SOFA 2014

6th International Workshop on Soft Computing Applications

24–26 July, 2014
Timișoara, Romania
Technical Co-Sponsors:

IEEE Romania
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Organized by:

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   – Arad Section

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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 Timişoara and a successful workshop!

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Arad

Lakham Jain
University of
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Branko Kovačević
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P. Georgieva (Portugal)                    M. Pater (Romania)                     R. J. Patton (UK)
H. Habbi (Algeria)
**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 Sfantul 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 (trolebuz) 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:**

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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 Mihaićuta

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 Ciocărlie

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, Dragoș 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. Arvintil, 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  
*Tubă 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: BUSINESS 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 based on Drum-Buffer-Rope philosophy
G. Prostean, A. Badea
Implementing the Agile Marketing Audit Using the A-Marketing Balance Scorecard System
Ș. 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 Brahnam

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,
Nicolaie 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 wound 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 Drugarın, E. Raduca
The study of a data transmission channel decoder without interference using the Electronic Workbench software
   S. Draghici, C. Anghel Drugarın, 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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