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Recent Researches in Artificial Intelligence, Knowledge Engineering & Data Bases

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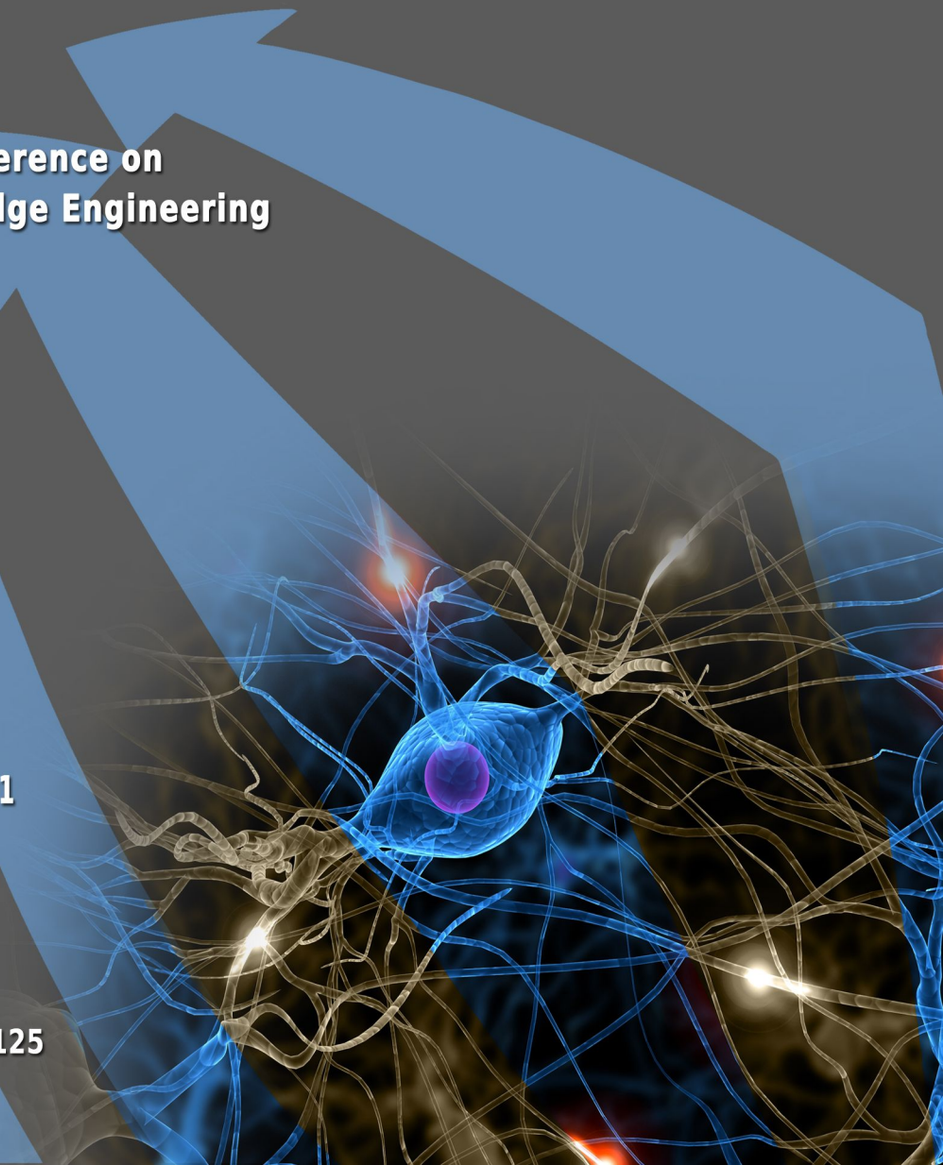
10th WSEAS International Conference on
Artificial Intelligence, Knowledge Engineering
and Data Bases (AIKED '11)

Cambridge, UK, February 20-22, 2011



ISBN: 978-960-474-273-8
PRINT VERSION ISSN: 1792-8117
ELECTRONIC VERSION ISSN: 1792-8125

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Published by WSEAS Press
www.wseas.org

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

ISSN: 1792-8117
ISBN: 978-960-474-273-8

World Scientific and Engineering Academy and Society

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Preface

This year the 10th WSEAS International Conference on ARTIFICIAL INTELLIGENCE, KNOWLEDGE ENGINEERING and DATA BASES (AIKED '11) was held in Cambridge, UK, February 20-22, 2011. The conference remains faithful to its original idea of providing a platform to discuss neural networks, mathematical foundation, time series analysis, fuzzy systems, information retrieval systems, image processing, data security, business architectures, video databases, content management, privacy issues, interoperability issues, knowledge classification tools, digital watermarking, electronic publishing, artistic imaging, digital typography, geographic information systems, wireless networks 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

Aggregation in Intelligent Systems

Professor Imre J. Rudas
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Abstract: The problem of aggregating information represented by fuzzy sets in a meaningful way has been of central interest since the late 1970s. In most cases, the aggregation operators are defined on a pure axiomatic basis and are interpreted either as logical connectives (such as t-norms and t-conorms) or as averaging operators allowing a compensation effect (such as the arithmetic mean).
On the other hand, it can be observed by some empirical tests that the above-mentioned classes of operators differ from those ones that people use in practice. Therefore, it is important to find operators that are, in a sense, mixtures of the previous ones, and allow some degree of compensation.
This talk summarizes the research results of the author and his co-workers that have been carried out in recent years on generalization of conventional aggregation operators. This includes, but is not limited to, the class of uninorms and nullnorms, absorbing norms, distance- and entropy-based operators, quasi-conjunctions and nonstrict means.

Brief Biography of the Speaker: Imre J. Rudas graduated from Banki Donat Polytechnic, Budapest in 1971, received the Master Degree in Mathematics from the Eotvos Lorand University, Budapest, the Ph.D. in Robotics from the Hungarian Academy of Sciences in 1987, while the Doctor of Science degree from the Hungarian Academy of Sciences in 2004. He received his first Doctor Honoris Causa degree from the Technical University of Kosice, Slovakia and the second one from “Polytechnica” University of Timisoara, Romania.
He is active as a full university professor. He served as the Rector of Budapest Tech from August 1, 2003 for a period of four years, and was reelected for three years in 2007. From 2010 Budapest Tech is changed to Obuda University and he was elected as the rector for five years.
He is a Fellow of IEEE, Senior Administrative Committee member of IEEE Industrial Electronics Society, member of Board of Governors of IEEE SMC Society, Chair of IEEE Hungary Section and Vice-President of the Hungarian Academy of Engineering.
He is the treasurer of IFSA (International Fuzzy System Association), he had been the President of Hungarian Fuzzy Association for ten years.
He serves as an associate editor of some scientific journals, including IEEE Transactions on Industrial Electronics, member of editorial board of Journal of Advanced Computational Intelligence, member of various national and international scientific committees. He is the founder of the IEEE International Conference Series on Intelligent Engineering Systems (INES) and IEEE International Conference on Computational Cybernetics (ICCC), and some international symposia. He has served as General Chairman and Program Chairman of numerous scientific international conferences.
His present areas of research activity are Computational Cybernetics, Robotics with special emphasis on Robot Control, Soft Computing, Computed-aided Process Planning, Fuzzy Control and Fuzzy Sets. He has published books, more than 450 papers in books, various scientific journals and international conference proceedings. He received more than 600 citations for his publications.

Plenary Lecture 2

Cosmology, Holography, the Brain and the Quantum Vacuum

Professor Antonio Alfonso-Faus
"Ad Honorem" Madrid Technical University (UPM)
SPAIN
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Abstract: Cosmology, as a science, started at the beginning of the last century with the advent of the Einstein cosmological equations. Based on these equations, the present main stream cosmological model is the well known big-bang (this name unwillingly coined by Fred Hoyle many years ago). Relatively recent additions to this model have been inflation, dark matter and dark energy.
This talk presents a smoothly behaved new cosmological model that mainly takes into account the "dark" part of the Universe. We consider it as the background frame, the substrate, of what we see. The inclusion of the holographic principle clarifies the entropy problem that we also apply to the human brain. We take it as an engineering information center. Finally, the inclusion of the quantum vacuum in this scene creates an important challenge, an opportunity for future research in the knowledge of the Universe.

Brief Biography of the Speaker: Antonio Alfonso-Faus graduated from the Technical University of Madrid (UPM), Spain, in 1964. He received the Diploma Space Science (Physics and Dynamics) from the University College, London, U.K., in 1965. Then he received the Master of Science Degree in Physics and Mathematics from the University of Minnesota, U.S.A., in 1967, followed by the Ph.D. Degree (Physics and Mathematics) at the same University, in 1968. He also holds a Doctor of Aeronautical Engineering Degree from the Technical University of Madrid (UPM), Spain, in 1969. Presently he is active as an Ad Honorem Professor (2010), at the same UPM, where he has served teaching and researching for the last 35 years. He served as academic positions: member of the board (6 years), coordinator of the Mechanical Engineering Unite (10 years) and Director of the "Aerotecnia" Department (6 years) at the E.U.I.T. Aeronautica, UPM.
He was a collaborator (5 years, 1968-1973) for the National Technical Institute for Aerospace (INTA, Spain), worked for Iberia L.A.E. (22 Years, 1973-1995) bridging knowledge between the University and the Industry. Member of the S.A.E. (U.S.A.) for aircraft engines technical specification for the Industry, Chairman of the Engine Trend Monitoring Team (ATLAS, four years), referee for various international scientific journals, chairman of various scientific international conferences (Frontiers of Fundamental Physics, Science for Health), full professor of Mechanical Engineering at the UPM (1995-2009), Golden Medal Award (UPM, 1999).
Research activities: Solar Wind, Interplanetary Magnetic Field, Lunar Wake, Cosmology and Astrophysics.

Plenary Lecture 3

Content Delivery Networks: Evolution, Technology, Functions, Potential Solutions, Research Areas

Professor Zoran Bojkovic
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Abstract: Content delivery network (CDN) is a comprehensive, end- to-end solution for optimizing global networks for Web content delivery. Users requesting information from a Web site may have those requests served from a location closer to them than the original server on which it is generated. By serving content from points a lot closer to the user, a CDN reduces the likelihood of hot spots by dispersing the different points of convergence and by distributing the workload among multiple servers. Delivering content from the edge of the network instead of the original server has the added benefit of additional reliability. The probability of the lost packets is decreased, while the performance of streaming audio and video is improved.

CDNs deploy servers in multiple geographically diverse locations in order to redirect users requests to the nearest available servers. End users observe higher QoS, while content providers offer more reliable and larger volumes of the service. At the same time, Internet service providers (ISPs) can also benefit from deploying CDN servers in their networks, as the total amount of the traffic transmitted in the backbone is reduced. In order to address the issue faced by many content providers, companies started to provide a service called content distribution network service. Content distribution network is a "shared" infrastructure in that the mirror servers (also called replica servers) belonging to a network service provider are usually "shared" between multiple content providers. The value provided by the network service providers is measured by the amount of content downloaded from the major servers and the peak bandwidth needed to serve the content from the mirror servers. One of the main challenges for providers is to be able to find the "nearest" mirror server corresponding to a client. Typically, the IP address of the client is used to identify the location of the client.

This plenary speech is organized as follows. After the introduction, showing the current status in the area, the next section will describe the evolution of content delivery technologies, together with content delivery network functions. The fact that the content delivery technique offers the service of large scale based on IP networks is taken into account. In order to satisfy QoS requirements for heterogeneous Internet applications, system performances are improved. The second part deals with potential solutions to problems in IP networks. The emerging applications require varying amounts of reliability, functionality, speed, efficiency, cost, effectiveness and scalability. Therefore, it is necessary to bridge the gap between the emerging heterogeneous applications with various demands of service capacity and IP networks. The emerging challenges are server placement and organization, content distribution, request routing and system management. Several approaches are opened for consideration like: efficient streaming in future Internet, end-to-end multimedia communications across complex combinations of networks, peer-to-peer hybrid or fully distributed networking for content handling, content adaptation to facilitate content capabilities, etc.

Brief Biography of the Speaker: Prof. dr Zoran Bojkovic is full professor of Electrical Engineering, University of Belgrade, Serbia. Also, he is a permanent visiting professor at the University of Texas at Arlington, TX, USA, EE Department. Until now, he has taught a number of courses in Electrical Technology, Telecommunication Systems, Image and Video Processing, Multimedia Wire/Wireless Communication Systems. He is the author or co-author of 6 international books published in USA, Canada, Singapore, China, India, Greece and Romania. Also, he has published 2 national monographies, 13 textbooks as well as more than 400 papers in peer-reviewed journals and conference proceedings. He has been Editor-in-Chief in 2 and Associate Editor in 3 WSEAS Journals. At present, he is a member of Editorial Board in 6 International Journals. He is co-editor in 51 International Books and International Conference Proceedings. He has conducted workshops/tutorials and seminars worldwide and participated in more than 70 research and industrial projects all over the world. Also, he has been a consultant to industry, research institutes and academia. Prof. Bojkovic is an active researcher in wire/wireless multimedia communications. He is a Senior Member of IEEE and WSEAS member of EURASIP. He is a full member of Engineering Academy of Serbia and a member of Serbian Scientific Society.

Plenary Lecture 4

Case-Based Reasoning Framework for Medical Diagnosis for Virtual Doctor System

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Iwate Prefectural University
Iwate, Japan
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Abstract: This plenary talk will provide an outline on our experience to build a virtual doctor system based on semantic case based reasoning (CBR) framework. Patients and users are categorized based on mental ontology framework and mental ontology framework. These two frame works are represented in OWL, (Ontology Web Language) for reasoning purpose. The CBR are categorized based on these ontologies. The reasoning has used Bayesian network based on collected relative decisions related to CBRs instantiated in relations to the observed parameters reflected on alignment of physical ontology and mental ontology. The resulted alignment namely the medical ontology represents a semantic CBR reflecting the patient symptoms. This talk gives an overview of these techniques and how to deploy them to build a prototype that can be used in local regional medical hospital in Japan.

Brief Biography of the Speaker: Dr. Hamido FUJITA, is a professor at Iwate Prefectural University (IPU), Iwate, Japan. He is director of ARISES (Advanced Research Institute on Software Strategies,)
http://www.fujita.soft.iwate-pu.ac.jp/arises/index.htm
He is the director of Intelligent Software Laboratory. He was associate Professor at the University de Montreal, Canada. On 1997 he moved back to Japan to become an executive committee member to establish Iwate Prefectural University on 1997. Then after from April 1998, he joined Iwate Prefectural University (IPU), Faculty of Software and Information Science, as Professor and head of Information System, directing at IPU two laboratories, Intelligent Software System Laboratory and Cognitive Systems Laboratory. He was a committee of establishing the Graduate School of Software Science, of IPU from 2000 for new Master and Doctor Programs that used Software practices Approach (SPA) concept as it main educational system in education. He has directed and led many project sponsored by the Ministry of Science, Education and Culture of Japan, and others from International sponsors and industry sponsors project on new software methodologies and intelligent systems. He contributed in software related inventions and got several international industrial Patents on new software methods on tableau related development. He has founded the SOMET (Software Methodologies, Tools and Techniques) organization on year 2000 in Paris, France marched to its 10th Anniversary. He has been invited to many universities in EU, and North America. He has supervised Ph.D students jointly with University of Laval, (Canada) University Technology, Sydney (UTS) Australia, He is also Professor at the University of Laval, Quebec, Canada supervising Graduate Studies students, he was a visiting Professor at the University of Paris_1, Sorbonne, 2003~2004. He worked as opponent for Ph.D student examination at Stockholm University, Sweden. He edited several special issues in International Journals on many hot issues in related to Knowledge based system and software technologies. He is currently heading a project on Intelligent HCI, and a project related to Mental Cloning as an intelligent user interface between human user and computers, supported by MEXT (Ministry of Education, Culture, Sports, Science and Technology), and SCOPE project on Virtual Doctor Systems, supported by Ministry of Internal Affairs, and Communications of Japan. He also, has several joint industrial projects with Japanese industry.