



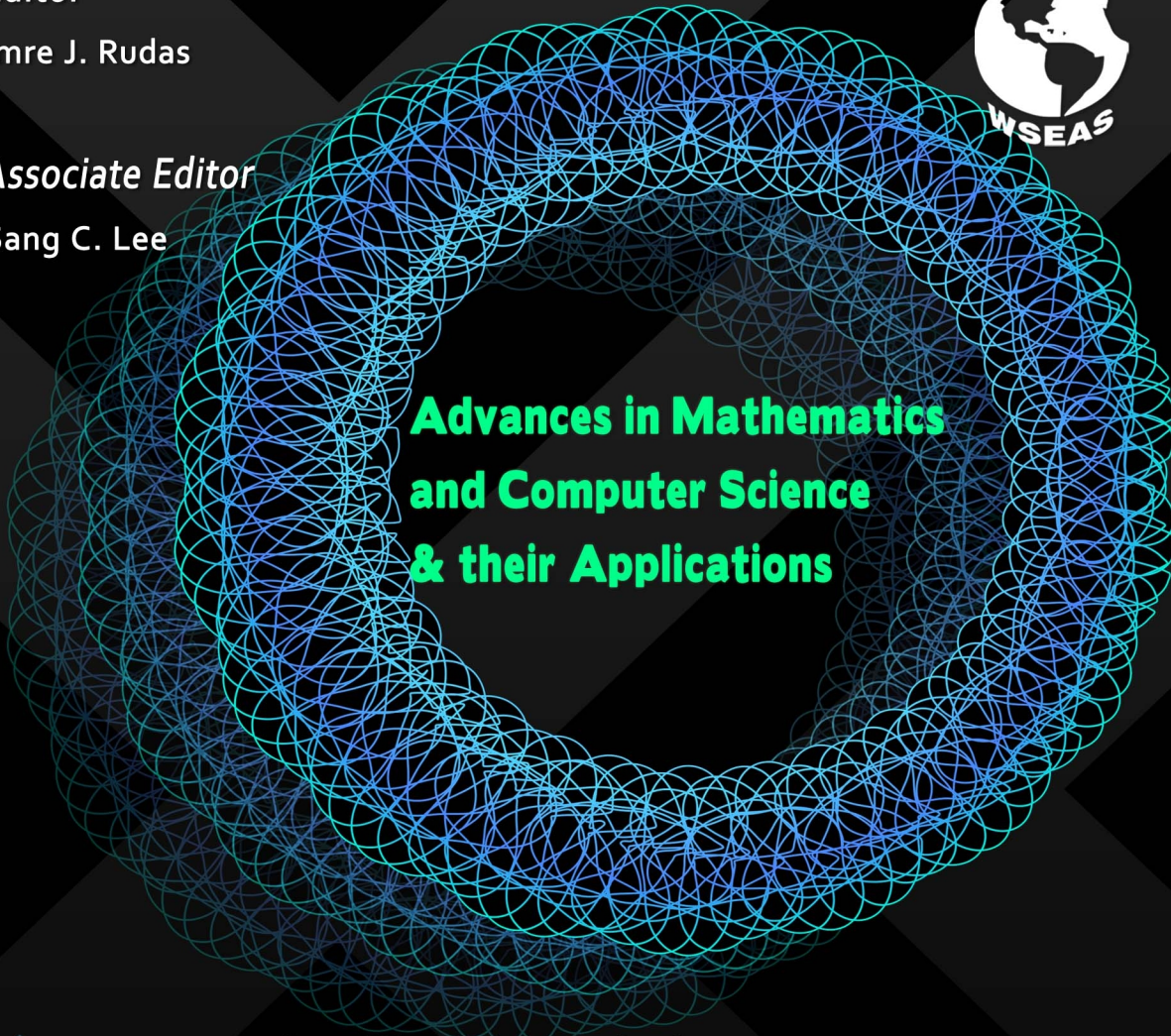
Editor

Imre J. Rudas



Associate Editor

Sang C. Lee



**Advances in Mathematics
and Computer Science
& their Applications**

- **Proceedings of the 18th International Conference on Mathematical Methods, Computational Techniques and Intelligent Systems (MAMECTIS '16)**
- **Proceedings of the 9th International Conference on Manufacturing Engineering, Quality and Production Systems (MEQAPS '16)**
- **Proceedings of the 9th International Conference on Urban Planning and Transportation (UPT '16)**
- **Proceedings of the 7th European Conference on Applied Mathematics and Informatics (AMATHI '16)**

Venice, Italy, January 29-31, 2016



ADVANCES in MATHEMATICS and COMPUTER SCIENCE and THEIR APPLICATIONS

**Proceedings of the 18th International Conference on Mathematical Methods,
Computational Techniques and Intelligent Systems (MAMECTIS '16)**

**Proceedings of the 9th International Conference on Manufacturing
Engineering, Quality and Production Systems (MEQAPS '16)**

**Proceedings of the 9th International Conference on Urban Planning and
Transportation (UPT '16)**

**Proceedings of the 7th European Conference on Applied Mathematics and
Informatics (AMATHI '16)**

**Venice, Italy
January 29-31, 2016**

ADVANCES in MATHEMATICS and COMPUTER SCIENCE and THEIR APPLICATIONS

**Proceedings of the 18th International Conference on Mathematical Methods,
Computational Techniques and Intelligent Systems (MAMECTIS '16)**

**Proceedings of the 9th International Conference on Manufacturing
Engineering, Quality and Production Systems (MEQAPS '16)**

**Proceedings of the 9th International Conference on Urban Planning and
Transportation (UPT '16)**

**Proceedings of the 7th European Conference on Applied Mathematics and
Informatics (AMATHI '16)**

**Venice, Italy
January 29-31, 2016**

Published by WSEAS Press
www.wseas.org

Copyright © 2016, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

ISSN: 2227-4588
ISBN: 978-1-61804-360-3

ADVANCES in MATHEMATICS and COMPUTER SCIENCE and THEIR APPLICATIONS

**Proceedings of the 18th International Conference on Mathematical Methods,
Computational Techniques and Intelligent Systems (MAMECTIS '16)**

**Proceedings of the 9th International Conference on Manufacturing
Engineering, Quality and Production Systems (MEQAPS '16)**

**Proceedings of the 9th International Conference on Urban Planning and
Transportation (UPT '16)**

**Proceedings of the 7th European Conference on Applied Mathematics and
Informatics (AMATHI '16)**

**Venice, Italy
January 29-31, 2016**

Editor:

Prof. Imre J. Rudas, Obuda University, Hungary

Associate Editor:

Prof. Prof. Sang C. Lee, Daegu Gyeongbuk Institute of Science and Technology, Korea

Committee Members-Reviewers:

Anca Croitoru
Sk. Sarif Hassan
Gabriela Mircea
Isaac Yeboah
Dana Anderson
Elena Scutelnicu
Daniela Litan
Ibrahim Canak
Vasile Cojocaru
Hamideh Eskandari
Claudia-Georgeta Carstea
Elena Zaitseva
Mihai Tiberiu Lates
Yixin Bao
Gabriella Bognar
Muhammet Koksall
Md. Shamim Akhter
Vassos Vassiliou
Yuqing Zhou
Maria Dobritoiu
U. C. Jha
Bhagwati Prasad
Emmanuel Lopez-Neri
Carla Pinto
Jose Manuel Mesa Fernández
Zanariah Abdul Majid
David Nicoleta
Snezhana Georgieva Gocheva-Ilieva
Al Emran Ismail
Robert L. Bishop
Glenn Loury
Fernando Alvarez
Morris Adelman
Mark J. Perry
Reinhard Neck
Ricardo Gouveia Rodrigues
Ehab Bayoumi
Igor Kuzle
Maria do Rosario Alves Calado
Gheorghe-Daniel Andreescu
Bharat Doshi
Gang Yao
Biswa Nath Datta
Gamal Elnagar
Goricane Darko
Lu Peng
Pavel Loskot
Shuliang Li
Panos Pardalos
Ronald Yager
Stephen Anco
Adrian Constantin
Ying Fan
Juergen Garloff
Y. Jiang
Vitale Cardone
Leonardo Cascini
Domenico Guida
Joseph Quartieri
Stefano Riemma
Gianfranco Rizzo
Mario Vento
Hyung Hee Cho
Kumar Tamma
Igor Sevostianov
Cho W. Solomon To
Jiin-Yuh Jang
Robert Reuben
Ali K. El Wahed
Yury A. Rossikhin
Pierre-Yves Manach
Ramanarayanan Balachandran
Sorinel Adrian Oprisan
Yoshihiro Tomita
J. Quartieri
Marcin Kaminski
ZhuangJian Liu
Abdullatif Ben-Nakhi
Ottavia Corbi
Xianwen Kong
Ahmet Selim Dalkilic
Essam Eldin Khalil
Jose Alberto Duarte Moller
Seung-Bok Choi
Marina Shitikova
Junwu Wang
Jia-Jang Wu
Moran Wang
Gilbert-Rainer Gillich
Thomas Panagopoulos
Jon Bryan Burley
Cyril Fleaurant
Biagio Guccione
Jose Beltrao
Ioannis Ispikoudis
Giuseppe Genon
Jose Luis Miralles
Carlos Guerrero
Inga Straupe
Giuseppe Luigi Cirelli
Francesco Ferrini
Sarima Cakula

Claudio Guarnaccia
Haziq Jeelani
Ivan G. Avramidi
Michel Chipot
Xiaodong Yan
Ravi P. Agarwal
Yushun Wang
Patricia J. Y. Wong
Jim Zhu
H. M. Srivastava
Martin Bohner
Martin Schechter
Ferhan M. Atici
Marco Sabatini
Gerd Teschke
Meirong Zhang
Lucio Boccardo
Shanhe Wu
Natig M. Atakishiyev
Jianming Zhan
Narcisa C. Apreutesei
Chun-Gang Zhu
Naseer Shahzad
Sining Zheng
Satit Saejung
Juan J. Trujillo
Tiecheng Xia
Stevo Stevic
Lucas Jodar
Noemi Wolanski
Zhenya Yan
Juan Carlos Cortes Lopez
Wei-Shih Du
Kailash C. Patidar
Janusz Brzdek
Jinde Cao
Josef Diblik
Jianqing Chen
Abdelghani Bellouquid

Table of Contents

Mathematical Aspects of Risk Management in Interconnected Utility Networks	11
<i>Stefan Schauer, Sandra König, Stefan Rass</i>	
Interval Methods of Optimization in Condition of Uncertainty	18
<i>Vitaly Levin</i>	
Hybrid Reformulation Based on a New Hybrid Ohm's Law for an Electrical Energy Hybrid Systems	27
<i>Sang C. Lee, Doo Seok Lee</i>	
Effect of First Order Chemical Reaction on Magneto Convection of Immiscible Fluids in a Vertical Channel	32
<i>J. C. Umavathi, Maurizio Ssaso, J. Prathap Kumar</i>	
A Stochastic Model for Real Estate Pricing Estimation and Description of Its Dynamics Based on the Pseudo-Poisson Type Processes	40
<i>Oleg Rusakov, Michael Laskin</i>	
How Embedding Nanoparticles Effects Semiconductor Thermal Conductivity	44
<i>Giovanni Mascali</i>	
Integrability in Elementary Functions of Certain Classes of Nonconservative Systems	50
<i>Maxim V. Shamolin</i>	
Verb-Object Selectional Preferences in Chinese Based on Distributional Semantic Model	59
<i>Chao Li, Fuji Ren, Xin Kang</i>	
A Conceptual Design of Next Generation Computer : Hybrid Spectral Computing and Analog Wave Computing	63
<i>Sang C. Lee, Hyun Lee</i>	
A Fresh Look at Lefebvre's Spatial Triad and Differential Space: A Central Place in Planning Theory?	68
<i>Michael Leary-Owhin</i>	
Cataloguing of Historical Masonry Bridges in the Campania Region for Damage Evaluation	74
<i>Alessandro Baratta, Ileana Corbi, Ottavia Corbi, Francesca Tropeano</i>	
Turning Brownfield Redevelopment-the Case of Summerset at Frick Park Neighborhood	78
<i>Xiaodan Li, Hao Yang</i>	
Integrating Form Defects of Mechanical Joints into the Tolerance Studies	84
<i>Yann Ledoux, Serge Samper, Julien Grandjean</i>	
Experimental Wind Tunnel Testing of a New Multidisciplinary Morphing Wing Model	90
<i>Michel Joel Tchatchueng Kammegne, Ruxandra Mihaela Botez, Mahmoud Mamou, Youssef Mebarki, Andreea Koreanschi, Oliviu Sugar Gabor, Teodor Lucian Grigorie</i>	

Deformations and Elements of Deformation Theory	98
<i>Nikolaj Glazunov</i>	
On Approximations by Polynomial and Trigonometrical Integro-Differential Splines of Two Variables	103
<i>I. G. Burova, S. V. Poluyanov</i>	
Recent Development of Control Theory from the Exterior Differential System and First Integral Theoretical Point of View	110
<i>Heungju Ahn</i>	
Embracing the Unknown in Intelligent Systems	115
<i>Rodolfo A. Fiorini</i>	
Medium Access Control (MAC) Enabling Parallelism to Mitigate Exposed Terminals Issues in Multihop Wireless Mesh Network (WMN)	125
<i>Vigneswara Rao Gannapathy, Ahamed Fayeez Bin Tuani Ibrahim, Lim Kim Chuan, Mohamad Kadim Bin Suaidi</i>	
Structural Damage Index Identification for Historical Masonry Bridges	135
<i>Alessandro Baratta, Ileana Corbi, Ottavia Corbi, Francesca Tropeano</i>	
Relativistic and Hereditary Viewpoints on the Dimensionless Hybrid Transformation	139
<i>Sang C. Lee, Heung Ju Ahn</i>	
A New Theorem on the Localization of Factored Fourier Series	144
<i>Hikmet Seyhan Özarıslan, Sebnem Yildiz</i>	
Euler/Quasi-Wavelet Method for the Variable Order Fractional Advection-Diffusion Equation with a Nonlinear Source Term	147
<i>Leijie Qiao, Xu Da</i>	
Hybrid Modelling by Projective Geometry	159
<i>Doo Seok Lee, Sang C. Lee</i>	
Statistics of k-μ Random Variable	163
<i>Dragana Krstić, Zoran Jovanović, Radmila Gerov, Dragan Radenković, Vladeta Milenković</i>	
Application of Synthetic Pseudo Panels to Investigate the Out-of-Home Discretionary Activity Duration	172
<i>Naznin Sultana Daisy, Mohammad Hesam Hafezi, Muhammad Ahsanul Habib</i>	
Interpolation of B1-Spline Curve	191
<i>Hyung Bae Jung, Doo-Yeoun Cho, Ju-Hwan Cha</i>	
Signific Knowlede in Mathematical Science	196
<i>Al Mutairi Alya O.</i>	
An Improved Harris-Affine Invariant Interest Point Detector	199
<i>Karina Perez-Daniel, Enrique Escamilla, Mariko Nakano, Hector Perez-Meana</i>	

Classifier-Assisted Optimization Frameworks	209
<i>Yoel Tenne</i>	
Characterizations of Feebly Totally Open Functions	217
<i>Raja Mohammad Latif, Mohammad Rafiq Raja, Muhammad Razaq</i>	
Convergence Analysis of an Extended Newton-Type Method for Implicit Functions and their Solution Mappings	224
<i>Mohammed Harunor Rashid</i>	
Infrastructure Development and Financing Approaches in Developing Nations: Constraints and Opportunities	235
<i>Olufemi A. Oyedele</i>	
Probabilistic Method of Data Computation, Interpolation and Modeling	252
<i>Dariusz Jacek Jakóbczak</i>	
Wireless RF Communication Based on TMS320c6713 DSP	258
<i>Neelima Kolhare, Rajshree Sarvadnya</i>	
Applications of Orthogonal Matrices in 2D Data Retrieval	264
<i>Dariusz Jacek Jakóbczak</i>	
Comparative Study of Thermally Induced Vibrations in Orthotropic Rectangular Plates: The ANOVA Approach	268
<i>Tripti Johri, Indu Johri</i>	
Comparison of Individual Charts to Monitor Peroxide Index of Olive Oil	272
<i>Luís M. Grilo, Helena L. Grilo</i>	
Nonlinear Parabolic PDE-Based Image Filtering	276
<i>Tudor Barbu</i>	
Authors Index	281

Authors Index

Ahn, H. J.	110, 139	Jakóbczak, D. J.	252, 264	Milenković, V.	163
Alya, O. Al M.	196	Johri, I.	268	Nakano, M.	199
Baratta, A.	74, 135	Johri, T.	268	Oyedele, O. A.	235
Barbu, T.	276	Jovanović, Z.	163	Perez-Daniel, K.	199
Botez, R. M.	90	Jung, H. B.	191	Perez-Meana, H.	199
Burova, I. G.	103	Kammegne, M. J. T.	90	Poluyanov, S. V.	103
Cha, J.-H.	191	Kang, X.	59	Qiao, L.	147
Cho, D.-Y.	191	Kolhare, N.	258	Radenković, D.	163
Chuan, L. K.	125	König, S.	11	Raja, M. R.	217
Corbi, I.	74, 135	Koreanschi, A.	90	Rashid, M. H.	224
Corbi, O.	74, 135	Krstić, D.	163	Rass, S.	11
Da, X.	147	Kumar, J. P.	32	Razaq, M.	217
Daisy, N. S.	172	Laskin, M.	40	Ren, F.	59
Escamilla, E.	199	Latif, R. M.	217	Rusakov, O.	40
Fiorini, R. A.	115	Leary-Owhin, M.	68	Samper, S.	84
Gabor, O. S.	90	Ledoux, Y.	84	Sarvadnya, R.	258
Gannapathy, V. R.	125	Lee, D. S.	27, 159	Schauer, S.	11
Gerov, R.	163	Lee, H.	63	Shamolin, M. V.	50
Glazunov, N.	98	Lee, S. C.	27, 63	Ssaso, M.	32
Grandjean, J.	84	Lee, S. C.	139, 159	Suaidi, M. K. B.	125
Grigorie, T. L.	90	Levin, V.	18	Tenne, Y.	209
Grilo, H. L.	272	Li, C.	59	Tropeano, F.	74, 135
Grilo, L. M.	272	Li, X.	78	Umavathi, J. C.	32
Habib, M. A.	172	Mamou, M.	90	Yang, H.	78
Hafezi, M. H.	172	Mascali, G.	44	Yildiz, S.	144
Ibrahim, A. F. B. T.	125	Mebarki, Y.	90	Özarıslan, H. S.	144