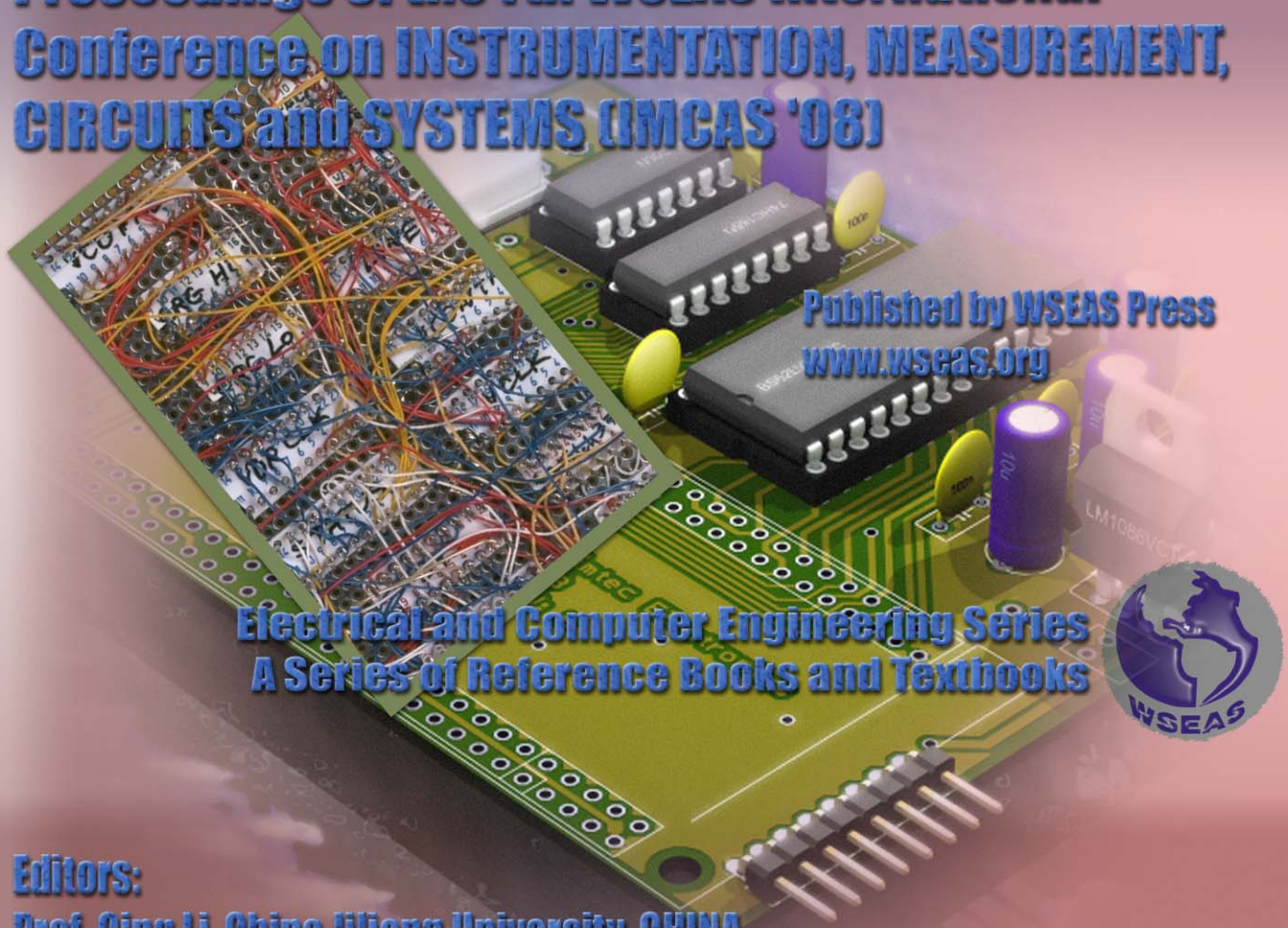
INSTRUMENTATION, MEASUREMENT, CIRCUITS AND SYSTEMS

Proceedings of the 7th WSEAS International Conference on INSTRUMENTATION, MEASUREMENT, CIRCUITS and SYSTEMS (IMCAS '08)



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Prof. Anping Xu, Hebei university of Technology, CHINA
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Hangzhou, China, April 6-8, 2008

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Preface

This book contains proceedings of the 7th WSEAS International Conference on INSTRUMENTATION, MEASUREMENT, CIRCUITS and SYSTEMS (IMCAS '08) which was held in Hangzhou, China, April 6-8, 2008.

We thank the China Jiliang University for the sponsorship . This conference aims to disseminate the latest research and applications in the afore mentioned fields. The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from **http://www.wseas.org/reports**. Your feedback encourages the society to go ahead as you can see in **http://www.worldses.org/feedback.htm**

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: **www.worldses.org/indexes**

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in these conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, ACM, Compendex, INSPEC, CSA .... see: www.worldses.org/indexes) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

Finally, we cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.

We are sure that this volume will be source of knowledge and inspiration for other academicians, scholars, advisors and industrial practitioners and will be considered as one more brilliant edition of the WSEAS related with a brilliant conference sponsored by China Jiliang University.

Proceedings of the 7th WSEAS International Conference on INSTRUMENTATION, MEASUREMENT, CIRCUITS and SYSTEMS (IMCAS '08)

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Plenary Lecture I

Inverse Acoustic and Electromagnetic Obstacle Scattering: Theory and Numerics

Professor Jun Zou
Department of Mathematics
The Chinese University of Hong Kong

Abstract: In this talk we shall present some breakthroughs that have been achieved in the past few years on inverse acoustic and electromagnetic obstacle scattering problems. Both theory and numerical simulations will be discussed. This is a joint work with Dr. Hongyu Liu (Washington University, Seattle) and supported by Hong Kong RGC grants (Project 404105 and Project 404606).

Brief Biography of the Speaker: Jun ZOU is a Professor in Department of Mathematics of The Chinese University of Hong Kong. Before taking up his current position in Hong Kong, he had worked two years (93-95) in University of California at Los Angeles (USA) as a post-doctoral fellow and a CAM Assistant Professor, worked two and a half years (91-93) in Technical University of Munich as a Visiting Assistant Professor and an Alexander von Humboldt Research Fellow (Germany), and worked two years (89-91) in Chinese Academy of Sciences (Beijing) as an Assistant Professor. His research areas include numerical solutions of electromagnetic Maxwell systems, interface problems, ill-posed Problems and inverse Problems. He has about 70 publications in the refereed international journals.

Plenary Lecture II

Fractal Time Series and Tele-Traffic

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Personal URL: http://www.freewebs.com/mingli/

Abstract: Fractal time series gains applications in various fields of sciences and technologies ranging from financial engineering to network traffic. The speech will describe several models of fractal time series, such as fractional Gaussian noise, the generalized Cauchy process, and so on. Possible applications of fractal time series to networking will be discussed.

Short Biography of the Speaker: Ming Li, Ph.D., is a professor in electronic communications and information systems, as well as computer science at East China Normal University, PR. China. He was with the School of Computing, National University of Singapore, before joining East China Normal University in 2004. His research areas relate to applied statistics and signal processing with the recent interests in fractal time series and time-frequency analysis, computer science currently focusing on network traffic modeling and network security, and measurement & control in the aspects of error analysis and optimal control. He has published over refereed 60 papers in international journals and international conferences in those areas.

Plenary Lecture III

Multimedia system – 3d Interactive Model Web (3DIMW)

Professor Rong-Jyue Fang
Department of Information Management,
College of Management, STUT,
Taiwan
E-mail: fang@nknucc.nknu.edu.tw

Abstract: Based on the functions of theoretical foundations and related literature analysis, study group develop a multimedia system named: 3D Interactive Model Web (3DIMW). The original purpose of research work targeting on constructing a learning platform for three-dimensional computer animation. The feasibility was based on the evaluated functions of 3-D animation techniques and the prototype constructed. Platform derived from three-dimensional computer animation technique associated with ASP.NET and SQL Database. After the completion of platform, consequent procedures were applied to examine the usefulness of it. Graphic science and drawing course was the object comes up with first choice. Later a Turbulence Phenomena simulation and nano sized physical representation showed that it is a good tool for learning complicated image description and maneuvering sophisticated micro-devices.

Brief Biography of the Speaker: Dr. Rong-Jyue Fang – 1984 graduated from The Pennsylvania State University IED Department PhD program. He had been Director of Computation Center, Department Chair of Industrial Technology, and Dean of R&D Office in National Kaohsiung Normal University, later, been a President of National Taitung (East Taiwan) University. In 2005, he moves to Southern Taiwan University of Technology as a Chair Professor. He concentrates his research on multimedia hardware, software, and system development for more than twenty years and gain more than twenty years financial support from Taiwan's National Science Council. In recent years, he works mostly on 3D Interactive Model Web.

Plenary Lecture IV

Analytical Synthesis Method:A New Circuit Design Method for Arbitrary Requirements

Professor Chun-Ming Chang
Senior Member, IEEE
Dept. of Electrical Engineering, Chung Yuan Christian University,
Chung-Li, Taiwan 32023, R. O. China
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Abstract: Analytical Synthesis Method (ASM) has been presented in several papers published in the IEEE Transactions on Circuits and Systems since 2003. It is one of the powerful design methods in the field of analog circuit design. It is the method using a succession of innovative algebra manipulation operations to decompose a complicated transfer function representing the relationship between the output and the input signals of a design project into many simple equations feasible by using the corresponding simple sub-circuitries. The simple sub-circuitries can be constructed by the desired configuration of the element such as the single-ended-input operational transconductance amplifiers (OTAs) and the grounded capacitors, both of which are used for absorbing and reducing the shunt parasitic capacitance and lead to have more precise output responses. In addition to this, the ASM can control the number of the terms in the complicated decomposition process such that the number of both active and passive components used in the circuit is the least compared to the previously reported ones. Then, the ASM is the only one method which can simultaneously achieve the three important criteria for the design of OTA-C circuits without trade-offs.

Due to the flexibility of the ASM, the simple sub-circuitries used in the circuit design can be changed and chosen according to different necessities for the target of the circuit design. For example, if the reduction of the number of the active and passive components used in the circuit is more important than the type of the element configurations like single-ended-input/differential-input OTAs and grounded/floating capacitors due to the consideration about power consumption, chip area, noise, and total parasitics……, etc., the minimum component OTA-C circuit can also be investigated and developed successfully using the ASMs. The fully flexible characteristic and the real demonstration in the literature of the ASM may make it be one of the most prospective methods in the field of analog circuit design in the near future..

Plenary Lecture V

Real-time In vivo and In situ Cellular Image Processing and Characterization: Challenges and Solutions

Associate Professor LIN Feng
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Abstract: We study the feasibility of 3D virtual histology through real-time in vivo and in situ cellular imaging. A prototype system has been developed based on photodynamic fluorescence signals, confocal endomicroscopy, and FPGA image processing and characterization computing. Experiments in its clinical applications have been conducted, mainly for diagnosis of early-stage mucous cancer. With the fine-grained parallel imaging programs mapped on the FPGA, a stream of focused optical sections of microstructures in the subsurface layers up to 300μm in depth, can be processed online and the extracted features can be visualized seamlessly with the endomicroscopy settings.

Brief Biography of the Speaker: Lin Feng, PhD, is an Associate Professor in School of Computer Engineering, Nanyang Technological University, Singapore. His research interests include bioinformatics, bioimaging and visualization, and high-performance computing. He has published about one hundred technical papers in journals, conferences and books, and served in several editorial boards and conference organization committees.

Plenary Lecture VI

Obstacle Avoidance for Kinematically Redundant Manipulators Based on an Improved Problem Formulation and Two Recurrent Neural Networks

Professor Jun Wang
Department of Mechanical and Automation Engineering
The Chinese University of Hong Kong
Shatin, N.T., Hong Kong

Abstract: With the wide deployment of kinematically redundant manipulators in industrial applications, obstacle avoidance emerges as an important issue to be addressed in robotic motion planning. In this talk, we show the formulation of the inverse kinematic control of redundant manipulators with obstacle avoidance task as a convex quadratic programming problem with both equality and inequality constraints. Compared with our previous formulation, the new problem formulation is more favorable with better solutions or bigger solution set to the problem. To solve this time-varying quadratic programming problem in real time, two recurrent neural networks are applied to compute inverse-kinematic solutions with obstacle avoidance capability in real time. The effectiveness of the proposed approach is demonstrated by using simulation results based on the Mitsubishi PA10-7C

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