

**Editors: Azami Zaharim, Kamaruzzaman Sopian, Nikos Mastorakis,
Valeri Mladenov**

Recent Researches in Applied Informatics & Remote Sensing



11th WSEAS International Conference on Applied Computer Science (ACS '11)

7th WSEAS International Conference on Remote Sensing (REMOTE '11)

Supported by Universiti Kebangsaan Malaysia



Penang, Malaysia, October 3-5, 2011

ISBN: 978-1-61804-039-8



RECENT RESEARCHES in APPLIED INFORMATICS and REMOTE SENSING

**Proceedings of the 11th WSEAS International Conference on Applied
Computer Science (ACS '11)
Proceedings of the 7th WSEAS International Conference on Remote
Sensing (REMOTE '11)**

**Penang, Malaysia
October 3-5, 2011**

Supported by Universiti Kebangsaan Malaysia

RECENT RESEARCHES in APPLIED INFORMATICS and REMOTE SENSING

**Proceedings of the 11th WSEAS International Conference on Applied
Computer Science (ACS '11)
Proceedings of the 7th WSEAS International Conference on Remote
Sensing (REMOTE '11)**

**Penang, Malaysia
October 3-5, 2011**

Published by WSEAS Press
www.wseas.org

Copyright © 2011, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: <http://www.worldses.org/review/index.html>

ISBN: 978-1-61804-039-8



World Scientific and Engineering Academy and Society

RECENT RESEARCHES in APPLIED INFORMATICS and REMOTE SENSING

**Proceedings of the 11th WSEAS International Conference on Applied
Computer Science (ACS '11)
Proceedings of the 7th WSEAS International Conference on Remote
Sensing (REMOTE '11)**

**Penang, Malaysia
October 3-5, 2011**

Editors:

Prof. Azami Zaharim, Universiti Kebangsaan, Malaysia
Prof. Kamaruzzaman Sopian, Universiti Kebangsaan, Malaysia
Prof. Nikos Mastorakis, Technical University of Sofia, Bulgaria
Prof. Valeri Mladenov, Technical University of Sofia, Bulgaria

International Program Committee Members:

Ronald Yager, USA
Amauri Caballero, USA
George Vachtsevanos, USA
Robert Finkel, USA
Demetrios Kazakos, USA
Theodore Trafalis, USA
Takis Kasparis, USA
Zhiqiang Gao, USA
Yan Wu, USA
Spyros Tragoudas, USA
Arkady Kholodenko, USA
Gregory Baker, USA
Galigeke Dattatreya, USA
Caroline Sweezy, USA
Asad Salem, USA
Dian Zhou, USA
Metin Demiralp, TURKEY
Olga Martin, ROMANIA
Panos Pardalos, USA
Constantin Udriste, ROMANIA
Kleanthis Psarris, USA
Andrew D. Jones, USA
Valeri Mladenov, BULGARIA
Neri F., ITALY
Chen S. Y., P. R. CHINA
Shyi-Ming Chen, R. O. C.
Yen K., USA
Rong-Jyue Fang, TAIWAN
Argyrios Varonides, USA
Nikolai Kobasko, USA
Xu Anping, P. R. CHINA
Hal J. Bloom, USA
Nicole Jacquinet-Husson, FRANCE
Jeffery J. Puschell, USA
Thomas H. Ahtor, USA
Steven A. Ackerman, USA
Bryan A. Baum, USA
Andrew Cheng, HONG KONG
Louis Garand, CANADA
Mitchell D. Goldberg, USA
Ronald J. Glumb, USA
Yongxiang Hu, USA
Hung-Lung A. Huang, USA
John Le Marshall, USA
Gin-Rong H. Liu, TAIWAN
Hanqing Lu, CHINA
Mervyn J. Lynch, AUSTRALIA
W. Paul Menzel, USA
Nicholas R. Nalli, USA
Shen-En Qian, CANADA
Henry E. Revercomb, USA
Guy Rochard, FRANCE
Leonid Roytman, USA
Timothy J. Schmit, USA
Joan Serra-Sagrasta, SPAIN
Makoto Suzuki, JAPAN
Pekka Toivanen, FINLAND
Si-Chee Tsay, USA
Fuzhong Weng, USA
Charles C. Wang, USA

Preface

This year the 11th WSEAS International Conference on Applied Computer Science (ACS '11) and the 7th WSEAS International Conference on Remote Sensing (REMOTE '11) were held in Penang, Malaysia, October 3-5, 2011. The conferences provided a platform to discuss programming languages, software engineering, educational software, object-oriented analysis and design, data mining, web engineering, mobile networks, algorithms, communication, operating systems, network modelling, satellite communications, sensor design and calibration, data acquisition and processing, image processing, pattern recognition, GIS, defence and security, environmental monitoring concepts, geological applications and climate, urban planning and development, remote sensing for energy and environmental systems 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 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.

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

Table of Contents

Plenary Lecture 1: Robust Speech Representations in Noisy Environments	12
<i>Tetsuya Shimamura</i>	
Plenary Lecture 2: General Problems of the Sampling-Reconstruction Procedure of Random Process Realizations	13
<i>Vladimir A. Kazakov</i>	
Plenary Lecture 3: Research of Rate Assignment on the Downlink of WCDMA	14
<i>CP. Ji</i>	
Plenary Lecture 4: Why Telehealth has not been Widely Implemented yet?	15
<i>Eko Supriyanto</i>	
Face Detection Methods	17
<i>Zyad Shaaban</i>	
Investigating the PROCESS Block for Memory Analysis	21
<i>Khairul Akram Zainol Ariffin, Ahmad Kamil Mahmood, Jafreezal Jaafar</i>	
Utilization of Modified Simulating Annealing as a Tool for Parallel Computing	30
<i>Jan Panus</i>	
Evaluation of the Existing Security Patterns in Software Security	35
<i>Salar Azimi Haredasht, Hassan Rashidi</i>	
FOREX Trend Classification using Machine Learning Techniques	41
<i>Areej Abdullah Baasher, Mohamed Waleed Fakhr</i>	
Comparative Study of Different Steganographic Techniques	48
<i>Akram M. Zeki, Adamu A. Ibrahim, Azizah A. Manaf, Shahidan M. Abdullah</i>	
A Contribution to Secure the Routing Protocol "Greedy Perimeter Stateless Routing" using a Symmetric Signature-Based AES and MD5 Hash	53
<i>Mohammed Erritali, Oussama Mohamed Reda, Bouabid El Ouahidi</i>	
Computational 3D Ultrasound Volumetric Rendering; an Object Oriented Open-Sources Approach	58
<i>Lai Khin Wee, Eko Supriyanto</i>	
Diagnosis of Breast Cancer using Hybrid Magnetoacoustic Method and Artificial Neural Network	64
<i>Maheza Irna Mohamad Salim, Abd Hamid Ahmad, Ismail Ariffin, Bustanur Rosidi, Eko Supriyanto</i>	
Automatic Region of Interest Generation for Kidney Ultrasound Images	70
<i>Wan Mahani Hafizah, Eko Supriyanto</i>	
Exploring WAP Capability in Transmitting Traffic Offences in Malaysia	76
<i>Bala Musa S., Mohd Hasan Selamat, Ali Abdalla Muftah</i>	

Search of Potential Vorticity Anomalies through Dry Intrusions Detection on Water Vapour Images	81
<i>K. Dejmal, J. Novotny</i>	
Decisions in the perspective Automated Artillery Fire Support Control System	87
<i>M. Blaha, L. Potuzak</i>	
Minimizing Energy Consumption in Wireless Sensor Networks Using Multi-hop Relay Stations	92
<i>Chutima Prommak, Sujitra Modhirun</i>	
General Problems of the Sampling-Reconstruction Procedure of Random Process Realizations	98
<i>Vladimir Kazakov</i>	
Parsing Algorithms for Grammars with Regulated Rewriting	103
<i>S. Turaev, M. Othman, M. H. Selamat, A. Krassovitskiy</i>	
An Algorithm for Generating MCCTree from XML Document	110
<i>Ummu Sulaim Sazaly, Mohd Hasan Selamat, Salmi Baharom, Marzanah Ab. Jabar</i>	
Rainfall Distribution Using Kriging Interpolation in Typhoon Rusa	115
<i>Min Seong Kim, Dong Hwan Kang, Kwang Ho Kim, Park Sa Kim, Kwang Ho Jin, Dae Il Seo, Byung Hyuk Kwon</i>	
Generalized Gamma Distributed Bayesian Estimator under Speech Presence Probability	118
<i>Atanu Saha, Tetsuya Shimamura</i>	
Remote Sensor Net for Wireless Temperature and Gas Measurement on Mining Dumps	124
<i>Radovan Hajovsky, Stepan Ozana, Pavel Nevřiva</i>	
Fifth Order Improved Runge-Kutta Method for Solving Ordinary Differential Equations	129
<i>Faranak Rabiei, Fudziah Ismail</i>	
A New Robust Digital Watermarking Algorithm Based on Genetic Algorithms and Neural Networks	134
<i>Prayoth Kumsawat, Kasama Pasitwilitham, Kitti Attakitmongcol, Arthit Srikaew</i>	
Transmission Characteristics of Grid-Shaped Networks on Ad-Hoc Wireless Sensor Networks	140
<i>Takayuki Hirano, Shinya Matsufuji, Takahiro Matsumoto</i>	
Fast Correlation Algorithm for an Orthogonal Set of Real-Valued Perfect Sequences from the Huffman Sequences	146
<i>Takahiro Matsumoto, Hideyuki Torii, Shinya Matsufuji</i>	
Pre-Post Accident Analysis Relates to Pre-Cursor Emotion for Driver Behavior Understanding	152
<i>Norzaliza M.Nor, Abdul Wahab, Hariyati Majid, Norhaslinda Kamaruddin</i>	
BIOSARP: Biological Inspired Self-Organized Secure Autonomous Routing Protocol for Wireless Sensor Network	158
<i>Kashif Saleem, Norsheial Fisal, Sharifah Hafizah</i>	
A Robust Optimum Response Surface Methodology based On MM-Estimator	166
<i>Habshah Midi, Mohd Shafie Mustafa, Anwar Fitrianto</i>	

Energy Efficiency Mechanism Using Mobile-Based Fermat's Spiral in WSN <i>Teddy Mantoro, Haroon Shoukat Ali, Media A. Ayu</i>	172
Probabilistic Real-time Routing Protocol for Mobile Ad-hoc Networks Based on IEEE 802.11b <i>Adel Ali Ahmed, Norsheila Fisal, Sharifah H. S. Ariffin</i>	178
The Effect of High Leverage Points on the Robust Autocorrelation Test in Multiple Linear Regression <i>Lim Hock Ann, Habshah Midi</i>	185
Application of Public Key Infrastructure in E-Business <i>A. Kazerooni, M. Adlband, O. Mahdiyar</i>	189
Using Semantic Web Technologies for Knowledge Management in E-Commerce Applications <i>Simona Elena Varlan</i>	194
DatabaseExplorer - Open Source Database Management Tool <i>Peter Janku, Michal Bliznak</i>	198
Authors Index	204

Plenary Lecture 1

Robust Speech Representations in Noisy Environments



Professor Tetsuya Shimamura

Saitama University

Japan

E-mail: shima@sie.ics.saitama-u.ac.jp

Abstract: Speech recognition is applied in many systems. In an environment without occurrence of noise, high recognition accuracy is achieved. However in noisy environments, it commonly shows a poor performance. To improve the performance of recognition system in noisy environments, we need a noise-robust speech representation. From this point of view, many methods have been proposed up to now. However, unfortunately, we are still struggling to find the robust speech representation form. Recently, Shannon and Paliwal proposed Autocorrelation Mel-frequency Cepstral Coefficients (AMFCC) method that uses higher-lag autocorrelation sequence as the input of Mel-frequency filter bank analysis to find Mel-frequency Cepstral Coefficients (MFCC) spectral representation. The recognizers that use this kind of spectral representations showed a better performance rather than the typical MFCC analysis directly on the speech signal. In this plenary speech, several robust speech representations are discussed, which include the MFCC and AMFCC spectral representations. And it is presented that robust features of speech are correlation functions and their modifications. Also, for the purpose of improving the performance of speech recognition in noisy environments, two methods using Autocorrelation and Double Autocorrelation sequences as the input of a Mel-frequency filter bank analysis to find MFCC spectral feature are derived. A word recognition experiment validates that both of the proposed methods achieve better results than the conventional MFCC spectral analysis on the input speech signal.

Brief Biography of the Speaker:

Tetsuya Shimamura received the B.E., M.E., and Ph. D. degrees in electrical engineering from Keio University, Yokohama, Japan, in 1986, 1988, and 1991, respectively. In 1991, he joined Saitama University, Saitama City, Japan, where he is currently a Professor. During this, he joined Loughborough University, UK, and The Queen's University of Belfast, UK, in 1995 and 1996, respectively, as a visiting Professor. He is an author or co-author of 6 books, and member of the organizing committee of several international conferences. His interests are in digital signal processing and its applications to speech, image and communication systems.

Plenary Lecture 2

General Problems of the Sampling-Reconstruction Procedure of Random Process Realizations



Professor Vladimir A. Kazakov

National Polytechnic Institute of Mexico

ESIME-Zacatenco, SEPI, Department of Telecommunications

Av. IPN, s/n, ESIME-Zacatenco, Ed. "Z-4", 3-r piso, D.F.

C.P. 07738, Mexico

E-mail: vkaz41@hotmail.com

Abstract: The Sampling-Reconstruction Procedure (SRP) of random process and field realizations is a very popular problem during a lot of decades. Unfortunately, this problem is completely not solved until present time. There is a well-known Balakrishnan/s theorem. This theorem describes SRP of stationary random process realizations. This theorem is characterized by some principal drawbacks: the probability density function (pdf) is not used; the mathematical model of sampled process is not realizable; the number of samples is equal to infinity; the reconstruction procedure is linear and the same for all types of random processes; the reconstruction error is equal to zero for all types of the processes.

In order to overcome these drawbacks, we suggest to use the conditional mean rule (CMR) for the statistical description of the SRP of random processes and fields. We take into account the pdf of sampled processes and fields. We can analyze the SRP of the following types: the process can be stationary or no stationary, the number of samples is arbitrary and limit, the intervals between neighbor samples can be arbitrary or periodical, etc. Generally, one can declare: any random process must have its own optimal reconstruction algorithm and reconstruction error function. In the case of Gaussian processes the reconstruction function is linear function and the reconstruction error function does not depend on the values of samples. If the sampled process is non Gaussian, then the reconstruction function is a non linear function of samples and the reconstruction error function depends on the samples. We illustrate these points by a lot of examples, including the SRP with jitter. Majority of our results are related with the SRP of continuous processes. But, additionally, we give same new results with respect of the SRP of processes with jumps.

Brief Biography of the Speaker:

Vladimir Kazakov was born in Moscow region in Russia in 1941. He received the Ph. D. degree in 1967 and the Full Doctor of Science degree in 1990 from Moscow Power Engineering Institute (Technical University). During 1966 – 1996 he worked in Ryazan Radioengineering University. Since 1996 until the present time he has worked in the National Polytechnic Institute of Mexico. His principal research interests lie in the statistical communication theory. He is the author of more than 200 scientific publications, among of them 2 books, 2 chapters of books, more than 50 papers in the International Journals, 17 patents of Russia and 2 patents of Mexico.

Plenary Lecture 3

Research of Rate Assignment on the Downlink of WCDMA



Professor CP. Ji

School of Electronics and Information Engineering
Liaoning Technical University
No.188 Longwan South Street; Huludao 125105
P. R. CHINA
E-mail: jcpcommunication@yahoo.cn

Abstract: As the economy and various social undertakings improving in recent years, the communication demand for people has been increasing, more and more high-speed transports provide important information service in the daily life. However, mobile communication systems have gradually faced the problem that communication channel is not enough and transmission rate is insufficient. This topic will combine the basic utility function of power control technology with the station assignment of power control technology. Voice services for the system can be met the requirements only by using power control. But for data services, the data rate may have a sudden changing characteristic. Therefore, the inappropriate allocation of rate may lead to the waste of resources and the decline of quality of wireless service. This topic will focus on the rate assignment on the downlink for WCDMA data users. The algorithm maps the QoS of the data users into a family utility function which is reflected the total throughput and the fairness, delay (finite retransmission times), error rate and the total system transmission power are as the constraint conditions. And the total effectiveness of all users is as the goal, we gain the user's SIR targets and data rates. The algorithm has a hierarchical structure, in which data-rate of mobile station is adjusted according to the feedback from the base station, and SIR target is adjusted by the mobile station according to their local information.

Brief Biography of the Speaker:

CP. Ji graduated from the Huaibei Normal University, China, in 1993. He is now the professor of Liaoning Technical University. As the senior Member of WASE and IACSIT, His research interests are computer communication & networks, wireless communication, digital signal processing, computer science and technology. He is the author of more than 70 papers published in international journals and conference proceedings, and invited book chapters. Meanwhile, he is also the referee for journals, conferences and research proposals.

Plenary Lecture 4

Why Telehealth has not been Widely Implemented yet?



Professor Eko Supriyanto

Head of Department for Clinical Science and Engineering
Faculty of Health Science and Biomedical Engineering
Universiti Teknologi Malaysia (UTM)
Johor Bahru, Malaysia
E-mail: eko@biomedical.utm.my

Abstract: Evolution from wired to wireless communication systems has brought great advantages to many sectors including telehealth services. Telehealth allows health care professionals to diagnose and treat patients in remote locations using telecommunication technology. In few developed countries, telehealth has become standard medical practice. Over 10,000 peer review papers have been published during past 20 years supporting the clinical effectiveness and cost savings of telehealth. Unfortunately, telehealth has not been implemented widely yet. In order to identify the resistance and enabling factors for the implementation of telehealth especially in developing countries, a comprehensive study has been done and will be presented in this conference. This includes communication and application technologies, standard and legal issues, cost and business models, as well as user and key player requirements. The study result shows that technology has become an important enabling factor. Some technologies even have fulfilled the critical requirements such as reliability, user friendliness, simplicity, safety, security, cost effectiveness, connectivity and compatibility. However, without solving of related legal issues, implementation of excellence business model as well as user acceptance, telehealth will be difficult to be implemented widely. Some telehealth models also will be presented in this conference. It is hoped that the developed model can be widely implemented in the near future. This will benefit to people in rural areas, developing countries, correction facilities (prison and rehabilitation centre), schools, mobile units, disaster areas, and industrial units (mines).

Brief Biography of the Speaker:

Assoc. Prof. Dr.-Ing. Eko Supriyanto is the head of Department for Clinical Science and Engineering, Universiti Teknologi Malaysia. He obtained his PhD in electronics engineering from University of Federal Armed Forces Germany, Hamburg. He worked as an academic staff at this university and a product development manager in private company in Duesseldorf, Germany, before moved to Malaysia. He was also a visiting professor at Ilmenau University of Technology, Germany. His involvement in the computer network and internet has been started with the development of Radio Packet Network Operating System (RPNOS) in 1994. He has 12 patents with some of them are for telemedicine products. He also obtained more than 20 international awards including awards for telemedicine system and interface. He has more than 100 publications in international journals and book chapters and one of authors in the Book of "Advances in Telemedicine: Technologies, Enabling Factors and Scenarios" edited by University of Medicine, Berlin, published by INTECH in March 2011. He was also active in WSEAS conferences since 2009 as speaker for 27 papers and session chairman.

Authors Index

Abdullah, S. M.	48	Ibrahim, A. A.	48	Nor, N. M.	152
Adlband, M.	189	Jaafar, J.	21	Novotny, J.	81
Ahmad, A. H.	64	Jabar, M. A.	110	Othman, M.	103
Ahmed, A. A.	178	Janku, P.	198	Ozana, S.	124
Ali, H. S.	172	Jin, K. H.	115	Panus, J.	30
Ann, L. H.	185	Kamaruddin, N.	152	Pasitwilitham, K.	134
Ariffin, I.	64	Kang, D. H.	115	Potuzak, L.	87
Ariffin, K. A. Z.	21	Kazakov, V.	98	Prommak, C.	92
Ariffin, S. H. S.	178	Kazerooni, A.	189	Rashidi, H.	35
Attakitmongcol, K.	134	Kim, K. H.	115	Reda, O. M.	53
Ayu, M. A.	172	Kim, M. S.	115	Rosidi, B.	64
Baasher, A. A.	41	Kim, P. S.	115	Saha, A.	118
Baharom, S.	110	Krassovitskiy, A.	103	Saleem, K.	158
Blaha, M.	87	Kumsawat, P.	134	Salim, M. I. M.	64
Bliznak, M.	198	Kwon, B. H.	115	Sazaly, U. S.	110
Dejmal, K.	81	Mahdiyari, O.	189	Selamat, M. H.	76, 103, 110
El Ouahidi, B.	53	Mahmood, A. K.	21	Seo, D. I.	115
Erritali, M.	53	Majid, H.	152	Shaaban, Z.	17
Fakhr, M. W.	41	Manaf, A. A.	48	Shimamura, T.	118
Faranak, R.	129	Mantoro, T.	172	Srikaew, A.	134
Fisal, N.	158, 178	Matsufuji, S.	140, 146	Supriyanto, E.	58, 64, 70
Fitrianto, A.	166	Matsumoto, T.	140, 146	Torii, H.	146
Fudziah, I.	129	Midi, H.	166, 185	Turaev, S.	103
Hafizah, S.	158	Modhirun, S.	92	Varlan, S. E.	194
Hafizah, W. M.	70	Muftah, A. A.	76	Wahab, A.	152
Hajovsky, R.	124	Musa, B. S.	76	Wee, L. K.	58
Haredasht, S. A.	35	Mustafa, M. S.	166	Zeki, A. M.	48
Hirano, T.	140	Nevriva, P.	124		