

2018 International Interdisciplinary PhD Workshop (IIPhDW 2018)

**Swinoujscie, Poland
9 – 12 May 2018**



**IEEE Catalog Number: CFP18P90-POD
ISBN: 978-1-5386-6144-4**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18P90-POD
ISBN (Print-On-Demand):	978-1-5386-6144-4
ISBN (Online):	978-1-5386-6143-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2018 International Interdisciplinary PhD Workshop (IIPhDW)

Table of Contents

Fludeoxyglucose Metabolism Modeling: An Overview.....	1
<i>Daniel Chalupa and Jan Mikulka</i>	
Introduction to car failure detection system based on diagnostic interface	4
<i>Bartosz Kowalik</i>	
A model of water thermal-hydraulics during sudden depressurization of a vessel filled with water under saturation conditions.....	8
<i>Rafał Bryk, Holger Schmidt, Thomas Mull, Oliver Herbst and Ingo Ganzmann</i>	
Simulation of the fuel gas valve PID controller in closed loop system.....	13
<i>Adam Trojnar and Piotr Ostalczyk</i>	
Application of visual speech synthesis in therapy of auditory verbal hallucinations	17
<i>Kamil Sorokosz</i>	
Energy efficiency analysis of railway turnout heating with a simplified snow model using classical and contactless heating method.....	21
<i>Mateusz Flis and Miroslaw Wołoszyn</i>	
Speech processing algorithm for isolated words recognition.....	27
<i>Michał Raczyński</i>	
New proposed radio system of object location.....	32
<i>Artur Chachlica</i>	
Evaluation methods of Frequency Response Analysis.....	36
<i>Wojciech Szoka and Szymon Banaszak</i>	
Convergence error exploration for electrical impedance tomography problems with open and closed domains.....	39
<i>Jan Dusek, Andres Vejar, Tomasz Rymarczyk and Jan Mikulka</i>	
Comparison of Algorithms for Hybrid Nonlinear Optimization Problem in Biological Wastewater Treatment Plant.....	45
<i>Robert Piotrowski, Piotr Hirsch and Jakub Lorenc</i>	
Universal Windows Application for the parameters calculation of shields against ionizing radiation.....	51
<i>Patryk Szumielewicz, Katarzyna Cichoń and Wojciech Chlewicki</i>	
High voltage line distance measurement and position detection based on stereoscopic image	54
<i>Paweł Kowalski and Maciej Czyżak</i>	
Precision landing options in Unmanned Aerial Vehicles	58
<i>Jiri Janousek and Petr Marcon</i>	
Analysis of reactivity changes during the operation of a nuclear power plant	61
<i>Jakub Sierchula</i>	
Combining Images Captured from a Multispectral Camera.....	67
<i>Petr Marcon, Jiri Janousek and Anna Siruckova</i>	
Frequency response modeling of power transformer windings considering the attributes of ferromagnetic core.....	71
<i>Katarzyna Trela and Konstanty Marek Gawrylczyk</i>	
Damping of torsional vibrations in electric drive with AC motor	74
<i>Lukasz Zawarczynski and Tadeusz Stefanski</i>	
Comparison of inverse problem solutions for 2D damp wall multilayer and nonhomogenous models.....	81
<i>Maciej Pańczyk, Tomasz Rymarczyk and Jan Sikora</i>	

An Introduction to a Novel Crossover Operator for Real-Value Encoded Genetic Algorithm: Gaussian Crossover Operator	85
<i>Daniel Figurowski and Michał Kubicki</i>	
DAQ-based measurements for ferromagnetic coil modeling using fractional derivatives..	91
<i>Marcin Sowa</i>	
Analysis of the impact of temperature load on the state of stress in a bolted flange connection.....	96
<i>Patryk Towarnicki and Rafał Grzejda</i>	
Improving the efficiency of Liquid Air Energy Storage by Organic Rankine Cycle module application	99
<i>Aleksandra Mikołajczak, Piotr Krawczyk, Marcin Wolowicz, Krzysztof Badyda and Michałina Kurkus-Gruszecka</i>	
Analysis of fractional capacitor and coil by the use of the Conformable Fractional Derivative and Caputo definitions.....	103
<i>Ewa Piotrowska</i>	
Analysis of time-frequency representation of Magnetic Barkhausen Noise for the need of damage evaluation of steels elements.....	108
<i>Grzegorz Psuj and Michał Maciusowicz</i>	
Deep CNN based decision support system for detection and assessing the stage of diabetic retinopathy.....	111
<i>Arkadiusz Kwasigroch, Bartłomiej Jarzembiński and Michał Grochowski</i>	
Data augmentation for improving deep learning in image classification problem	117
<i>Agnieszka Mikołajczyk and Michał Grochowski</i>	
The influence of core geometry on no-load losses of medium power transformers	123
<i>Joanna Wojtkun, Bolesław Bródka and Dorota Stachowiak</i>	
Is it safer to transport a three-year-old child in a forward-facing child restraint system or in a rear-facing one while head-on collision?.....	128
<i>Edyta Rola and Daniel Wdowicz</i>	
Model Predictive Control for Variable Stiffness Elasticity Actuator	131
<i>Maksymilian Szumowski and Marek Ogonowski</i>	
Combined analysis of GSR and EEG signals for emotion recognition.....	137
<i>Paweł Tarnowski, Marcin Kołodziej, Andrzej Majkowski and Remigiusz Rak</i>	
Influence of endplates on the value of a critical moment	142
<i>Krzysztof Wierzbicki</i>	
Air-gap data transmission using screen brightness modulation	147
<i>Dawid Bąk and Przemysław Mazurek</i>	
Examination of the impact of the number of approximation nodes on the quality of transfer function models describing the diffusion of the electromagnetic field	151
<i>Konrad Dudziak, Krzysztof Stawicki and Andrzej Brykalski</i>	
Detection analysis of Flood Embankment by Electrical Impedance Tomography	156
<i>Tomasz Rymarczyk and Paweł Tchórzewski</i>	
Implementation 3D Level Set Method to Solve Inverse Problem in EIT	159
<i>Tomasz Rymarczyk and Paweł Tchórzewski</i>	
Hybrid Tomographic Device for Acquisition of Electrical Tomography Data	162
<i>Jakub Szumowski, Michał Oleszek, Tomasz Rymarczyk, Przemysław Adamkiewicz and Jan Sikora</i>	
Image Reconstruction Methods in Radio and Ultrasound Tomography	165
<i>Tomasz Rymarczyk, Przemysław Adamkiewicz, Krzysztof Polakowski and Jan Sikora</i>	
Application of Least Angle Regression Methods for Image Reconstruction in EIT.....	169
<i>Edward Kozłowski, Tomasz Rymarczyk and Przemysław Adamkiewicz</i>	

The use of a neural controller in masonry tomography	172
<i>Tomasz Rymarczyk and Grzegorz Kłosowski</i>	
The use of a neural controller to disinfect water with ultraviolet light	177
<i>Tomasz Rymarczyk and Grzegorz Kłosowski</i>	
Localization and Navigation Based on Radio Tomographic Imaging in Beacon Technology	182
<i>Michał Gołąbek, Przemysław Adamkiewicz, Tomasz Rymarczyk and Jan Sikora</i>	
Advanced Tomographic Platform for Real-Time Image Reconstruction and Biomedical Signal Analysis	186
<i>Tomasz Rymarczyk, Andres Vejar, Paweł Nita and Paweł Tchórzewski</i>	
Solving Inverse Problem for Electrical Impedance Tomography Using Topological Derivative and Level Set Method	191
<i>Tomasz Rymarczyk and Katarzyna Szulc</i>	
Quality Control System for Data Acquisition and Image Reconstruction with Smart hybrid ECT Device	196
<i>Tomasz Rymarczyk, Konrad Kania, Jakub Szumowski, Paweł Tchórzewski, Przemysław Adamkiewicz and Jan Sikora</i>	
Modelling of photovoltaic cells in variable conditions of temperature and intensity of solar insolation as a method of mapping the operation of the installation in real conditions..	200
<i>Anna Zielińska, Andrzej Bień and Mikołaj Skowron</i>	
Load Balancing Algorithms in Heterogeneous Web Cluster	205
<i>Fatma Mbarek and Volodymyr Mosorov</i>	
Sinusoidal modulation with higher harmonics limitation	209
<i>Tomasz Binkowski</i>	
Investigation of photovoltaic panels using simulation tool during light intensity and temperature changes	214
<i>Dariusz Sobczyński</i>	
Monochromatic textures' features extraction using extended GLCM approach for classification of autonomous cleaning robot work area	220
<i>Andrzej Seul</i>	
Comparative Analysis of Passenger Car and Non-Road Machinery Specific Emission in Real Operating Conditions	226
<i>Natalia Szymlet, Piotr Lijewski, Paweł Fuć, Barbara Sokolnicka and Maciej Siedlecki</i>	
Analysis of specific emission of exhaust gases from gasoline direct injection engine in real operation conditions and on dynamic engine dynamometer	231
<i>Barbara Sokolnicka, Natalia Szymlet, Paweł Fuć, Piotr Lijewski and Maciej Siedlecki</i>	
Influence of microstrip line deformation on scattering matrix parameters in strain sensing applications	235
<i>Przemysław Lopato and Michał Herbko</i>	
Towards high precision Electrical Capacitance Tomography multilayer sensor structure using 3D modelling and 3D printing method.....	238
<i>Aleksandra Kowalska, Robert Banasiak, Radosław Wajman, Andrzej Romanowski and Dominik Sankowski</i>	
Impact of multiple magnet sources on flow parameters of arterial blood with a specific pulse	244
<i>Piotr Gas and Mikołaj Skowron</i>	
Problems of mesh generation in numerical modeling of the combustion engine with variable compression ratio.....	248
<i>Mariusz Rzasa and Adam Ilnicki</i>	
Particle automata model of renal cancer progression	254
<i>Marta Panuszewska, Bartosz Minch and Witold Dzwirzel</i>	

The characteristics and main causes of power system failures basing on the analysis of previous blackouts in the world	257
<i>Daria Złotecka and Krzysztof Sroka</i>	
Architecture of the system of 1:10 scale autonomous car - requirements-based design and implementation.....	263
<i>Mateusz Perciński and Mikołaj Marcinkiewicz</i>	
Application of Artificial Neural Network and OpenCL in Spectral and Wavelet Analysis of Phase Current of LSPMS Machine	269
<i>Konrad Górný, Wojciech Pietrowski and Grzegorz Wiśniewski</i>	
Fractional-, variable-order discrete-time linear equations – numerical investigations of parameters.....	273
<i>Piotr Oziąblo</i>	
Review and comparison of smoothing algorithms for one-dimensional data noise reduction	277
<i>Pawel Kowalski and Robert Smyk</i>	
Probabilistic approach to seam tracking of butt welding	282
<i>Grzegorz Sypniewski and Krzysztof Okarma</i>	
Forward Forecast of Stock Prices Using LSTM Neural Networks with Statistical Analysis of Published Messages	288
<i>Damian Faustryjak, Michał Majchrowicz and Lidia Jackowska-Strumillo</i>	
Fuzzy queries on relational databases	293
<i>Grzegorz Nowakowski</i>	
Towards digital vehicle identification based on Engine Control Units memory analysis .	300
<i>Mariusz Matusiak and Zbigniew Chaniecki</i>	
The impact of aeration for removal chloroform from water	305
<i>Anita Sowa-Watrak and Mariusz Rząsa</i>	
Web-based Real-Time Simulation System	310
<i>Tomasz Karla and Jarosław Tarnawski</i>	
Computing methods for fast and precise body surface area estimation of selected body parts	316
<i>Gustaw Rzyman, Grzegorz Redlarski, Aleksander Palkowski, Piotr M. Tojza, Marek Krawczuk and Janusz Siebert</i>	
Shape optimization of the multi-slot coaxial antenna for local hepatic heating during microwave ablation.....	319
<i>Piotr Gas and Barbara Szymanik</i>	
Basic evaluation of limb exercises based on electromyography and classification methods	323
<i>Aleksander Palkowski, Grzegorz Redlarski, Gustaw Rzyman and Marek Krawczuk</i>	
Influence of measurement conditions on the magnetic Barkhausen noise properties	326
<i>Grzegorz Psuj, Michał Maciusowicz and Piotr Chudzik</i>	
On a fractional-order backward difference equation solution solved by a microcontroller	330
<i>Mariusz Matusiak, Piotr Ostalczyk and Dominik Sankowski</i>	
Determination of the response time of new generation electromagnetic injectors as a function of fuel pressure using the internal photoelectric effect.	335
<i>Mateusz Bor, Tomasz Borowczyk, Wojciech Karpiuk and Rafał Smolec</i>	
Numerical Analysis of Eddy Current Transducer with Rotating Permanent Magnets for Planar Conducting Plates Testing	340
<i>Jacek Grochowiak and Tomasz Chady</i>	
WWW Interface for an Electrical Capacitance Tomography System.....	344
<i>Damian Wanta, Jacek Kryszyn, Jakub Buraczyk and Waldemar T. Smolik</i>	

LabVIEW Based Data Acquisition System for Electrical Capacitance Tomography	348
<i>Jacek Kryszyn, Damian Wanta, Patryk Kulpanowski and Waldemar T. Smolik</i>	
Impact of the Reference Model on the Values of Maximum Dynamic Error	353
<i>Krzysztof Tomczyk and Marek Sieja</i>	
System for remote parental control and management of rooted Smart TVs.....	357
<i>Michał Majchrowicz, Paweł Kapusta, Damian Faustryjak and Lidia Jackowska-Strumillo</i>	
Region Based Adaptive Binarization for Optical Character Recognition Purposes	361
<i>Hubert Michalak and Krzysztof Okarma</i>	
Analysis of Cluster Heads Positions in Stable Election Protocol for Wireless Sensor Network	367
<i>Abdulla Juwaidi and Lidia Jackowska-Strumillo</i>	
Performance analysis of Short-Time Fourier Transform algorithm with selected optimization methods.....	371
<i>Grzegorz Rybak, Zbigniew Chaniecki, Krzysztof Grudzień, Andrzej Romanowski and Dominik Sankowski</i>	
Local concentration changes in eccentric and concentric silo discharging modes using X-ray tomography	377
<i>Selam Waktola, Krzysztof Grudzien, Laurent Babout and Jerome Adrien</i>	
Distributed systems for acquisition and analysis of multi-source data in industrial and medical tomography	381
<i>Tomasz Rymarczyk</i>	
Image processing for evaluation of settled layer during pneumatic conveying of granular solids.....	387
<i>Mateusz Milak, Krzysztof Grudzień, Zbigniew Chaniecki, Andrzej Romanowski and Dominik Sankowski</i>	
Industry 4.0 and Science: Mechatronic Feed Drive System Case Study	392
<i>Michał Kubicki, Krzysztof Pietrusiewicz and Paweł Waszcuk</i>	
Corrosion Detection and Measurement Using Eddy Current Method	398
<i>Paweł Frankowski</i>	
Fast Quality Assessment of 3D Printed Surfaces Based on Structural Similarity of Image Regions.....	401
<i>Jarosław Fastowicz and Krzysztof Okarma</i>	
Transient Lorentz Force Density Distribution in a Single and Double Layer Conducting Spheres	407
<i>Adam Ryszard Zywica, Marcin Ziolkowski and Stanisław Gratkowski</i>	
Application of optical signals for combustion process diagnosis	410
<i>Andrzej Kotyra</i>	
Implementation of Fractional Order PID controller based on Recursive Oustaloup'e Filter	414
<i>Michał Zamojski</i>	