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Preface

This year the 12th International Conference on Telecommunications and Informatics (TELE-INFO '13), the 12th International Conference on Signal Processing (SIP '13) and the 12th International Conference on Microelectronics, Nanoelectronics, Optoelectronics (MINO '13) were held in Baltimore, MD, USA, September 17-19, 2013. The conferences provided a platform to discuss telecommunications, informatics, nonlinear signals and systems, signal reconstruction, computed imaging, nanoelectronics, quantum electronics, optoelectronics etc with participants from all over the world, both from academia and from industry.

Their 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 these conferences are published in this Book that will be sent to international indexes. They will be also available in the E-Library of the WSEAS. Extended versions of the best papers will be promoted to many Journals for further evaluation.

Conferences such as these 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

Telecommunications in Cooperative Intelligent Transport Systems

Professor Tomas Zelinka
Czech Technical University in Prague
Faculty of Transportation Sciences
Czech Republic
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Abstract: Intelligent Transport Systems (ITS) solutions offer wide range of telecommunications-based applications concentrated namelyon the traffic management, traffic safety improvementor e.g. on environmental impact minimization. Stand-alone vehicle support can improve driver´s ability to correctly act in critical situations or improve efficiency of transport process. However, benefits of such support can be magnified if the individual vehicles can suitably exchange data with the other vehicles on the road as well as with the infrastructure systems.Recently emphasis in this area turned ITSto the Cooperative ITS where each equipped vehicle has got ability to communicate with the otherequipped vehicles (V2V) as well as with the infrastructuresystems (V2I). Cooperative ITS implementationsrequire guaranteed quality mobiledata services, low data latency and widely spread roads and highways network coverage. Publically available wireless mobile data services can offer quite reasonable area coverage. However, provided packet service latency use to be above Cooperative ITS requirements and mostly noguaranteed service quality and securityis available.
New generation of OFDM based services specificallyDSRC 5.9 (Data Short Range communication) designed for the V2V and V2I communication or publically availableLTE services open conditions for provisioning of appropriate telecommunications services. Theirfirst implementations prove appearance of the new potentialin this area. Our view of this potential will be presented.
Transferred data volumesboth inV2V and V2I regimesextremely quickly grow.Step by step vehicles integration in the global networks, however, represents fertile conditions forindividual vehicles networks attacks. Hostile attack ofvehicle on board data communication network based typically on the CAN(Controlled Area Network)can easily cause fatal consequences. Therefore telecommunications security ismore and more understood as the crucial part of the Cooperative ITS telecommunications solutions. Some our approaches improving availabletelecommunications security tools will be presented, as well.

Brief Biography of the Speaker: Professor of Informatics at the Czech Technical University (CTU) in Prague,
PhD in Experimental Physics at the Czechoslovak Academy of Sciences,
Master degree in Cybernetics and Computer Sciences at the CTU in Prague,
2005 - CTU in Prague,Faculty of Transport Sciences(FTS)
Basic and advanced lectures in area of telecommunications sciences, specific telecommunication solutions for the Intelligent Transport Systems (ITS) and cooperative ITS, telecommunications services management etc.,
R&D - specific telecommunications solutions dedicated for the ITS, Electronic Toll Collection (ETC) acting as well as the national representative in ISO/CEN, vehicle On Board Units architecture, security in telecommunications etc.
1993 – 2005 Communications business
New products R&D, business development for products like VSAT data services (EuroTel) or IP/SS7based international voice networks interconnect within CEEMEA region (Global One (JV of Sprint Int., FT, DT), acting as the external mentor at the of the CTU in Prague, FTS and member of governmental telecommunications liberalization committee
1976 – 1993 Czechoslovak Academy of Sciences, Geophysical Institute
Experimental laboratory and observatory methods in geophysics, studies of the variations and drift of the Earth magnetic field, data communication solutions within international geomagnetic observatory system (INTERMAG), computer modeling of magnetic material structures with on-line laboratory identification, laboratory study of the magnetic properties of rocks,
1972 – 1976 Industrial R&D Automatic control systems for the technological processes – CNC (Computer Numerical Control),Data communications and computer based control in the heavy duty technological processes,
Published above 125 scientific papers, monographs, books and University textbooks in physics, informatics, ITS, transport telematics and telecommunications.

Plenary Lecture 2

Image Processing Algorithm for Shape Recognition by Invariant Features

Professor Milan Tuba
Faculty of Computer Science
University Megatrend Belgrade
Serbia
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Abstract: Digital image processing is one of the most used procedures in the wide area of human activities like medicine, manufacturing, science etc. Image processing covers a range of techniques, from elementary pixel based and local signal processing for some desirable image transformations to more complex algorithms for segmentation, recognition and information deduction. This plenary lecture describes an algorithm for shape recognition based on invariant features. After initial processing, that may include noise reduction, processing that emphasizes certain features, initial thresholding and segmentation, the image is ready for shape recognition. However, since the detected shapes can be in various positions and distances which makes template based recognition difficult, invariant features of the shapes are preferred for recognition. Additional problem is that usually such features are not enough for reliable discrimination and additional elements are added to the algorithm to enhance classification. Some elements of the pre-processing as well as classification may be hard optimization problems so optimization metaheuristics, specifically from the swarm intelligence family, are used at these stages.

Brief Biography of the Speaker: Milan Tuba is Professor of Computer Science and Provost for mathematical, natural and technical sciences at Megatrend University of Belgrade. He received B. S. in Mathematics, M. S. in Mathematics, M. S. in Computer Science, M. Ph. in Computer Science, Ph. D. in Computer Science from University of Belgrade and New York University. From 1983 to 1994 he was in the U.S.A. first as a graduate student and teaching and research assistant at Vanderbilt University in Nashville and Courant Institute of Mathematical Sciences, New York University and later as Assistant Professor of Electrical Engineering at Cooper Union Graduate School of Engineering, New York. During that time he was the founder and director of Microprocessor Lab and VLSI Lab, leader of scientific projects and supervisor of many theses. From 1994 he was Assistant Professor of Computer Science and Director of Computer Center at University of Belgrade, from 2001 Associate Professor, Faculty of Mathematics, and from 2004 also a Professor of Computer Science and Dean of the College of Computer Science, Megatrend University Belgrade. He was teaching more than 20 graduate and undergraduate courses, from VLSI Design and Computer Architecture to Computer Networks, Operating Systems, Image Processing, Calculus and Queuing Theory. His research interest includes mathematical, queuing theory and heuristic optimizations applied to computer networks, image processing and combinatorial problems. He is the author or coauthor of more than 150 scientific papers and coeditor or member of the editorial board or scientific committee of number of scientific journals and conferences. Member of the ACM since 1983, IEEE 1984, New York Academy of Sciences 1987, AMS 1995, WSEAS, SIAM, IFNA.