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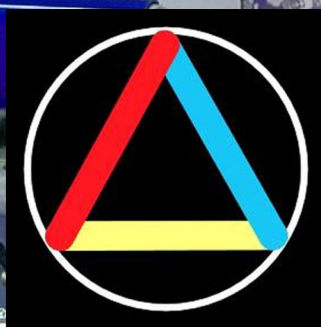
Recent Advances in Automation & Information

Proceedings of the 11th WSEAS International Conference
on AUTOMATION & INFORMATION (ICAI '10)

"G. Enescu" University, Iasi, Romania, June 13-15, 2010

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Preface

This year the 11th WSEAS International Conference on AUTOMATION & INFORMATION (ICAI '10) was held at "G. Enescu" University, Iasi, Romania, June 13-15, 2010. The conference remains faithful to its original idea of providing a platform to discuss circuits and systems, electronics, filters, mobile communications, optoelectronics, signal processing, automatic control and robotics, human-machine systems and cybernetics, computational linguistics, natural language processing, computer algebra, artificial intelligence, image sequence processing, numerical analysis, microprocessors, computer architecture, software tools and environments, geometric modeling and fractals etc. with participants from all over the world, both from academia and from industry.

Its 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 this conference 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.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Variational Based Image Inpainting Methods by using Cellular Neural Networks



Professor Alexandru Gacsadi

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Abstract: Image inpainting is an interpolation problem where an image with missing or damaged parts is restored. The most often used image inpainting applications are for pictures or films known or damaged partially. Discarding some unwanted parts, text or objects from the whole image space, special effects can be carried out using image restoration.

Complex mathematical models based on partial differential equations (PDE) or variational computing were proposed as techniques for restoring damaged or partially known images. Those methods are computational expensive and difficult to implement, even when a large serial processing computing power is available.

The Cellular Neural Networks (CNN) based parallel processing ensures computing-time reduction if the processing algorithm can be implemented on a continuous-time analogue CNN-UM (Cellular Neural/Nonlinear Networks Universal Machine) or using FPGA implemented emulated digital CNN-UM. Even if variational computing methods are used, the design of CNN templates ensuring the desired processing of the gray-scale image remains an important step.

In the present paper, some variational based CNN methods are presented and analyzed that can be used for the reconstruction of damaged or partially known images. Efficiency of these inpainting methods can be enhanced by combining them with nonlinear template that ensures the growth of the local properties spreading area along with regional ones.

Brief Biography of the Speaker:

Alexandru Gacsadi received the M.Sc. and the Ph.D. degree in Electronic Engineering and Telecommunications, both from the "Politehnica" University of Timisoara, Romania, in 1986 and 2001, respectively. Since 1991 he is with the University of Oradea, Romania, and currently he is a professor at the Electronics Department of the Electrical Engineering and Information Technology Faculty responsible for teaching data acquisitions, cellular neural networks applications and robotics.

His research interests are in the area of neural networks, cellular neural networks and its applications, image processing and analysis with applications in medical imaging, processing and analysis of biomedical data, smart transducers, and robotics.

He has published more than 70 papers in national and international journals, conferences, workshops and symposium proceedings, authored 3 books and 5 application guides. He conducted or acting as active member for more than 15 research and development projects, grants and contracts in his field of interest.

Professor Alexandru Gacsadi has been involved in setting up national and international conferences as a reviewer and/or member of organizing committee. He is a member of the: IEEE Society (CAS), Society of Electronic Engineers from Romania and Romanian Society for Industrial Robotics.

Plenary Lecture 2

The Phenomenon Identification of air Circulation in Spaces with Harm Releases



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Abstract: It presents a method to identify the value of concentration in certain areas of rooms where the air is introducing superposition effect of flow convection natural/artificial and diffusion and a recirculation of its, which acts as a feedback circuit. Starting from the necessity of knowledge as accurate mathematical models that characterize the conduct of processes subject to automation was introduced progressively consider a simplified model of air recirculation for the release of carbon dioxide, then considered the phenomenon of flow convection, and finally was completed and the phenomenon of diffusion. Based on the results obtained by numerical simulation have made a number of conclusions regarding the location of the transducers, necessary to monitor environmental parameters and conclusions on specific points of execution. The result helps to understand how to conduct a recirculation phenomenon, and may form a basis for future adaptive adjustment of the concentration value of the room.

Brief Biography of the Speaker:

Marius-Constantin Popescu is Associate Professor of Department of Electromechanical of Faculty of Engineering in Electromechanics, Environment and Industrial Informatics Craiova within the University of Craiova, Romania. He has published more than 140 papers in national and international journals, conferences, workshops and symposium proceedings, authored 11 books and 10 application guides. He conducted or acting as active member for more than 17 research and development projects, grants and contracts in his field of interest.

Professor Marius-Constantin Popescu has been involved in setting up national and international conferences as a reviewer and/or member of organizing committee. He is a member of the: AGIR (General Association of Engineers in Romania), SRAIT (Romanian Society of Automation and Technical Informatics). He had participated in 9 WSEAS International Conferences, presenting papers and attending the scientific meetings. He has also 20 papers published by WSEAS Transactions and NAUN International Journals.

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