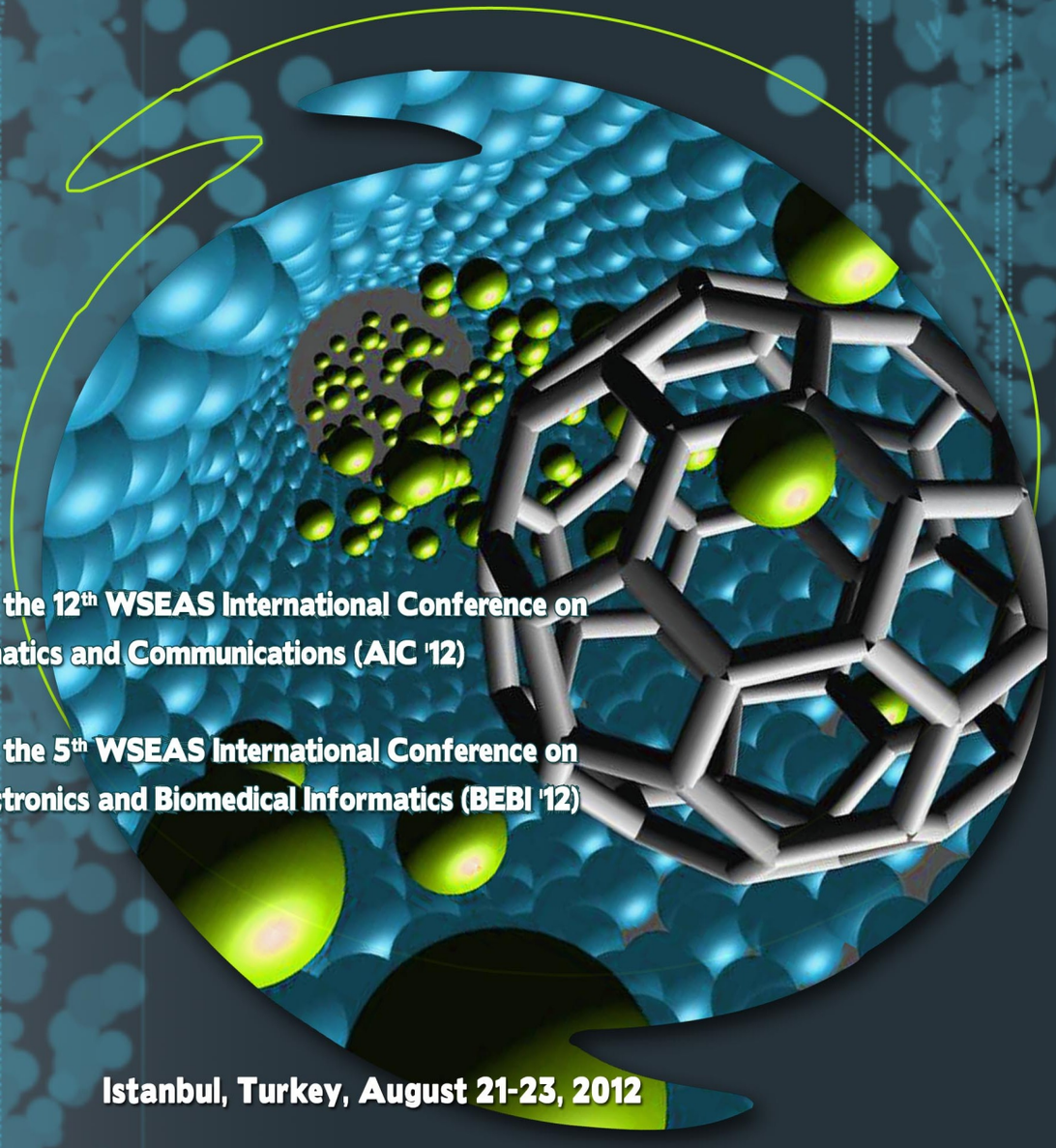
Editors
Metin Demiralp
Alexander N. Pisarchik

Advances in Applied Information Science



- Proceedings of the 12th WSEAS International Conference on Applied Informatics and Communications (AIC '12)
- Proceedings of the 5th WSEAS International Conference on Biomedical Electronics and Biomedical Informatics (BEBI '12)

Istanbul, Turkey, August 21-23, 2012

Recent Advances in Electrical Engineering Series | 4

Advances in Applied Information Science

ADVANCES in APPLIED INFORMATION SCIENCE

Proceedings of the 12th WSEAS International Conference on Applied Informatics and Communications (AIC '12)

Proceedings of the 5th WSEAS International Conference on Biomedical Electronics and Biomedical Informatics (BEBI '12)

Istanbul, Turkey
August 21-23, 2012

Recent Advances in Electrical Engineering Series | 4

Published by WSEAS Press
www.wseas.org

ISSN: 1790-5117
ISBN: 978-1-61804-113-5

ADVANCES in APPLIED INFORMATION SCIENCE

Proceedings of the 12th WSEAS International Conference on Applied Informatics and Communications (AIC '12)

Proceedings of the 5th WSEAS International Conference on Biomedical Electronics and Biomedical Informatics (BEBI '12)

Istanbul, Turkey
August 21-23, 2012

Published by WSEAS Press
www.wseas.org

Copyright © 2012, 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 no less that two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: http://www.worldses.org/review/index.html

ISSN: 1790-5117
ISBN: 978-1-61804-113-5

World Scientific and Engineering Academy and Society

ADVANCES in APPLIED INFORMATION SCIENCE

Proceedings of the 12th WSEAS International Conference on Applied Informatics and Communications (AIC '12)

Proceedings of the 5th WSEAS International Conference on Biomedical Electronics and Biomedical Informatics (BEBI '12)

Istanbul, Turkey
August 21-23, 2012

Editors:
Prof. Metin Demiralp, Istanbul Technical University, Turkey
Prof. Alexander N. Pisarchik, Centro de Investigaciones en Óptica, Mexico
International Program Committee Members:
Kevin Kam Fung Yuen
Andrea Piras
Elena Zaitseva
Muhammad Musaddique Ali Rafique
Yuqing Zhou
John Antonopoulos
Petr Hajek
Tiberiu Socaciu
Yong Kheng Goh
Claudiu Mereuta
Pavel Varacha
Yoshiyuki Tohno
Daniela Cristina Momete
Mansooreh Shariatmadare Tehrani
Eleazar Jimenez Serrano
Gabriel Badescu
Josip Music
Hongjun Liu
Ozlem Coskun
Photios Anninos
Kumaravel
Panagiotis Gioannis
Dzenana Donko
Anastasios Salis
Daniela Litan
S. Sarala Subramani
Mirela-Catrinel Voicu
Zakaria Zubi
Hung-Jen Yang
Mohammad Al-Amri
Sk. Sarif Hassan
Humberto Varum
Claudia A. F. Aiub
Tsvetelina Draganova
Arun Sharma
Zulkefli Mansor
José Metrôlho
Ming-Shen Jian
Ana-Cornelia Badea
Jose Alberto Duarte Moller
Manjunath KN KN
Svetla Vassileva
Álvaro Santos
Onintra Poobrasert
Zengshi Chen
Constantino Martins
Vimala Chinnaraj
Carla Pinto
Md. Jakir Hossen
Ivan Pogarcic
Kyunghee Lee
Yi-Chao Wu
Aw Yoke Cheng
Baritz Mihaela
Mihai Timis, Mihai
Corina Carranca
Howe Hing Tang Collin
Marcio Dorn
Serban Corina
Giovanni Aiello
Satish Kumar Duraiswamy
Walid Oueslati
Eleonora Catsigeras
Krishnaveni Marimuthu
Mahboobeh Mahmoodi
Romana Ishrat
Eustache Muteba Ayumba
Inácio Fonseca
Paresh Rathod
Seong Baeg Kim
Dana Anderson
YuLung Wu
Vinod DS
Carlos Rivas-Echeverria
Miroslav Voznak
Antigona Trofor
Chunwei, Lu Wini Lu
Khin Wee Lai
Stoican Mirela
Alexander N. Pisarchik
Calin Ciufudean
Hime Aguiar
Thaweesak Yingthawornsuk
Yang Zhang
Ankit Patel
Wan Hussain Wan Ishak
Larion Alin
Jerzy Respondek
JainShing Wu
Kostantinos Kalovrektis
Manuela Panoiu
Gabriela Mircea
Md. Shamim Akhter
Hugo Cruz-Suarez
Elena Bautu
Theodoros Xanthos
Martin Skutil
Montri Phothisonothai
Vijay Kumar G
Pedro Nucci
Yu Zhang
Nikos Loukeris
Lukas Kouril
Dhaval Vyas
Alejandro Fuentes-Penna
Sorinel Oprisan
Valentina E. Balas
Abdel-Badeeh Salem

Preface

This year the 12th WSEAS International Conference on Applied Informatics and Communications (AIC '12) and the 5th WSEAS International Conference on Biomedical Electronics and Biomedical Informatics (BEBI '12) were held in Istanbul, Turkey, August 21-23, 2012. The conferences provided a platform to discuss applied informatics, system architecture, operating systems, data bases, optical computers, microprocessors, broadband networks, communications, applied electromagnetics, computer networks, military communications, biomedical circuits, neural engineering, biomaterials, biomechanics, medical imaging 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

Table of Contents

Plenary Lecture 1

Language Technologies – Theories and Applications

Assistant Professor Velislava Stoykova
Bulgarian Academy of Sciences
Institute for Bulgarian language
Sofia, Bulgaria
E-mail: vstoykova@yahoo.com

Abstract: Language technologies are very lively interdisciplinary area of research and applications in the fields of informatics, information technologies and linguistics. Natural languages are the common spread way of communication and they have been studied and described from ancient times till nowadays. At the same time, the information technologies applications offer fast ways of processing and exchanging linguistic information of different kind – textual, audio, visual, etc. by means of various programming products and some of them (like e-mails) are widely used nowadays for communication purposes independently of the language used. Language technologies, also, are applied very successfully in language research, and particularly in lexicography for fast production and updating of different language reference sources like dictionaries, encyclopedias, etc. In our talk, we are going to analyze the general ideas and problems in design and applications of language technologies products including with a multilingual purposes.

Brief Biography of the Speaker: Prof. Dr. Velislava Stoykova has received her MA degree from Sofia University. In 2004 she has received a PhD in computational linguistics and afterward, she is working active in the field. Her major areas of interest are: language modelling, natural language processing, computational lexicography, e-learning. From 1990 to 1995 she worked at Bulgarian Academy of Sciences, Institute for Parallel Processing as a programmer. From 1995 to 2011 she joined the research team of the Institute for Bulgarian language of Bulgarian Academy of Sciences as a researcher. From 2011 she works at the Bulgarian Academy of Sciences, Institute for Bulgarian language as a professor. Prof. Dr. Stoykova has one book, more than 30 published papers in international conference proceedings and scientific journals, and is a co-author of two dictionaries. She is a member of the research team at the Institute for Bulgarian Language. She had worked on many research projects (national and international) as a member of the research team and as a project leader. Prof. Dr. Stoykova is a member of Bulgarian Lexicographic Society and a member of Bulgarian Artificial Intelligence Association.

Plenary Lecture 2

Comparative Study and Simulations for Classic and Advanced Models of the Electric Arc

Assistant Professor Manuela Panoiu
Electrical Engineering and Industrial Informatics Department
Engineering Faculty of Hunedoara
Polytechnic University of Timisoara
Romania
E-mail: manuela.panoiu@fih.upt.ro

Abstract: The electric arc furnace (EAF) is one of the modern ways of making steel. Nowadays, electric arc furnaces are designed for very large power input ratings. The electric arc furnace behaves like a non-linear load. Due to the nature of both, the electrical arc and the melt down process, these devices, especially the UHP (Ultra High Power) EAF's can cause large power quality problems, mainly harmonics, interharmonics, flicker and voltage unbalances. Previous studies have shown that the electric arc furnace is chaotic in nature and standard control techniques are not effective. However, because that, heuristic human control is used on electric arc furnaces. This paper, presents a study regarding the modeling and simulating the electric arc. Some measurements made on an EAF in an industrial plant are also present. The measurements demonstrate the negative effects of the nonlinearity of the electric arc in the electric supply. In order to make a study for efficient control the EAF and for improving the electric power quality it was necessary to find some models of the electric arc, models that simulate the nonlinearity of the electric arc. It was analyze by simulation several classic and advanced models of the electric arc. Will be present some of the classic models: models based on non – linear and time – variable resistances, models based on the linear approximation of voltage – current characteristic of the electric arc and models where the voltage and current are related by hyperbolic functions (using the diameter or length of the arc). Advanced models that used artificial neural networks will be also present. The results of the simulation were compared with the measurements results. It was compared the waveforms of the three phase arc currents and voltages, the current – voltage characteristics, the electric powers and the total harmonics distortions, THD, of the currents and voltages.

Brief Biography of the Speaker: Manuela Panoiu was born in 1965, graduate the Computer Science Faculty, Polytechnic University of Timisoara in 1989. She receives his PhD degree in Electrical Engineering in 2001 at Polytechnic University of Timisoara and is currently Assistant Professor at the Electrical Engineering and Industrial Informatics Department of Engineering Faculty of Hunedoara, Polytechnic University of Timisoara, Romania. Her research interests focus on advanced computer programming, modelling and simulating systems, and artificial intelligence. She has until now published over 80 research papers in Journals and conferences and participate to 10 research projects.

Plenary Lecture 3

On Improved Modeling of Survivability-Supported Traffic Engineering in Multi-Service Networks

Professor Dimitris Karras
Chalkis Institute of Technology
Dept. Automation, Evoia, Greece
E-mail: dakarras@hotmail.com

Abstract: In this plenary lecture, a number of optimisation models and iterate heuristic algorithms that address the survivability-supported Traffic Engineering (TE) problem in multi-service networks for multimedia are presented. In such networks traffic demands with different Quality of Service (QoS) and survivability requirements (e.g. existence of a node disjoint backup path for each primary path) inhere. The optimisation models for engineering the QoS traffic with different survivability prerequisites and the Best-Effort (BE) traffic are based on special admission control/routing Mixed Integer Programming (MIP) and Linear Programming (LP) optimisation sub-problems, which are solved sequentially. LP relaxations of the MIP sub-problems are also provided. The iterative heuristic TE algorithms are based on a modified version of the Dijkstra's algorithm. The above methods are used for the solution of the TE problem in two different networks and their performance is compared. An integrated approach based on the aforementioned work, for prioritised 1:1/1+1 protection and restoration-supported TE in multi-service networks, in the case of single or multiple node/link failure(s), is also presented and tested.

Brief Biography of the Speaker: Dimitrios A. Karras received his Diploma and M.Sc. Degree in Electrical and Electronic Engineering from the National Technical University of Athens, Greece in 1985 and the Ph. Degree in Electrical Engineering, from the National Technical University of Athens, Greece in 1995, with honours. From 1990 and up to 2004 he has collaborated as visiting professor and researcher with several universities and research institutes in Greece. Since 2004, after his election, he has been with the Chalkis Institute of Technology, Automation Dept., Greece as associate professor in Digital Systems and Signal Processing as well as with the Hellenic Open University, Dept. Informatics as a visiting professor in Communication Systems (since 2002 and up to 2010). He has published more than 50 research refereed journal papers in various areas of pattern recognition, image/signal processing and neural networks as well as in bioinformatics and telecommunications and more than 150 research papers in International refereed scientific Conferences. His research interests span the fields of pattern recognition and neural networks, image and signal processing, image and signal systems, biomedical systems, communications, networking and security. He has served as program committee member in many international conferences, as well as program chair and general chair in several international workshops and conferences in the fields of signal, image and automation systems. He is, also, editor in chief of the International Journal in Signal and Imaging Systems Engineering (IJSISE), topics editor in chief of the International Journal of Digital Content Technology and its Applications (JDCTA) as well as associate editor in various scientific journals. He has been cited in more than 380 research papers, his h-index is 10 and his Erdos number is 5.

Plenary Lecture 4

eHealth Record vs Personal Privacy: Benefits and Concerns

Professor Dimitrios Xanthidis
Department of Compuer Science
Imam University
Riyadh, Kingdom of Saudi Arabia
E-mail: xanthidisdim@ccis.imamu.edu.sa

Abstract: There is a conflict identified between the utilization of the information technology in developing an online database system to keep an electronic health record of patients' and the need to protect the individual's personal data. A total of 301 individuals participated in this study from all walks of life and various professions, including medical practitioners, nurses, technical experts, patients and academics. The majority of the local population is in favor of the plan in general but many ask for more information and a lot of parameters must be studied before the initiation of the plan to avoid conflict with various groups of people opposing the plan mainly due to lack of information on its details.

Brief Biography of the Speaker: Dr. Dimitrios Xanthidis holds a Phd degree in electronic information sciences in 2008 from UCL (University College London) after receiving his M.Sc. in Information Systems from Hawaii Pacific University in 1996 and his B.Sc. in Computer Science from the same institution in 1994. His main areas of interest are in relational databases, object-oriented analysis and design, object-oriented programming, algorithms as to Computer Science and eSociety, eHealth, eGovernment, Social Media, eCommerce, eLearning and Knowledge Economy as to Information Sciences. From 1996 to 1998 he headed the Pythagoras Institute department of Computer Programming, from 1998 to 2001 he headed XINI Institute department of Computing, from 2002 to 2009 he headed DEI College and New York College departments of Computer Science and from 2011 till now he is an assistant professor of Computer Science at Imam University in Riyadh, Saudi Arabia. Dr. Dimitrios Xanthidis has a chapter in one book and more than 20 published papers in international conference proceedings and scientific journals. He is a member of the academic board of the Computer and Information Sciences College at Imam University, member of the Graduation Project Committee, member of the scientific committee of a few conferences and member of the research team in two research organizations.

Plenary Lecture 5

Nonlinear Tracking: The Approach Based on Extended Kalman-Like UFIR Filtering

Professor Yuriy S. Shmaliy
Department of Electronics
DICIS, Guanajuato University
Salamanca, 36855, Mexico
E-mail: shmaliy@salamanca.ugto.mx

Abstract: Tracking of moving objects is often provided employing the first-order and sometimes the second-order extended Kalman filters. The problem we meet here is associated with the process noise covariance which cannot always be specified correctly and also with the model temporary uncertainties. In this lecture, we show that an efficient remedy against these problems is unbiased averaging associated with finite impulse response (FIR) filtering. For suboptimal nonlinear tracking in discrete-time state-space with additive white noise, we accordingly derive and discuss the first- and second-order extended Kalman-like unbiased FIR filters (EFIR1 and EFIR2, respectively). Unlike the extended Kalman filter (EKF), the EFIR1 one does not require noise covariances and initial errors. By virtue of this, it demonstrates better robustness against temporary uncertainties in real world. Only within a narrow region around an actual process noise covariance, the EFIR filter falls a bit short of EKF and it demonstrates better performance otherwise. We show that the optimal averaging interval for EFIR filters can be determined via measurement in a "learning" circle and then re-determined and updated whenever necessary. We also notice that the second-order approximation can improve the local performance, but it can also deteriorate it. Thus, there can be given no definitive recommendations about its use, at least for tracking problems.

Brief Biography of the Speaker: Dr. Yuriy S. Shmaliy is Full Professor in Electrical Engineering of the University of Guanajuato, Mexico, since 1999. He received the B.S., M.S., and Ph.D. degrees in 1974, 1976 and 1982, respectively, from the Kharkiv Aviation Institute, Ukraine. In 1992 he received the Dr.Sc. degree from the Soviet Union Government. In March 1985, he joined the Kharkiv Military University. He serves as Full Professor beginning in 1986 and has a certificate of Professor from the Ukrainian Government in 1993. In 1993, he founded and, by 2001, had been a director of the Scientific Center "Sichron" (Kharkiv, Ukraine) working in the field of precise time and frequency. His books Continuous-Time Signals (2006) and Continuous-Time Systems (2007) were published by Springer, New York. His book GPS-based Optimal FIR Filtering of Clock Models (2009) was published by Nova Science Publ., New York. He also edited a book Probability: Interpretation, Theory and Applications (Nova Science Publ., New York, 2012) and contributed to several books with invited chapters. Dr. Shmaliy has 292 Journal and Conference papers and 80 patents. He is IEEE Fellow; was rewarded a title, Honorary Radio Engineer of the USSR, in 1991; was listed in Marquis Who's Who in the World in 1998; was listed in Outstanding People of the 20th Century, Cambridge, England in 1999; and was listed in The Contemporary Who's Who, American Bibliographical Institute, 2003. He is currently an Associate Editor for Recent Patents on Space Technology. He serves on the Editorial Boards of several International Journals and is a member of the Organizing and Program Committees of various Int. Symposia. His current interests include statistical signal processing, optimal estimation, and stochastic system theory.

Plenary Lecture 6

Energy & Environmental Problems Facing the Third World and Their Probable Solutions

Professor D. P. Kothari
Director General, RGI, Nagpur
Former Director General, VITS Indore
Former Vice Chancellor, VIT Vellore
Former Director I/c IIT Delhi
INDIA
E-mail: dpk0710@yahoo.com

Abstract: This paper briefly discusses some important energy problems facing the third world countries and presents the current electric generation scenario in most of the developing countries with facts and figures in respect of India. It is hoped that, with systematic, advance planning, through measures like co-generation, energy management, and energy conservation, the electric energy supply scenario of AD 2020 will be free of the perennial problems of power shortages, voltage fluctuations etc.

Brief Biography of the Speaker: Prof. Kothari is the recipient of National Khosla Lifetime achievement Award [2005] from Indian Institute of Technology, Roorkee, Eminent Engineering Personality from the Institution of Engineers [2001]. Prior to his assuming charge as Director General of RGI Nagpur he was Director General of VGI Indore (2010-2011) .He served as Vice Chancellor of VIT University for 3 years (2007 – 2010). He served as Director i/c, IIT, Delhi [2005], Deputy Director [Administration], IIT, Delhi [2003-06], Principal, VRCE, Nagpur [1997-98], Head, Centre for Energy Studies, IIT, Delhi [1995-97].
He was visiting professor at RMIT, Melbourne, Australia in 1982-83 and 1989 for two years. He was NSF Fellow at Purdue University, USA in 1992. Published / presented 712 research papers in various reputed journals and conferences, guided 32 PhDs, 64 M.Tech Thesis, authored 27 books in Power Systems and other allied areas. Prof. Kothari is a Fellow of the Indian National Academy of Engineering [FNAE], Indian National Academy of Sciences [FNASc], Institution of Engineers [FIE] and Fellow, IEEE.

Plenary Lecture 7

Biomedical Informatics; New Insights in Next Generation of Clinical and Basic Human Biological Sciences

Assis. Prof. Babak Khalili Hadad
Dept. of Biological Sciences
Faculty of Sciences
Azad University
Roudehen branch, Tehran
Iran
E-mail: khalili@riau.ac.ir

Abstract: The mechanisms of many diseases are not well known. Because of that a lot of materials and drugs are utilized in medical fields without any useful reason. The ambiguous unsolved problems are time-consuming for physicians and make the treatment processes hard. Many people suffer from the invasive treatments because the mechanism of their illness is not well known and, consequently, there is no effective drug or treatment method against their medical problem. Todays, with the help of Biomedical informatics (BMI) as a new multi-purposes interdisciplinary science, application of biomedical knowledge and information to improve patient care and medical sciences research are facilitated. Study on cellular and/or molecular modeling and simulation, drug design, docking and computational biochemistry, sequence analysis, analysis of gene expression and regulation, protein expression, mutations in cancer are some parameter that are facilitated by such Bioinformatical approaches.
Our research lines focus on clinical investigations in combination to Biomedical informatics. The mechanisms of unknown errors of bone formation, hormonal malfunctions, consequently, drug design and docking are the main topics of interests.
The main ways to join computer sciences to molecular medical sciences will be explained and a new insight into Heterotopic ossification by focusing on the role of Transforming growth factor – β super family, as well as the main biomedical causes of Adolescent idiopathic scoliosis (AIS) will be presented as two examples.

Brief Biography of the Speaker: Babak Khalili Hadad graduated from Azad University- Sciences and Research Branch in Biochemistry, where he has started to combine Biomedical sciences with Bioinformatics to explain the mechanism of some diseases. Computer-aided drug design and delivery, docking and ligand- target protein interaction are among his interests. Before that he had graduated in Msc. degree of Clinical and applied Biochemistry from Kerman University of Medical Sciences, and B.Sc. of Cell and Molecular Biology, from Shiraz University of Sciences. He has started to teach Biochemistry (Advanced animal & plant metabolism, Control of metabolism, Pure and Clinical Enzymology, Clinical biochemistry, Bioinformatics) and Molecular biology since 1998. He has been in the organizing committee of some Bioinformatics congresses up to now and also, the editorial board member of American Journal of Bioinformatics Research. He has also been awarded several times as Top university professor and Top researcher. His research interests in Azad University, Faculty of Sciences - Roudehen Branch focus on Biochemical aspects of Bone diseases, specially, Heterotopic ossification and Scoliosis, Blood disorders and Hormonal malfunctions.
He has 17 published papers and 3 submitted as well as 16 presentations in national and international congresses.

Plenary Lecture 8

Extremely Low Frequency Magnetic Field Effects on Nerve Conduction Velocity, Depolarization Amplitude and Latency on Nerve Action Potential

Associate Professor Selcuk Comlekci
Department of Electronics and Communication Engineering
Faculty of Engineering
Suleyman Demirel University
TURKIYE
E-mail: selcukcomlekci@sdu.edu.tr

Abstract: The aim of this study was to investigate the effects of extremely low frequency (ELF) magnetic field on nerve conduction velocity, depolarization amplitude and latency. The nerve was exposed to extremely low frequency magnetic field by utilizing a special Helmholtz applicator. The experiments were carried out on a group of healthy volunteers. The group consisted of 20 persons, aged 30–52 years, 10 male and 10 female. This study two main states were conducted; pre-exposure group and post-exposure group. 4-channel NCS/EMG/EPS digital electromyography was used for the recording on latencies, depolarization amplitude and nerve conduction velocity from pre-exposure and post exposure group. The values of distal and proximal responses from median nerve were obtained as procedure. In this study demonstrated that affect power frequency with 50 Hz-1 mT magnetic field on human median nerve. 50 Hz-1 mT magnetic field should not be recognized as safe for conduction mechanism on a nerve.

Brief Biography of the Speaker: Selcuk Comlekci received his B.S. degree in Electrical Engineering from Hacettepe University, in 1980, and M.Sc. degree from Science Instıtute of Suleyman Demirel University in 1996 and received his Ph.D. degree in Electrical and Electronics Engineering from Sakarya University, Turkey, in 2002. His research interests are RF Measurement and Instrumentation, Neuro-Fuzzy Applications, Soft Computing Techniques, Electromedical Design, EMI/EMC Applications, and general Biomedical Engineering. From 1982 to 1996, he was a Senior Engineer in Official Duties. Dr. Comlekci is associate professor at Department of Electronics and Communication Engineering, Suleyman Demirel University, Isparta, Turkey. He gives much kind of lectures both for undergraduate and graduate at his department. He is Senior Member of IEEE (2007), URSI, and BIOELECTROMAGNETICS Societies. Also he has current membership in IEEE, EMC Society and EMO (Turkish Chamber of Electrical Engineering). IEEE, ICES (International Comittee on Electromagnetic Safety) chose him as a member of ICES TC95 Main Committee in 2008. He is the third member from Turkey in this comittee. He is Independent Expert for FP7 (Independent Expert, FP7, Cordis, Expert Management Module, Number:EX2002B014021). He handle "Excellent Participant Award", '95 TCDC SHP Training Workshop (Funded by UNDP), 1995. He placed in “Listing in IBC Outstanding Scientists of the 21st Century, Inaugural Edition, 2007” and “Listing in Marquis Who's Who in Science and Engineering, 9th Edition, 2006-2007”. Dr. Comlekci has founded the first Turkish Chapter of IEEE, Engineering in Medicine and Biology Society in 2005. He is currently Chair of the Chapter. He has published nearly 100 technical papers in journals and conference proceedings. He is conducting national and international Research Projects in Biomedical Engineering. He worked at Arizona State University, USA, Ira A. Fulton School of Engineering, Harrington Department of Bioengineering as an Adjunct Faculty and Visitor Scientist in Dr. Akay’s Lab during 2007 for post-doc study.

Plenary Lecture 9

Finite Element Analysis of Teeth Restored with Ceramic Crowns

Associate Professor Liliana Sandu
University School of Dentistry
Specialization Dental Technology
Department of Prostheses Technology
„Victor Babeş" University of Medicine and Pharmacy Timişoara
Romania
E-Mail: lilianasandu@gmail.com

Abstract: Owing to improved material properties of ceramics, jacket crowns have become popular as esthetic restorations. However, in order to function for a long term, it is necessary to ensure that they possess high mechanical strength and that microleakage should be avoided as much as possible. Therefore, in choosing a material for the definitive restorations, it should be one where stress will not concentrate at the cervical area. Finite element analyses have been used for many investigations, because they can reproduce structures of various shapes of teeth with many elements defined with specific Young's modulus and Poisson's ratio values. In this manner, the distribution and magnitude of stress at any point can be precisely analyzed. The objective of the studies was to evaluate, by finite element analysis, the influence of different parameters on the stress distribution in teeth prepared for full ceramic crowns and in the restorations. The geometry of the teeth were obtained by 3D scanning using a manufactured device. The nonparametric modeling software was used to obtain the shape of the teeth structures. Different tooth preparations were designed and complete ceramic crowns were designed for all preparation types. Models were exported in Ansys finite element analysis software for structural simulations. Maximal equivalent stresses were recorded in the tooth structures and in the restoration for all preparation types. Numerical simulations provide a biomechanical explanation for stress distribution in prepared teeth and overlying crowns. Acknowledgements: This work was supported by CNCSIS-UEFISCSU, project number PN II-RU TE_217/2010.

Brief Biography of the Speaker: Dr. Liliana Sandu is Associate Professor at the University School of Dentistry, Specialization Dental Technology, Department of Prostheses Technology, „Victor Babeş" University of Medicine and Pharmacy Timişoara. She is graduated of the University School of Dentistry, University of Medicine and Pharmacy Timişoara, Romania (1998). She received the titles PhD in Dentistry (2004); primar in general dentistry (2008), specialist in orthodontics and dento-facial orthopedics (2012). Dr. Liliana Sandu participated at 84 national and international conferences, 31 training and continuous improvement courses. Her research activity is proven by 5 research projects won by competition, as project manager, 2 collaborations in other research projects. The research areas are: three dimensional reconstructions after laser scaning, CTs, three dimensional modeling, computer aided design, numerical simulations (finite element analyses) in the field of removable partial dentures (compounds of the removable partial dentures frameworks, abutment teeth): statically analyses, thermal analyses, analyses of the fatigue action, calculus of the degradation factor and life time, design optimizations), modern welding procedures of dental alloys in inert gas: laser welding, microplasma welding (experimental studies regarding welding parameter determination destructive and nondestructive analyses). The publications in the research field are: published books (13); published courses and working guides (10); published articles (140); published abstracts (160); scientific communications at conferences (194).

Plenary Lecture 10

Survey the Effect of Probiotic Doogh as a Bio-functional Medicine

Professor Khashayar Tabari
Young Researchers Club
Lahijan Branch
Islamic Azad University
Lahijan, Iran
E-mail: khashayar.tabari@yahoo.com

Abstract: At present, claims about reduction of disease risk are tentative and functional food as bio-functional medicine can be effective in this role. Among the most promising target is functional gastrointestinal disorder containing Irritable bowel syndrome (IBS) that is common through the world, including Iran, which is unclear and it has not been effective treatment. Therefore, it's necessary to find a bio-functional medicine for treatment and control symptoms, including abdominal pain and defecation changes. This study was aimed to determine the effectiveness of probiotic doogh on the general relief of symptoms associated with IBS.
Methods: Subjects were recruited from volunteer groups of adolescent patients in Tehran. A total of sixty adolescent patients were randomized into two groups of trial and control. Pre- and post-treatment symptoms were investigated using a questionnaire. Thirty one patients received probiotic and 29 ones normal doogh for 3 weeks.
Probiotic doogh were manufactured by combination usual starters with Lactobacillus acidophilus LA5 and Bifidobacterium bifidum BB 12, and coded. The symptoms were followed before, during and after three weeks of treatment. Data were analyzed by SPSS (Ver. 17) and differences between groups were compared statistically using of chi-square and t-test.
Results: A total number of 60 patients were recruited in this study of whom 36 (60%) were female and 24(40%) male. The average age of participants was 16.1±9 which did not differ between two groups. The onset of symptoms did not show any difference between two groups. The trial group had a history of 3.7±3.1 years while this was 3.5±2.9 for the controls.
In overall, patients who were given probiotic doogh had shown a better response in the control of abdominal pain and flatulence than those who were treated with normal doogh. A significant difference was shown between two groups in the response of treatment for other symptoms including epigastric pain, vomiting, frequency of defecation and feces consistency.
Conclusion: According to our research, adding probiotic doogh to the diet may relieve symptoms of IBS especially, abdominal pain and flatulence and favorably influence on colonic flora. The most promising health benefits are reduction in symptoms of IBS and enhancement of the immune system.

Brief Biography of the Speaker: Professor of Science and Technology in Medicine Department, Payame Noor University, Iran. He is member in International Society of Biomedicals, member in International Society of Clinical Bioclinical and Biostatistics and also he is member of Young Researchers Club at Islamic Azad University.
His works concern the conception, synthesis and physicochemical studies of new biomaterials for applications in surgery, Biocompatibility and kinetic of bioactivity. He is also worked in many research project performed in Molecular Techniques Unit.
He is author of more than 20 articles published in international journals and 30 international conferences.

Plenary Lecture 11

A New Invention Process of Manufacturing a Softgel Capsule Probiotics as Pre-Healthy Medicine

Assistant Professor Mahsa Tabari
Department of Agriculture
Lahijan Branch
Islamic Azad university
Lahijan, Iran
E-mail: ma.tabari@gmail.com

Abstract: Recent scientific investigation has supported the important role of probiotics as a part of a healthy medicine for human and may be an avenue to provide a safe, cost effective, and 'natural' approach that adds a barrier against microbial infection.
The stability, viability and quality of products containing probiotic bacteria have been problematic, therefore This paper presents a new invention process of manufacturing a softgel capsule probiotics as pre-healthy medicine, health maintenance and disease prevention.
Materials and methods: The present invention is directed to a process of manufacturing o softgel capsules containing microencapsulated probiotic bacteria comprising the steps of; (a) providing microencapsulated probiotic bacteria with at least coating, at least vegetable lipid having a melting point of between 35 and 75 degree centigrade; (b) suspending it in a suspending formulation to make it fill; (c) mixing the fill at low intensity and low temperature to make a mixed fill; (d) reducing agglomerates of microencapsulated probiotic bacteria; (e) encapsulating the de-agglomerated fill in a softgel capsule.
Then it was surveyed the stability of capsules under defined conditions.
Results: The invention relates to a process of manufacturing a softgel capsule containing microencapsulated probiotic bacteria and to the product made according to this process. More specifically, the product of the invention is stable at room temperature for at least 24 months.

Brief Biography of the Speaker: Mahsa Tabari was born in Bojnourd, Iran. She received M. Sc. degree (2002-2004) Food Science and Technology at Islamic Azad University of Science and Research Branch, Tehran, Iran.
Since 2006 she has been with the Islamic Azad University of Science and Research Branch, Tehran, Iran where she received Ph. D. degrees in 2010. At present, she is an assistance professor at the Islamic Azad University, Department of Food Science and Technology, Lahijan Branch, Iran.
From 2010 she works as a Assistance of Professor in the Islamic Azad University. She is interested Toxicology, bio-functional Food Design Technology and Intelligent approaches for prediction quality parameters in biotecnology.
She is also involved in many research project performed in bio-functional Techniques Unit. From 2008. Electronic Micro-system development standing for a single used thermalcycler for PCR in a wide range of use, especially for medicine and environmental hazardous factors detection. She is also performing a diagnostic research of genetic disorders or pathogens detection. She is an author or co-author of eight full text publications and an author or co-author of 13 conference abstracts in a wide field of biotechnology and molecular medicine research.

Plenary Lecture 12

Cloud Computing and its Impact on the Healthcare Industry

Professor Nasseh Tabrizi
Department of Computer Science
East Carolina University
Greenville, NC
USA
E-mail: TABRIZIM@ecu.edu

Abstract: Cloud computing with its 'pay-as-you-go' features that lowers the initial investment requirement partially through the reduction of maintenance and administration costs is potentially going to help generate opportunities for economic prosperity over the next few years. The advantages of cloud computing include scalability, availability, and cost saving, however, it is necessary to consider all the facts before planning as the migration towards cloud computing may not be the best choice for everyone. Moreover, one need to consider the major disadvantages of using cloud computing that is its increased risks and concerns about the security, privacy, and data ownership. During this talk I will discuss the different aspects of security, privacy, policy, and ownership issues in cloud computing and its impact specifically on the healthcare and also its implications on the patients' privacy in cloud based electronic medical records.

Brief Biography of the Speaker: Tabrizi received his B.S. degree in Computer Science from Manchester University, UK. He then completed his M.S. and Ph.D. from Automatic Control and Systems Engineering Department, Sheffield University, UK. Tabrizi worked in Manchester University for two years prior to his appointment at East Carolina University in 1984. He is the Graduate Program Director of Computer Science and founder and director of Software Engineering graduate program at East Carolina University. His research interests are in the areas of Virtual Reality, Modeling and Simulation, Computer Vision, Signal and Image Processing, Software Engineering, Internet and Multimedia, Assistive Technologies, and Computer Science Education. Tabrizi and his research team have prototyped different project in his Technology Innovation lab including Archival Data Extraction and Assessment (ADEAP) system, Electronic Medical Records Management, An Agent and Virtual Reality-based Course Delivery System, RFID based Learning Assessment System, and Virtual Reality based Home Inspection and Training System. Tabrizi has participated on several major grants. His research team is involved in creation of innovative technologies including the recent one on Brain-Computer Interfaces for Communicating with Individuals with Severe/Profound Intellectual Disabilities. Tabrizi publications include diverse areas of research in computer science, technology, and software engineering. He was named ECU's scholar teacher in 2000 and has received best paper award.