2017 European Conference on Electrical Engineering and Computer Science (EECS 2017)

Bern, Switzerland
17 – 19 November 2017
Table of Contents

Preface .........................................................................................................................................................xiii
Organizing Committee ...............................................................................................................................xiv
Program Committee ....................................................................................................................................xv
Reviewers ....................................................................................................................................................xvii

Algorithms for Signal Processing

Deep Learning-Based Steganalysis Against Spatial Domain Steganography .....................................................1
Dong-Hyun Kim and Hae-Yeoun Lee

BAIPAS: Distributed Deep Learning Platform with Data Locality and Shuffling ..............................................5
Mikyoung Lee, Sungho Shin, Seungkyun Hong, and Sa-kwang Song

A Software Measurement Plan Management Guided by an Automated Metrics Suggestion Framework ..................................................9
Sarah A. Dahab, Juan José Hernández Porras, and Stephane Maag

A New Algorithm for a Public Key Cryptosystem Using Elliptic Curve .......................................................17
Nissa Mehibel and M'hamed Hamadouche

A Modified Speech Recognition Algorithm for People with Physical Disabilities ......................................23
Khalid A. Darabkh, Laila Haddad, and Saadeh Sweidan

Topographical-Geodetic Data for Tactical and Technical Control of Artillery Fire ..................................................28
M. Blaha, K. Šilinger, and B. Přikryl

Filtering and Denoising Analysis for Decoded Speech Signal of CELP Codec .............................................33
Zhenyan Fan, Xiaodong Zhuang, Guiqi Sun, and Nikos E. Mastorakis

Some Statistical Study on the Short-Time Spectrum of Unvoiced Pronunciation Signal ...........................................37
Xiaodong Zhuang, Nikos. E. Mastorakis, and George Ioannidis
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of Pediatric Foot Disorders Using Decision Tree and Neural Networks</td>
<td>41</td>
</tr>
<tr>
<td>Jungkyu Choi, Hee-Sang Lee, and Jung-Ja Kim</td>
<td></td>
</tr>
<tr>
<td>Hybrid Parallel Multiple Sequence Alignment Based on Artificial Bee Colony on the Supercomputer JUQUEEN</td>
<td>47</td>
</tr>
<tr>
<td>Plamenka Borovska, Veska Gancheva, Ivailo Georgiev, and Desislava Ivanova</td>
<td></td>
</tr>
<tr>
<td>Mission Possible: A Gamified Approach to Handle Cancer Survivors Stress</td>
<td>52</td>
</tr>
<tr>
<td>Asmaa A. Shalaby and Nahla Barakat</td>
<td></td>
</tr>
<tr>
<td>A Reliable Relaying Protocol in Wireless Sensor Networks</td>
<td>56</td>
</tr>
<tr>
<td>Khalid A. Darabkh and Mohammad Z. Al-Yabrodi</td>
<td></td>
</tr>
<tr>
<td>Comparison of Different Approaches to Continuous-Time System Identification from Sampled Data</td>
<td>61</td>
</tr>
<tr>
<td>Martin Tůma and Pavel Jura</td>
<td></td>
</tr>
<tr>
<td>Distortion of Short Square Pulses by Transmission Line on Printed Circuit Board</td>
<td>66</td>
</tr>
<tr>
<td>Milan Sigmund and Lubomir Brancik</td>
<td></td>
</tr>
<tr>
<td>Investigating Parallel Implementations of Electronic Voting Verification and Tallying Processes</td>
<td>70</td>
</tr>
<tr>
<td>Israa A. Saadeh and Gheith A. Abandah</td>
<td></td>
</tr>
<tr>
<td>Synergy of Computer Modeling of Lateral Surface “Area” of Schwartz’s Cylinder</td>
<td>76</td>
</tr>
<tr>
<td>Eugeny Smirnov and Artem Uvarov</td>
<td></td>
</tr>
<tr>
<td>Application of Pareto Approach to Improve the State Dependent Riccati Equation (SDRE) Controller Performance</td>
<td>81</td>
</tr>
<tr>
<td>Souza L. C. G., Bigot P., and Souza A. G.</td>
<td></td>
</tr>
<tr>
<td>A Machine-Learning Based Methodology for Performance Analysis in Particles Accelerator Facilities</td>
<td>90</td>
</tr>
<tr>
<td>Ugo Gentile and Luigi Serio</td>
<td></td>
</tr>
<tr>
<td>A New Scaled Secant-Type Conjugate Gradient Algorithm</td>
<td>96</td>
</tr>
<tr>
<td>Issam A. R. Moghrabi</td>
<td></td>
</tr>
<tr>
<td>bearing failures detection in induction motors using the stator current analysis based on Hilbert Huang transform</td>
<td>101</td>
</tr>
<tr>
<td>Mohamed-Nacer Saadi, Messaoud Boukhenaf, Abdelghani Redjati, and Noureddine Guersi</td>
<td></td>
</tr>
</tbody>
</table>
Numerical Solution of Fractional Control Problems via Fractional Differential Transformation ............................................................... 107
Josef Rebenda and Zdeněk Šmarda

A Metamodel Composition Driven Approach to Design New Domain Specific Modeling Languages ........................................................................ 112
Anas Abouzahra, Ayoub Sabraoui, and Karim Afdel

Applications of Computers in Mathematical Problems
Evaluation of Gait Characteristic of Elderly People with Visual Impairment based on Plantar Pressure Distribution Analysis .................................................. 119
Ji-Yong Jung, Chang-Min Yang, and Jung-Ja Kim

Differential Flatness-Based Control of Current/Voltage Stabilization for a Single-Phase PFC with Multiphase Interleaved Boost Converters ........................................................................... 124

EMG Spectral Analysis for Prosthetic Finger Control ........................................................................................................... 131
Mehrdad Heydarzadeh, Javad Birjandtalab, and Mehrdad Nourani

Applications of Computers in Sciences
Differential Flatness Based Control of 3-Phase AC/DC Converter .................................................................................. 136

Self-Similarity in the Wide Sense for Information Flows With a Random Load Free on Distribution .................................................................................. 142
Oleg Rusakov and Michael Laskin

Preprocessing Ship Trajectory Data for Applying Artificial Neural Network in Harbour Area .................................................................................. 147
Kwang Il Kim and Keon Myung Lee

Quality of Extracted Sequential Rules by Session Identification Using STT and Cookies ........................................................................... 150
Jozef Kapusta, Michal Munk, and Dominik Halvoník

Fast Computation of Sample Entropy Based on the Iteration of Neighborhood Matrix ........................................................................... 155
Guiqi Sun, Xiaodong Zhuang, Zhenyan Fan, Nikos E. Mastorakis, and George Ioannidis

Learning Aided Structures for Image Segmentation in Complex Background ........................................................................... 158
Manami Barthakur, Kandarpa Kumar Sarma, and Nikos Mastorakis
Data Mining and Algorithms

An Improved Security Architecture for an InterCloud Reference Model ...................................................166
Cherif Ghazel, Yosra Abassi, and Leila Saidane

The Application of a Single Algorithm for Filtering Different Noise in the Image .................................174
Astrit Hulaj, Adrian Shehu, and Xhevahir Bajrami

Data Mining Models for Selection of the Best Spectral Reflectance Indices in Estimation of Crop Yields and Classification of Maize Hybrid Types Using SpectroRadiometer Data ..........................................................................................................................180
Hamza Erol, Celaleddin Barutçular, Ayman El Sabagh, and Recep Erol

Micrographic Image Segmentation Using Level Set Model based on Possibilistic C-Means Clustering ..........................................................................................................................188
Nabil Chetih, Naim Ramou, Zoubeida Messali, Amina Serir, and Yamina Boutiche

Acoustic Emission Source Localization in Plate-Like Structure ................................................................193
El Yamine Dris, R. Drai, A. Benammar, and D. Berkani

Educational Process Mining: A Systematic Literature Review .........................................................................198
Mohamed A. Ghazal, Osman Ibrahim, and Mostafa A. Salama

Algorithms in Management Systems

Performance Evaluation of Non-Local Means (NLM) Algorithms for Grayscale Image Denoising .................................................................................................................................204
Fabrizio Russo

Comparative Tests of Decision Making Algorithms for a Multiversion Execution Environment of the Fault Tolerance Software ..........................................................................................................................211
Igor Kovalev, Anna Voroshilova, Vasily Losev, Mikhail Saramud, Maria Chuvashova, and Aleksandr Medvedev

A Comparative Study on Parameter Selection and Outlier Removal for Change Point Detection in Time Series .................................................................................................................................218
Cemre Candemir and Kaya Oğuz

Identification of Nonlinear Discrete Dynamic Systems Using Enhanced Genetic Programming .................................................................................................................................225
Rami A. Maher and Mohammad J. Mohammad

Pseudo-CT Generated Through Multi-Metric Image Registration and Atlas Fusion (Application to T1-Weighted Brain MRI) .................................................................................................................................230
Wafa Boukellouz, Abdelouahab Moussaoui, and Abdelmalik Taleb-Ahmed

Top-N Query Processing with Real-time Entity Resolution .........................................................................236
Liang Zhu, Shuaibing Fan, Qin Ma, Weiyi Meng, and Haibo Liu
Collaborative Technologies for Knowledge Management with e-Research Training .................................................................242
Karolina González Guerrero and Yaneth Patricia Caviativa Castro

Special Session: Advances in the Artificial Intelligence and Cloud Computing Technologies

On the Reliability of Cascade Size as a Virality Measure .................................................................247
Sarah Elsharkawy, Ghada Hassan, Tarek Nabhan, and Mohamed Roushdy

Towards Overcoming Limitations of Current Integrity Schemes in the Cloud Environment .................................................................254
Hathout Basma, Ghoniemy Samy, and Ibrahim Osman

Improved Driver Drowsiness Detection Model Using Relevant Eye Image’s Features .................................................................261
Walid Hussein and M. Samir Abou El-Seoud

A Social Aware Approach for Online Social Networks Data Allocation and Replication .................................................................266
Mohamed Esam Elsaid, Ahmed Shawish, and Christoph Meinel

Towards Natural Disasters Detection from Twitter Using Topic Modelling .................................................................272
Mohamed Hagras, Ghada Hassan, and Nadine Farag

MalNoD: Malicous Node Discovery in Internet-of-Things through Fingerprints .................................................................280
Aliaa Walid, Ahmad Mostafa, and Mostafa Salama

Power Systems

Identification of Nonlinear Systems .................................................................286
Adil Brouri, Laila Kadi, and Smail Slassi Sennou

Day-Ahead Probabilistic Photovoltaic Power Forecasting Models Based on Quantile Regression Neural Networks .................................................................289
L. Alfredo Fernandez-Jimenez, Sonia Terreros-Olarte, Montserrat Mendoza-Villena, Eduardo Garcia-Garrido, Enrique Zorzano-Alba, Pedro M. Lara-Santillan, Pedro J. Zorzano-Santamaria, and Alberto Falces

Asynchronous Machine Set for Electrical Laboratories Part 1: Noise Load .................................................................295
Jaroslav Lokvenc and Rene Drtina

Asynchronous Machine Sets for Electrical Laboratories Part 2: Power Characteristics .................................................................300
Jaroslav Lokvenc and Rene Drtina

The Study of the Autonomous Power Supply System of the More/All Electric Aircraft in AC/DC and DC/DC Processing .................................................................305
Lucjan Setlak, Rafal Kowalik, and Wojciech Redo
Nonlinear Systems Identification With Discontinuous Nonlinearity .................................................. 311
Mohamed Benyassi and Adil Broui

Stability of Interval Positive Fractional Continuous Time Linear Systems ........................................... 314
Tadeusz Kaczorek

Applications of Internet of Things and Web Services

Landscape Painterly Rendering Based on Observation ........................................................................... 318
Dongwann Kang and Kyunghyun Yoon

Additive Manufacturing of a Rheological Characterized Cement-Based Composite Material .................................................. 326

Pedagogical Training and Research with video Game for Strengthening in Knowledge Processes ........................................................................................................................................ 332
José Eduardo Padilla Beltrán, Yaneth Patricia Caviativa Castro, and María Inés Mantilla

Automatic Differentiation of Computer Programs in the Time and Frequency Domain .................................................. 335
H. Martin Bücker and Daniel Walther

Soft Computing Modeling of Schools Grouping via Score Data ........................................................................... 341
Ivan Borshukov and Olga Georgieva

Video Games as an Influence in Meaningful Learning ........................................................................... 347
José Eduardo Padilla Beltrán, Yaneth Patricia Caviativa Castro, and María Inés Mantilla

Internet of Things within the Service Architecture of Intelligent Transport Systems .................................................. 351
Anastasia I. Levina, Alissa S. Dubgorn, and Oksana Yu. Iliashenko

OCF Healthcare Proof of Concept (PoC) on Libelium MySignals ........................................................................... 356
Hongki Cha and Jonghong Jeon

Mathematical Models in Electrical Engineering

Comparison of LLC and LCCT Converter Topologies ........................................................................... 365
Michal Prídala, Michal Frivaldský, and Seppo J. Ovaska

Mathematical Models and Simulation of key Multi- Pulse Rectifiers in field of Autonomous Electric Power Supply System, using Matlab/Simulink Programming Environment Compatible with the Concept of a More Electric Aircraft (MEA) ........................................................................................................................................ 370
Lucjan Setlak, Rafał Kowalik, and Wojciech Redo
Optimal Hydropower Production for Xin’anjiang Hydropower Station Using Future Scenarios .................................................................................................................................................. 376
Muhammad Zaman, Shouqi Yuan, Junping Liu, Muhammad Imran Nawaz, Jinghong Wan, and Yangfan Li

Overtonges evaluation in electrical networks with isolated neutral - analytical calculation and experimental tests .................................................................................................................. 380
Paul Mihai Mircea, Gabriel Buzatu, Ion Mircea, Ion Marin, Doru Ursu, and Florin Bocai

The Effect of Return Path Current on Analog Sensor Readings in Mixed-Signal Embedded Applications .................................................................................................................................................. 386
Airs Lin, Aleksander Milshteyn, Manuel Garcia, Khosrow Rad, Charles Liu, and Khalil Dajani

Electric Power Distribution Planning Tool Based on Geographic Information Systems and Evolutionary Algorithms .................................................................................................................................................. 396
Eduardo Garcia-Garrido, L. Alfredo Fernandez-Jimenez, Montserrat Mendoza-Villena, Pedro M. Lara-Santillan, Pedro J. Zorzano-Santamaria, Enrique Zorzano-Alba, and Alberto Falces

Numerical Methods and Computers

Smart Home Energy System Modeling and Implementation .................................................................................................................................................. 402
Jawad Lotfi, Farid Abdi, and Mohamed Fouad Abbou

Anatomical Reconstructions Using Computational Tools .................................................................................................................................................. 405
Luis Fernando Vargas Tamayo, Leonardo Emiro Contreras Bravo, and Ricardo Augusto Rios Linares

A Study of Extended Sample Entropy Based on the Correlation Integral .................................................................................................................................................. 410
Guiqi Sun, Xiaodong Zhuang, Zhenyan Fan, and Nikos E. Mastorakis

Renewable Energy Sources and Environment

Ditto Subsystem : A Case Study for Building Experiment Environment in StarBED Using TopDL .................................................................................................................................................. 415
Masatoshi Enomoto, Tomoya Inoue, Kuni Akashi, Shinsuke Miwe, Toshiyuki Miyachi, and Daisuke Miyamoto

The Assessment of Wind Speed Distortions in a Simulated Flow Around a Lattice Cellular Communication Mast .................................................................................................................................................. 421
Valerijs Bezrukovs, Vladislavs Bezrukovs, Sabine Upnere, Deniss Bezrukovs, and Antans Sauhats

Influence of the Passive Shielding on the Optimal Working Point of the Wireless Power Transfer Systems .................................................................................................................................................. 429
Michal Frivaldscky and Miroslav Pavelek

xi
Demand-Side Management: Design for Cooperation and Storage Utilization ..............................................435
    Nhat Vinh Vo, Klaus Frank, Josef Haunschmied, Raimund Kovacevic,
    and Georg Panholzer

Algorithms and Computers in Mechanical Engineering
Static and Dynamic Aspects of Different Tunneling NOI Nanotransistors
with Oxide and Vacuum ..................................................................................................................................441
    Cristian Ravariu and Dan Mihaiescu
Simple Realization of Quadrature Sinusoidal Oscillator with Independent
Control ......................................................................................................................................................445
    Amornchai Chaichana and Winai Jaikla
Safety Distance Calculations for Macrocell Mobile Base Station and on Site
Radiation Measurements .................................................................................................................................449
    Ibraheem M. Fayed and Eman S. El-Din
Three-Inputs Single-Output Voltage-Mode Universal Filter with Orthogonal
Control Using Single Commercially Available IC ........................................................................................454
    Peerawut Suwanjan, Surapong Siripongdee, and Winai Jaikla
Hand Pose Estimation with CNN-RNN ........................................................................................................458
    Zhongxu Hu, Youmin Hu, Bo Wu, and Jie Liu
The Improvement Effect of Muscular Activities and Foot Forces according
to Sound Stimulus in Muscle Strength Imbalance during Gait ......................................................................464
    Seung-Rok Kang, Jae-Wook Nah, Chul-Un Hong, and Tae-Kyu Kwon

Applications of Control Systems
A New Cluster Head Replacement Protocol for Wireless Sensor Networks .................................................472
    Khalid A. Darabkh, Wala'a S. Al-Rawashdeh, Raed T. Al-Zubi,
    and Sharhabeel H. Alnabelsi
Development of a Prototype of an Automatic System for Shrimp Fusing
Telecontrol as a Viable Proposal for Small Producers ..................................................................................477
    Ivan Daniel Oviedo, Carlos A. Altamirano, Marcos E. Millan, Nestor X. Arreaga,
    and Vladimir Sanchez Padilla
A Study on the Effect of Complex Rehabilitation Exercise Methods
through Short-Term Active Sling Exercises and Vibration Balls on the Upper
Limb Muscle Activity of People with Myelopathy ......................................................................................484
    Juhwan Oh and TaeKyu Kwon

Author Index ............................................................................................................................................489