

SOFA 2014

6th International Workshop
on Soft Computing Applications

24–26 July, 2014
Timișoara, Romania

Technical Co-Sponsors:

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Organized by:

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Welcome Message

Soft computing (SC) is a collection of methodologies that are trying to cope with the main disadvantage of the conventional (hard) computing: the poor performances when working in uncertain conditions. The fundamental idea of soft computing is to emulate the human like reasoning. The classic constituents of SC are fuzzy logic, neural network theory and probabilistic reasoning, but new methods are continuously emerging: belief networks, genetic algorithms, anytime algorithms, chaos theory, some parts of learning theory, etc. Due to the large variety and complexity of the domain, the constituting methods of SC are not competing for a comprehensive ultimate solution. Instead they are complementing each other, for dedicated solutions adapted to each specific problem. Hundreds of concrete applications are already available in control, decision making, pattern recognition and robotics. The SC systems are tolerant to imprecision, uncertainty, and partial truth. Their main advantages are tractability, robustness, and low cost implementations. At the same time SC is a major developing vector of the Artificial Intelligence.

Our pleasant duty is to gratefully acknowledge the support provided by the sponsors and co-sponsors of the SOFA 2014 workshop, to thank the reviewers for their work and all others involved in the preparation of the program. Last but not least, we would like to thank the authors for their valuable contribution!

We wish all participants a pleasant stay in Timișoara and a successful workshop!

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General Information

Venue: The 6th SOFA Workshop will take place at Hotel Timișoara in the city of Timișoara, Romania.

Address: Mărășești street, no. 1-3, 300086 Timișoara. Telephone: 0040 256 498 852

The conference sessions will take place in *Room Roma*, on the ground floor (nearby the hotel registration).

Language: The official language of the workshop is English.

Registration desk: The conference registration desk will be open for the whole duration of the event.

Presentations: All papers (except invited lectures) are expected to be presented in max. 15 minutes (discussions included). Presentations can be made by using a data projector. All authors are kindly requested to take their presentation on CD or USB and upload it on the conference laptop during the break before their session. We do not support authors in using their own laptop.

Posters: The size of the posters is expected to be A0. Posters will be on display during the whole meeting. The authors are requested to set up their work on the 24th before Lunch and to take it down on the 26th, during Lunch. Discussions concerning the posters will be held during coffee breaks.

Best Student Paper Competition: All the papers submitted as student papers will participate in the Best Student Paper Competition. A committee will evaluate them during the workshop and the award will be given during the last session on Saturday.

Publication: The conference proceedings will be published within three and four months after the conference. The volume will be published by Springer, *Advances in Intelligent and Soft Computing* (ISSN: 1867-5662).

Internet: There will be free of charge Internet facilities for the workshop participants.

Lunch: Registered participants are welcomed to lunch, at Hotel Timișoara.

Social programs: *Cocktail Party* at Hotel Timișoara – 24th of July, 18:00-20:00

Optional excursion to the *Recas Wine Cellar* – 26th of July. Departure from the Hotel Timișoara parking lot at 19:00. Participants can register for the excursion at the conference registration desk.

Parking is available in the hotel parking or in a public parking lot, right next to the hotel (entrance from street Sfântul Ioan). Both parking lots are supervised and paid.

Insurance: The Organizers of the Workshop do not provide insurance and do not take responsibility for any loss, accident or illness that might occur during the Workshop or in the course of travel to or from the meeting site. It is, therefore, the responsibility of the participants to check their coverage with their insurance provider.

Voltage: The electricity supply is 220 V AC (50 Hz).

Weather: In July and August is very hot, ranging between 28 and 38 degrees Celsius.

Public transportation in Timișoara: Several bus (autobuz), tram (tramvai) and trolleybus (troilebuz) routes connect Timișoara's main areas and tourist attractions.

The public transportation system runs between 4:45am and 11:15pm.

Tickets must be purchased beforehand and validated in the ticket-stamping machine upon boarding. Tickets are interchangeable for all three forms of transport with the exception of express buses.

Taxi numbers for Timișoara:

City Taxi - 949 Dacia Taxi - 944

Eco Taxi - (256) 120-120

Getax - 962 or (256) 134-470

Grup Taxi - 946 Radio Taxi - 940

Regal Taxi - 943 Tudo Taxi - 945

Vest Taxi - 953

PROGRAM

Thursday, 24th July

- 9:00-9:10 **OPENING - VALENTINA E. BALAS**
- 9:10 - 9:40 **OPENING LECTURE – CHAIR: VALENTINA E. BALAS**
Decision Support Systems in Practice – *Lakhmi Jain*
- 9:40 - 10:40 **INVITED TALK – CHAIR: VALENTINA E. BALAS**
Advances in Evolutionary Multi-Objective Optimization and Applications – *Tan Kay Chen*
- 10:40 - 11:00 *Coffee Break*
- 11:00 - 13:15 **IMAGE, TEXT AND SIGNAL PROCESSING**
CHAIR: MARIUS M. BALAS
A Comparative Study of Text-To-Speech Systems in Labview
Manuela Panoiu, Cezara-Liliana Rat, Caius Panoiu
Parallel Neural Fuzzy Based Joint Classifier Model for Grading Autistic Disorder
Anju Pratap, C. S. Kanimozhiselvi, R. Vijayakumar, K.V Pramod
Image Processing with Android Steganography
D. Bucerzan, C. Rațiu
- INTELLIGENT TRANSPORTATION**
CHAIR: CAIUS PANOIU
Social Cities: Redistribution of Traffic Flow in Cities Using a Social Network Approach
Alexandru Topirceanu, Alexandru Iovanovici, Cristian Cosariu, Mihai Udrescu, and Mircea Vladutiu
The Computer Assisted Parking of a Bluetooth Controlled Car Using Fuzzy Logic
Caius Panoiu, Manuela Panoiu, Cezara-Liliana Rat, Raluca Rob
A location-aware solution for predicting driver's destination in Intelligent Traffic Systems
Emilian Necula
- MODELING AND APPLICATIONS**
CHAIR: MARIUS M. BALAS
The electronic verification of the weight and the amount of food consumed by animals in a farm
Doru Anastasiu Popescu, Nicolae Bold

FEM Modeling of Some Raising Effects of the Magnetic Liquids around Vertical Conductors with a Current Flow

D. Vesa, M. Greconici, I. Tatai

Hard as a rock or deformation controlled?

Sima Gheorghe, Dan Glavan, Alexandru Popa, E. Muncut

13:15-14:30 *Lunch*

14:30-16:15 **BIOMEDICAL APPLICATIONS**

CHAIRS: VASILE STOICU-TIVADAR AND LĂCRĂMIOARA STOICU-TIVADAR

Using Modern Technologies to Facilitate Translating Logical Observation Identifiers Names and Codes

Daniel-Alexandru Jurcau, Vasile Stoicu-Tivadar and Alexandru Serban

Data Analysis for Patients with Sleep Apnea Syndrome: A Complex Network Approach

Alexandru Topirceanu, Mihai Udrescu, Razvan Avram and Stefan Mihaicuta

Mobile applications supporting healthy life style

Oana-Sorina Lupșe, Adrian Căprioru, Lăcrămioara Stoicu-Tivadar

Fuzzy expert system prediction of lumbar spine sub-chondral sclerosis and lumbar disk hernia

Norbert Gal, Diana Andrei, Vasile Stoicu-Tivadar, Dan Ion Nemeș, Emanuela Nădășan

Server-side Image Segmentation and Patient Related Data Storage

Ioan Virag, Lăcrămioara Stoicu-Tivadar, Mihaela Crișan-Vida, Elena Amăricăi

Dedicated BSN for personal indoor monitoring

Stefan Mocanu

Romanian Sign Language Oral Health Corpus in Video and Animated Avatar Technology

Ionut Adrian Chiriac, Lăcrămioara Stoicu-Tivadar, Elena Podoleanu

16:15-16:30 *Coffee Break*

16:30-17:45 **NEURAL NETWORK AND APPLICATION**

CHAIR: VIOREL NICOLAU

Fermat Number Applications and Fermat Neuron

V. K. Madan, M. M. Balas, S. Radhakrishnan

Data Clustering Using a Modified Fuzzy Min-Max Neural Network

Manjeevan Seera , Chee Peng Lim, Chu Kiong Loo , Lakhmi C. Jain

Adaptive Neuro-Fuzzy System for Current Prediction in Electric Arc Furnaces

Manuela Panoiu, Loredana Ghiormez, Caius Panoiu

Exact Hessian Matrix Calculation for Complex-Valued Neural Networks

Calin-Adrian Popa

Functioning State Estimator of Pump-Motor Group of MOP-Type Drive Mechanisms using Neural Networks

V. Nicolau, M. Andrei

18:00-20:00 *Cocktail Party*

Friday 25 July

9:00-10:00 INVITED TALK – **CHAIR:** VALENTINA E. BALAS
Hybrid intelligent techniques in autonomous complex systems
Ioan Dumitrache

10:00-11:30 **KNOWLEDGE-BASED TECHNOLOGIES FOR WEB APPLICATIONS, CLOUD COMPUTING, SECURITY ALGORITHMS AND COMPUTER NETWORKS**
CHAIR: MIHAELA LUCA

Self-Organizing System for the Autonomic Management of Collaborative Cloud Applications

Bogdan Solomon, Dan Ionescu and Cristian Gadea

An Architecture and Methods for a Platform for Big-Data Analysis

Bogdan Ionescu, Dan Ionescu, Cristian Gadea, Bogdan Solomon and Mircea Trifan

Process Mining Functional and Structural Validation

Maria Laura Sebu, Horia Ciocârlie

Evaluating the performance of discourse parser systems

Elena Mitocariu

Considerations Regarding an Algebraic Model for Inference and Decision on Heterogenous Sensory Input

Violeta Tulceanu

Integrated Design Pattern for Intelligent Web Applications

Zsolt Nagy

11:30-11:45 *Coffee Break*

11:45-13:15

KNOWLEDGE BASED TECHNOLOGIES

CHAIR: MIRCEA VLADUTIU

Heuristic Optimization of Wireless Sensor Networks using Social Network Analysis

*Alexandru Iovanovici, Alexandru Topirceanu, Mihai Udrescu,
Lucian Prodan and Mircea Vladutiu*

Interactive Applications for Studying Mathematics with the use of an Autostereoscopic Display

Monica Ciobanu, Antoanela Naaji, Ioan Virag, Ioan Dascal
Determining the similarity of two web applications using the edit distance

Doru Anastasiu Popescu, Dragoş Nicolae

Generative Learning Object Assessment Items for a Set of Computer Science Disciplines

Ciprian-Bogdan Chirila

Performance Metrics for Persistent Routing

S. N. Orzen

Parity-based Concurrent Error-detection Architecture applied to the IDEA NXT Crypto-algorithm

Andreea Bozesan, Flavius Opritoiu, Mircea Vladutiu

13:15-14:00

Lunch

14:00-15:00

INVITED TALK – CHAIR: VOICU GROZA

Contemporary Software Challenges: Big Data and Cloud Computing
Dan Ionescu

15:00-16:15

SPECIAL SESSION: SOFT COMPUTING TECHNIQUES FOR TIME-SERIES ANALYSIS

CHAIRS: ALINA BARBULESCU AND NICOLAIE POPESCU-BODORIN

DuPont financial ratio analysis using Logical aggregation

A. Rakićević, P. Milošević, B. Petrović, D.G. Radojević

Testing Biorthogonal Wavelets on Magnetocardiogram Processing Algorithms

B. Arvinti I, M. Costache, R. Stolz

Modelling and Simulation of Hearing with Cochlear Implants: a Proposed Method for Better Auralization

A. M. Kuczapski, G.-D. Andreescu

Vessel Tracking and Anomaly Detection using Level 0/1 and High-Level Information Fusion Techniques

R. Abielmona, R. Falcon, P. W. Vachon, V. Z. Groza

On the Long Range Dependence Property of the Electrical Signals Collected in Cavitation Field

A. Barbulescu, S. V. Balas, I. E. Koles, C. A. Mnerie

16:15-16:30 *Coffee Break*

16:30 -18:30 **SPECIAL SESSION: SOFT COMPUTING & FUZZY LOGIC IN BIOMETRICS**

CHAIRS: VALENTINA E. BALAS AND NICOLAIE POPESCU-BODORIN

Iris Recognition – Selecting a Fuzzy Region of Interest in Standard Eye Images

Tuba Celik

Establishing PNN-Based Iris Code to Identity Fuzzy Membership for Consistent Enrollment

V. E. Balas, C. M. Noaica, J.R. Popa, C. Munteanu, V. C. Stroescu

Best Practices in Reporting Iris Recognition Results

N. Popescu-Bodorin, V. E. Balas

Data Classification Based on Fuzzy-RBF Networks

A. R. Várkonyi-Kóczy, B. Tusor, J. Bukor

Fuzzy Correlational Direction Multidimensional Scaling

Mika Sato-Ilic

New Method of Iris Recognition using Dual Tree Complex Wavelet Transform

Anca Ignat, Mihaela Luca, Adrian Ciobanu

Recognition of Pedestrian Active Events by Robust to Noises Boost Algorithm

M. Favorskaya, L.C. Jain

Optic Disc Recognition Method for Retinal Images Reviewer

Florin Rotaru, Silviu Ioan Bejinariu, Cristina Diana Niță, Ramona Luca, Mihaela Luca, Anca Ignat

Fast Fingerprint Orientation Field Estimation Incorporating General Purpose GPU

Ali Ismail Awad

Rotation Invariant Texture Retrieval Using Dual Tree Complex Wavelet Transform

Anca Ignat, Mihaela Luca

Emotion Recognition From Images Under Varying Illumination Conditions

P. Suja, Sherin Mariam Thomas, Shikha Tripathi, V. K. Madan

SESSION CLOSING DISCUSSION

Future Regional Collaboration on Biometrics, Soft Computing & Fuzzy Logic

A. R. Várkonyi-Kóczy, N. Popescu-Bodorin, V. E. Balas

18:30-19:30

TUTORIAL – Introduced by MARIUS M. BALAS

DataFlow SuperComputing for ExaScale Applications

Jakob Salom

Saturday 26 July

- 9:00-10:00** **INVITED SPEAKER – CHAIR: LAKHMI JAIN**
Advances in Urban Video-based Surveillance Systems: a Survey
Margarita Favorskaya
- 10:00-11:00** **FUZZY APPLICATIONS, THEORY AND FUZZY CONTROL**
CHAIR: MARIUS M. BALAS

Fuzzy scoring algorithm and long term job performance
D. Balas Timar, V. E. Balas, R. Lile
Expert Control for the Coupled Tanks Greenhouse
Marius M. Balas, Martin Buchholz and Sanda Balas
Wireless programmable thermostat using Raspberry Pi
Razvan Nicolae Vasiliu, Mircea Popa, Marius Marcu
Cooperative Task Scheduler For Entry Level Microcontrollers
Razvan-Mihai Aciu, Horia Ciocarlie
- 11:00-11:15** *Coffee Break*
- 11:15-14:00** **SPECIAL SESSION: BUSSINESS PROCESS MANAGEMENT**
CHAIR: GABRIELA PROSTEAN

Management, Traceability and Control of Industrial Processes
Gheorghe Sima, Ramona Lile, Glavan Dan, Elena Muncut
Aspects of Forecasting for the European Automotive Industry
S.I. Maistor, R. Negrea, M.L. Mocan, A. Turi
Switching the Center of Software Development from IT to Business
Experts Using Intelligent Business Process Management Suites
Cristian Olariu, Maria Gogan, Frank Rennung
Software platform modelling for utility, time and personal management
Gabriela Prostean, Serban Popa
Innovative computerized techniques for individual management
optimization
Serban Popa, Andra Badea, Adrian Vartosu, Constantin Dumitrescu
Supply Chain collaboration model base d on Drum-Buffer-Rope
philosophy
G. Prostean, A. Badea
Implementing the Agile Marketing Audit Using the A-Marketing
Balance Scorecard System
Ş. Miclea, M.Izvercian, C-F. Buciuman

Technological Implications in the Development and Modelling of the Intellectual Capital

L.M. Gogan, A. Draghici, L. Ivascu

Optimizing processes among companies using decision support technologies

Irina Steliana Stan

Proposed KPIs for optimization and value determination of an e-business

Ion-Sorin Stroe

Competency training in wind power projects

A. Badea, S. Popa, M. Tamasila, I. Taucean

14:00-15:00 *Lunch*

15:00-16:00 **INVITED SPEAKER – CHAIR: LAKHMI JAIN**

Robust Ensemble Learning for Data Mining

Sheryl Brahnham

16:00-18:45 **METHODS AND APPLICATIONS IN ELECTRICAL ENGINEERING**

CHAIR: OCTAVIAN PROSTEAN

Device For Automatic Control of the Petersen Coil

Dumitru Toader, Costantin Blaj, Petru Ruset, Ioan Dorin Hategan,

Nicolae Pinte, Beatrice Arvinti

Novel Topology Flyback Inverter for a Microgrid System

E. Guran, O. Cornea, N. Muntean

Driving of the electroenergetic systems in the optimal zone

O. Gana

Mathematical modelling and numerical simulation of the dual winded induction generator's operating regimes

Ioan Filip, Iosif Szeidert, Octavian Prostean

Voltage and Current Signals Processing in Functioning of Nonlinear Loads

Raluca Rob, Caius Panoiu, Manuela Panoiu

Centring in Magnetic Field of the Hydrogenerator Rotors using Orbit Diagram

L. Padeanu, G. Liuba, M. Biriescu, V. Nedelea, M. Mot, M. Svoboda

Traffic Behaviour Simulator SIMULO with Sensor Coverage Computation

Codruta-Mihaela Istin, Razvan-Mihai Aciu, Horia Ciocarlie

Determination of Reference Mechanical Angular Speed for Wind Power Systems

C.P. Chioncel, L. Bereteu, D.L. Petrescu, M. Babescu

Study of Encoders with data transmission binary channels without interference. Simulation of the Encoder functioning using the Electronic Workbench software

S. Draghici, C. Anghel Drugarin, E. Raduca

The study of a data transmission channel decoder without interference using the Electronic Workbench software

S. Draghici, C. Anghel Drugarin, E. Raduca

Artificial Intelligence Techniques for Optimal Power Flow

C. Barbulescu, S. Kilyeni, A. Simo, C. Oros

19:00

DEPARTURE TO RECAS WINE CELLAR (OPTIONAL)

POSTERS

Hybrid Neuro-Fuzzy Approaches for Abnormality Detection in Retinal Images

D. Jude Hemanth, Valentina E. Balas and J. Anitha

Optimistic Multi-Granulation Rough set based Classification for Neonatal jaundice Diagnosis

S. Senthil Kumar, H. Hannah Inbarani, Ahmad Taher Azar, Hala S. Own, Valentina Emilia Balas, Teodora Olariu

Boosted Decision Trees for Vertebral Column Disease Diagnosis

Ahmad Taher Azar, Hanaa S. Ali, Valentina E. Balas, Teodora Olariu, Rujita Ciurea

Opportunity Analysis of Change Requests in Automotive Projects

Andrei Hutanu, Gabriela Prostean, Stephan Volker, Dumitru Mnerie

Research of Automotive Change Management and supportive Risk-Management

Stephan Volker, Gabriela Prostean, Andrei Hutanu

Cast-Resin Dry-Type Transformer Thermal Modeling Based on Particle Swarm Optimization

D. Azizian, M. Bigdeli

Applying Intelligent Optimization Algorithms for Evaluation of Transformer Black Box Model

Mehdi Bigdeli, Mohammad Valii, Davood Azizian

Givens orthogonal transformation based estimator versus RLS estimator - case study for an induction generator model

Ioan Filip, Iosif Szeidert

Energy Performance Optimization of Wireless Sensor Networks

Cosmina Illes, Cristian Vasar and Ioan Filip

Jigsaw inspired meta-heuristic for selecting the optimal solution in Web service composition

Viorica Rozina Chifu, Ioan Salomie, Emil Șt. Chifu, Cristina Bianca Pop, Petru Poruțiu, Marcel Antal

Hybrid Invasive Weed Optimization Method for Generating Healthy Meals

Viorica R. Chifu, Ioan Salomie, Emil Șt. Chifu, Cristina Bianca Pop, Dan Valea, Madalina Lupu, Marcel Antal

Integrated supervision and control system for air-electrical aggregates

Dan Ungureanu-Anghel, Octavian Prostean, Ioan Filip, Mihai Popescu

Maximum Power Point Control Approach for Wind Generators

Cristian Vasar, Marius Babescu, Doru-Ionut Petrescu, Octavian Prostean and Radu Boraci

Equivalent speed and equivalent power of the wind systems that works at variable wind speed

Florica Balog, Horia Ciocarlie, Marius Babescu, Gheza-Mihai Erdodi

Behavior of the wind systems optimally controlled at variable wind speeds

Horia Ciocarlie, Florica Balog, Gheza-Mihai Erdodi, Doru-Ionut Petrescu

Therapeutic conduct and management of rehabilitee treatment measured with Zebris device and applied using WinSpine software

Diana Andrei, V. Dan Poenaru, Dan Nemes, Dan Surducan, Norbert Gal-Nadasan

Early-warning of Financial Crises based on Fuzzy Logic

E. Sztojanov, G. Stamatescu, I. Sztojanov

Geometric model of a railway wheel with irregular contour

T. Mazilu

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