IOAN DZIŢAC

FLORIN GHEORGHE FILIP

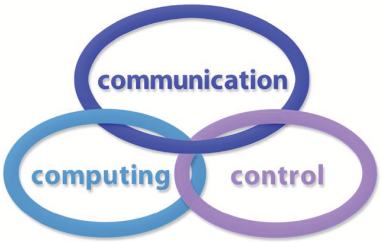
MIŞU-JAN MANOLESCU
(editors)

ABSTRACTS OF ICCCC PAPERS

Volume 4 (2014)

5th International Conference on Computers, Communications and Control, ICCCC 2014

România, Oradea – Băile Felix, May 6-10, 2014



Conference Organizers:
AGORA UNIVERSITY OF ORADEA
under the aegis of
INFORMATION SCIENCE & TECHNOLOGY SECTION
of the
ROMANIAN ACADEMY

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Contents

A Note from the General Chair

I. Dzitac

The abstracts of all accepted papers for ICCCC2014 are published in this volume: *Abstracts of ICCCC Papers*, 4(2014), ISSN 1844-4334.

All presented papers at ICCCC 2014, after strict peer-reviewing process, will be included in the *Proceedings of the International Conference on Computers, Communications & Control* (4-6 pages/paper), which will be published as a supplementary issue of the *International Journal on Computers, Communications & Control* (IJCCC, INT J COMPUT COMMUN, ISSN: 1841-9836) and will be submitted for indexing/coverage to Thomson Reuters (ISI Web of Science/Web of Knowledge), Scopus, EBSCO and other international databases.

After presentation and discussions in conference sessions, extended versions of some selected high-quality papers will be published in IJCCC (IF = 0.441 in JCR2012, 8-16 pages/paper) and will be indexed in Science Citation Index Expanded (ISI).

The title of extended paper must be different of proceedings paper and the old title must be cited. Is mandatory also provide a brief description of the differences between the extended manuscript and the preliminary version published in conference proceedings.

Paper previously published in conference proceedings are eligible for consideration provided that the papers have undergone substantial revision.

Ioan Dzitac,
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A Brief Presentation of Agora University

M.J. Manolescu, A. Manolescu, I. Dzitac

Agora University is a small and young, but dynamic and flexible, higher education private institution. Agora University, including Law and Economics Faculty, was founded in 2000 by the Agora Foundation (Founder Rector: Mişu-Jan Manolescu; Founder Dean: Adriana Manolescu). By the Decision of the Romanian Agency for Quality Assurance in Higher Education, taken on 20th of December 2010, Agora University was accredited with the qualifier *trust*. On 3 April 2012 was published the Act 59/2012 regarding the establishment and accreditation of Agora University of Oradea.

Actual Staff of Agora University:
Adriana Manolescu (president of Senate); Mişu-Jan Manolescu (President of Administration Council); Ioan Dzitac (Rector); Gabriela Bologa (Dean of Law and Economics Faculty), Elena Ana Iancu (Director of Social Sciences Department).

Fields/Programs of Bachelor:
- Law: Law - 4 years.
- Management: *Management* - 3 years.
- Accountability: *Accountability and Management Information Systems* - 3 years.
- Administration Sciences: *Local Police* - 3 years.

Fields/Programs of Master:
- Law: *Criminal and Penal Sciences* - 1 year.
- Management: *Human Resource Management* - 2 years.
- MBA: *Master Business Administration* - 12, 16 or 24 months (in collaboration with Southeastern University, Florida, USA).

Agora University's Policy of Internationalization:

Agora University institutional partners: Libera Universita degli San Pio V, Rome, Italy Instituto di Studi Politici S. Pio V, Rome, Italy; Consorzio Universitario d'Isernia, Italy; Istituto di Ricerche Sociali Economiche e Ambientali (IRSEA), Rome - Italy; Istituto di Scienze e Tecnologie della Cognizione (ISTC)-CNR , Rome, Italy; O.Di.S.E.A. Onlus, Rome, Italy; Regional Centre for Development and Retraining of Manpower (DRMKK)- Debrecen, Hungary; Universidade de Santiago de Compostela, Spain; Universita degli Studi di Roma La Sapienza, Italy; Universita degli Studi di Cassino (Frosinone), Italy; Universita degli Studi di Modena e Reggio Emilia, Italy; Universita degli Studi di Palermo, Italy; Universidade de les Illes Balears, Spain; Universite de la Sorbonne Nouvelle Paris III, France; University of Belgrade, Belgrad, Serbia; University of Malta, Malta; University of Montenegro, Montenegro; University of Thessaly, Greece; University Tunis El Manar, Tunisia; Southeastern University, Lakeland, Florida, USA; Chinese Society for Management, Beijing, China; Southwestern University of Finance and Economics, Chengdu, China; Kalasalingam University, India.

External honorary members of Agora University Senate (in chronological order of election): Acad. Florin Gheorghe Filip, Romanian Academy, Romania; Prof. Pierre Borne, L'Ecole Centrale de Lille, France; Prof. George Metakides, University of Patras, Greece; Prof. Felisa Cordova, University of Santiago of Chile, Chile; Prof. Yezid Donoso, University of the Andes, Bogota, Colombia; Prof. Gang Kou, Southwestern University of Finance and Economics, China; Prof. Yong Shi, University of Nebraska at Omaha, United States; Dr. K. Sridharan, Kalasalingam University, India.

Doctor Honoris Causa of Agora University (in chronological order of election): Acad. Florin Gheorghe Filip, Romanian Academy (2012); Prof. Robert Joseph Childs, Southeastern University, Florida, USA (2012); Prof. Grigor Moldovan, Babes-Bolayi University of Cluj Napoca, Romania (2013); Prof.Constantin Rosca, University of Craiova, Romania (2013): Prof. Yong Shi, University of Chinese Academy of Sciences (2014).

Guests in Book of Honor of the Agora University: Prof. Vasile Baltac, SNSPA Bucharest; Prof. Boldur Barbat, Universitatea Lucian Blaga, Sibiu; Prof. Gabriel Ciobanu, Institute of Romanian Academy, Iasi; Acad. Paul Dan Cristea (1941-2013), Romanian Academy; Prof. Janos Fodor, Obuda University, Budapest, Hungary; Prof. Angel Garrido, UNED, Spain; Prof. Kaoru HIirota, Tokyo Institute of Technology, Japan; Acad. Solomon Marcus, Romanian Academy; Dr. Milan Stojanovic, Faculty of Organizational Sciences, University of Belgrad, Serbia; Prof. Athanasios Styliadis, University of Kavala, Greece; Acad. Dan Tufis, Romanian Academy; Prof. Lotfi A. Zadeh, University of California, Berkeley, USA; Prof. Stephan Olariu, Old Dominion University, USA; Prof. Pierre Borne, L'Ecolle Centrale de Lille, France; Acad. Gheorghe Paun, Romanian Academy & Academia Europaea, Prof. Felisa Cordova, University of Santiago de Chile; Prof. Gang Kou, Southwestern University of Finance and Economics, China; Prof. Yong Shi, University of Nebraska at Omaha, USA; Prof. Vinod K. Madan, Kalasalingam University, India etc.

Discover SWUFE International Summer Camp 2014: On May 19, 2013 was signed an Agreement of Cooperation between Agora University of Oradea - Romania (Rector Ioan Dzitac), and the Southwestern University of Finance and Economics (SWUFE) in Chengdu, China (Dean Gang Kou, School of Business Administration in SWUFE), including visits and training periods for the students.

The Southwestern University of Finance and Economics (SWUFE) in Chengdu, China has invited Agora University students to go and experience life as an international student in their university this summer from 29st June to 12th July. At this camp you will be able to attend a series of lectures (delivered in English) by leading professors from SWUFE and get the chance to meet with senior professionals from local business. To give a sense of local culture you will get the chance to learn about Chinese calligraphy, martial arts, traditional music, and cuisine.

The program is about more than just academic/professional learning; the focus is on providing an unforgettable experience and introduce you to all aspects of life in China. The "Discover SWUFE 2014" summer camp is open to students from Agora University and other partner universities, and all local activities are free of charge, including course fees, accommodation, transportation around Chengdu, and meals.

International conferences organized by Agora University:
1. International Conference on Computers Communications and Control (start year: 2006);
2. Agora International Law Conference (start year: 2007);
3. Agora International Economics Conference (start year: 2007).

International journals edited by Agora University:
1. International Journal of Computers, Communications & Control (start 2006, 6 issues/year, ISI WoS/WoK, Scopus, EBSCO, DOAJ etc.);
2. Agora International Journal of Juridical Sciences (start year: 2007, 2 issues/year, DOAJ, EBSCO, ULRICHS etc.);
3. Agora International Journal of Economical Sciences (start year: 2007, 1 issue/year, Index Copernicus, SOCOL@R etc.).

Agora International Primary School (AIPS): In Agora University Campus we have as partner AIPS, authorized by the Ministry of National Education. AIPS is a modern school, which aims to shape its rhythm of adaptation to the European standards in education. That is why, starting from the truth that learning is a continuous process, beyond the purchases specific to each discipline of study AIPS puts particular emphasis on the training of competencies, on the cultivation of self-confidence, on stimulating curiosity, on training the skills to learn how to learn, on the development of positive attitudes.

The objectives aimed by AIPS are fulfilled by covering a complete school program which includes, besides the compulsory educational program (set in the national curriculum), support for activities of thoroughness/development on areas of learning, four meals a day (breakfast, lunch, and two snacks), optional courses for the cultivation and the development of individual abilities, to develop individual skills, extracurricular activities.

The importance that AIPS gives to the intensive learning of English language is reflected in the number of study hours, in the professional quality of those who teach and in the methods and resources that are used. By teaching foreign languages - English, French, German, Italian - AIPS aim is to develop pupils' capabilities to adapt to different multicultural contexts.

Academic Agora of Romanian–Indian Friendship: On 17 October 2013 was signed an Agreement of Cooperation between Agora University of Oradea from Romania (Rector Ioan Dzitac) and the Kalasalingam University from India (Chancellor K, Sridharan), including collaboration in education, research, visits for the professors' and training periods for the students. Based on this agreement on 8 May 2014 is planned , the Constituent Assembly of the "Academic Agora of Romanian–Indian Friendship" (at Hotel President in Băile Felix), as an extended association between academic people from Romania and India.

Oradea, April 12, 2014.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
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Foreword: 5th International Conference on Computers, Communications & Control, ICCCC 2014

I. Dzitac, F.G. Filip, M.J.Manolescu

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Abstract

In this foreword we presents 5th edition of the *International Conference of Computers, Communications & Control* (ICCCC) and a brief description of the *International Journal of Computers, Communications & Control* (IJCCC). ICCCC and IJCCC were founded in 2006 by the authors of this foreword (I. Dzitac, F.G. Filip, M.J. Manolescu).

ICCCC is organized in every even year begging since 2006. ICCCC 2014 is focused to 4 special sessions, in order to exchange ideas, problems, solutions, and to work together in a friendly environment. With every edition of the ICCCC the evaluation process is more demanding and therefore many good works had to be rejected.

IJCCC is a bimonthly journal indexed/covered by the Science Citation Index Expanded (ISI WoS/WoK, Thomson Reuters), Scopus, EBSCO, DOAJ etc.

This volume includes the abstracts of 53 papers, coauthored by 121 researchers from 18 countries (Australia, Chile, China, Colombia, France, Germany, Hungary, India, Italy, Korea, Pakistan, Poland, Romania, Russia, Serbia, Spain, United Kingdom, United States): 48 regular accepted papers and 5 invited papers presented by five keynote speakers (Yong Shi- China, Fuad Aleskerov - Russia, Pascale Zarate - France, Antonio Di Nola - Italy and Ioan Dumitrache - Romania).

ICCCC 2014 Keynote Speakers

Yong SHI,
University of Chinese Academy of Sciences
& Research Center on Fictitious Economy; Data Science,
Chinese Academy of Sciences,
Beijing 100190, China, E-mail: yshi@gucas.ac.cn
& College of Information Science & Technology,
University of Nebraska at Omaha,
NE 68182, USA, E-mail: yshi@unomaha.edu

Dr. Yong Shi, born in Chengdu City in Sichuan Province of PR China on August 24, 1956, obtained his BS degree in Mathematics from Southwest Petroleum Institute, China, 1982, Master of Business Administration (MBA), National Center for Industrial Science and Technology Management Development (co-sponsored by USA and China), Dalian University of Science and Technology, China, 1983 and Ph D, degree in Management Science from University of Kansas, USA, 1991.

He has been an Assistant Professor (1991-1996), Associate Professor (1996 -1999), Professor (1999 - 2004) and the Charles W. and Margre H. Durham Distinguished Professor of Information Technology, Peter Kiewit Institute, University of Nebraska, USA (1999 -2004). He was also a visiting professor at National University of Singapore (1995), a research fellow at Russia Academy of Sciences (2003) and a visiting professor at Korea Advanced Institute of Science and Technology (2013). He has been invited to give research speeches at a number of prestigious overseas campuses, including Princeton University, University of Chicago, Duke University, Purdue University, Ohio State University, University of Minnesota, Rensselaer Polytechnic Institute, University of Miami, Rutgers University, University of Pittsburgh, Southern Methodist University, University of Colorado, Boulder in USA; University of Cambridge, Brunel University in UK; McMaster University, York University in Canada; University of Tokyo, Kyoto University, Hirosaki University in Japan, The Australia e-Health Research Centre, ICT Centre, CSIRO, Brisbane, Tasmanian ICT Centre, CSIRO, Tasmania in Australia, Korea Advanced Institute of Science and Technology in Korea; National Chiao Tung University and National Taiwan University, Taiwan; University of Granada, Spain; Barcelona Super Computing Center, Spain; Institute of Computing Science, Poznan University of Technology, Poland.

In 2007, he was appointed as the Executive Deputy Director, Chinese Academy of Sciences Research Center on Fictitious Economy & Data Science. In 2014, he was appointed as the director of Key Research Lab on Big Data Mining and Knowledge Management, Chinese Academy of Sciences.

He published 21 books (19 in English: 9 by Springer, 3 by World Scientific, 2 by Elsevier, 1 McGraw-Hill/Irwin). Among them, 8 books have been cited 60 times by others. He published 158 research papers in 86 different journals and numerous papers in international conferences ranging from economics, finance, social science, and computational sciences. There are more than 400 SCI/SSCI citations by others. One of his papers has been cited 84 times by others, which has been ranked as the top 0.1% hot papers by ESI (Essential Science Indicators) of ISI Web of Science from 2009-2010 and the top 1% highly cited articles from 2001-2011.

Fuad ALESKEROV,
National Reasearch University Higher School of Economics,
Moscow, Russia.
E-mail: alesk@hse.ru

Professor Fuad Aleskerov is a Chair of Higher Mathematics at the Department of Economics of HSE, head of Laboratory of Decision Sciences of HSE, leading research fellow of the Centre for Studies of Civil Society and Non-for-profit Sector (CSCSNS), head of the MSc progamme Mathematical modeling of HSE, head of department, Institute for Control Sciences.

Professor Aleskerov graduated from Mathematics Department of Moscow State University in 1974, and was affiliated with the Institute of Control Sciences before joining HSE in 2004. He held visiting positions in many universities, including California Institute of Technology (USA), University of Paris (France), Istanbul University (Turkey), University of Torino (Italy).

His research interests are in the fields of individual and collective decision theories, discrete mathematics, micro- and macroeconomic modeling, political sciences. He held numerous research grants and taught over 20 courses in mathematics and mathematical economics at an undergraduate and graduate levels. Professor Aleskerov authored over 100 research articles and eight books, including Theory of choice, with M. Aiserman, Elsevier, 1995, Arrowian aggregation models, Springer, 1999, and Utility maximization, choice and preferences, with D.Bouyssou and F.Monjardet, Springer, 2007 (2nd ed.).

Pascale ZARATE,
University of Toulouse 1, France,
IRIT- Institut de Recherche en Informatique de Toulouse
E-mail: Pascale.Zarate@irit.fr

Dr. Pascale Zarate is a Professor at Toulouse 1 Capitole University. She conducts her researches at the IRIT laboratory (http://www.irit.fr). She holds a Ph.D. in Computer Sciences, Decision Support from the LAMSADE laboratory at the Paris Dauphine University, Paris (1991). She also holds a Master degree in Computer Science from the Paul Sabatier University, Toulouse, France (1986); as well as a Bachelors degree Toulouse, France (1982). Pascale Zarate's current research interests include: Decision Support Systems; distributed and asynchronous decision making processes; knowledge modelisation; cooperative knowledge based systems; cooperative decision making. She is the Editor-in-Chief of the International Journal of Decision Support System Technology (IGI Global).

Since 2000, she is head of the Euro Working Group on DSS (www.euro-online.org). She published several studies and works: one book, edited two books, edited 11 special issues in several international journals, two proceedings of international conferences, 22 papers in several international journals, two papers in national journals, five chapters in collective books, 26 papers in international conferences. She belongs the Editorial Scientific Committee of three International Journals: Journal of Decision System (Lavoisier), ComSIS, Intelligent Decision Technologies (IOSPress). She was chairing the IFIP TC8/WG8.3 conference devoted to Collaborative Decision Making (http://www.irit.fr/CDM08).

Antonio DI NOLA,
University of Salerno, Italy, Department of Mathematics
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Dr. Antonio Di Nola is Full Professor of Mathematical Logic and Director of the Department of Mathematics of the University of Salerno. He is also Leader of the research project *Logic and algebra of uncertain information*, Editor in Chief of *Soft Computing*, Springer Verlag, Associate Editor of *International Journal of Computers Communications & Control, Fuzzy Sets and Systems, Mathematica Slovaca, Optimization and Decision Making.*

Since the nineties he has been a leading proponent of the study of algebraic models of Lukasiewicz logic (MV-algebras), the most important among the many-valued logics. His contribution to the study of MV-algebras, witnessed by the seventeen citations of his works in the fundamental monograph *Algebraic foundations of many-valued reasoning*, includes: a functional representation theorem for all MV-algebras (Di Nola's Representation Theorem); the discovery of categorical equivalences between categories of MV-algebras and categories of groups, rings, and semi-rings, profitably used in the literature of MV-algebras, the discovery of an equational axiomatisation of all varieties of MV-algebras, and a normal form theorem for Lukasiewicz logic.

Today is actively committed to apply ideas from algebraic geometry in the MV-algebra and in the study of probability which admit infinitesimal values. He is author/coauthor of more than 150 scientific works, published on international journals of logic, algebra and computer science.

Ioan DUMITRACHE,
Politehnica University of Bucharest, Romania.

Professor Ioan Dumitrache graduated from Politehnica University Bucharest (PUB) with a PhD in Electric Automation (1970). He has completed research internships in USA, Germany and France. Prof. Dumitrache served as Deputy Dean (1976-1984) and Dean (1984-1990) of the Faculty of Automatic Control and Computers. In the period 2000- 2004 he served as Rector of PUB. In 2000 he was elected Member of The Academy of Technical Sciences and in 2003 he was elected Corresponding Member of the Romanian Academy. He is the President of The Romanian Society of Automation and Technical Informatics and since 1998 served as a president of NURC. He is member of different IFAC Committee and as a Romanian representative for the IFAC.

Prof. Dumitrache researches into algorithms and advanced control strategies, intelligent manufacturing, robotics, modeling and controlling bioprocesses, either as Principal Investigator or Coordinator of larger teams. He is the Chief Editor of *Control Engineering and Applied Informatics* and serves as member of the editorial board of similar journals. Prof. Dumitrache has authored more than 20 books and monographs in tuning engineering, intelligent control of processes, numerical control of processes, optimizations, control engineering, intelligent robots etc. Prof. Dumitrache has authored more than 260 articles in peer-review journals and international proceedings. He has edited 16 volumes of national and international conferences in automation and information technology.

Special Session 01: Decision Support Systems for Supply Chain Management and their Dynamics. New Proposals and Directions

Organizers & Chairs:

Angel ORTIZ,
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Dr. Angel Ortiz is a Professor at the Universitat Politecnica de Valencia (UPV), Spain. He is an industrial engineer and Ph.D. in Industrial Engineering from UPV.

He are developing research and enterprises activities in Supply Chain Management, Business Process Management and Information Technologies.

He has authored more than 20 papers in journals as Computers in Industry, IJCIM, IJPE, Omega and others.

He has participated also in several European Projects of V-CHAIN Project (Virtual Enterprise for Supply Chain Management-GRD1-2000-25881) and University leader of ECOSELL (Extended Collaborative Selling Chain- GRD1-2001-40692), UEML (Unified Enterprise Modelling Language- IST - 2001 - 34229, a Thematic Network) and V-CHAIN ASIA-IT (ASI/B7-301/97/0126-49).

Prof. Angel Ortiz has developed projects about SCM, BPM, IT and Enterprise Engineering in several enterprises from different sectors (automotive, tiles, furniture, beverages, food, packaging, textile etc.). I am a member of the IFAC TC5.3 "Enterprise Integration and Networking"and IFIP TC5 WG 5.12 "Architectures for Enterprise Integration". He has participated in several Masters in Spain and courses in others countries like France, Mexico and Sweden.

Florin Gheorghe FILIP,
Romanian Academy, Romania.

Acad. Florin Gheorghe Filip (b. July 25, 1947) is graduate degree and M.Sc. in Control Eng. & Computer Science (1970), Ph.D. in Automation (1982), Senior Researcher (1990), Full Professor (1998) and Ph.D. Supervisor (1993).

Still very young he became corresponding member of the Romanian Academy (in 1991, when he was only 44 years old), and at 52 years old (1999) become full member in the highest cultural and scientific forum of Romania, something that is extremely rare in the "world of immortals".

Professor Filip is a Member of the Romanian Academy (1999) and 10 years (2000-2010) he was Vice- President of the Romanian Academy, and since 2010 was elected a President of the Section "Information Science and Technology" of Romanian Academy.

Academician Filip presently is General Director of the Romanian Academy Library

and President of the Section "Information Science and Technology" of Romanian Academy (since 2010).

He is also Doctor Honoris Causa of Lucian Blaga University of Sibiu (2000); Valahia University, Targoviste (2007); Ovidius University, Constanta (2007); Ecolle Centrale de Lille (France) (2007); Technical University Traian Vuia, Timisoara (2009); Agora University of Oradea (2012).

The scientific and managerial contributions of Professor Filip consist of more than 200 scientific papers published in scientific journals and conference proceedings, 6 monographs, 20 volumes edited in different languages like Romanian, French and English and the coordination of more than 50 scientific projects. He is member and coordinator of numerous prestigious professional associations, like IFAC, SiE, ATIC, SRAIT and others.

He was member in the scientific committees of more than 60 international conferences and congresses and member in editorial boards of more than 10 ISI scientific journals, at two being chief editor.

Session Scope: The goal of this workshop is to deal with new proposals in the decision support system (DSS) field related with the integration of the decision-making process concerning Supply Chain Management (SCM) with special focus on demand management and operations planning in a dynamic and distributed environment.

DSS is a computer-based information system, which assists manager in their decision-making process. New requirements needs new DSS proposals to include improvements on the data management, decision models, interaction among systems and people in global decision process.
Special focus will be made over complex decisions where:
1) the DSS proposes different solutions using different decision models or,
2) the DSS include a sequential decision process where sub-DSS outputs are inputs for other sub-DSS.

Session Topics: Decision Support System is a multidisciplinary research area that can be applied in several sectors.
This special session will be focused to new proposals in the DSS field dealing with:

T.1.1. The main components in DSS: Data Models, Aggregation/Disaggregation, ETL , Data-Driven DSS; Decision Models: Mathematical Programming, Solvers, Rules, Expert Systems; Processes: Decision sequence, Interaction steps; User Interfaces: Interface design, Novel interaction techniques, usability.

T.1.2. Complex decisions solved using different models and sequential DSS where DSS outputs are inputs for other DSS;

T.1.3. Application in Supply Chain Management using a period-driven or an event-driven approach;

T.1.4. DSS Experiences in the industry;

T.1.5. DSS in Education.

Special Session 02: Network Optimization and Security

Organizers & Chairs:

Yezid DONOSO,
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Dr. Eng. Yezid Donoso, is an Associate Professor at the Universidad de los Andes in the Computing and System Engineering Department in Bogota, Colombia, South America.

He is a consultant in computer network and optimization. He holds a degree in System and Computer Engineering, a M.Sc. degree in System and Computer Engineering, a D.E.A. in Information Technology and a Ph.D. (Cum Laude) in Information Technology from Girona University, Girona, Spain. IEEE Senior Member. Distinguished Professor, given by Universidad del Norte, Colombia, October 2004. National Award of Operations research given by the Colombian Society of Operations Research, 2004.

He is co-author of the book Multi-Objective Optimization in Computer Networks Using Metaheuristics (2007) and Network Design for IP Convergence.

Vinod MADAN,
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Dr.Eng. V.K. Madan obtained his B.Tech. (Electrical Engineering) from Indian Institute of Technology (IIT), Delhi in 1970, and Ph.D. from IIT, Bombay in 1989. He was on a two-year (1990-92) post-doctoral fellowship at the University of Saskatchewan, Canada. He had also visited University of Toronto and Universit Pierre-et-Marie-Curie, Paris while returning from Saskatchewan in 1992, and HEIG-VD, Switzerland and Tor Vergata University of Rome in 2012.

He has been working as a Senior Professor at Kalasalingam University since January 2011. He worked as a Professor at Birla Institute of Technology & Science (BITS), Pilani from 2009 to 2010 after superannuation from Bhabha Atomic Research Centre (BARC), Mumbai in 2008 at 60 years. At BARC, he had courtesy appointment as a professor at Homi Bhabha National Institute, an adjunct professor at BITS, Pilani, a recognized teacher of the University of Mumbai, and a research board member of the Kalasalingam University.

At BARC, he had developed electronics and computer based instruments and systems for various applications of the Department of Atomic Energy. He also conducted research in various areas like application of digital signal processing (DSP) to various

fields, gamma ray spectral analysis, frequency spectral analysis, non destructive evaluation (NDE), neural networks, population sciences. A part of the research work is significant in the development of the field of nuclear spectral analysis using DSP.

He has authored/ coauthored above 100 technical articles in diverse disciplines, and published in journals (including papers still best in many aspects in the field, and successfully solved recognized tough technical problems like Walsh deconvolution and applied to gamma ray spectral analysis), conferences, symposia, a book chapter, and the invited paper for the inaugural issue of Paritantra, a journal of the Systems Society of India. He was a reviewer for the IEEE Transactions on Instrumentation, IETE Journal of Research, and for many conferences and symposia.

Session Scope: The convergence in communication networks and computing has led the exponential growth of new applications and information systems. Nowadays, users and applications generate and request more data demanding efficient and secure management. New algorithms are needed to manage the network resource allocation improving the network performance, response against failures, congestion and attacks; and to avoid loss of confidentiality, integrity or availability in the network.

Session Topics:

T.2.1. Network Optimization: Advanced Network Architecture; Computational complexity and data structures; Distributed Algorithms for control and management in Communication Systems; Energy Efficiency in Wireless Networks; Mobility, Handoff, and Location Management; Network Algorithm analysis; Network Structure, Routing and Resource Management; Networks Survivability against Failures, Congestion and Attacks; Network Planning; Quality of Service / Quality of Experience Optimization; Software Define Network; Scheduling and Network Optimization; Self-Organizing Networks; Reliable Networks; Special Topics in Network Optimization.

T.2.2. Security:Intrusion; Detection and Prevention Systems; Network Authentication and Key Management; Network Reliability; Privacy and Anonymity; Secure Networking; Secure Network Protocols; Security for Cloud Networking; Security for Internet Applications; Security for Wireless Sensor Networks; Security for Smart Grids; Security for Vehicular Networks; Security for Critical Infrastructures; Special Topics in Security.

Special Session 03: Data Mining and Intelligent Knowledge Management

Organizers & Chairs:

Gang KOU,
Southwestern University of Finance and Economics,
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Dr. Gang Kou is a Professor and Executive Dean of School of Business Administration, Southwestern University of Finance and Economics, managing editor of International

Journal of Information Technology & Decision Making (SCI-indexed) and editor-in-chief of Springer book series on Quantitative Management.

Previously, he was a professor of School of Management and Economics, University of Electronic Science and Technology of China, and a research scientist in Thomson Co., R&D.

He received his Ph.D. in Information Technology from the College of Information Science & Technology, University of Nebraska at Omaha; got his Master degree in Department of Computer Science, University of Nebraska at Omaha; and B.S. degree in Department of Physics, Tsinghua University, Beijing, China.

He has participated in various data mining projects, including data mining for software engineering, network intrusion detection, health insurance fraud detection and credit card portfolio analysis. He has published more than eighty papers in various peer-reviewed journals and conferences.

Gang Kou has been Keynote speaker/workshop chair in several international conferences. He co-chaired Data Mining contest on The Seventh IEEE International Conference on Data Mining 2007 and he is the Program Committee Co-Chair of the 20th International Conference on Multiple Criteria Decision Making (2009) and NCM 2009: 5th International Joint Conference on INC, ICM and IDC. He is also co-editor of special issues of several journals, such as Annals of Operations Research, Journal of Multi Criteria Decision Analysis, Decision Support Systems, Journal of Supercomputing and Information Sciences.

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Dr. Peng's research interests cover Knowledge Discover in Database and data mining, multi-criteria decision making, data mining methods and modeling, knowledge discovery in real-life applications. She published more than sixty papers in various peer-reviewed journals and conferences. She is the Workshop Chair of the 20th International Conference on Multiple Criteria Decision Making (2009), guest editor of Annals of Operations Research's special issue on Multiple Criteria Decision Making on Operations Research.

Session Scope: Data mining (DM) and knowledge management (KM) are two important research areas, but with different emphasis. Research and practice in these two areas have been largely conducted in parallel. Although both data mining and knowledge management have been active areas in research and practice, there is still a lack of idea exchange between these two camps. The first goal of this workshop is to bridge this

gap. It has been well-known that data mining algorithms can discover hidden patterns from large-scale databases. However, the results of data mining may not be regarded as knowledge. To elicit explicit knowledge from the hidden patterns of data mining, which is useful to the end-users, the theory of human knowledge management should be adopted. Such a "special" knowledge, different from traditional knowledge since it can be stored, transformed, disseminated and expanded, is called intelligent knowledge. The second goal of this workshop is to discuss the research issues beyond data mining, foundation of intelligent knowledge management, and the process of identifying intelligent knowledge.

Session Topics: The workshop welcomes both high-quality academic (theoretical or empirical) and practical papers in the broad ranges of data mining and intelligent knowledge management related topics including, but not limited to the following:
Data mining interpretation; Data mining and knowledge transfer; Data analysis and knowledge management; Data mining and risk management; Data warehousing in knowledge management; Evaluations of hidden patterns; Optimization based data mining for knowledge management; Practical issues of data mining; Integration of data mining and knowledge management; Intelligent knowledge algorithms; Man-machine interaction in data mining; Intelligent knowledge management.

Special Session 04: Soft Computing and Intelligent Applications

Organizers & Chairs:

Fuad ALESKEROV,
National Research University Higher School of Economics, Moscow, Russia
& Institute of Control Sciences of Russian Academy of Sciences, Moscow, Russia

Gaston LEFRANC,
Pontificia Universidad Catolica de Valparaiso, Chile,
E-mail: gaston.lefranc@gmail.com

Session Scope: The Program Committee is soliciting paper describing original, previously unpublished, completed research, not currently under review by another conference or journal, addressing state-of-the-art research and development in all areas related to Computational Intelligence.

Session Topics: All original and high-quality research papers related to, but not limited to the following are welcome:

1. Business intelligence;
2. Fuzzy logic-based methods;
3. ANN, evolutionary computing;
4. Collective/swarm intelligence.

Brief Description of International Journal of Computers, Communications & Control

Journal name: *International Journal of Computers, Communications & Control.*
Acronym: IJCCC
Brief name of journal in ISI Web of Science: INT J COMPUT COMMUN.
International Standard Serial Numbers: ISSN 1841-9836.
Publisher: CCC Publications - Agora University
Starting year of IJCCC: 2006
Founders of IJCCC: I. Dzitac (Associate Editor in Chief), F.G. Filip (Editor in Chief) and M.J. Manolescu (Managing Editor).
Deputy Managing Editor: Horea Oros (Romania).
Executive Editor: Razvan Andonie (USA).

Number of Issues/Year: Beginning 2013 IJCCC is a bimonthly journal, with 6 issues/year(February, April, June, August, October and December).

Every even year IJCCC will publish a supplementary issue with a Proceedings of International Conference on Computers, Communications and Control.

IJCCC Scope. Unique Features Distinguishing IJCCC: IJCCC is directed to the international communities of scientific researchers in universities, research units and industry.

IJCCC publishes original and recent scientific contributions in the following fields: Computing & Computational Mathematics; Information Technology & Communications; Computer-based Control.

To differentiate from other similar journals , the editorial policy of IJCCC encourages the submission of original research papers (8-16 pages) that focus on the integration of the 3 "C" (Computing, Communication, Control).

In particular the following topics are expected to be addressed by authors:
1) Integrated solutions in computer-based control and communications;
2) Computational intelligence methods (with particular emphasis on fuzzy logic-based methods, ANN, evolutionary computing, collective/swarm intelligence);
3) Advanced decision support systems (with particular emphasis on the usage of combined solvers and/or web technologies).

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June 4, 2008

Dr. Ioan Dzitac
CCC Publications
Piata Tineretului 8, Oradea, Jud
Bihor, 410526 ROMANIA

Dear Dr. Ioan Dzitac,

I am pleased to inform you that ***International Journal of Computers Communications & Control*** has been selected for coverage in Thomson Reuters products and custom information services. Beginning with V. 2 (1) 2007, this publication will be indexed and abstracted in the following:

- Science Citation Index Expanded (also known as SciSearch®)
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Sincerely,

Marian Hollingsworth

Marian Hollingsworth
Director, Publisher Relations

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Oradea, March-25-2014.

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Abstracts of Keynote Lectures

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
5th International Conference on Computers, Communications and Control,
ICCCC 2014, România, Oradea–Băile Felix, May 6-10, 2014, ISSN 1844-4334, 4(2014).

Big Data, Big Data Mining and Data Science*

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Abstract

At present, Big Data becomes reality that no one can ignore. Big Data is our environment whenever we need to make a decision. Big Data is a buzz word that makes everyone understands how important it is. Big Data shows a big opportunity for academia, industry and government. Big Data then is a big challenge for all parties.

This talk will discuss some fundamental issues of Big Data problems, such as data heterogeneity vs. decision heterogeneity, data stream research and data-driven decision management. Furthermore, this talk will provide a number of real-life Bid Data Applications.

In the conclusion, the talk suggests a number of open research problems in Data Science, which is a growing field beyond Big Data.

Keywords: Big Data, applications, open research problems.

*Keynote Lecture: 2014, May 07, 12:00-13:00, Agora University - Blue Aula.
Chair: Florin Gheorghe Filip, Romanian Academy, Romania.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
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Choice Procedures in Big Data Analysis

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Abstract

A set of choice procedures is presented for an analysis of big data, especially, in the search problem. These procedures include different versions of a superposition of super-threshold choice rules, and several other rules, including Pareto-rule and uni-criterial rule.

It is shown that the proposed procedures perform better than known procedures, e.g., Support Vector Machines. A comparison of different procedures on Microsoft Data is presented.

Keywords: Big Data, search problem, rules.

*Keynote Lecture: 2014, May 07, 12:00-13:00, Agora University - Blue Aula,
Chair: Ioan Dzitac, Aurel Vlaicu University of Arad/ Agora University of Oradea, Romania.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
5th International Conference on Computers, Communications and Control,
ICCCC 2014, România, Oradea–Băile Felix, May 6-10, 2014, ISSN 1844-4334, 4(2014).

Tools for Collaborative Decision Making*

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Abstract

Decision-making has evolved recently thanks to the introduction of information and communication technologies in many organizations, which has led to new kinds of decision-making processes, called "collaborative decision-making"n , at the organizational and cognitive levels.

The author will present the development of the decision-making process in organizations. Decision-aiding and its paradigm of problem solving are defined, showing how decision-makers now need to work in a cooperative way. Definitions of cooperation and associated concepts such as collaboration and coordination are given and a framework of cooperative decision support systems is presented, including intelligent DSS, cooperative knowledge-based systems, workflow, group support systems, collaborative engineering, integrating with a collaborative decision-making model in part or being part of global projects.

Several models and experimental studies are also included showing that these new processes have to be supported by new types of tools, several of which are described in order to calculate or simulate solutions or global solutions for decision-making modification. Definitions and new trends for these models are given, along with types of systems.

Keywords: Decision making, tools, trends.

*Keynote Lecture: 2014, May 07, 13:00-14:00, Agora University - Blue Aula.
Chair: Felisa Cordova, University of Santiago de Chile, Chile.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
5th International Conference on Computers, Communications and Control,
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Fuzzy Logic as a Logic*

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Abstract

We will show how, following the paradigm of Fuzzy Logic, as suggested by Lotfi Zadeh, under suitable conditions, very sofisticated, and useful logical systems can be defined and explored.

Keywords: Lotfi A. Zadeh, fuzzy logic, logical systems.

*Keynote Lecture: 2014, May 07, 16:00-17:00, Hotel President - Room S1.
Chair: Bogdana Stanojević, Mathematical Institute of the Serbian Academy of Sciences and Arts, Serbia.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
5th International Conference on Computers, Communications and Control,
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From Computer Controlled Processes to Intelligent Cyber-Physical Systems

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Abstract

The real progresses in computer to computer (C2C), mobile, ad-hoc and wireless communication, in the development of Internet-based service-oriented platforms as well as in sensors and actuators technologies, allows now the creation of wireless sensors and actuators networks (WSAN), which, interacting with embedded control systems give a new dimension and creates new challenges for control applications.

Actually, there are created the technological premises for solving the problem of global optimization for complex processes, including communication, data/ information processing aspects and real-time control. Quality of Control (QoC) and Quality of Services are designed as integrated behavioral attributes for such networked control systems. But it is necessary to develop also a new approach in modeling and analysis of such systems, in order to take full advantage from the technology. Such an approach is supposed to take into consideration all dynamical and energetic aspects related to physical processes, integrated with data and information processing and communication performances, as they appear in such networked real-time complex systems.

Naturally evolving from C2 (computer from control), through C4 (computer, communication and cognition for control), the Cyber-Physical Systems (CPS) paradigm represents the most recent integrative concept which is providing the framework for abstraction and modeling, design and analysis of complex systems, including physical systems, WSAN, (embedded) control systems and computers. CPS are engineered systems that are built from and depend upon the synergy of computational and physical components. They bring together two innovation areas: embedded systems and global digital networks. Networked systems are included today in all infrastructures, giving them features of intelligence, but making them, at the same time, more vulnerable.

In this paper will be highlighted relevant aspects of the evolution of control system theory and technology, from C2 towards CPS, underlining the main challenges and research directions and the connections with other fields of interest as mathematics, physics, biology and neurology, which should be taken into account by engineers in order to relies reliable, intelligent, flexible, smart CPS. There are also included some special applications of CPS in power systems, mobility and advanced production, underlining their high potential for innovation and sustainability

Keywords: C2C, modeling, rules, applications.

*Keynote Lecture: 2014, May 07, 17:30-18:30, Hotel President - Room S1.
Chair: Vinod K. Madan, Kalasalingam University, India.

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Abstracts of Regular Lectures

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
5th International Conference on Computers, Communications and Control,
ICCCC 2014, România, Oradea–Băile Felix, May 6-10, 2014, ISSN 1844-4334, 4(2014).

On Access Control For The Online Social Networks

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Abstract

Today Online Social Networks(OSN) has become enumerous growth in recent years and can have millions of users. OSNs offer many social interactions and sharing information so that it can have number of security issues and it can not have any privacy concerns with multiple users so this they[7] propose an approach to the protection of shared data associated with multiple users.

In [12] proposed an authorization requirements, policy specification scheme and policy enforcement mechanisms were. In [12] presented a logical representation of an access control model. It discuss a proof of concept prototype of the mechanisms to leverage the existing logic. Here we discuss the face book in a case sensitive manner.

Keywords: Online Social Networks (OSN), authorization, access control and sharing.

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A Model-Driven DSS for Managing the Shortage Planning of Ceramic Companies

M.M.E. Alemany, A. Ortiz, A. Boza, Vicente S. Fuertes-Miquel

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Abstract

In ceramic companies, the uncertainty in the tone and gage obtained in units of the same finished good (FG) makes that frequent discrepancies between planned homogeneous quantities and the real ones occur. This fact can lead to a shortage situation where certain customer orders previously committed cannot be served because there is not enough homogeneous units of a specific FG (i.e. with the same tone and gage).

In this paper, a Model-Driven DSS is proposed to reassign the actual homogeneous stock and the planned homogeneous sublots to already committed orders under uncertainty.

Keywords: Decision Support System, mathematical programming models, lack of homogeneity in the product; shortage planning.

Acknowledgement
This research has been carried out in the framework of the project PLANGES-FHP funded by the Spanish Ministry of Economy and Competitiveness (Ref. DPI2011-23597) and the Polytechnic University of Valencia (Ref. PAID-06-11/1840) and the ADENPRO-PJP project (Ref. SP20120703) of the Polytechnic University of Valencia.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
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A Mathematical Model of an Effective Personnel Selection in Network Structures

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Abstract

We consider an important problem of selection of candidates for employees according to their requirements. We propose a new model that finds effective matching between the set of employers and candidates. A characterization of the model and its advantages are given.

Keywords: Mathematical model, aggregation, personnel selection, matching, network structures.

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Using Fuzzy Logic for the Estimation of the Technical State of Automotive Disc Brakes

M. Baban, C.F. Baban, C. Bungău, G. Dragomir, R.M. Pancu

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Abstract

According to existing studies the phenomena that occur in the exploitation of the braking system are very complex and an analytical mathematical modeling of braking process it is difficult to be developed. Since these phenomena are also characterized by some uncertain- ties, a fuzzy logic approach has been employed in this research for the estimation of technical state of the disc brakes.

Their technical state was expressed through the thickness variation, which was used as the output linguistic variable. The vibrations and temperature of the disc brakes were used as the input linguistic variables. The fuzzy decision system for the estimation of technical state of the disc brakes has been implemented with the Fuzzy Logic $Toolbox^{TM}$ of the $Matlab^{®}$ software, which can be employed to determine if the thickness of the disc brakes becomes smaller than the limit value prescribed by the manufacturer.

Keywords: Disc brake, temperature, vibration, thickness variation, fuzzy logic.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
5th International Conference on Computers, Communications and Control,
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A Computer System for an Effective Personnel Selection

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Abstract

The problem of effective personal recruitment is investigated.
We describe main problems and propose a computer system for their solution.
A description, main components and application of the system are presented.

Keywords: Computer system, personnel selection, mathematical model, aggregation.

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Event Management in Decision-Making processes with Decision Support Systems

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Abstract

DSS systems are exposed to events from any decision level of the company and it is possible to start the decision process from scratch in case any unexpected internal and external events take place. Thus, an event monitoring and management system should interact with the DSS to manage events that might affect their decisions. It should act as a supra-system to identify when decisions made are still valid or need to be reanalysed.

The traditional configuration of DSS (where they collect internal and external information of the organization and the decision-maker is involved in the decision-making process) should be extended to treat event management using a monitoring and management system which monitors internal and external information and facilitate the introduction of no monitored events.

Keywords: Decision Support System, Decision-making, event management.

Acknowledgement
This research has been carried out in the framework of the project PLANGES-FHP funded by the Spanish Ministry of Economy and Competitiveness (Ref. DPI2011-23597) and the Polytechnic University of Valencia (Ref. PAID-06-11/1840) and the ADENPRO-PJP project (Ref. SP20120703) of the Polytechnic University of Valencia.

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Binding Android Steganography by Windows Steganography

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Abstract

This paper presents a new solution regarding the field of Digital Steganography in order to provide solutions for confidential communication between computers and mobile devices. Based on the SmartSteg application the authors propose a new solution in order to provide security of digital data that is transferred through todays available platforms for communication.

We developed an improved version of SmartSteg, a package of steganography and cryptography applications that works both on Android and Windows platform. Whatever the device used (computer, smart phone or tablet), the user will be able to share secret information through Internet and Mobile Networks.

Key words: Steganography, LSB, cryptography, android, Windows, SmartSteg.

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On Computer Representation of Simple Geometric Objects

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Abstract

Representations of simple geometric objects seems to be inherent for human reasoning processes. There is a saying amongst experienced engineers the a good drawing is better than a thousand words. It seems obvious that a drawing or diagram can be easily perceived by the human mind and are linked to representations used in what is called diagrammatic or sometimes visual reasoning. In contrast, computer representations of even simple geometric objects are described by expressions in a formal language even if it is called diagrammatic representation like in (Larkin and Simon 1987).

So the question proposed by our paper is: can simple geometric objects be represented in computers in other ways than symbolic expressions. To answer this question we analyze the possibility to employ deep learning neural networks to create non-symbolic representations of simple geometric objects.

Key words: Diagrammatic representation, learning, neural networks.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
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Control System of Auto Moving Vehicle using for Artificial Turf Ground Performance Test

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Abstract

Recently, artificial turf ground is increasing according to holding of variety international game and change of school play ground to artificial turf from clay. Artificial turf ground is needed to meet standard certification to play international game. This standard certification is given by shock performance test during the specified period.

The control system of auto moving vehicle using for artificial turf ground performance test is proposed. This system consisted with driving module, wireless communication module, and direction sensing module. Experiment is conducted to verify the performance of developed control system of auto moving vehicle. From the performance test, developed auto moving vehicle has maximum velocity of 1m/sec, trajectory following error of 1.3 deg for operating condition.

Key words: Control system, auto moving vehicle, performance test, driving module, wireless communication module, direction sensing module.

I. Dzitac, F.G. Filip, M.J. Manolescu (eds.), *Abstracts of ICCCC Papers*,
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A Method for Training a Neural Network with a Small Number of Examples Used for Robot Control

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Abstract

This paper describes a method of obtaining neural network training examples and a neural model for robot control. The training examples are obtained from the robot model for direct kinematic analysis by successively modifying the coordinates of the joints between the lowest and the highest values, according to an algorithm described in the paper.

The neural model is obtained by neural network modelling and training, having the appropriate structure required by the number of the robots freedom degrees, with the input data as the end-effectors coordinates and the output data, as the coordinates of the joints. Thus, the neural model will simulate the robots inverse kinematics. A known method for obtaining training examples is the use of the mathematical model for the inverse kinematic analysis and the consideration of an even distribution of the training points in the robots workspace. The validation of the method has been achieved by the comparison of the results in the case of the two methods used, for three sets of training examples.

The novelty of the method consists in the way the training examples are generated so that the neural model "learns the influence of the kinematic axes movement upon the coordinates of the effector.

Key words: Neural network, method, robot, control.

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Neural Model Used to Predict the Cost of Abrasive Waterjet Cutting Process

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Abstract

The paper presents a neural model used to control an abrasive water jet cutting machine and predict the cost of the process. The material features, the orifice diameter and the abrasive consumption are considered to be the input parameters. The output parameters are the feed rate, the energy consumption and the water consumption.

A neural model with back propagation algorithm was used. A set of data obtained from the "Waterjet Web Reference Calculator" was used to model the process. The training and the validation data were calculated based on the values presented by the waterjet cutting machines manufacturers. In another paper [1] the authors have presented a neural model for controlling the speed of cutting and the abrasive consumption.

Key words: waterjet, processing, neural, network, model

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A Dynamic Assignment Simulation Model Using Petri Nets Applied to a Public Penal Defensory

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Abstract

The assignment of defense to criminal cases in the courts has historically been an activity assigned to lawyers. However, when the workload during the year fall only a few lawyers assignment form should be revised. This paper examines how you can distribute the allocation causes within defenders, from the perspective of engineering, specifically the simulation.

Petri nets, a tool commonly used in the modeling of parallel, concurrent and dynamic systems, are used as a vehicle simulation. Furthermore, as the system studied is stochastic, the versatility provided by the Monte Carlo model, commonly used in finance or physics fail to address complex systems whose description by other probabilistic approaches are difficult, either by time or complexity. The use of decision trees is also added to the simulation model to cover the different possibilities allowing decision model have to reject the reality of the action of the attorneys in the processing of their cases in the criminal courts. All this would not be valid if the time variable is not integrated within the simulation.

The model described in this paper considers a charging time in which a lawyer (within the set of firms considered) misses the workload that would have more workload assumed when present in court: thus lawyers with pending leave work earlier times, must negotiate causes within the court, and at the end of the day are with the backlog of prior periods plus acquired on each day. The reporting period is one year, but the model can disaggregate level week workload of each defender. A maximum number of cases handled by a lawyer in each period is considered, which vary in the extent that they are resolved in time.

Key words: Petri nets, simulation models, decision trees, Monte Carlo method, lawyers defenders.

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Control of Feed Flow Rate with Fuzzy Logic for a Cement Mill

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Abstract

This paper proposes a fuzzy controller for a cement mill. The paper presents how the fuzzy controller is designed using the Fuzzy Inference System Editor from MATLAB. The fuzzy controller is an important part of a closed loop for grinding circuit.

Process control is an essential part of the cement milling system. In this study, a fuzzy controller was designed for control of the feed flow rate at the entering of the mill, with purpose to avoid overfilling or emptying the mill. Finally, some simulation results based on MATLAB-Simulink are obtained.

Key words: Fuzzy controller, cement mill, fresh feed control, ball mill, feed change.

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A Comprehensive Approach to Offline Advanced Error Troubleshooting in Intelligent Manufacturing Systems

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Abstract

The objective of this work consists in proposing an offline version of the software framework for error troubleshooting in a flexible manufacturing system [1].

The main difference between the online and the offline version is that the error database and is stored on the mobile device and the frame marker device is connected directly to the FMS components without the need of the PC.

Key words: FMS, frame maker, error, troubleshooting.

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Procedural Aspects Concerning Intelligent Design Environment for Real-Time Applications

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Abstract

For the real-time applications control algorithms constitute an important issue, considerred from different perspectives. First of all, due to the spreading on a large scale of dedicated chips (as microcontrollers) with specific commandments for memory space and language possibilities, the control algorithm to be implemented on such a circuit for real-time systems needs to be as simple is possible, without loosing in performances.

From the designer perspective, the control algorithm has to be easy to understand and to implement, easy to optimize and last but not least, it has to ensure the best possible behaviour for the controlled system. Once the motivations exposed, the next step is to present a design environment which provides the possibility to choose between a classical control algorithm (as state feedback stabilisation represents) and a new approach (interpolative controllers) with the possibility to modify the designed parameters in order to obtain the optimum behaviour for the controlled system. This opportunity is given through the inner structure and operating laws of the algorithm and exploited using genetic algorithm-based techniques.

Key words: Design environment, interpolative control algorithms, genetic algorithms, intelligent optimization.

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Optimization of Energy Consumption in WSN by Using a Facility Location Model

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Abstract

In this work, a mathematical optimization model for the allocation of sensor nodes in a wireless network is presented. The model corresponds to a facility location problem without installation costs and it is applied to a set of one hundred nodes which are randomly distributed over a field of 100 x 100 m^2 .

The results show that less energy is consumed with the model than the LEACH protocol. However, this should be taken only as a reference since this is only one of the protocols in use. An interesting observation is that the results are achieved with an easy-to-solve formulation since it considers a linear objective function and linear constraints of the inequality type.

An objective function with the expression of the total energy spent per round could be used, but the model resolution requires greater computational capabilities and it is discarded.

Key words: Wireless Sensors Networks (WSN), facility location, energy efficiency.

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A Multihoming Load Balancing Algorithm for a Fairness Resource Allocation in Heterogeneous Wireless Networks

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Abstract

Continuous growth of the number of mobile users and the broadband requirements of new applications suppose a crucial challenge in planning, maintenance and resource allocation in cellular networks for the telecommunication operators. Providers must ensure a quality of service for users in a new environment based in Heterogeneous Wireless Networks (HWN).

A good way to achieve this goal is to prevent a large number of services of mobile users being connected to the same access networks and therefore reducing the possibility of overloading it. This paper presents a load balancing optimization scheme that enables operators to make decisions about re-allocation of each of the services in different access networks, keeping the required Quality of Service (QoS).

We propose 1) a mathematical model addressed as a fairness resource allocation in order to obtain a global load balancing, and 2) a two-step algorithm based on the anchor-adjustment heuristic to solve it. Our algorithm aims to unload the network with maximum load while at the same time, the other networks are balanced. As a result, we show that our algorithm

nds (near)-optimal solutions while keeps low complexity.

Key words: Fairness, load balancing, multihoming, quality of service, wireless heterogeneous networks.

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Auditing Multi-domain Policies in Programmable Networks

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Abstract

Programmable Network like SDN allows administrators to program network infrastructure according to service demand and custom-defined policies. Several proposals establish and guarantee custom-defined policies using a controller that defines actions and rules to process the network trafic in the devices of a single domain. However, actual networks are multi-domain where several domains are interconnected. Then, because SDN controllers in a domain cannot define nor monitor policies in other domains, network administrators cannot ensure that their own policies, origin policies are being enforced by the domains not directly managed by them (i.e. foreign domains).

We present AudiT, a multi-domain SDN policy verifier that identifies whether an origin policy is enforced by foreign domains. AudiT com- prises (1) an extension to the OpenFlow protocol to enable external auditing, (2) an Audit protocol to gather information about the actions performed by network devices to carry the ows of interest, and (3) a validation engine that takes that information and detects security policy violations.

This paper presents our approach and illustrates its application using an example considering multiple SDN networks.

Key words: network operating systems, software-defined networking, network management, policy verification.

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An Energy Eficient and Predictive Routing Algorithm using a Double Kalman Filter for Mobile Wireless Sensor Networks

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Abstract

Mobile Wireless Sensor Networks is being an attractive field due to its applicability to an increasingly amount of mobile scenarios such as wild monitoring, disaster prevention, object guidance and health monitoring. In addition, since the sensors have limited batteries, data routing has to be done strategically in order to extend the battery lifetime as much as possible.

In this paper, we assume GPS free sensor devices, where considering a predictive technique to estimate the sensor position in a circle trajectory scenario can be useful to know when the sensor will be as close as possible to a sink, and then, help us to reduce the energy consumption by the fact for transmitting data at a short distance.

In our work, we propose an predictive algorithm based on Kalman filter techniques to estimate the proper time at which the sensor is close as much as possible to a sink, in order to reduce the energy consumption in the sensor. The results of our predictive routing algorithm are compared against a traditional technique.

Key words: MWSN, position estimator, Double Kalman filter.

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Mathematical Decision Model for Reverse Supply Chains Inventory

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Abstract

In the reverse supply chain inventory theory, inventory models are concerned with demand of reusable parts, stock replenishment, ordering cycle, delivery lead time, number of disassembled products, ordering costs.

The particularity of these models consists in the occurrence of a high uncertainty in quantity and quality of the returned products and parts. To deal with these uncertainties, an inventory model that incorporates decision variables at proactive and the reactive levels is proposed in this paper.

Keywords: Inventory models, supply chain, reverse.

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Simulation of Induced Bias Matrix Model for Consistency Test

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Abstract

Consistency test is an important research topic in the pairwise comparison matrix (PCM). Our previous paper "a simple method to improve the consistency ratio of the pairwise comparison matrix in ANP, European Journal of Operational Research, 213 (1) 246-259" introduced an induced bias matrix to efficiently identify the most inconsistent elements and preserve most of the original comparison information.

This paper further discusses the identification processes of the induced bias matrix, and perform simulation experiments under millions numbers of random reciprocal pairwise comparison matrices with different orders to verify the effectiveness of the induced bias matrix model. More specifically, one million of positively reciprocal matrices with orders 3 to 7 whose values were randomly picked from the seventeen numbers (1/9, 1/8, /7, , 1, 2, 3, .., 9) were randomly generated in order to obtain random reciprocal matrices, then calculate the consistency ratios (CR) for each random matrix. If the CR¡0.1, discard the generated matrix, if the CR?0.1, then apply the induced bias matrix model to modify the inconsistent entry and improve the consistency ratio. If the consistency ratio of the generated randomly reciprocal pairwise comparison matrix cannot be reduced to be lower than 0.1, then record the corresponding matrix. By following such steps, we conducted experimental simulation to validate the efficiency of the proposed induced bias matrix model. We found that some matrices generated randomly could pass the consistency test, and the higher the orders of matrices are, the less the matrices have CR¡0.1. When the orders of random matrices increase to 7, all matrices generated randomly have CR¡0.1, and they need to be adjusted.

Keywords: Reciprocal pairwise comparison matrix, consistency ratio, induced bias matrix, simulation experiment.

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Eco-Horizon 2020: Multifunctional Scenario Interface for Biologists

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Abstract

"What-if" scenarios have been developed in 2013 for biology/ecology, within a demanding context as regards validating exploratory research in service-oriented engineering. To enable field research personnel to write hand-tailored scenarios, the appliance had a multifunctional user-centred interface, proven to be in line with the trends of "Eco-Horizon 2020".

After reinforcing the rationale (scenarios are an easy way to simulate unhappened events) and the approach (studying stability in living systems via boundedly rational models avoiding intractable mathematics), the paper outlines two generations of interface: implemented and in design (according to the new openings). In conclusion: "Eco-Horizon 2020" multifunctional scenario interfaces are not only a convenient tool for biology/ecology field researchers, but an illustration of innovative in-house engineering R&D.

Keywords: What-if scenarios (WISC); Service-Oriented Engineering (SOE) / post-industrial engineering; anthropocentric interfaces /user-centred interfaces; stability in living systems; Horizon 2020 (H2020).

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Sentiment Analysis in Social Media

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Abstract

The paper focuses on the correlation Romanian lexical resources in order to harmonize them to respond optimally to one of the most actual problematic issues in the research area of the natural language processing, sentiment analysis. In fact, it is about sentiment analysis found on different forums, blogs, social networking in a virtual environment (e.g. new auto trends on Wall-Street, the new economy), given the rising interest of the public consumer. Time is always limited, he/she chooses to seek information on the various products that he/she needs, especially from the experience of others like him/her (we called it experience on horizontal).

In general terms, sentiment analysis requires competence (linguistic, psychosocial, etc.) to identify the views of those who are exposed in the virtual world respects to products or/ and special needs. The decision-making process is affected most often by the online comments from the interested seeker. We are assisting to a huge amount of emotional messages, on topics of public interest, especially on social media channels, and other manifestation forms on- or off-line. Given that the offered possibility, to monitor in real time the sentiments of those who express their opinions, we intend to implement a computational technology based on existing resources, open-source or freely available for research purposes, and that can be used for establishing Gold standards in sentiment analysis issue, such as SentiWordNet.

We present in this paper a method for integrating Romanian lexical resources from emotional perspective, in developing, which can be used in sentiment analysis. This study is intend to help direct beneficiaries (public consumer, marketing managers, PR firms, politicians, investors), but, also, specialists and researchers in the field of natural language processing, linguists, psychologists, sociologists, economists, etc.

Keywords: Linguistic resources, sentiment analysis, lexicon, semantic classes, social-media.

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Numerical Simulation on the Three-Dimensional Unsteady Compressible Flow Characteristics inside a High-Speed Control Valve

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Abstract

Three-dimensional unsteady compressible flow characteristics inside a high-speed solenoid valve are investigated using numerical simulations. The solenoid valve operates at large operation frequency (up to 1,000 Hz) in the large pressure differences between the inlet and outlet of the valve.

The flow phenomenon inside the solenoid valve has not been known much compared to its long use in the various industrial areas. A numerical simulation by solving Navier-Stokes equations are utilized and it is found that choked flow, supersonic expansion, and a strong curved shock are observed inside the valve during on/off operations. It is expected that present results can be used for the design of the solenoid valve.

Keywords: Compressible flow, unsteady flow, high speed control, solenoid valve, computational fluid dynamics.

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Colony of Robots Based on Multi-Agent System for Closed Three-Dimensional Enviroments Exploration

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Abstract

In this paper a MAS (Multi-Agent System) is used in small Colony of Robots, conformed by mobile robots and a quadcopter, based on heterogeneous MAS capable of performing exploration in closed environments. The objective of the system is to quickly recognize a closed three-dimensional environment, without access to references such as a GPS (Global Positioning System), to perform exploration of each unit with different characteristics and perform a joint recognition.

All communications work wirelessly with a system responsible of data collection, tracking and managing all collected information. Finally, it provides a basis for multi-agent robots which allow recognition, mapping and information gathering in places where units are efficiently deployed the entire colony's abilities.

Keywords: Colony of robots, multi-agent systems, robotics.

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PCA Encrypted Short Acoustic Data Inculcated in Digital Color Images

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Abstract

We propose to develop a generalized algorithm for hiding audio signal using image steganography.

The authors suggest transmitting short audio messages camouflaged in digital images using principal component analysis as an encryption technique. The quantum of principal components required to represent the audio signal is achieved by removing the redundancies is a measure of the magnitude of the eigen values. The aforementioned technique follows a dual task of encryption and in turn also compresses the audio data, sufficient enough to be buried in the image. A 57Kb audio signal was decipherd from the stego image with a high PSNR of 236.96 and a correspondingly low MSE of 3.326610-6 with an equalized high quality audio output.

Keywords: Image steganography, principal component analysis, eigen threshold.

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Choice of Countermeasures in Project Risk Management

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Abstract

The paper proposes a new method for project risk management. It is proposed how, after risk identification, the countermeasures for risk mitigation and elimination can be selected, taking into account the cost and effort linked to them as well as the weights assigned by the decision maker to risk attributes, such as probability or consequences, and the values of those attributes.

The risk attributes and weights, as well as the maximal total risk and the maximal total effort of risk mitigation accepted by the decision maker for the project are expressed as fuzzy numbers, which in turn constitute models for linguistic expressions.

Keywords: Project risk, risk management, risk countermeasures.

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Dynamic comprehensive evaluation method with twice-aggregation

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Abstract

Comprehensive evaluation methods are to evaluate a discrete set of feasible alternatives with respect to a finite set of attributes and select an appropriate alternative. For the situation that the attribute values are affected as time and traditional weighted average operator weights do not consider the relationship between the integrated data, this paper is devoted to investigating the dynamic comprehensive evaluation method (DCEM). The DCEMs have the twice-aggregation processes. First, the overall attribute value at some period is aggregated by power weighted average (PWA) operators. Second, the definition of the dynamic power weighted average (DPWA) operator is given in the paper, and then the complex overall attribute value of the alternative is determined by the DPWA operators.

The best alternative can be selected by the complex overall attribute value after the twice-aggregation processes. The DCEM can not only deal with the multi-period attribute value in alternative evaluation, but also capture the sophisticated nuances the user wants to reflect in the aggregated value. Finally, a numerical example is introduced to illustrate the reasonability and feasibility of the proposed method.

Keywords: Dynamic comprehensive evaluation method, power weighted average operators, dynamic power weighted average operators, twice-aggregation.

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Minimum mean square error estimators for the exponential SSALT model

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Abstract

Accelerated life testing (ALT) is commonly practiced in product life testing and analysis to reduce operation time and cost as products may have high reliability under normal conditions. In step stress accelerated life-testing (SSALT) model, many researchers assumed that failure time follows Exponential distribution. This paper presents the minimum mean square error (MMSE) estimators for mean life and failure rate of Exponential distribution model based on failure censored SSALT data. The parameters for Exponential distribution are estimated by revising the corresponding unbiased estimators under mean square error (MSE) optimization criterion. The resulting estimators are called minimum mean square error (MMSE) estimators. Monte Carlo simulations investigation illustrates shows that the unbiased estimators are more efficient than the corresponding maximum likelihood estimators (MLEs) in small and moderate sample size. On the other hand, two Theorems illustrate that MSE of the resulting MMSE estimators are smaller than that of the corresponding unbiased estimators.

Keywords: Step-stress accelerated life-testing (SSALT), exponential distribution, mean life, failure rate, mean square error (MSE).

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Software Application for Automatic Financial Data Capture in EU funded Projects Reporting System

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Abstract

The novelty of the paper consists in the presentation, for the first time, of AutoFiState software application for automatic financial data capture in projects financed through ESF in Romania.

The AutoFiSate application was developed on the basis of results obtained in the fields of automated testing and scripting languages. The use of the AutoFiState software application leads to maximum effectiveness in how European Social Funds funds are used by reducing the time needed to draw up the financial reports and the related labor costs.

Keywords: Automatic financial data capture, automated testing, scripting languages.

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Application of the Analysis of Self-similar Teletraffic with Long-range Dependence (LRD) at the Network Layer Level

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Abstract

In a previous paper it was proposed, and theoretically confirmed, that analysis of selfsimilar traffic ows with long-range dependence may be restricted to the network layer.

In this paper this novel concept is applied to the study of traffic recorded in an IEEE 802.3u network environment with the aim of proving its validity as a simple and efficient tool for high speed computer network traffic ow analysis.

Keywords: Long-range dependence, network layer, self-similar process, traffic models.

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New high-precision efficient models of pattern analysis

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Abstract

The paper presents the newest technique of recognition of sustainable patterns which partially solves the task of choosing the right method of comprehensive analysis of data to obtain high-quality results offering the most extensive view on the investigated objects, their structural components and behavior over time.

Models of a linear pattern classification, ordinal-invariant and diffusion-invariant pattern clustering are described in the paper.

Keywords: Data analysis, pattern analysis, linear pattern classification, ordinal-invariant pattern clustering.

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An Algorithm for Production Planning Based on Supply Chain KPIs

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Abstract

This paper observe multi-period multi-product production planning problem in make-tostock production environment with limited production capacity. Such problem is identified in Fast Moving Consumer Goods industry.

The goal was to develop an algorithm for supporting dynamic production triggering decisions in relation with two supply chain key performance indicators: stock cover and customer service level. The presented approach is applied to a real example in several scenarios based on different decision criteria.

Keywords: production planning, stock cover, customer service level, heuristic algorithm.

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Fuzzy Euclidian Normed Spaces

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Abstract

In this paper, we obtain some important results concerning fuzzy Euclidian normed spaces: every fuzzy Euclidian normed spaces is complete, every two norms on finite dimensional vector space are equivalent, every linear isomorphism between finite dimensional fuzzy normed spaces is a topological isomorphism, any fuzzy norm on $\mathbb{R}$ generates a fuzzy norm on $\mathbb{R}^n$.

Fuzzy Euclidian normed spaces can be proven to be a suitable tool for data mining. The method is based on embedding the data in fuzzy Euclidian normed spaces and to carry out data analysis in these spaces.

Keywords: Fuzzy norm, fuzzy Euclidian normed spaces, topological isomorphism.

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Decision Model for Assessing Healthcare ICT Support Implications: User Perception

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Abstract

This paper presents a multi-criteria decision model based upon user judgments to assist the evaluation process of an Information and Communication Technology (ICT) network system in health care to improve the quality of service (QoS). Measuring quality in health care services is not an easy task, as there are many competing goals involved, human, economic, communications technology, governmental and others. Integrating multiple criteria decision analysis (MCDA) methodology with modeling and simulation through Optimization Network Engineering Tool (OPNET) platform permit to characterize main ICT user and identify priority applications to examine network QoS requirements and implications.

The proposed approach permitted to identify the main users, to elaborate a profile and characterization of the ICT support requirements according to their main daily task in answer to a service requirement. The results generate evidence related to the important factors effecting quality in hospital requirement as availability of services and the need for ubiquitous access to integrated information. The stakeholder interface perception and resources for ICT network support are investigated through a case study for Chilean hospitals.

Keywords: MCDA, Decision support, User perception, ICT Healthcare.

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An Online Load Balancing Algorithm for a Hierarchical Ring Topology

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Abstract

Ring networks are an important topic to study because they have certain advantages over their direct network counterparts: easier to manage, better bandwidth, cheaper and wider communication paths. This paper proposes a new online load balancing algorithm for distributed real-time systems having a hierarchical ring as topology. The novelty of the algorithm lies in the goal it tries to achieve and the method used for load balancing.

The main goal of the algorithm is to correctly utilize the computing resources in order to satisfy the average response time of clients.

The secondary goal is to ensure fairness between the numbers of requests solved per client with respect to the average response time. A request from a client is moving through the network until a node considers that it can solve the request in the promised average time for that client or until it seems like the best opportunity to avoid any additional delays in solving it. A performance analysis and motivation for the proposed algorithm is given with respect to the goals it tries to achieve. The results show that the proposed algorithm satisfies its goals.

Keywords: Ring, hierarchical, distributed, balancing, algorithm, fairness.

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Representing IT Performance Management as Metamodel

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Abstract

Many empirical studies have shown that the business value from investment in IT projects can be greater than the one being currently achieved. Thus it calls for specific focus on IT governance in order to reach fusion between business and IT goals. Good IT performance management should enable the business and IT executives to understand how IT is contributing to the achievement of business goals.

The paper addresses the issue of representing IT governance best practice frameworks as ontological metamodels. Special attention is dedicated to VAL IT framework, which represents a comprehensive framework to maximize business value from IT investments. The paper points out the necessity of analyzing, comparing and integrating IT governance frameworks in order to complement different knowledge and generate ontological metamodel of IT performance management.

Scope of our work is in the static aspect of the framework and as the metalanguage Extended Entity/Relationship model is used.

Keywords: IT governance, ontology, metamodels, IT investment, IT performance management.

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Cloud Service Management System for Innovative Clusters. Application for North-West Region of Romania

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Abstract

In order to stimulate and optimize the organization and management of innovative clusters from value chain perspective and guide their planning activities towards a differentiation strategy in which cluster members cooperate, we propose a Cloud Service Management System (CSMS) that provides IT services for these innovative clusters companies that can be customized for both enterprises with the associated clusters.

Within such a system, actors begin to depend one on another and to take advantage of the local knowledge base. Each cluster is designed to have a different profile which will integrate all the companies mapped with it, with the objective of keeping the profile and data for each company. For the existing companies the idea is to migrate their services into the related cluster for integration within CSMS. Thus, our proposed CSMS will consider and meet different quality of services (QoS) parameters of each individual enterprise and service which will be included in specific Service Level Agreements (SLAs), after the negotiation between the cloud service provider and the CSMS. Realizing that technological progress is at the heart of regional development and decision-makers could support the development of technology clusters towards transforming them into regional innovative clusters, the aplication of our proposal aims to overcome existing bottlenecks in terms of business strategies and regional development policies in the North-West region of Romania.

Keywords: Cloud computing, Service oriented architecture, open cloud, open architecture, IT services, innovative clusters, Suplly Chain Management (SCM).

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A Conceptual Architecture of Ontology Based Knowledge Management System for Failure Mode and Effects Analysis

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Abstract

FMEA (Failure Mode and Effects Analysis) is a systematic method for procedure analyses and risk assessment. It is a structured way to identify potential failure modes of a product or process, probability of their occurrence, and their overall effects. The basic purpose of this analysis is to mitigate the risk and the impact associated to a failure by planning and prioritizing actions to make a product or a process robust to failure. Effective manufacturing and improved quality products are the fruits of successful implementation of FMEA. During this activity valuable knowledge is generated which turns into product or process quality and efficiency. If this knowledge can be shared and reused then it would be helpful in early identification of failure points and their troubleshooting, and will also help the quality management to get decision support in time. But integration and reuse of this knowledge is difficult because there are number of challenges e.g., unavailability of unified criteria of FMEA knowledge, lack of semantic organization, natural language text based description of knowledge, most of the times FMEA is started from scratch instead of using existing knowledge that makes it incomplete for larger systems, and above all its success depends on the knowledge which is stored in the brains of perfectionists in the form of experience which may or may not be available anytime anywhere.

In this article we are proposing an Information and Communication Technology (ICT) based solution to preserve, reuse, and share the valuable knowledge produced during FMEA. In proposed system existing knowledge available in repositories and experts head will be gathered and stored in a knowledge base using an ontology, and at the time of need this knowledge base will be inferred to make decisions in order to mitigate the probable risks.

Keywords: Knowledge management, ontology, FMEA.

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PARMODS: A Parallel Framework For MODS Metaheuristics

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Abstract

In this paper, we propose a novel framework for the parallel solution of combinatorial problems based on MODS theory (PARMODS), in which the metaheuristics are derived from the Deterministic Swapping (MODS) method. These approaches represents the feasible solution space of any combinatorial problem through a Deterministic Finite Automata, after this, some components from the automata theory are defined and then, the optimization process is carried out.

In this set, we find methods such as the original MODS, the SAMODS (MODS + Simulated Annealing), SAGAMODS (MODS + Simulated Annealing + Genetic Algorithms) and, EMODS (Evolutionary MODS) which have been utilized in different contexts, some of them are related to data base optimization, operational research and, multi-objective combinatorial optimization.

The key idea of this framework is to exploit the parallel resources that we have available in nowadays and combine the solutions provide by each MODS method in a unique optimization process. This allows us to explore regions of the feasible solution space that could not be explored making use of the classical (sequential) MODS implementations. Some experiments are performed making use of well-known TSP instances. Partial results shows that PARMODS provides better solutions than the sequential MODS implementations.

Keywords: MODS, combinatorial optimization, parallel framework.

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Implementing BPMN 2.0 scenarios for AAL@Home Solution

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Abstract

Ageing tendency of European population and live longer and independently desire requires AAL solution for particular elders (chronic diseases, disabilities, aso). NITICS project aim is to develop advanced ITC solutions including monitoring and navigational support for indoor to support elderly in their daily activities.

This paper offers a BPMN implementation for indoor assistance based on IoT (sensor monitoring) and Activity workflow implementation. Our solution offers an intelligent Care Center solution for caregivers monitoring and elders support.

Keywords: IoT, AAL@Home, BPA, BPM, BPMN, workflow.

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Multicriteria Supplier Classification for Decision Support Systems: Comparative Analysis of Two Methods

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Abstract

In this paper the analysis of two multicriteria decision making (MCDM) methods for classification of suppliers is presented. The MCDM methods correspond to Electre and FlowSort and both are applied to the classification of providers in an actual case of the local softdrink bottling industry.

The results show that even though Electre is an outranking method it may well classify suppliers in a similar manner as FlowSort does. Both methods are situable for automating suppliers clustering when developing strategies in the sense of Kraljic for supply chain management.

Keywords: supply management, Electre, FlowSort, decision support systems.

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Synthetic Network Traffic Dataset Generation for behavioral Profiling

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Abstract

Proper labeled network traffic dataset play crucial role in design of anomaly based Intrusion Detection Systems (IDS). Network traffic profiling based IDS is promising filed of research which requires labeling of normal and anomaly instances for different profiles. For various network protocols and service levels different behavioral profiles of the users/network traffic may exists. Most of publically available dataset are labeled on intrusion or attack level.

Non-availability of profiling based labeling is a big challenge for network traffic profiling research. In this paper an approach to generate synthetic dataset based on different characteristics of standard NSL KDD 1999 sub-dataset has been proposed. This dataset is categorized based on protocol and service, and then some basic characteristics like minimum and maximum values for each attribute are calculated. Based on these values various network service behavioral profiles are synthetically generated for each protocol_service profiles. Training and testing dataset are generated so as to be used as benchmark dataset for performance analysis of network traffic profiling based IDS.

Keywords: Intrusion Detection System, Network Traffic Dataset, Network Traffic Profiling, Behavioral Profiling.

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Infilling of Rainfall Information using Genetic Programming

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Abstract

The study suggests the use of Genetic Programming (GP) based monthly model for infilling of missing rainfall records in the rainfall time series for 3 rain gauge stations in the Yarra River Basin in Australia from the available rainfall information from the nearby stations. The RMSE and CC values of the validation data indicate the potential of the suggested model.

Further, it is also interesting to note that GP evolved mathematical models are able to predict the subtle inherent non-linearity in the apparently predominantly linear behavior of the process.

Keywords: Infilling rainfall, mathematical model, genetic programming.

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GLM Analysis for fMRI using Connex Array

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Abstract

In the last decades, magnetic resonance imaging gained lot of popularity, and also functional magnetic resonance imaging (fMRI) due to the fact that MRI is a harmless and efficient technique for human cerebral activity studies; fMRI aims to determine and to locate different brain activities when the subject is doing a predetermined task. In addition, using fMRI analysis, nowadays we can make prediction on several diseases.

The purpose of this paper is to describe the General Linear Model for fMRI statistical analysis algorithm, for a 64 x 64 x 22 voxels dataset on a revolutionary parallel computing machine, Connex Array. We make a comparison to other computing machines used in the same purpose, in terms of algorithm time execution (statistical analysis speed).

We will show that by taking advantage on its specific parallel computation each step in GLM analysis, Connex Array is able to answer successfully to computational challenge raised by fMRI computation: the speed-up.

Keywords: Connex array, functional magnetic resonance imaging, image reconstruction, parallel algorithms, parallel processing.

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Machine minimization for scheduling jobs with interval constraints and limited machine workload capacity: A resolution method based on evolutionary game-theoretical model

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Abstract

We present an extension of the machine minimization for scheduling jobs with interval constraints, adding a limited machine workload capacity.

We propose a mixed integer linear programming (MIP) model for an exact solution and explore an alternative resolution method based on a non-cooperative evolutionary game. Our resolution method guarantees a feasible solution of the problem and computational experiments show that its solution is within 9% difference from the optimal solution, but it takes only 2% of the time required to solve the problem to optimality by MIP model over GAMS 22.7.2/CPLEX 11.0.

Keywords: machine minimization, scheduling, interval constraints, evolutionary game theoretical. model.

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Opportunistic Forwarding Algorithm for Delay Tolerant Networks in Rural Applications

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Abstract

Many rural areas in the world do not have the infrastructure to access Internet. This contributes to the increase in the poverty and education gaps between connected and disconnected communities. Although, several governments and organizations are doing efforts to connect people in those regions through several initiatives; many of those communities remain isolated and do not have a permanent contact with near towns or cities.

A networking solution for these cases could be one where the information is stored for some time and forwarded once it is possible, until it reaches an Internet connected node. From this final node, the request can be sent and the reply can be retrieved and start its way back to the original requester. This kind of network is known as Delay/Disruption Tolerant Network (DTN).

This paper proposes a new mathematical optimization model for DTN where the prob- ability of availability of the path taken to the destination is maximized, obtaining the most likely available path. The authors also present an opportunistic forwarding heuristic algorithm that takes into account the availability probability of a nodes neighbors and then decides if the node should forward the message or store it until next time. The model proposed can find the best path in the scenarios presented and the forwarding algorithm can deliver the messages in all cases where there is a path from origin to destination but it can take a considerable amount of time, depending on the threshold (alpha) to accept an availability probability.

Keywords: Disruption-Tolerant, Delay-Tolerant, availability probability, opportunistic for- warding, ICT for rural development, Rural telecommunications.

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Structuring a Mesh Wireless Network

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Abstract

There are many people in rural areas and in the cities periphery without internet connection because of its high cost or lack of the necessary facilities. Currently mobile phones have internet but some people cannot afford such high-cost devices. It is necessary to have a low-cost network to accomplish the communities' needs. We are seeking a low cost network implementation providing communication between groups of people with internet access. The network is implemented with old computers and inexpensive items devices, whose maintenance can be made by a person of the same community. In this work, specifically the implementation of a wireless mesh network (WMN) is proposed with internet access using an access point (AP) to the corporate network USACH (Universidad de Santiago de Chile). This access point, at present consists of a standard PC connected via cable to the network USACH, which feeds, also via cable, an old router (3COM DSL / Router) with wireless output. With the AP currently operating, it follows to implement the Mesh network, basically with the same AP and Linksys WRT54G routers that form the back-bone network. To this back-bone network it can be connected a number of Lap-tops, tablets, smart-phones and even wireless (Wi-Fi), in ad-hoc configured network, via software in each node. The mesh designed constitutes an extension of the Internet itself, but with some different features. Bandwidth decreases depending on the number of users; a back-bone path is needed to optimize the network because the farthest devices to reach the AP have a higher delay since communication jumps from node to node to get to the AP. A planning and deployment will be included depending on the topology location of the network site. To constitute back-bone route, the software router should be configured. This Meshed structure allows a remote AP device have several alternative routes to arrive at the Internet.

Keywords: Wireless Mesh Network, reconfigure software internet, backbone network.

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