was born in Florence, Italy, in 1966. He received the Dr. Ing. degree in Electronics from the University of Florence, Italy, in 1993 and the Ph.D. degree in Telecommunications and Informatics from the University of Florence, Italy, in 1997. From 1994 to 1997, he was with the Electronic Engineering Department of the University of Florence, Italy. He was Technical External Secretary of the European Community COST 227 Action, entitled "Integrated Space/Terrestrial Mobile Networks". He also contributed to the Resource Management activity of the Working Group 3000 within the RACE Project, called "Satellite Integration in the Future Mobile Network" (SAINT, RACE 2117). From 1997 to 1998, he was with OTE of the Marconi Group, Florence, Italy, where he was involved in a GSM development program. In the same period he also contributed to the COST 252 Action ("Evolution of Satellite Personal Communications from Second to Future Generation Systems") research activities by studying the performance of Packet Reservation Multiple Access (PRMA) protocols suitable for supporting voice and data transmissions in low earth orbit mobile satellite systems. In 1999 he joined the Information Engineering Department of the University of Siena, Italy, first as research associate and then as assistant professor. He teaches the advanced course of Telecommunication Networks at the University of Siena. From 1999 to 2003 he participated to the project "Multimedialità", financed by the Italian National Research Council (CNR). From 2000 to 2003, he contributed to the activities of the "Personalised Access to Local Information and services for tOurists" (PALIO) IST Project within the fifth Research Framework of the European Commission (www.palio.dii.unisi.it). At present, he is involved in the SatNEx network of excellence of the FP6 programme in the satellite field (www.satnexus.org), as leader of two work packages: radio resource management techniques (ja2330) and cross-layer air interface design (ja2230). From 2004 he is vice-Chair of the COST 290 Action (www.cost290.org), entitled "Traffic and QoS Management in Wireless Multimedia Networks" (Wi-QoS).

Gottfried Luderer*Arizona State University, USA***T2 - RFID – RADIO FREQUENCY IDENTIFICATION: TECHNOLOGY BASICS AND BUSINESS USES**

Abstract: Imagine that arbitrary objects and even people or animals can carry a small inexpensive tag, replacing the ubiquitous bar code by something like a cheap piece of circuitry – costing just a few cents. And furthermore that this tag can be read from a short distance of a few meters without the need for a line-of-sight connection. The tag can be coded with its own unique identification. The tag does not need its own power source but is discovered by nearby reading devices sending short inquiry messages and listening to the coded "back scattered" responses. The underlying technology has been around for many years, but it is just getting mature enough to become practically useful. RFID is in the process of widespread introduction, for monitoring merchandize in the supply chain from manufacturer to customer, e.g. at Walmart, to inclusion in your passport or implanting tags in your dog. This seminar will briefly survey the technology and look at various business

applications. RFID categories like active and passive tags will be discussed as well as system architectures. What are obstacles to its introduction, technical and political, and potential benefits as well as abuses? Of all recently introduced electronic technologies, RFID may have the largest impact on our daily lives in the coming years.

Biography: Dr. Gottfried W. R. Luderer was appointed Professor, ISS Chair of Telecommunication, at Arizona State University in the Fall of 1990. His current research program in networking includes work in the areas of control of ISDN/Broadband ISDN networks, mobile communication networks, and multimedia communication, which ranges from call processing for intelligent network services to network management. Research emphasis is on advanced software technologies for development of telecommunication networks, as used in switches, for signaling and in network management, with a focus on object and component technology and formal definition techniques. From 1965 to 1989, Dr. Luderer was with AT&T Bell Labs, at last directing research on next generation switch architectures, based on fast packet switching technology on the hardware side and object-oriented design technology on the software side, resulting in some of the earliest demonstration networks for multimedia communication. Dr. Luderer holds Diplomingenieur (M.S) and Dr.-Ing. (Ph.D) degrees in Electrical Engineering from the Technical University of Braunschweig, Germany. He holds two patents. While at Bell Labs, he taught at Stevens Institute of Technology in Hoboken, NJ, and at Princeton University. He is member of ACM, IEEE, IEEE Computer and Communication Societies

TECHNICAL PROGRAM: SYMPOSIUMS & SPECIAL SESSION

Friday, September 29

Friday, September 29, 14:00-15:30, (HVAR)

SYM1/I: SYMPOSIUM ON EMC: SAFETY ASPECTS I

Symposium organizers: Dragan Poljak, Vesna Roje, University of Split
Chair: Vesna Roje, University of Split

ELECTROMAGNETIC-THERMAL MODELING OF THE HUMAN BODY (A)

Assessment of Human Exposure to Power Substation Electric Field, INVITED TALK

Dragan Poljak, Nikša Kovač, University of Split, Croatia; Cristina Gonzales, Andres Peratta, Wessex Institute of Technology, United Kingdom; Sasa Kraljevic, HEP Croatia

Multi-Monopole Model of Man for SAR Evaluations

Michele Bozzetti, Giovanna Calo, Francesco Lattarulo, Vincenzo Petruzzelli, Politecnico di Bari, Italy

Finite Element Model of the Human Head Exposed to Electrostatic Field Generated by Video Display Units

Damir Cavka, Dragan Poljak, University of Split, Croatia; Andres Peratta, Wessex Institute of Technology, United Kingdom

Geometrical Aspects of 3D Human Body Exposed to Extremely Low Frequency High Voltage Electric Fields. A BEM Approach

Andres Peratta, Cristina Gonzalez, Wessex Institute of Technology, United Kingdom; Dragan Poljak, University of Split, Croatia

ELECTROMAGNETIC-THERMAL MODELING OF THE HUMAN BODY (B)

Finite Element Thermal Model of the Human Exposed to Electric Field Generated From GSM Base Station

Damir Cavka, University of Split, Croatia

A Simple Finite Element Model of Heat Transfer in the Human Eye

Mario Cvetković, Damir Cavka, Dragan Poljak, University of Split, Croatia

Analytical Model of Human Body When Exposed to High Frequency Electromagnetic Fields

Ana Komadina, Dragan Poljak, University of Split, Croatia

Friday, September 29, 16:00-17:30, (HVAR)

SYM1/II: SYMPOSIUM ON EMC: SAFETY ASPECTS II

Symposium organizer: Draga Poljak, Vesna Roje, University of Split
Chair: Dragan Poljak, University of Split

Electromagnetic Effects on Transmission Lines, INVITED TALK

David Larrabee, East Stroudsburg University, United States

Usage Limitations of Field Strength Probes for RADHAZ Survey

Antonio Sarolic, University of Split, Croatia

Modelling Radar Antenna in NEC

Boze Tokić, Ministry of Defence, Croatia

Teaching Electromagnetic Radiation Effects on Humans

David Larrabee, East Stroudsburg University, United States

Electromagnetic Field Measurements In Student Microwave Laboratory

Krešimir Malarić, University of Zagreb, Croatia; Sandra Antešević Maričić, Kigen, Croatia

Modeling Panel Antenna in NEC

Tihomir Pušnik, VIPnet d.o.o., Croatia; Dragan Poljak, University of Split, Croatia

Saturday, September 30

SYMPOSIUM ON QOS IN WIRELESS MULTIMEDIA NETWORKS

Saturday, September 30, 14:00-15:30, (HVAR)

SYM2/I: WIRELESS ACCESS OPTIMIZATION

Symposium organizer: G. Giambene, Universita' degli Studi di Siena, Italy
Chair: Tomaz Javornik, Jozef Stefan Institute, Slovenia

Dynamic TXOP Configuration for QoS Enhancement in IEEE 802.11e Wireless Lan

Jakub Majkowski, Ferran Casadevall Palacio, Universitat Politecnica de Catalunya, Spain

Comparison of WiMAX Coverage at 450MHz and 3.5GHz

Tomaž Javornik, Gorazd Kandus, Andrej Horvat, Igor Ozimek, Jozef Stefan Institute, Slovenia

Cross-layer design of packet scheduling algorithm

Dung Luong Dinh, Nam H. Do, Budapest University of Technology and Economics, Hungary

Palm's Machine-Repair Model with a Generalised Poisson Input Stream and Constant Service Time

Seferin Todorov Mirtchev, Technical University of Sofia, Bulgaria

Saturday, September 30, 16:00-17:30, (HVAR)

SYM2/II: QOS SUPPORT AND ADAPTIVITY FOR MULTIMEDIA APPLICATIONS

Symposium organizer: G. Giambene, Universita' degli Studi di Siena, Italy

Chair: G. Giambene, Universita' degli Studi di Siena, Italy

Optimizing SIP service provisioning in internet connected MANETs, INVITED TALK

Marcel Castro, Andreas Kasser, Karlstad University, Sweden

Evaluation of QoS Support for Multimedia Traffics in IEEE 802.11e

Alessandro Andreadis, Giuliano Benelli, Riccardo Zamboni University of Siena, Italy

The Importance of Adaptive Applications in Mobile Wireless Networks

Michael Neofytou, Kyriakos Stavrou, Vasos Vassiliou, Andreas Pitsillides, University of Cyprus, Cyprus

Video-streaming Transmission with QoS over Cross-Layered Ad hoc Networks

Guillermo Díaz Delgado, Víctor Carrascal Frías, Mónica Aguilar Igartua, Technical University of Catalonia (UPC), Spain

Quality of Service in Mesh Mode IEEE 802.16 Networks, INVITED TALK

Mehmet Sukru Kuran, Birkan Yilmaz, Fatih Alagoz, Tuna Tugcu, Bogazici University, Turkey

Friday, September 29, 11:00-12:30, (HVAR)

SS1 – SPECIAL SESSION ON AD-HOC AND SENSOR NETWORKS

Chair: Guillermo Díaz Delgado, Technical University of Catalonia

Policy Based Data Access in Wireless Adhoc Networks
Qurban Memon, UAE University, United Arab Emirates

AR Modeling for Temporal Extension of Correlated Sensor Network Data

Hossein Najafi, Farshad Lahouti, Mohsen Shiva, University of Tehran, Iran

Visualization of Mobile Ad-Hoc Laboratory Network (S-Net)

Biljana Jagodic, Ivica Cubic, Ericsson Nikola Tesla, Croatia

Multipath Routing for Video-Streaming Services Over IEEE 802.11e Ad Hoc Networks

Víctor Carrascal Frías, Guillermo Díaz Delgado, Mónica Aguilar Igartua, Technical University of Catalonia (UPC), Spain

TECHNICAL PROGRAM: GENERAL CONFERENCE

Friday, September 29

Friday, September 29, 09:00-10:30, (BRAČ)

S1 - MOBILE AND WIRELESS COMMUNICATIONS I

Chair: Simone Molendini, University of Lecce, Italy

Experience-Driven Selective Scan for 802.11 Networks

Franco Tommasi, Andrea Tricco, Simone Molendini, University of Lecce, Italy

Simulated Annealing Algorithms for Optimal Packet Scheduling in Ad Hoc Networks

Marcos Aurelio Belchior, Kyra Wulffert, Peter Zipf, Manfred Glesner, Darmstadt University of Technology, Germany

Wideband Propagation Channel Parameters Measurement Inside an University Building

Mate Mrše, Zoran Blazevic, Igor Zanchi, Ivan Marinovic, University of Split, Croatia

An Interworking Architecture and Handoff Scheme in Heterogeneous Network Environments

Seongsoo Park, Daesik Woo, Donghahk Lee, Jaehwang Yu, Jongtae Lim, Sehyun Oh, SK Telecom, Korea, South

Friday, September 29, 11:00-12:30, (BRAČ)

S2 - MOBILE AND WIRELESS COMMUNICATIONS II

Chair: Gottfried Luderer, Arizona State University, USA

Simulation of Dynamic Call Admission Control for CDMA Systems

Mihaly Katona, Imre Sandor, Budapest University of Technology and Economics, Hungary

Efficient Reliable Multicast Strategies for Content Delivery

Ilka Miloucheva, Nilson Reyes, Jens Mahnke, Karl Jonas, Fraunhofer Institute, Germany

Distributed Measurement System Based on Wireless Mobile Device and Application Repository Server

Andrea Aiello, Notangle, Italy; Domenico Luca Carni, Domenico Grimaldi, Giuseppe Guglielmelli, Francesco Lamonaca, University of Calabria, Italy

Sensitivity Analysis of Hybrid DS / FH Spread Spectrum Communication System Capacity

Muhammad Khan, Dingrong Shao, Beihang University, China

Friday, September 29, 09:00-10:30, (HVAR)

S3 – INTELLIGENT TRANSPORT SYSTEMS

Chair: Ennio Gambi, Università Politecnica delle Marche, Italy

GPS Assisted Alternative Path Modeling and Guidance

Tero Viitala-Kiss, Nokia, Finland; Jouni Ikonen, Lappeenranta University of Technology, Finland

Performance of Automotive Spread Spectrum Radars

Giorgia Righi, Susanna Spinsante, Franco Chiaraluce, Ennio Gambi, Università Politecnica delle Marche, Italy

Friday, September 29, 09:00-10:30, (KORČULA)

S4: INTERFACES AND COMMUNICATION PROTOCOLS

Chair: Andreas Diehl, University of Plymouth

Modeling the Performance of a Distributed Application Based on Web Services

Ezudin Kurtovic, Institute for Informatics and Telematics, City of Sarajevo, Bosnia and Herzegovina; Vlado Glavinic, University of Zagreb, Croatia

Scalable and Secure Architecture for Digital Content Distribution

Valer Bocan, Politehnica University of Timisoara, Romania; Mihai Fağadar-Cosma, Alcatel Romania, Romania

An Approach for Interoperable Service Mediation in Diverse Telecommunication Networks

Andreas Diehl, University of Plymouth, Germany; Kishore Angrishi, Hamburg University of Technology, Germany

Sixrm: Full Mesh Reliable Source Ordered Multicast

Pedro Miguel Fonseca Marques Ferreira, João Orvalho, Fernando Boavida, University of Coimbra, Portugal

IMUNES Based Distributed Network Emulator

Zrinka Puljiz, Miljenko Mikuc, University of Zagreb, Croatia

Friday, September 29, 11:00-12:30, (KORČULA)

S5: TELECOMMUNICATION SERVICES AND QoS

Chair: Hrvoje Dujmic, Univerzity of Split, CROATIA

Parametric Models for Speech Quality Estimation in GSM Networks

Michele Barile, Pietro Camarda, Roberto Dell'Aquila, Nicola Vitti, Politecnico di Bari, Italy

The Role of Position Reporting Frequency in LBS QoS Establishment

Lidija Busic, Renato Filjar, Ericsson Nikola Tesla d.d, Croatia

Composite Noise Temperature at Low Earth Orbiting Satellite Ground Station

Shkelzen Cakaj, Post and Telecommunication of Kosovo; Kresimir Malaric, University of Zagreb, Croatia

Parallel SIP Proxy Servers Using Direct Routing Approach

Viktor Matic, Ivan Franicevic, Darko Sekalec, University of Zagreb, Croatia

TIMETABLE A: TECHNICAL PROGRAM, WORKSHOPS

Hotel Marjan, Friday, September 29			
Time/Hall	BRAČ	HVAR	KORČULA
08:00-15:00	REGISTRATION		
09:00-10:30	S1: Mobile and Wireless Communications I	S3: Intelligent Transport Systems	S4: Interfaces and Communication Protocols
11:00-12:30	S2: Mobile and Wireless Communications II	SS1: Ad-hoc and Sensor Networks	S5: Telecommunication Services and QoS
12:30-14:00	Lunch		
14:00-15:30	S6: Network Operations and Management	SYM1/I: Symposium on EMC: Safety Aspects I	S8: Communications Software
16:00-17:30	S7: Next Generation Networks and Services	SYM1/II: Symposium on EMC: Safety Aspects II	
17:45-18:15	Invited talks		
18:30-19:30	Guided Tour in Split		
20:00-21:30	Evening in Split		

Hotel Marjan / Ship Dubrovnik, Saturday, September 30			
08:00-13:00	REGISTRATION		
09:00-10:30			
10:30-12:00	OPENING CEREMONY & KEYNOTE SPEECH (HALL ADRIATIC)		
12:00-13:30	Conference Luncheon		
14:00-15:30	S A I L I N G	SYM2/I: Symposium on QoS in Wireless Multimedia Networks I	WICT/I: Workshop on Information and Communication Technologies I
16:00-17:30		S9: Signal Processing and Coding	SYM2/II: Symposium on QoS in Wireless Multimedia Networks II
17:45-18:15	Invited talk		
18:30-19:30	Dinner		
21:00-22:30	Evening in Dubrovnik		

Ship Dubrovnik, Sunday, October 1			
08:30 – 09:30	Invited talk		
09:30-11:30	Guided Tour in Dubrovnik		
12:00-13:30	Lunch		
14:00-15:30	S A I L I N G	S10: Internet and IP Based Environments	WICT/III: Workshop on Information and Communication Technologies III
16:00-17:30		S11: Research/Education Methodology	PS: Poster Session
17:30-18:00	Awards Presentations		
18:00-18:30	Leaving the ship		

TIMETABLE B: TUTORIALS, BUSINESS FORUM, MEETINGS

Hotel Marjan, Friday, September 29			
Time/Hall	ADRIATIC	MLJET	
08:00-15:00	REGISTRATION		
09:00-10:30	COST 290 7 th MCM	09:00 – 09:30 Integral Forest Fire Monitoring System of National Park Paklenica	Symposium Nikola Tesla: Scientist out of time I (Hall VIS)
10:30 – 12:30		09:45 – 10:15 The Pervasive Computing, Ericsson Nikola Tesla	
12:30-14:00	Lunch		
14:00-15:30	COST 290 7 th MCM	e-Ticketing: The Implementation of e-Ticket System at Split Airport	
16:00-17:30		Invited talks	
17:45-18:15	Guided Tour in Split		
18:30-19:30	Evening in Split		
20:00-21:30	Evening in Split		

Hotel Marjan / Ship Dubrovnik, Saturday, September 30			
08:00-13:00	REGISTRATION		
09:00-10:30	COST 290 7 th MCM	Presentations of Prototypes, Systems, Applications and Services I	
10:30-12:00	OPENING CEREMONY & KEYNOTE SPEECH (HALL ADRIATIC)		
12:00-13:30	Conference Luncheon		
14:00-15:30	S A I L I N G	Symposium Nikola Tesla: Scientist out of time II	Presentations of Prototypes, Systems, Applications and Services II
16:00-17:30		Education in ICT session Academy and Industry session	
17:45-18:15		Invited talk	
18:30-19:30		Dinner	
21:00-22:30	Evening in Dubrovnik		

Ship Dubrovnik, Sunday, October 1			
08:30-09:30	Invited talks		
09:30-11:30	Guided Tour in Dubrovnik		
12:00-13:30	Lunch		
14:00-15:30	S A I L I N G	Round table CROGRID Polyproject	TUTORIAL 2
16:00-17:30		Awards presentation	
17:30-18:00		Awards presentation	
18:00-18:30	Leaving the ship		

Friday, September 29, 14:00-15:30, (BRAČ)

S6: NETWORK OPERATIONS AND MANAGEMENT

Chair: Matthias Scheffel, Munich University of Technology, Germany

Efficiency of Decentralized Self-Managing System for IEEE 802.11 WLANs

Hrvoje Tkalcic, Croatia Airlines d.d., Croatia (Hrvatska)

Robust and Survivable Network Design for Entirely Uncertain Traffic Demand Patterns

Matthias Scheffel, Munich University of Technology, Germany

Usability of Mobile Ad Hoc Networks for IP Services

Ivica Cubic, Ivan Barbarić, Ericsson Nikola Tesla d.d., Croatia

An Improved Technology for Content Matching Intrusion Detection System

Yang Wang, Hidetsune Kobayashi, Nihon University, Japan

The Management Infrastructure of a Network Measurement System for QoS Parameters

Alexandru Bikfalvi, Paul Patras, Cristian Mihai Vancea, Virgil Dobrota, Technical University of Cluj-Napoca, Romania

Friday, September 29, 16:00-17:30, (BRAČ)

S7: NEXT GENERATION NETWORKS AND SERVICES

Chair: Jouni Ikonen, Lappeenranta University of Technology, Finland

Open Access Networks: Operating Options and Challenges of Business Logic

Matti Juutilainen, Jouni Ikonen, Liisa-Maija Sainio, Jari Porras, Lappeenranta University of Technology, Finland

Regional Networks and Operator Neutrality in Finland

Tuomas Karhula, Jouni Ikonen, Matti Juutilainen, Lappeenranta University of Technology, Finland

An Integration Architecture to 4TH Generation Wireless Networks

Xu Yang, MPI-QMUL Information Systems Research Centre, China; John Bigham, University of London, Macao Polytechnic Institute, United Kingdom

Performance Limitation of an Inter-City Optical Ring Network with Short-Period Dispersion-Managed Fiber due to the Presence of Cross-Phase Modulation

Satya Prasad, Meer Nazmus Sakib, Md. Nazmul Alam, Redwan Noor Sajjad, Bangladesh University of Engineering and Technology, Bangladesh

Friday, September 29, 14:00-15:30, (KORČULA)

S8: COMMUNICATIONS SOFTWARE

Chair: Zoran Skocir, University of Zagreb, Croatia

Improving Virtual Team Communication

Krešimir Pripužić, Luko Gjenero, Hrvoje Belani, University of Zagreb, Croatia

MUDCOM: Cost Modeling Framework for Design of Telecommunications Software Systems

Moinul Khan, Intel Corporation, United States

Towards Dynamic Web Service Generation on Demand

Ivan Magdalenic, Boris Vrdoljak, Zoran Skocir, University of Zagreb, Croatia

Use of distributed resources in mobile environment

Tommi Kallonen, Jari Porras, Lappeenranta University of Technologies, Finland

Saturday, September 30

Saturday, September 30, 16:00-17:30, (BRAČ)

S9 - SIGNAL PROCESSING AND CODING

Chair: Giovanni Cancellieri, Politecnica delle Marche, Italy

Frequency Domain MMSE Equalization with Moving FFT for MBOK DS-UWB System

Shin Woo Kang, Se Bin Im, Hyung Jin Choi, Sungkyunkwan University, Korea, South

Complexity issues in the introduction of High Definition in H.264/AVC based videoconferencing

Susanna Spinsante, Ennio Gambi, Franco Chiaraluce, Stefano Morichetti, Università Politecnica delle Marche, Italy

Design of irregular LDPC Codes for flexible Encoder and Decoder Hardware Realization

Frank Kienle, Torben Brack, Norbert When, University of Kaiserslautern, Germany

Variable Rate LDPC Codes for Wireless Applications

Marco Baldi, Giovanni Cancellieri, Franco Chiaraluce, Università Politecnica delle Marche, Italy

Adaptive Noise Cancellation Based on Neural Network

Maja Stella, Dinko Begusic, Mladen Russo, University of Split, Croatia

Sunday, October 1

Sunday, October 1, 14:00-15:30, (BRAČ)

S10 - INTERNET AND IP BASED ENVIRONMENTS

Chair: Hrvoje Dujmic, University of Split

Internet Shopping System using Cryptographic ID Technology and ID Compression Methods

Kouichi Kikuchi, Kazumasa Takami, Soka University, Japan; Shinichiro Goto, Osamu Mizuno, NTT Information Sharing Platform Laboratories, Japan

Multicast state scalability in QoS MPLS networks

Ivo Rozić, JP HT d.o.o., Bosnia and Herzegovina

Agent Based Data Collecting in a Forest Fire Monitoring System

Ljiljana Bodrožić, Darko Stipaničev, Maja Stula, University of Split, Croatia

Secure Mobile IPv6 for B3G Networks

Domenico Celentano, Antonio Fresa, CoRiTeL, Italy; Maurizio Longo, Fabio Postiglione, University of Salerno, Italy; Anton Luca Robustelli, CoRiTeL, Italy

IP Telephony Network Saving Capacity due to Substitution of PSTN by IP Network

Milutin Kapov, University of Split, Croatia; Damir Dlaka, Ericsson Nikola Tesla d.d., Croatia

Sunday, October 1, 16:00-17:30, (BRAČ)

S11 - : RESEARCH/EDUCATION METHODOLOGY

Chair: Burdescu Dumitru Dan, University of Craiova, Romania

E-Learning Platform Characterization from User Traffic

Marian Cristian Mihaescu, Burdescu Dumitru Dan, *University of Craiova, Romania*

A T-Learning Platform based on Digital Terrestrial Television

Marco Baldi, Adelmo De Santis, Damiano Falcone, Ennio Gambi, Susanna Spinsante, *Università Politecnica delle Marche, Italy*

CPM/PERT Project Planning Methods as E-learning Optional Support

Jadranka Marasovic, Tea Marasović, *University of Split, Croatia*

Italian-Croatian Remote Laboratory Distributed on Geographical Network

Mladen Borsic, Drago Cmurk, *University of Zagreb, Croatia*; Pasquale Daponte, *University of Sannio, Italy*; Claudio De Capua, *University of Reggio Calabria, Italy*; Domenico Grimaldi, *University of Calabria, Italy*; Tomislav Kilic, *University of Split, Croatia*; Tarik Mutapčić; *Tarmel d.o.o., Croatia*; Maria Riccio, *DIDAGROUP S.p.A, Italy*

The Campus Satellitare del Salento: a Scalable and Transparent e-learning Application

Franco Tommasi, Antonio Campa, Simone Molendini, *University of Lecce, Italy*

TECHNICAL PROGRAM: POSTER PRESENTATIONS

Sunday, October 1

Sunday, October 1, 16:45-18:15, (KORCULA)

PS – POSTER SESSION

Chair: Josko Radic, University of Split

A Hybrid Fault-Tolerant Algorithm for MPLS Networks

Maria Hadjiona, Chryssis Georgiou, Vasos Vassiliou, *University of Cyprus, Cyprus*

Iterative Object Reconstruction from Limited Spectrum Based on Soft Approach

Josko Radic, Nikola Rozic, Mladen Russo, *University of Split*

SoftCOM 2006 PROFESSIONAL PROGRAM: WORKSHOP, ROUND TABLE

Saturday, September 30

Saturday, September 30, 14:00-15:30, (KORCULA)

WICT/I – WORKSHOP ON INFORMATION AND COMMUNICATION TECHNOLOGIES I

Chair: Riri Fitri Sari, *University of Indonesia, Indonesia*

Design and Implementation of Dynamic and Collaborative Virtual Reality Using Croquet

Riri Fitri Sari, Abdul Khayyi, *University of Indonesia, Indonesia*

Evaluation of FTP Throughput in Mobile Ad-hoc Networks Running AODV-UU Routing Protocol

Nenad Ukić, *Ericsson Nikola Tesla d.d. Croatia*; Josip Lörincz, *University of Split, Croatia*

Charging and Billing Models in Mobile Networks

Goran Kraljevic, Ivan Krasic, *HT Mobile Communications, Bosnia and Herzegovina*

Agent Technology for Timetabling

Ivan Curak, Ljiljana Bodrozic, *University of Split, Croatia*

Saturday, September 17, 16:00-17:30, (KORCULA)

WICT/II – WORKSHOP ON INFORMATION AND COMMUNICATION TECHNOLOGIES II

Chair: Zoran Blazevic, *University of Split, Croatia*

Target Tracking in Radar Technology

Maja Sekelja, Zoran Blazevic, Igor Zanchi, Ivan Marinovic, *University of Split, Croatia*

Reliability of Traffic on Sensor Networks using Simple Protocols

Gustavo Luchine, *University of Brasilia - UnB (Brazil) / Anatel - Government Telecommunications Agency, Brazil*; Regis Picanco, Alexandre Romariz, *University of Brasilia (UnB), Brazil*

Switching Fabric Architectures for High-Speed Networks

Hamed Kovacevic, *University Dzermal Bijedic Mostar, Bosnia and Herzegovina*; Faruk Turcinhodzic, *University Sarajevo, Bosnia and Herzegovina*

Sunday, October 1

Sunday, October 1, 14:00-15:30, (KORCULA)

WICT/III – WORKSHOP ON INFORMATION AND COMMUNICATION TECHNOLOGIES III

Chair: Inge Gavat, *University of Bucharest, Romania*

A Comparative Study of Features Extraction Methods and Testing Time for Speech Recognition in Romanian Language

Inge Gavat, Corneliu Octavian Dumitru, *Politehnica University of Bucharest, Romania*

Multi Regression Analysis of Internet Operating Systems Quality

Ning Chang, *Cisco Systems, United States*

Experimenting Guided Navigation on Mobile Agent-based Hybrid Sensor Networks

Michele Di Santo, Nadia Ranaldo, Pablo A. Rostani, *University of Sannio, Italy*

Quality of Service in IEEE 802.16

Josko Rebic, *Elmap d.o.o., Croatia*

Chair: Leo Budin, Polyproject leader

University of Zagreb, CROATIA

Ivan Slapnicar

University of Split, CROATIA



DEVELOPMENT OF GRID INFRASTRUCTURE AND ITS APPLICATIONS AT THE UNIVERSITY OF SPLIT

Introducing the grid infrastructure at the University of Split through the CRO-GRID project resulted in the considerable gain in know-how among the scientists of the University. Recently, the University has also entered the European FP 6 project Enabling Grid for E-Science (EGEE 2). Concerning applications, the Croatian search engine which was developed through the project, has several features which makes it highly applicable in the Croatian web space. First, we have implemented the Croatian grammar rules, which enhances the search quality. Second, the engine uses grid resources, and is thus less dependent of the local computing power. Third, the engine can be easily tailored to satisfy search needs of a particular subdomain, and, finally, the engine has data mining capabilities

based on various matrix algorithms. The web site for the search engine is www.trazilica.hr.

Dr. Ivan Slapnicar is a Professor of Mathematics at the University of Split. He received his B.Sc. and M.Sc. degrees from the University of Zagreb, Croatia, and his Ph.D. from the FernUniversität Hagen, Germany. From 1985 he has held different research and management positions at the University of Split. His main research interests are numerical linear algebra and applications. He has authored or coauthored over 20 research articles. He is principal investigator in the projects "Accurate and Fast Matrix Algorithms and Applications" "CRO-GRID Applications - Indexing Web/Local Networks and Data Mining". He is reviewer for major journals in the field and for TEMPUS projects of the European Union. Dr. Slapnicar is a member of the Society for the Industrial and Applied Mathematics (SIAM) and the Croatian Mathematical Society. More information is available at <http://www.fesb.hr/~slap>.

Sinisa Srblic

University of Zagreb, CROATIA



CRO - GRID WRAPPER OF PUBLIC INFORMATION SYSTEM PIE: END-USER PROGRAMMABLE INTERNET ENVIRONMENT

We developed three-layer SOPM (Service-Oriented Programming Model) that enables personalization of cyberspace through development of end-user applications. SOPM consists of execution, design, and translation environments. Distributed application execution environment is based on the Coopetition-Based Distributed Architecture (CBDA). We designed CBDA as the three-tiered coordination architecture. End-user distributed application design environment is based on the Simple Service Composition Language (SSCL). We defined a new statement-based textual language for service composition based on CBDA. Since SSCL is primarily intended for end-users, its syntax is

simple but expressive enough to enable process modeling through Web service composition. Distributed application translation environment is based on parallel distributed compilation and interpretation. During compilation, SSCL language is translated into CL language (Coopetition Language). We defined CL language based on standard WS-BPEL and WSDL languages. We extended WS-BPEL language with WSDL descriptions of all invoked services in order to enable the distributed parallel interpretation.

We implemented the proposed SOPM model into end-user development framework PIE (Programmable Internet Environment). PIE is a web-browser based environment for building and running SOPM applications over the Internet.

Sinisa Srblic is a Professor at the University of Zagreb, School of Electrical Engineering and Computing. He received his B.S. degree in electrical engineering in 1981, and M.S. and Ph.D. degrees in computer engineering in 1985 and 1990 respectively, all from the University of Zagreb, Croatia. He was visiting the University of Toronto, Canada, from 1993 to 1995 where he worked on the NUMAchine multiprocessor project. As a visiting scientist from 1995 to 1996, he was working with the Advanced Technology Group of AT&T, USA, on caching of Internet objects in large distributed multimedia systems. During summers 1997, 1998, and during fall 1999, he was visiting AT&T Labs, Internet Platform Organization, San Jose, California, USA, where he continue his research on caching of Internet objects in large distributed multimedia systems. During summer 2000, he was visiting the University of California, Irvine, Department of Information and Computer Science, Center for Embedded Computer Systems, California, USA, where he worked on a design of the SpecC Profiler, which is a specification-level exploration tool.

Ivan Maric

SRCE, CROATIA



CRO - GRID – NATIONAL GRID INFRASTRUCTURE AND ACTIVE PARTNERSHIP IN EUROPEAN E-INFRASTRUCTURE

Introducing the grid infrastructure through CRO-GRID poliprojekt (start in early 2003.) will be seen in the future as a major step in a process of building national grid infrastructure. Thanks to all project partners SRCE lead the successive process of joining a major European FP6 grid project – Enabling Grid for E-science (EGEE II). Croatian institutions (SRCE, IRB and FESB), using Joint Research Unite model, starting from 1st April 2006 are partners on EGEE II project and their contributions to EGEE 2 project is made within existing EGEE II Network Activities (NAs) and Service Activities (SAs).

Croatian competitiveness is based on the success of R&D and innovation. This, in turn, assumes a) major investment in building national grid infrastructure and b) active involvement in major European project to stay at frontier. It is therefore very important to allocate an appropriate level of funding for national grid infrastructure and for CRO-GRID successor projects.

Ivan Maric is a Deputy Director and CTO of University Computing Centre – SRCE. He received his B.Sc. in Electrical Engineering from University of Zagreb in 1990. He is a prominent member of the team which initiated experimental implementations of the Internet in Croatia in 1990 and 1991 by establishing and constructing the academic computer network CARNet. Since the beginning of the 90s and continuing until today he has been the leader in the construction of the CARNet network and implementation of the latest information and communication technologies, such as the first in Europe production implementation of the ATM technology at the state level (1955 – 1997) or planning and implementation of gigabit technologies (2002 – 2004). Since 2005 Ivan Maric was actively involved in international connection of CRO-GRID project with EU FP6 project Enabling Grid for E-science (EGEE II). Currently he acts as CRO-GRID Joint Research Unite representative in EGEE II project.

Karolj Skala

University of Zagreb, CROATIA



CRO - GRID APPLICATIONS

Advancement of computer usage in scientific work is based on development of e-Science technologies. More generally e-Science refers to development of the next generation infrastructure to support computationally based science and engineering. Science and technical systems increase more and more in complexity. Regarding that and in order to solve complex problems, effective utilization of distributed computing, network storage and advanced visualization resource is being used.

CRO GRID Applications project represents the strategically important developing technologies in the area of the high performance computing as a testbed applications. As a project results we established the Grid Application Portal and the three typical applications in various disciplines of science and engineering:

- Optimisation of Transport Management,
- Indexing and Search of Web/Local Networks – Data Mining,
- Simulation and Modelling of Protein Folding with Catalytic Activity of Enzymes.

The applications on distributed infrastructure and sophisticated tools for scientific and engineering work are now available (e-science service). This creates the environment for efficient scientific work, and a testbed for up-to-date improved methods and generic grid applications. Development of grid technology on the national level enabled the access to EU Grid related projects within the FP6 and to other global grid systems and generic EGEE Bioinformatics applications as well.

Karolj Skala is a senior researcher at Ruđer Bošković Institute and full professor of University in Zagreb. He graduated at Electrical Engineering Faculty in 1974, did the M.Sc. in Electrical Engineering 1979 and the Ph.D. degree in Electrical Engineering in 1983 at University in Zagreb. From 1986 to 1993 he has been leader of the Electronics Laboratory in the LAIR department of Ruđer Bošković Institute. In the postgraduate courses he is teaching Programmable Logic Devices and Multimedia Communications. Now he is on the head of Centre of Information and Computer Science. He is the chairman of the international scientific symposium Hypermedia and Grid systems. Prof. Skala is a member of the ICOMT, MIPRO and ELMAR programme committees, and a member of the EUROMICRO, AACE and IEEE associations. He is a participant in the European Community project COST#254 and COST#276. K. Skala is a member of Croatian Academy of Technical Science and the associate member of Hungarian Academy of Science. He is the project leader of the CRO GRID Applications national project and the four EU FP6 Grid related projects.

The collaborating Institutions are:

- Ruđer Bošković Institute, Zagreb
- Faculty of Electrical Eng. Mechanical Eng. and Naval Architecture, University of Split
- Faculty of Transport and Traffic Engineering, University of Zagreb
- Faculty of Natural Sciences, Department of Mathematics, University of Zagreb

Karolj Skala is a senior researcher at Ruđer Bošković Institute and full professor of University in Zagreb. He graduated at Electrical Engineering Faculty in 1974, did the M.Sc. in Electrical Engineering 1979 and the Ph.D. degree in Electrical Engineering in 1983 at University in Zagreb. From 1986 to 1993 he has been leader of the Electronics Laboratory in the LAIR department of Ruđer Bošković Institute. In the postgraduate courses he is teaching Programmable Logic Devices and Multimedia Communications. Now he is on the head of Centre of Information and Computer Science. He is the chairman of the international scientific symposium Hypermedia and Grid systems. Prof. Skala is a member of the ICOMT, MIPRO and ELMAR programme committees, and a member of the EUROMICRO, AACE and IEEE associations. He is a participant in the European Community project COST#254 and COST#276. K. Skala is a member of Croatian Academy of Technical Science and the associate member of Hungarian Academy of Science. He is the project leader of the CRO GRID Applications national project and the four EU FP6 Grid related projects.

Hrvoje Gold

University of Zagreb, CROATIA



CRO - GRID APPLICATIONS: OPTIMIZATION OF TRANSPORT MANAGEMENT

PRACTICAL VEHICLE ROUTING PROBLEMS SOLVING IN DISTRIBUTED COMPUTING ENVIRONMENT

The problems that use a fleet of vehicles to serve (deliver/collect) certain load at a certain number of locations are known in literature as the Vehicle Routing Problems (VRP). By solving a VRP problem the attempt is made to reduce the transportation costs which may be reflected in the saving of the overall traveled path, saving in the number of vehicles required to perform the work or saving of the overall time of performing the whole business. VRP represent NP-hard combinatorial problem. The exact solution can be found only for problems of small size (approximately 100 locations and 10 vehicles). Practical problems are usually solved by modifications of the existing heuristic and meta-heuristic algorithms, e.g. simulated annealing, lambda local search. The computation can be accelerated by distributing the algorithms i.e. by dividing the tasks to several computers. In order to simplify the process of developing the algorithms, we developed the specialized programming language Mars and interactive graphical environment Venera, that together provides a suitable development system for fast and efficient implementation, adjusting and testing of routing algorithms, as well as their adaptation to different variations of practical VRP problems. Apart from the basic numerical and character data types and language constructions, the programming language Mars also contains data types that are used in setting and solving VRP problems (customer, vehicle, arc), related functions and statements (vehiclecount, customercount, move, addarc, delarc) and special statements for local searches and minimization (maximization) of the objective function. In order to speed up the problem solving procedure, the instructions (parallel, parallel wait) that support writing of distributed algorithms and their execution on the cluster/grid infrastructure have been included. Mars interpreter is integrated in Venera environment and can be run in the client or server mode. To input the data on the locations of customers as well as to visualize the resulting routes, interface to a geographic information system Miranda, that use digital map with transport network layer, has been developed. The system has been tested on standard problems from literature and practical problems generated by municipal waste collection company (capacitated vehicle routing problem - CVRP), national postal company (capacitated vehicle routing problem with time windows - CVRPTW), newspaper publisher (multi-depot VRPTW), distributor of consumer goods (multi-trip VRPTW) and pharmaceutical wholesale (multi-trip VRPTW with priorities). Depending on the posed constraints and goals of optimization, obtained savings range between 20% to 40% .

Hrvoje Gold is a Professor at the University of Zagreb, Faculty of Transport and Traffic Engineering. He received his B.S. and M.S. degrees in electronics in 1974 and 1979 respectively and Ph.D. degree in traffic and transport technology in 1994, all from the University of Zagreb, Croatia. He has authored or coauthored over 60 scientific papers that are the results of his research in the development of methods and techniques for semantic and symbolic processing of information, application of general systems theory to built up generic traffic theory, use of the remote sensing in the analysis of transport and traffic systems and research in the development of intelligent transport systems. He actively participated, as the principal investigator or researcher, in over 14 national and 2 European research projects and has 2 technical advancements. He is the principal investigator in the project "CRO-GRID Applications - Optimization of Transport Management". At the Faculty of Transport and Traffic Engineering he has the leading role in the set up and development of the information and communication infrastructure, Internet and web systems and services, wireless network, Multimedia Laboratory, Optical Communications Laboratory, Digital Control of the Railway System Laboratory, Remote Sensing Laboratory and FTTE-GRID Laboratory. Now he is head of the Department of Intelligent Transport Systems.

Kurt R. Richter

Austrian Academy of Sciences



NIKOLA TESLA EUROPEAN TIME

Tesla's inventions and discoveries were pioneering in many areas. But already during his life time his personality was disputed and he was involved in many quarrels as far as his patents were concerned which all seemed to have been solved in his favour. Already during the turn of the last century in many textbooks his name did not exist. Nowadays his name is remembered only by the Tesla transformer to generate high voltages at high frequency and by the measuring unit of the magnetic field. Also many of his patents are so much forgotten that today sometimes patents are issued which can be seen near those of Tesla's. No doubt, his contributions changed the world and still are not out of date. They

will help to keep on developing civilisation and the wellbeing of humanity.

Kurt R. Richter, born in Vienna, Austria, in 1933, graduated in Communication Engineering in 1958 and received his PhD 1961 from the University of Technology in Vienna (TUW), Austria. He was Associate Professor at the TUW before he became Full Professor for Fundamentals of Electrical Engineering at the Technical University Graz (TUG), Austria, in 1975. Since 2000 he is Professor Emeritus at the TUG. From 1971 to 1973 he worked for 2 years as a scientist at the Advance Projects Directorate at the Goddard Space Flight Center of NASA in Greenbelt, MD, USA. Since 1980 he is actively involved in IEEE in many positions (Founding chairman of the IEEE Austria Section, Director of IEEE Region 8 etc.). From 2001 – 2003 he was a member of the IEEE Educational Activities Board (EAB) and member of several EAB committees as the Committee for Global Accreditation Activities and others. He is an IEEE Fellow, a corresponding member of the Austrian Academy of Sciences and honorary member of the Croatian Academy of Technical Sciences. He is Senior Trainer in an IEEE Region 8 Workshop Program on "Development of Leadership Skills" and has conducted many workshops in Europe; Africa and the Middle East.

Aleksandar Marinčić

Serbian Academy of Sciences and Arts



NIKOLA TESLA AND WIRELESS ENERGY TRANSMISSION

Nikola Tesla started some time around 1890 to investigate the uses of high frequency currents for efficient illumination and developed system for efficient light production by single wire and no wire lamps. Gradually he became convinced that the single wire transmission is possible and in the end he used only ground and elevated plate as the open resonant circuit transmitter. He patented in 1900 so called the four resonant circuit transmitter-receiver system after initial disclosure of antenna-ground basic radio arrangement in the 1893 lecture. Tesla's name has been unjustifiably neglected by many historians of science in spite of the fact that the highest court in USA invalidated Marconi's radio patent as it contained nothing that has not been

protected by patents of Tesla, Stone and Lodge.

Aleksandar Marinčić, received his BS degree in 1956, and MS in 1957, both from Belgrade University, Yugoslavia, and his Ph.D. degree in 1963 from Sheffield University, England, all in Electrical Engineering. In his rich curriculum he was Docent at the Department of Electrical Engineering, University of Belgrade, then Visiting Associate Professor, UNESCO expert and Acting Chief Technical Advisor at the Middle East Technical University, Ankara, Turkey, Associate Professor at the Electronics Faculty of Niš, Professor of the Faculty of Electrical Engineering at the University of Belgrade, Visiting Professor at the University of Sheffield, the Professorial Fellow in 1989 at the University of Cardiff. He participated for four years in the international project COST 25/2 on satellite antenna design, guided and participated in over 15 projects for various institutions. He published 120 papers in periodicals and conference proceedings, 3 books on Optoelectronics, parts in 3 other books, and one Lecture Notes on Microwave Circuits. In 1977 he authored the Introduction and Commentaries that accompanied the publication of Nikola Tesla's diary manuscript, The Colorado Springs Notes, 1899-1900 and in 1982 became Director of the Nikola Tesla Museum in Belgrade. He was invited speaker at 12 national and international meetings. He was for five years Editor-in-Chief of Yugoslav periodical Electrotechnics. He is a member of the Yugoslav Union of EE, of ETAN and of the IEEE. In 1991 he was elected corresponding member of the Serbian Academy of Sciences and Arts. He is also a member of the Science Committee of the Tesla Memorial Society.

SYMPOSIUM NIKOLA TESLA: PROGRAM

Friday, September 30

08:00 – 15:00 REGISTRATION

SYMPOSIUM NIKOLA TESLA: SCIENTIST OUT OF TIME I/ZNANSTVENIK IZVAN VREMENA I

Friday, September 29, 09:00-10:00, (VIS)

INVITED SPEAKERS / POZVANA PREDAVANJA

Chair: *Dragan Poljak, Universiti of Split, CROATIA*

Nikola Tesla's European Time

K. Richter

Nikola Tesla and Wireless Energy Transmission

A. Marincic

Friday, September 29, 10:00-11:00, (VIS)

WIRELESS COMMUNICATIONS / BEŽIČNE KOMUNIKACIJE

Chair: *Dragan Poljak, Universiti of Split, CROATIA*

Analysis of Tesla's Transmitter using Wire Antenna Theory

D. Poljak, Z. Blazevic, V. Doric, M. Cvetkovic

Fundamentals of radio Communication - The Invention of Radio

P. Milicic

Modelling Tesla's Radio System as a Transmission Line

Z. Blazevic, D. Poljak, M. Cvetkovic

Wireless Tesla Transponder - Field-physical basis for electrically bidirectional far range transponders according to the invention of Nikola Tesla

K. Meyl

Friday, September 29, 11:00-12:00, (VIS)

TESLA'S INVENTIONS, LEGACY AND FOLLOWERS / TESLINI PRONALASCI, OSTAVŠTINA I SLJEDBENICI

Chair: *Zoran Blazevic, Universiti of Split, CROATIA*

Nikola Tesla i "borba struja " od New Yorka do Šibenika

A.S. Telento

On Tesla from the Central Library of Physics

A. Valenta

The "Lifter" project - Lebdjelica na ionski pogon

J. Kandrata, D. Laktasic, T. Gombac

AC Electromotor Construction by 3D Modelling and Cluster Rendering

T. Skala, M. Todorovac, K. Skala

Friday, September 29, 12:00-13:00, (VIS)

THE PORTRAIT OF THE SCIENTIST/PORTRET ZNANSTVENIKA

Chair: *Zoran Blazevic, Universiti of Split, CROATIA*

Svetac Znanosti - Mucenik Humanosti

M. Filipi

Tesla - Scientist Out of Time

M. Cvetkovic, D. Poljak, Z. Blazevic

Svijet kakav tesko mozemo zamisliti

M. Filipi

Velicanstvena galerija prijatelja i zena

M. Filipi

Saturday, September 30

08:00 – 15:00 REGISTRATION

SYMPOSIUM SUMMARY AND ROUND TABLE

Saturday, September 30, 14:00-15:30, (ADRIATIC)

TESLA'S VERSUS HERTZIAN PROPAGATION CONCEPT

Moderators: *D. Poljak, Z. Blazevic, University of Split,
CROATIA*

Nikola Tesla's European Time

K. Richter

Nikola Tesla and Wireless Energy Transmission

A. Marincic

Antenna versus Transmission Line Modeling of Tesla's Radio System

D. Poljak, Z. Blazevic

BUSINESS FORUM

PROTOTYPES, SYSTEMS, APPLICATIONS AND SERVICES

INTEGRAL FOREST FIRE MONITORING SYSTEM OF NATIONAL PARK PAKLENICA

Darko Stipanicev, Maja Stula, Damir Krstinic, Ljiljana Bodrozic, *University of Split, CROATIA*

Friday, September 29, 09:00 – 09:30, (MLJET)

Abstract: Integral forest fire monitoring system (IPNAS) is system for early detection of forest fire based on the images captured by the video cameras in the visible spectra during day and near infrared spectra during night. The system is based on the field units and central processing unit. The field unit is conceived of controlled video cameras, network embedded video server, wireless TCP/IP based communication unit, mini meteo-station and network embedded data server for collecting meteorological and system process parameters. The field units could be energy independent powered by solar cells and mini wind generators. Central processing unit is the main system part where all calculations, presentations, image and data archiving are done. The system was developed under support of Ministry of science, education and sport of Republic Croatia and Split and Dalmatia County authorities.

After intensive experimental testing during 2006 fire season on three locations in Split and Dalmatia County in June 2006. the first working unit was opened in National park Paklenica.

The project was quite demanding because the monitoring station was located on Crni Vrh (1110 m altitude) reachable only by foot. During the 2005, the monitoring tower was build by firms Adut from Split and Elektromehanika Zadar and in early summer 2006, the monitoring, computer and communication equipment was installed by Alarm Automatika Rijeka and Lama Split. The software was based on our IPNAS software adapted to this particular location. The main part is still the image based automatic early detection of forest fire, but we have also implemented new and powerful system for archived data and archived images review and processing. Also the system was fully integrated with GIS of National park Paklenica

IMPLEMENTATION OF THE E-TICKET SYSTEM AT SPLIT AIRPORT

Slavko Roguljic, *Split Airport, Technical Director*

Friday, September 29, 10:30 – 11:00, (MLJET)

Abstract: As part of its Simplifying the Business Initiative, International Air Transport Association is leading the scheduled airline industry to eliminate paper tickets for all passengers by December 2007. This will save US\$ 3 billion of costs for airlines and improve customer service to passengers who will no longer need to collect, carry, or show paper tickets. Accordingly, airports and ground handlers will no longer need to collect and dispatch tickets back to airlines.

This requires every passenger check-in to revolve around the usage of electronic tickets (ET), rather than collection of paper tickets. As a result, every ground handler (airport) must have an ET compliant check-in system (DCS) and have all staff fully trained to serve passengers with e-ticket.

Because, Split Airport is ground hadler of more than 50 different airlines operating to Split Airport during the 2006, processing ET will become a mandatory requirement . Therefore, at the beginning of May 2006, Split Airport and Croatia Airlines established a team of experts in order to define all requirements related to the implementation of the E Ticketing System up to the beginning of 2007.

MAXtv – NEW GENERATION OF TELEVISION

Emil Flatz, *T - HT*

Saturday, September 30, (ADRIATIC)

MAXtv – televizija novog doba Zamislite televizijski program po svom izboru. Zamislite kako posuđujete film ravno iz naslonjača jednostavnim klikom na daljinskom upravljaču. A sad još zamislite kakogledate film bez dugih i dosadnih reklama koje vas ometaju. Više ne morate zamišljati. Mi smo se pobrinuli za to: predstavljamo vam uslugu MAXtv

PRESENTATION OF PROTOTYPES

DAILY OBJECT TRACKING AND MANAGEMENT SYSTEM BASED ON MULTI-HOP DATA TRANSMISSION VIA AN ACTIVE RFID

Daisuke Morikawa, *KDDI Corporation*

Saturday, September 30, 09:00 – 09:45, (MLJET)



Abstract: This paper describes object tracking and management system using an active-type RFID tag system. Transmitted ID from each RFID is programmable based on detecting information from the surrounding's objects and each RFID tag exchanges its own information. This proposed system is self-organizing so that the existence of centralized database is not necessary. The architecture design of proposed system in pervasive environment are also described. In particular, this paper proposes employing both semantic (attributes of an object) information and relative object relationship.

THE PERVASIVE COMPUTING

Ivica Cubic, Nenad Ukic, *Ericsson Nikola Tesla, CROATIA*

Friday, September 29, 09:45 – 10:15, (MLJET)

Saturday, September 30, 16:00 – 16:45, (MLJET)



Abstract: With the constant evolution of electronics and software technologies, computing devices are increasingly becoming an integral component of the world around us. The next step is interconnection of these numerous processing and communicating capable devices (sensors, mobile phones, electronic devices and computers) in order to bring new values and services.

EDUCATION IN ICT

Saturday, September 30, 16:00 – 17:30, (ADRIATIC)

1. FER AND THE REFORM OF THE HIGHER EDUCATION IN CROATIA

Vedran Mornar, *FER, University of Zagreb, CROATIA*

In the academic year 2005/2006, Republic of Croatia reformed the higher education system and implemented the Bologna Declaration. Faculty of Electrical Engineering and Computing, University of Zagreb, not only introduced the three main cycles of the higher education, but took the opportunity to completely remodel the whole education process. Instead of the model where students took the lectures and then repeatedly tried to pass the exams, the continuous assessment was introduced. The new study programs were accredited by the German accreditation agency ASIIN.

Vedran Mornar is a Professor of Computer Science at Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia, where he currently teaches several graduate and undergraduate computing courses. He graduated and received his PhD degree in Computer Science at the same university. As a Fulbright scholar, he studied at University of Southern California, Los Angeles for an academic year. His professional interest is in application of operational research in real world information systems, database design, development and implementation. He is an editor of international journal "Computing and Information Technology". In 2006, he was elected as the dean of Faculty of Electrical Engineering and Computing.

2. EDUCATION IN ICT AT FESB

Ivica Puljak, *FESB, University of Split, CROATIA*

Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture of the University of Split (FESB) has changed its study programmes in accordance with the Bologna process starting from academic year 2005/2006. Three cycle education has been introduced including bachelor, master and doctoral level studies. Education in the area of ICT has been provided at all three levels. At the bachelor level it has been provided through the study of Electrical Engineering and Information Technology and the study of Computing. At the master level it has been provided through the study of Communication and Information Technology, the study of Computing, and the study of Electronics and Computer Engineering. At the doctoral level it has been provided through the study of Electrical Engineering and Information Technology.

GENERAL INFORMATION



Split town



Ship Dubrovnik

VENUE



CONFERENCE HOTEL INFORMATION

Hotel Marjan is located right on the coast, along the Split city center and beneath the park-forest Marjan. Its only 5 minute walk away to ACI

marina Split, and about 15 minutes to ferry port, bus and train terminal. Hotel is fully air-conditioned.

Guests have at their disposal 106 rooms, single and double. All rooms have recently been renovated, and each room has a balcony, bathroom and toilette and a direct phone line.

TRAVELING TO SPLIT

by air: Split can be reached directly from Amsterdam, Brussels, Frankfurt, London, Lyon, Manchester, Munich, Paris, Vienna and via Zagreb from all world airports

by ship: Split harbor is daily connected with Ancona. Ship connections are also available with Venice, Pescara and Bari.

SHIP AND CRUISING INFORMATION

The second part of the Conference program will be held aboard the ship "Dubrovnik":

SHIP LOCATIONS:

Split, Sept. 30
Dubrovnik, Sept. 30 - Oct. 1
Split, Oct. 1

THE ITINERARY:

SPLIT – DUBROVNIK, Sept. 30
08.00 Boarding the ship at Split harbour
14.00 Departure from Split to Dubrovnik
20.00 Anchoring at Dubrovnik harbour

DUBROVNIK-SPLIT, Oct. 1
12.00 Departure from Dubrovnik to Split
18.00 Anchoring at Split harbour
19.00 Leaving the ship

WEATHER

In October the weather in Split is very nice, with an average temperature of about 20 degrees Celsius and the sea temperature is agreeable for swimming



PROCEEDINGS



All participants will receive the Final Program and CD – ROM Proceedings when registering at the conference desk.

LANGUAGE

The Conference language is English.

REGISTRATION

Friday, September 29: 08:00-15:00
Saturday, September 30: 08:00-13:00

SECRETARY

Mladen Russo
FESB Split
University of Split
R. Boškovića b.b.
Fax: +385 21 463 877
E-mail: softcom@fesb.hr

21000 Split, Croatia
Tel: +385 21 305 825

<http://www.fesb.hr/SoftCOM>