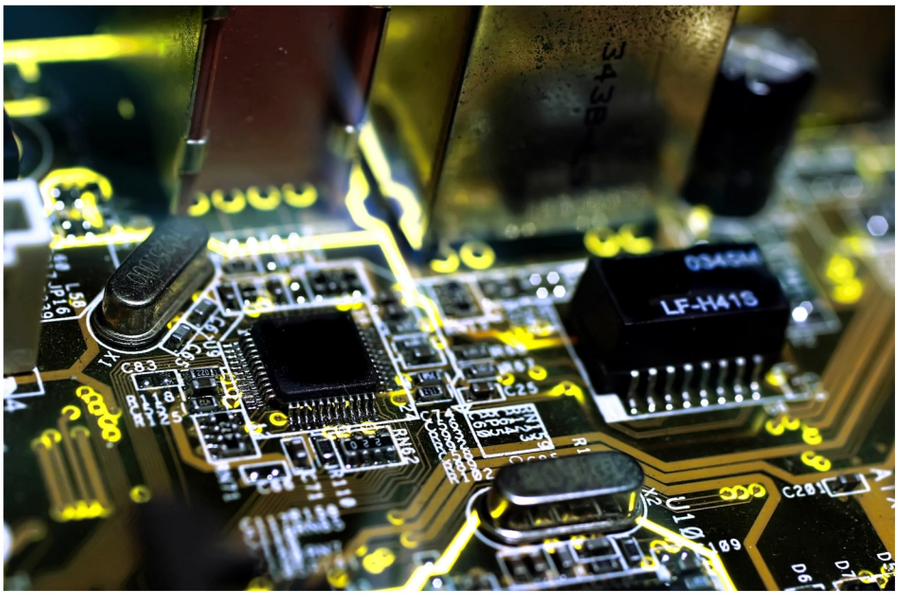
Recent Advances in Electrical and Computer Engineering

Proceedings of the 2014 International Conference on Circuits, Systems, Signal Processing, Communications and Computers (CSSCC '14)

Venice, Italy, March 15-17, 2014



Edited by

Kleanthis Psarris
Valeri Mladenov
Pierre Borne
George Vachtsevanos

ISBN: 978-1-61804-228-6

Recent Advances in Electrical and Computer Engineering

RECENT ADVANCES in ELECTRICAL and COMPUTER ENGINEERING

Proceedings of the 2014 International Conference on Circuits, Systems, Signal Processing, Communications and Computers (CSSCC '14)

Venice, Italy
March 15-17, 2014

RECENT ADVANCES in ELECTRICAL and COMPUTER ENGINEERING

Proceedings of the 2014 International Conference on Circuits, Systems, Signal Processing, Communications and Computers (CSSCC '14)

Venice, Italy
March 15-17, 2014

Copyright © 2014, by the editors

All the copyright of the present book belongs to the editors. 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 editors.

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

ISBN: 978-1-61804-228-6

RECENT ADVANCES in ELECTRICAL and COMPUTER ENGINEERING

Proceedings of the 2014 International Conference on Circuits, Systems, Signal Processing, Communications and Computers (CSSCC '14)

Venice, Italy
March 15-17, 2014

Organizing Committee

General Chairs (EDITORS)

- Prof. Kleanthis Psarris,
  The City University of New York,
  USA
- Prof. Valeri Mladenov,
  Technical University of Sofia,
  Bulgaria
- Prof. Pierre Borne, IEEE France Section Chair,
  IEEE Fellow, IEEE/SMC Past President,
  Ecole Centrale de Lille, France
- Prof. George Vachtsevanos,
  Georgia Institute of Technology,
  Atlanta, Georgia, USA

Senior Program Chair

- Professor Philippe Dondon
  ENSEIRB
  Rue A Schweitzer 33400 Talence
  France

Program Chairs

- Prof. Filippo Neri
  Dipartimento di Informatica e Sistemistica
  University of Naples "Federico II"
  Naples, Italy
- Prof. Constantin Udriste,
  University Politehnica of Bucharest,
  Bucharest, Romania
- Prof. Sandra Sendra
  Instituto de Inv. para la Gestión Integrada de Zonas Costeras (IGIC)
  Universidad Politécnica de Valencia
  Spain

Tutorials Chair

- Professor Pradip Majumdar
  Department of Mechanical Engineering
  Northern Illinois University
  Dekalb, Illinois, USA

Special Session Chair

- Prof. Pavel Varacha
  Tomas Bata University in Zlin
  Faculty of Applied Informatics
  Department of Informatics and Artificial Intelligence
  Zlin, Czech Republic

Workshops Chair

- Prof. Ryszard S. Choras
  Institute of Telecommunications
  University of Technology & Life Sciences
  Bydgoszcz, Poland

Local Organizing Chair

- Assistant Prof. Klimis Ntalianis,
  Tech. Educ. Inst. of Athens (TEI),
  Athens, Greece

Publication Chair

- Prof. Gen Qi Xu
  Department of Mathematics
  Tianjin University
  Tianjin, China

Publicity Committee

- Prof. Reinhard Neck
  Department of Economics
  Klagenfurt University
  Klagenfurt, Austria
- Prof. Myriam Lazard
  Institut Superieur d' Ingenierie de la Conception
  Saint Die, France

International Liaisons

- Prof. Ka-Lok Ng
  Department of Bioinformatics
  Asia University
  Taichung, Taiwan
- Prof. Olga Martin
  Applied Sciences Faculty
  Politehnica University of Bucharest
  Romania
- Prof. Vincenzo Niola
  Departement of Mechanical Engineering for Energetics
  University of Naples "Federico II"
  Naples, Italy
- Prof. Eduardo Mario Dias
  Electrical Energy and Automation
  Engineering Department
  Escola Politecnica da Universidade de Sao Paulo
  Brazil

Steering Committee

- Professor Aida Bulucea, University of Craiova, Romania
- Professor Zoran Bojkovic, Univ. of Belgrade, Serbia
- Prof. Metin Demiralp, Istanbul Technical University, Turkey
- Professor Imre Rudas, Obuda University, Budapest, Hungary

Program Committee

Prof. Lotfi Zadeh (IEEE Fellow,University of Berkeley, USA)
Prof. Leon Chua (IEEE Fellow,University of Berkeley, USA)
Prof. Michio Sugeno (RIKEN Brain Science Institute (RIKEN BSI), Japan)
Prof. Dimitri Bertsekas (IEEE Fellow, MIT, USA)
Prof. Demetri Terzopoulos (IEEE Fellow, ACM Fellow, UCLA, USA)
Prof. Georgios B. Giannakis (IEEE Fellow, University of Minnesota, USA)
Prof. George Vachtsevanos (Georgia Institute of Technology, USA)
Prof. Abraham Bers (IEEE Fellow, MIT, USA)
Prof. David Staelin (IEEE Fellow, MIT, USA)
Prof. Brian Barsky (IEEE Fellow, University of Berkeley, USA)
Prof. Aggelos Katsaggelos (IEEE Fellow, Northwestern University, USA)
Prof. Josef Sifakis (Turing Award 2007, CNRS/Verimag, France)
Prof. Hisashi Kobayashi (Princeton University, USA)
Prof. Kinshuk (Fellow IEEE, Massey Univ. New Zeland),
Prof. Leonid Kazovsky (Stanford University, USA)
Prof. Narsingh Deo (IEEE Fellow, ACM Fellow, University of Central Florida, USA)
Prof. Kamisetty Rao (Fellow IEEE, Univ. of Texas at Arlington,USA)
Prof. Anastassios Venetsanopoulos (Fellow IEEE, University of Toronto, Canada)
Prof. Steven Collicott (Purdue University, West Lafayette, IN, USA)
Prof. Nikolaos Paragios (Ecole Centrale Paris, France)
Prof. Nikolaos G. Bourbakis (IEEE Fellow, Wright State University, USA)
Prof. Stamatios Kartalopoulos (IEEE Fellow, University of Oklahoma, USA)
Prof. Irwin Sandberg (IEEE Fellow, University of Texas at Austin, USA),
Prof. Michael Sebek (IEEE Fellow, Czech Technical University in Prague, Czech Republic)
Prof. Hashem Akbari (University of California, Berkeley, USA)
Prof. Yuriy S. Shmaliy, (IEEE Fellow, The University of Guanajuato, Mexico)
Prof. Lei Xu (IEEE Fellow, Chinese University of Hong Kong, Hong Kong)
Prof. Paul E. Dimotakis (California Institute of Technology Pasadena, USA)
Prof. M. Pelikan (UMSL, USA)
Prof. Patrick Wang (MIT, USA)
Prof. Wasfy B Mikhael (IEEE Fellow, University of Central Florida Orlando,USA)
Prof. Sunil Das (IEEE Fellow, University of Ottawa, Canada)
Prof. Panos Pardalos (University of Florida, USA)
Prof. Nikolaos D. Katopodes (University of Michigan, USA)
Prof. Bimal K. Bose (Life Fellow of IEEE, University of Tennessee, Knoxville, USA)
Prof. Janusz Kacprzyk (IEEE Fellow, Polish Academy of Sciences, Poland)
Prof. Sidney Burrus (IEEE Fellow, Rice University, USA)
Prof. Biswa N. Datta (IEEE Fellow, Northern Illinois University, USA)
Prof. Mihai Putinar (University of California at Santa Barbara, USA)
Prof. Wlodzislaw Duch (Nicolaus Copernicus University, Poland)
Prof. Tadeusz Kaczorek (IEEE Fellow, Warsaw University of Tehcnology, Poland)
Prof. Michael N. Katehakis (Rutgers, The State University of New Jersey, USA)
Prof. Pan Agathoklis (Univ. of Victoria, Canada)
Prof. P. Demokritou (Harvard University, USA)
Prof. P. Razelos (Columbia University, USA)
Dr. Subhas C. Misra (Harvard University, USA)
Prof. Martin van den Toorn (Delft University of Technology, The Netherlands)
Prof. Malcolm J. Crocker (Distinguished University Prof., Auburn University,USA)
Prof. S. Dafermos (Brown University, USA)
Prof. Urszula Ledzewicz, Southern Illinois University , USA.
Prof. Dimitri Kazakos, Dean, (Texas Southern University, USA)
Prof. Ronald Yager (Iona College, USA)
Prof. Athanassios Manikas (Imperial College, London, UK)

Prof. Keith L. Clark (Imperial College, London, UK)
Prof. Argyris Varonides (Univ. of Scranton, USA)
Prof. S. Furfari (Direction Generale Energie et Transports, Brussels, EU)
Prof. Constantin Udriste, University Politehnica of Bucharest , ROMANIA
Dr. Michelle Luke (Univ. Berkeley, USA)
Prof. Patrice Brault (Univ. Paris-sud, France)
Dr. Christos E. Vasios (MIT, USA)
Prof. Jim Cunningham (Imperial College London, UK)
Prof. Philippe Ben-Abdallah (Ecole Polytechnique de l'Universite de Nantes, France)
Prof. Photios Anninos (Medical School of Thrace, Greece)
Prof. Ichiro Hagiwara, (Tokyo Institute of Technology, Japan)
Prof. Metin Demiralp (Istanbul Technical University / Turkish Academy of Sciences, Istanbul, Turkey)
Prof. Andris Buikis (Latvian Academy of Science. Latvia)
Prof. Akshai Aggarwal (University of Windsor, Canada)
Prof. George Vachtsevanos (Georgia Institute of Technology, USA)
Prof. Ulrich Albrecht (Auburn University, USA)
Prof. Imre J. Rudas (Obuda University, Hungary)
Prof. Alexey L Sadovski (IEEE Fellow, Texas A&M University, USA)
Prof. Amedeo Andreotti (University of Naples, Italy)
Prof. Ryszard S. Choras (University of Technology and Life Sciences Bydgoszcz, Poland)
Prof. Remi Leandre (Universite de Bourgogne, Dijon, France)
Prof. Moustapha Diaby (University of Connecticut, USA)
Prof. Brian McCartin (New York University, USA)
Prof. Elias C. Aifantis (Aristotle Univ. of Thessaloniki, Greece)
Prof. Anastasios Lyrintzis (Purdue University, USA)
Prof. Charles Long (Prof. Emeritus University of Wisconsin, USA)
Prof. Marvin Goldstein (NASA Glenn Research Center, USA)
Prof. Costin Cepisca (University POLITEHNICA of Bucharest, Romania)
Prof. Kleanthis Psarris (University of Texas at San Antonio, USA)
Prof. Ron Goldman (Rice University, USA)
Prof. Ioannis A. Kakadiaris (University of Houston, USA)
Prof. Richard Tapia (Rice University, USA)
Prof. F.-K. Benra (University of Duisburg-Essen, Germany)
Prof. Milivoje M. Kostic (Northern Illinois University, USA)
Prof. Helmut Jaberg (University of Technology Graz, Austria)
Prof. Ardeshir Anjomani (The University of Texas at Arlington, USA)
Prof. Heinz Ulbrich (Technical University Munich, Germany)
Prof. Reinhard Leithner (Technical University Braunschweig, Germany)
Prof. Elbrous M. Jafarov (Istanbul Technical University, Turkey)
Prof. M. Ehsani (Texas A&M University, USA)
Prof. Sesh Commuri (University of Oklahoma, USA)
Prof. Nicolas Galanis (Universite de Sherbrooke, Canada)
Prof. S. H. Sohrab (Northwestern University, USA)
Prof. Rui J. P. de Figueiredo (University of California, USA)
Prof. Valeri Mladenov (Technical University of Sofia, Bulgaria)
Prof. Hiroshi Sakaki (Meisei University, Tokyo, Japan)
Prof. Zoran S. Bojkovic (Technical University of Belgrade, Serbia)
Prof. K. D. Klaes, (Head of the EPS Support Science Team in the MET Division at EUMETSAT, France)
Prof. Emira Maljevic (Technical University of Belgrade, Serbia)
Prof. Kazuhiko Tsuda (University of Tsukuba, Tokyo, Japan)
Prof. Milan Stork (University of West Bohemia , Czech Republic)
Prof. C. G. Helmis (University of Athens, Greece)
Prof. Lajos Barna (Budapest University of Technology and Economics, Hungary)
Prof. Nobuoki Mano (Meisei University, Tokyo, Japan)

Prof. Nobuo Nakajima (The University of Electro-Communications, Tokyo, Japan)
Prof. Victor-Emil Neagoe (Polytechnic University of Bucharest, Romania)
Prof. E. Protonotarios (National Technical University of Athens, Greece)
Prof. P. Vanderstraeten (Brussels Institute for Environmental Management, Belgium)
Prof. Annaliese Bischoff (University of Massachusetts, Amherst, USA)
Prof. Virgil Tiponut (Politehnica University of Timisoara, Romania)
Prof. Andrei Kolyshkin (Riga Technical University, Latvia)
Prof. Fumiaki Imado (Shinshu University, Japan)
Prof. Sotirios G. Ziavras (New Jersey Institute of Technology, USA)
Prof. Constantin Volosencu (Politehnica University of Timisoara, Romania)
Prof. Marc A. Rosen (University of Ontario Institute of Technology, Canada)
Prof. Alexander Zemliak (Puebla Autonomous University, Mexico)
Prof. Thomas M. Gatton (National University, San Diego, USA)
Prof. Leonardo Pagnotta (University of Calabria, Italy)
Prof. Yan Wu (Georgia Southern University, USA)
Prof. Daniel N. Riahi (University of Texas-Pan American, USA)
Prof. Alexander Grebennikov (Autonomous University of Puebla, Mexico)
Prof. Bennie F. L. Ward (Baylor University, TX, USA)
Prof. Guennadi A. Kouzaev (Norwegian University of Science and Technology, Norway)
Prof. Eugene Kindler (University of Ostrava, Czech Republic)
Prof. Geoff Skinner (The University of Newcastle, Australia)
Prof. Hamido Fujita (Iwate Prefectural University(IPU), Japan)
Prof. Francesco Muzi (University of L'Aquila, Italy)
Prof. Les M. Sztandera (Philadelphia University, USA)
Prof. Claudio Rossi (University of Siena, Italy)
Prof. Christopher J. Koroneos (Aristotle University of Thessaloniki, Greece)
Prof. Sergey B. Leonov (Joint Institute for High Temperature Russian Academy of Science, Russia)
Prof. Arpad A. Fay (University of Miskolc, Hungary)
Prof. Lili He (San Jose State University, USA)
Prof. M. Nasseh Tabrizi (East Carolina University, USA)
Prof. Alaa Eldin Fahmy (University Of Calgary, Canada)
Prof. Ion Carstea (University of Craiova, Romania)
Prof. Paul Dan Cristea (University "Politehnica" of Bucharest, Romania)
Prof. Gh. Pascovici (University of Koeln, Germany)
Prof. Pier Paolo Delsanto (Politecnico of Torino, Italy)
Prof. Radu Munteanu (Rector of the Technical University of Cluj-Napoca, Romania)
Prof. Ioan Dumitrache (Politehnica University of Bucharest, Romania)
Prof. Corneliu Lazar (Technical University Gh.Asachi Iasi, Romania)
Prof. Nicola Pitrone (Universita degli Studi Catania, Italia)
Prof. Miquel Salgot (University of Barcelona, Spain)
Prof. Amaury A. Caballero (Florida International University, USA)
Prof. Maria I. Garcia-Planas (Universitat Politecnica de Catalunya, Spain)
Prof. Petar Popivanov (Bulgarian Academy of Sciences, Bulgaria)
Prof. Alexander Gegov (University of Portsmouth, UK)
Prof. Lin Feng (Nanyang Technological University, Singapore)
Prof. Colin Fyfe (University of the West of Scotland, UK)
Prof. Zhaohui Luo (Univ of London, UK)
Prof. Mikhail Itskov (RWTH Aachen University, Germany)
Prof. George G. Tsypkin (Russian Academy of Sciences, Russia)
Prof. Wolfgang Wenzel (Institute for Nanotechnology, Germany)
Prof. Weilian Su (Naval Postgraduate School, USA)
Prof. Phillip G. Bradford (The University of Alabama, USA)
Prof. Ray Hefferlin (Southern Adventist University, TN, USA)
Prof. Gabriella Bognar (University of Miskolc, Hungary)

Prof. Hamid Abachi (Monash University, Australia)
Prof. Karlheinz Spindler (Fachhochschule Wiesbaden, Germany)
Prof. Josef Boercsoek (Universitat Kassel, Germany)
Prof. Eyad H. Abed (University of Maryland, Maryland, USA)
Prof. F. Castanie (TeSA, Toulouse, France)
Prof. Robert K. L. Gay (Nanyang Technological University, Singapore)
Prof. Andrzej Ordys (Kingston University, UK)
Prof. Harris Catrakis (Univ of California Irvine, USA)
Prof. T Bott (The University of Birmingham, UK)
Prof. Petr Filip (Institute of Hydrodynamics, Prague, Czech Republic)
Prof. T.-W. Lee (Arizona State University, AZ, USA)
Prof. Le Yi Wang (Wayne State University, Detroit, USA)
Prof. George Stavrakakis (Technical University of Crete, Greece)
Prof. John K. Galiotos (Houston Community College, USA)
Prof. M. Petrakis (National Observatory of Athens, Greece)
Prof. Philippe Dondon (ENSEIRB, Talence, France)
Prof. Dalibor Biolek (Brno University of Technology, Czech Republic)
Prof. Oleksander Markovskyy (National Technical University of Ukraine, Ukraine)
Prof. Suresh P. Sethi (University of Texas at Dallas, USA)
Prof. Hartmut Hillmer(University of Kassel, Germany)
Prof. Bram Van Putten (Wageningen University, The Netherlands)
Prof. Alexander Iomin (Technion - Israel Institute of Technology, Israel)
Prof. Roberto San Jose (Technical University of Madrid, Spain)
Prof. Minvydas Ragulskis (Kaunas University of Technology, Lithuania)
Prof. Arun Kulkarni (The University of Texas at Tyler, USA)
Prof. Joydeep Mitra (New Mexico State University, USA)
Prof. Vincenzo Niola (University of Naples Federico II, Italy)
Prof. Ion Chryssoverghi (National Technical University of Athens, Greece)
Prof. Dr. Aydin Akan (Istanbul University, Turkey)
Prof. Sarka Necasova (Academy of Sciences, Prague, Czech Republic)
Prof. C. D. Memos (National Technical University of Athens, Greece)
Prof. S. Y. Chen, (Zhejiang University of Technology, China and University of Hamburg, Germany)
Prof. Duc Nguyen (Old Dominion University, Norfolk, USA)
Prof. Tuan Pham (James Cook University, Townsville, Australia)
Prof. Jiri Klima (Technical Faculty of CZU in Prague, Czech Republic)
Prof. Rossella Cancelliere (University of Torino, Italy)
Prof. L.Kohout (Florida State University, Tallahassee, Florida, USA)
Prof. D' Attelis (Univ. Buenos Ayres, Argentina)
Prof. Dr-Eng. Christian Bouquegneau (Faculty Polytechnique de Mons, Belgium)
Prof. Wladyslaw Mielczarski (Technical University of Lodz, Poland)
Prof. Ibrahim Hassan (Concordia University, Montreal, Quebec, Canada)
Prof. Stavros J.Baloyannis (Medical School, Aristotle University of Thessaloniki, Greece)
Prof. James F. Frenzel (University of Idaho, USA)
Prof. Mirko Novak (Czech Technical University in Prague,Czech Republic)
Prof. Zdenek Votruba (Czech Technical University in Prague,Czech Republic)
Prof. Vilem Srovnal,(Technical University of Ostrava, Czech Republic)
Prof. J. M. Giron-Sierra (Universidad Complutense de Madrid, Spain)
Prof. Zeljko Panian (University of Zagreb, Croatia)
Prof. Walter Dosch (University of Luebeck, Germany)
Prof. Rudolf Freund (Vienna University of Technology, Austria)
Prof. Erich Schmidt (Vienna University of Technology, Austria)
Prof. Alessandro Genco (University of Palermo, Italy)
Prof. Martin Lopez Morales (Technical University of Monterey, Mexico)
Prof. Ralph W. Oberste-Vorth (Marshall University, USA)

Prof. Vladimir Damgov (Bulgarian Academy of Sciences, Bulgaria)
Prof. Menelaos Karanasos (Brunel University, UK)
Prof. P.Borne (Ecole Central de Lille, France)

Additional Reviewers

Angel F. Tenorio	Universidad Pablo de Olavide, Spain
Ole Christian Boe	Norwegian Military Academy, Norway
Abelha Antonio	Universidade do Minho, Portugal
Xiang Bai	Huazhong University of Science and Technology, China
Genqi Xu	Tianjin University, China
Moran Wang	Tsinghua University, China
Minhui Yan	Shanghai Maritime University, China
Jon Burley	Michigan State University, MI, USA
Shinji Osada	Gifu University School of Medicine, Japan
Bazil Taha Ahmed	Universidad Autonoma de Madrid, Spain
Konstantin Volkov	Kingston University London, UK
Tetsuya Shimamura	Saitama University, Japan
George Barreto	Pontificia Universidad Javeriana, Colombia
Tetsuya Yoshida	Hokkaido University, Japan
Deolinda Rasteiro	Coimbra Institute of Engineering, Portugal
Matthias Buyle	Artesis Hogeschool Antwerpen, Belgium
Dmitrijs Serdjuks	Riga Technical University, Latvia
Kei Eguchi	Fukuoka Institute of Technology, Japan
Imre Rudas	Obuda University, Budapest, Hungary
Francesco Rotondo	Polytechnic of Bari University, Italy
Valeri Mladenov	Technical University of Sofia, Bulgaria
Andrey Dmitriev	Russian Academy of Sciences, Russia
James Vance	The University of Virginia's College at Wise, VA, USA
Masaji Tanaka	Okayama University of Science, Japan
Sorinel Oprisan	College of Charleston, CA, USA
Hessam Ghasemnejad	Kingston University London, UK
Santoso Wibowo	CQ University, Australia
M. Javed Khan	Tuskegee University, AL, USA
Manoj K. Jha	Morgan State University in Baltimore, USA
Miguel Carriegos	Universidad de Leon, Spain
Philippe Dondon	Institut polytechnique de Bordeaux, France
Kazuhiko Natori	Toho University, Japan
Jose Flores	The University of South Dakota, SD, USA
Takuya Yamano	Kanagawa University, Japan
Frederic Kuznik	National Institute of Applied Sciences, Lyon, France
Lesley Farmer	California State University Long Beach, CA, USA
João Bastos	Instituto Superior de Engenharia do Porto, Portugal
Zhong-Jie Han	Tianjin University, China
Francesco Zirilli	Sapienza Universita di Roma, Italy
Yamagishi Hiromitsu	Ehime University, Japan
Eleazar Jimenez Serrano	Kyushu University, Japan
Alejandro Fuentes-Penna	Universidad Autónoma del Estado de Hidalgo, Mexico
José Carlos Metrôlho	Instituto Politecnico de Castelo Branco, Portugal
Stavros Ponis	National Technical University of Athens, Greece

Table of Contents

Keynote Lecture 1: On the Distinguished Role of the Mittag-Leffler and Wright Functions in Fractional Calculus 17
Francesco Mainardi

Keynote Lecture 2: Latest Advances in Neuroinformatics and Fuzzy Systems 18
Yingxu Wang

Keynote Lecture 3: Recent Advances and Future Trends on Atomic Engineering of III-V Semiconductor for Quantum Devices from Deep UV (200nm) up to THZ (300 microns) 20
Manijeh Razeghi

Bayesian Inference for Phase Unwrapping using Multiple Interferograms Based on Statistical Mechanics of Three-State Ising Model 23
Yohei Saika, Tatsuya Uezu

Fourier Optics for Investigating the Impact of Roughness to Scatterometry 29
H. Gross, S. Heidenreich, M. Bar

Symbolic Computer-Aided Design for Wireless Power Transmission 35
Takuya Hirata, Kazuya Yamaguchi, Yuta Yamamoto, Ichijo Hodaka

The TLS to Study Deformations using ICP Algorithm 40
V. Barrile, G. M. Meduri, G. Bilotta

Efficient Wireless Power Transfer - Resonance does not imply High Efficiency 45
Kazuya Yamaguchi, Ichijo Hodaka

A Fully-Differential Regulated Telescopic Operational Transconductance Amplifier 49
J. Mallek, H. Mnif, H. Daoud, M. Loulou

A Novel Delay and Overshoot Estimation model for VLSI Global Interconnects 53
M. Kavicharan, N. S. Murthy, N. Bheema Rao

Using Non-Sinusoidal Inputs for Efficient Wireless Power Transmission 58
Yuta Yamamoto, Ichijo Hodaka, Kazuya Yamaguchi, Takuya Hirata

An Efficient Distributed Tree Structure Modelling for VLSI Circuits 61
M. Kavicharan, N. S. Murthy, N. Bheema Rao

Software Maintenance from the Change Theory Perspective 66
Maeda Hanafi, Amal Abdel-Raouf

Proposal of a Flexible and Efficient System Development Approach 72
Michiko Oba, Taku Yamaguchi

A Genetic Programming Approach to Telecommunications Fraud Detection and Classification 77
Constantinos S. Hilas, Spyridon A. Kazarlis, Ioannis T. Rekanos, Paris A. Mastorocostas

Investigating the Reliability of Nano-Scaled BDD-Based Gates 84
Azam Beg, Ajmal Beg

An Analysis of Social Media Usage in Teaching and Learning: The Case of SEEU 90
Lejla A. Bexheti, Burim E. Ismaili, Betim H. Cico

Image Security with Different Techniques of Cryptography and Coding: A Survey 95
Mona F. M. Mursi, Hossam Eldin H. Ahmed, Fathi E. Abd El-Samie, Ayman H. Abd El-Aziem

Computer-Vision Based Visual Inspection and Crack Detection of Railroad Tracks 102
Mohammad Farukh Hashmi, Avinash G. Keskar

Analysis the Effect of Pedagogical Agent using Leaners' Eye Movements 111
Noh Kyung-Bo, Ki-Sang Song, Sang Chun Nam

Hand-off Performance Enhancement in Heterogeneous Mobile Networks using Radio Access Technology Selection Algorithm 116
Ibraheem M. Fayed

Identification of Direct and Indirect Discrimination in Data Mining 124
P. Priya, J. C. Miraclin Joyce Pamila

Suitable Propagation Loss Models for Mobile Communications in Jordan 131
M. S. H. Al Salameh, M. M. Al-Zu'bi

PSCM: Proxy Server Cache Mechanism for Video on Demand System 136
Saleh Ali Alomari, Putra Sumari

General Study of Self Excited Induction Generator used in Isolated Renewable Energy Conversion Source 143
Mohamed Barara, Ahmed Abbou, Mohamed Akherraz , Abderrahim Bennassar, Mohamed Larbi Elhafyani

Efficient Answering of XML Queries using Holistic Twig Pattern Matching 150
Divya Rajagopal, Miraclin Joyce Pamila J. C.

Code Optimization and Performance Analysis of Oceanographic Software Package NEMO for GPGPU Systems 156
Plamenka Borovska, Desislava Ivanova

FPGA Implementation of Modular Exponentiation Using Single Modular Multiplier 162
M. Issad, B. Boudraa, M. Anane, S. Seddiki

Stability Analysis of Impedance type Haptic Interface 168
Neelu Nagpal, Jyoti Ohri

Investigation of Antenna based of New Frequency Selective Surface (FSS) for WLAN Applications 173
Moufida Bouslama, Moubarek Traii, Ali Gharsallah, Tayeb A. Denidni

Square Root Generator for Galois Field in Multiple-Valued Logic–Larger Systems 176
Nabil A. Abu-Khader, Nesreen F. Al-Nashashibi

Formant Frequency Tuning in Professional Byzantine Chanters 181
Georgios Chrysochoidis, Georgios Kouroupetroglou

Design of 0.05-5 GHz LNA for Cognitive Radios Receiver 187
W. Farrag, A. Ragheb, N. Rashid

An Improved Genetic Algorithm for PID Parameter Tuning 191
Jyoti Ohri, Naveen Kumar, Minakshi Chinda

An Efficient Load Balancing Algorithm for Virtualized Cloud Data Centers 199
Ali Naser Abdulhussein Abdulhussein, Jugal Harshvadan Joshi, Atwine Mugume Twinamatsiko, Arash Habibi Lashkari, Mohammad Sadeghi

Reducing the Number of Sub-Trees for Frequent Itemsets Mining 213
Supatra Sahaphong, Gumpon Sritanratana

Performance of Frame Synchronization Symbols for an OFDM System in Dispersive Channels 218
Ali A. Eyadeh

Analysing and Devising a Model for Trustworthy Software 222
Bekim Fetaji, Nasih Reci, Majlinda Fetaji

Analysis of ECDH Key Agreement Protocol through Linear Temporal Logic 229
Ashwini Kumar

Segmentation of Brain MRI Image Based on Clustering Algorithm 236
Siti Noraini Sulaiman, Noreliani Awang Non, Iza Sazanita Isa, Norhazimi Hamzah

Investigating Factors that Influence E-School Management in High Schools in Macedonia 242
Majlinda Fetaji, Bekim Fetaji

FSS Shielding and Antenna Discrimination Effect on Interference Mitigation Techniques 248
Lway F. Abdulrazak

Considering the Design of Cloud Computing Structures on Computer Systems: New Designs in Global Economic Development 254
J. S. Boyce

Dynamic Voltage Restorer Behaviour 259
F. Ghezal, S. Hadjeri, M. Benghanem, S. Zidi

Single Carrier Multi-Tone Modulation Scheme 264
Roman M. Vitenberg

Area Efficient Multiband Frequency Divider 271
C. Jagadeeshwaran, C. Sundarrasu

Analysis of Voice Over Wi-Fi in a Wireless Lan with IEEE 802.11b Standard 275
Zubeir Izaruku Dafalla, Mayyada Harmoshi

Authors Index 279

Keynote Lecture 1

On the Distinguished Role of the Mittag-Leffler and Wright Functions in Fractional Calculus

Professor Francesco Mainardi
Department of Physics, University of Bologna, and INFN
Via Irnerio 46, I-40126 Bologna, Italy
E-mail: francesco.mainardi@bo.infn.it.it

Abstract: Fractional calculus, in allowing integrals and derivatives of any positive real order (the term "fractional" is kept only for historical reasons), can be considered a branch of mathematical analysis which deals with integro-di erential equations where the integrals are of convolution type and exhibit (weakly singular) kernels of power-law type. As a matter of fact fractional calculus can be considered a laboratory for special functions and integral transforms. Indeed many problems dealt with fractional calculus can be solved by using Laplace and Fourier transforms and lead to analytical solutions expressed in terms of transcendental functions of Mittag-Leffler and Wright type. In this plenary lecture we discuss some interesting problems in order to single out the role of these functions. The problems include anomalous relaxation and diffusion and also intermediate phenomena.

Brief Biography of the Speaker: For a full biography, list of references on author's papers and books see:
Home Page: http://www.fracalmo.org/mainardi/index.htm
and http://scholar.google.com/citations?user=UYxWyEEAAAAJ&hl=en&oi=ao

Keynote Lecture 2

Latest Advances in Neuroinformatics and Fuzzy Systems

Yingxu Wang, PhD, Prof., PEng, FWIF, FICIC, SMIEEE, SMACM
President, International Institute of Cognitive Informatics and Cognitive Computing (ICIC)
Director, Laboratory for Cognitive Informatics and Cognitive Computing
Dept. of Electrical and Computer Engineering
Schulich School of Engineering
University of Calgary
2500 University Drive NW,
Calgary, Alberta, Canada T2N 1N4
E-mail: yingxu@ucalgary.ca

Abstract: Investigations into the neurophysiological foundations of neural networks in neuroinformatics [Wang, 2013] have led to a set of rigorous mathematical models of neurons and neural networks in the brain using contemporary denotational mathematics [Wang, 2008, 2012]. A theory of neuroinformatics is recently developed for explaining the roles of neurons in internal information representation, transmission, and manipulation [Wang & Fariello, 2012]. The formal neural models reveal the differences of structures and functions of the association, sensory and motor neurons. The pulse frequency modulation (PFM) theory of neural networks [Wang & Fariello, 2012] is established for rigorously analyzing the neurosignal systems in complex neural networks. It is noteworthy that the Hopfield model of artificial neural networks [Hopfield, 1982] is merely a prototype closer to the sensory neurons, though the majority of human neurons are association neurons that function significantly different as the sensory neurons. It is found that neural networks can be formally modeled and manipulated by the neural circuit theory [Wang, 2013]. Based on it, the basic structures of neural networks such as the serial, convergence, divergence, parallel, feedback circuits can be rigorously analyzed. Complex neural clusters for memory and internal knowledge representation can be deduced by compositions of the basic structures.

Fuzzy inferences and fuzzy semantics for human and machine reasoning in fuzzy systems [Zadeh, 1965, 2008], cognitive computers [Wang, 2009, 2012], and cognitive robots [Wang, 2010] are a frontier of cognitive informatics and computational intelligence. Fuzzy inference is rigorously modeled in inference algebra [Wang, 2011], which recognizes that humans and fuzzy cognitive systems are not reasoning on the basis of probability of causations rather than formal algebraic rules. Therefore, a set of fundamental fuzzy operators, such as those of fuzzy causality as well as fuzzy deductive, inductive, abductive, and analogy rules, is formally elicited. Fuzzy semantics is quantitatively modeled in semantic algebra [Wang, 2013], which formalizes the qualitative semantics of natural languages in the categories of nouns, verbs, and modifiers (adjectives and adverbs). Fuzzy semantics formalizes nouns by concept algebra [Wang, 2010],

verbs by behavioral process algebra [Wang, 2002, 2007], and modifiers by fuzzy semantic algebra [Wang, 2013]. A wide range of applications of fuzzy inference, fuzzy semantics, neuroinformatics, and denotational mathematics have been implemented in cognitive computing, computational intelligence, fuzzy systems, cognitive robotics, neural networks, neurocomputing, cognitive learning systems, and artificial intelligence.

Brief Biography of the Speaker: Yingxu Wang is professor of cognitive informatics and denotational mathematics, President of International Institute of Cognitive Informatics and Cognitive Computing (ICIC, http://www.ucalgary.ca/icic/) at the University of Calgary. He is a Fellow of ICIC, a Fellow of WIF (UK), a P.Eng of Canada, and a Senior Member of IEEE and ACM. He received a PhD in software engineering from the Nottingham Trent University, UK, and a BSc in Electrical Engineering from Shanghai Tiedao University. He was a visiting professor on sabbatical leaves at Oxford University (1995), Stanford University (2008), University of California, Berkeley (2008), and MIT (2012), respectively. He is the founder and steering committee chair of the annual IEEE International Conference on Cognitive Informatics and Cognitive Computing (ICCI*CC) since 2002. He is founding Editor-in-Chief of International Journal of Cognitive Informatics and Natural Intelligence (IJCINI), founding Editor-in-Chief of International Journal of Software Science and Computational Intelligence (IJSSCI), Associate Editor of IEEE Trans. on SMC (Systems), and Editor-in-Chief of Journal of Advanced Mathematics and Applications (JAMA). Dr. Wang is the initiator of a few cutting-edge research fields or subject areas such as denotational mathematics, cognitive informatics, abstract intelligence (□I), cognitive computing, software science, and basic studies in cognitive linguistics. He has published over 160 peer reviewed journal papers, 230+ peer reviewed conference papers, and 25 books in denotational mathematics, cognitive informatics, cognitive computing, software science, and computational intelligence. He is the recipient of dozens international awards on academic leadership, outstanding contributions, best papers, and teaching in the last three decades.

http://www.ucalgary.ca/icic/

http://scholar.google.ca/citations?user=gRVQjskAAAAJ&hl=en

Editor-in-Chief, International Journal of Cognitive Informatics and Natural Intelligence
Editor-in-Chief, International Journal of Software Science and Computational Intelligence
Associate Editor, IEEE Transactions on System, Man, and Cybernetics - Systems
Editor-in-Chief, Journal of Advanced Mathematics and Applications
Chair, The Steering Committee of IEEE ICCI*CC Conference Series

Keynote Lecture 3

Recent Advances and Future Trends on Atomic Engineering of III-V Semiconductor for Quantum Devices from Deep UV (200nm) up to THZ (300 microns)

Professor Manijeh Razeghi
Center for Quantum Devices
Department of Electrical Engineering and Computer Science
Northwestern University
Evanston, Illinois 60208
USA
E-mail: razeghi@eecs.northwestern.edu

Abstract: Nature offers us different kinds of atoms, but it takes human intelligence to put them together in an elegant way in order to realize functional structures not found in nature. The so-called III-V semiconductors are made of atoms from columns III (B, Al, Ga, In. Tl) and columns V(N, As, P, Sb,Bi) of the periodic table, and constitute a particularly rich variety of compounds with many useful optical and electronic properties. Guided by highly accurate simulations of the electronic structure, modern semiconductor optoelectronic devices are literally made atom by atom using advanced growth technology such as Molecular Beam Epitaxy (MBE) and Metal Organic Chemical Vapor Deposition (MOCVD). Recent breakthroughs have brought quantum engineering to an unprecedented level, creating light detectors and emitters over an extremely wide spectral range from 0.2 mm to 300 mm. Nitrogen serves as the best column V element for the short wavelength side of the electromagnetic spectrum, where we have demonstrated III-nitride light emitting diodes and photo detectors in the deep ultraviolet to visible wavelengths. In the infrared, III-V compounds using phosphorus ,arsenic and antimony from column V ,and indium, gallium, aluminum, ,and thallium from column III elements can create interband and intrsuband lasers and detectors based on quantum-dot (QD) or type-II superlattice (T2SL). These are fast becoming the choice of technology in crucial applications such as environmental monitoring and space exploration. Last but not the least, on the far-infrared end of the electromagnetic spectrum, also known as the terahertz (THz) region, III-V semiconductors offer a unique solution of generating THz waves in a compact device at room temperature. Continued effort is being devoted to all of the above mentioned areas with the intention to develop smart technologies that meet the current challenges in environment, health, security, and energy. This talk will highlight my contributions to the world of III-V semiconductor Nano scale optoelectronics. Devices from deep UV-to THz.

Brief Biography of the Speaker: Manijeh Razeghi received the Doctorat d'État es Sciences Physiques from the Université de Paris, France, in 1980.
After heading the Exploratory Materials Lab at Thomson-CSF (France), she joined Northwestern University, Evanston, IL, as a Walter P. Murphy Professor and Director of the Center for

Quantum Devices in Fall 1991, where she created the undergraduate and graduate program in solid-state engineering. She is one of the leading scientists in the field of semiconductor science and technology, pioneering in the development and implementation of major modern epitaxial techniques such as MOCVD, VPE, gas MBE, and MOMBE for the growth of entire compositional ranges of III-V compound semiconductors. She is on the editorial board of many journals such as Journal of Nanotechnology, and Journal of Nanoscience and Nanotechnology, an Associate Editor of Opto-Electronics Review. She is on the International Advisory Board for the Polish Committee of Science, and is an Adjunct Professor at the College of Optical Sciences of the University of Arizona, Tucson, AZ. She has authored or co-authored more than 1000 papers, more than 30 book chapters, and fifteen books, including the textbooks Technology of Quantum Devices (Springer Science+Business Media, Inc., New York, NY U.S.A. 2010) and Fundamentals of Solid State Engineering, 3rd Edition (Springer Science+Business Media, Inc., New York, NY U.S.A. 2009). Two of her books, MOCVD Challenge Vol. 1 (IOP Publishing Ltd., Bristol, U.K., 1989) and MOCVD Challenge Vol. 2 (IOP Publishing Ltd., Bristol, U.K., 1995), discuss some of her pioneering work in InP-GaInAsP and GaAs-GaInAsP based systems. The MOCVD Challenge, 2nd Edition (Taylor & Francis/CRC Press, 2010) represents the combined updated version of Volumes 1 and 2. She holds 50 U.S. patents and has given more than 1000 invited and plenary talks. Her current research interest is in nanoscale optoelectronic quantum devices.

Dr. Razeghi is a Fellow of MRS, IOP, IEEE, APS, SPIE, OSA, Fellow and Life Member of Society of Women Engineers (SWE), Fellow of the International Engineering Consortium (IEC), and a member of the Electrochemical Society, ACS, AAAS, and the French Academy of Sciences and Technology. She received the IBM Europe Science and Technology Prize in 1987, the Achievement Award from the SWE in 1995, the R.F. Bunshah Award in 2004, and many best paper awards.