

Transactions on Engineering Technologies

Sio-Iong Ao · Len Gelman
Haeng Kon Kim
Editors

Transactions on Engineering Technologies

25th World Congress on Engineering
(WCE 2017)

 Springer

Editors

Sio-Iong Ao
International Association of Engineers
Hong Kong
Hong Kong

Len Gelman
School of Computing and Engineering
The University of Huddersfield
Queensgate, Huddersfield
UK

Haeng Kon Kim
Department of Computer and
Communication
Engineering College, Catholic University of
DaeGu
DaeGu
Korea (Republic of)

ISBN 978-981-13-0745-4 ISBN 978-981-13-0746-1 (eBook)
<https://doi.org/10.1007/978-981-13-0746-1>

Library of Congress Control Number: 2018943704

© Springer Nature Singapore Pte Ltd. 2019

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

A large international conference on Advances in Engineering Technologies and Physical Science was held in London, UK, July 5–7, 2017, under the World Congress on Engineering 2017 (WCE 2017). The WCE 2017 is organized by the International Association of Engineers (IAENG); the Congress details are available at: <http://www.iaeng.org/WCE2017>. IAENG is a nonprofit international association for engineers and computer scientists, which was founded originally in 1968. The World Congress on Engineering serves as good platforms for the engineering community to meet with each other and to exchange ideas. The conferences have also struck a balance between theoretical and application development. The conference committees have been formed with over three hundred committee members who are mainly research center heads, faculty deans, department heads, professors, and research scientists from over 30 countries. The congress is truly global international event with a high level of participation from many countries. The response to the Congress has been excellent. There have been more than six hundred manuscript submissions for the WCE 2017. All submitted papers have gone through the peer review process, and the overall acceptance rate is 51%.

This volume contains thirty revised and extended research articles written by prominent researchers participating in the conference. Topics covered include mechanical engineering, engineering mathematics, computer science, knowledge engineering, electrical engineering, wireless networks, and industrial applications. The book offers the state of the art of tremendous advances in engineering technologies and physical science and applications, and also serves as an excellent reference work for researchers and graduate students working on engineering technologies and physical science and applications.

Hong Kong, Hong Kong
Queensgate, UK
DaeGu, Korea (Republic of)

Sio-Iong Ao
Len Gelman
Haeng Kon Kim

Contents

Homogenization of Electromagnetic Fields Propagation in a Composite	1
Helene Canot and Emmanuel Frenod	
Statistics of Critical Load in Arrays of Nanopillars on Nonrigid Substrates	17
Tomasz Derda and Zbigniew Domański	
Quantifying the Impact of External Shocks on Systemic Risks for Russian Companies Using Risk Measure ΔCoVaR	31
Alexey Lunkov, Sergei Sidorov, Alexey Faizliev, Alexander Inochkin and Elena Korotkovskaya	
An Innovative DSS for the Contingency Reserve Estimation in Stochastic Regime	43
Fahimeh Allahi, Lucia Cassettari, Marco Mosca and Roberto Mosca	
A Simulation Study on Indoor Location Estimation Based on the Extreme Radial Weibull Distribution	59
Kosuke Okusa and Toshinari Kamakura	
Infant Mortality and Income per Capita of World Countries for 1998–2016: Analysis of Data and Modeling by Increasing Returns	71
I. C. Demetriou and P. C. Tzitziris	
Mathematical Models for the Study of Resource Systems Based on Functional Operators with Shift	95
Oleksandr Karelin, Anna Tarasenko, Viktor Zolotov and Manuel Gonzalez-Hernandez	
A Useful Extension of the Inverse Exponential Distribution	109
Pelumi E. Oguntunde, Adebowale O. Adejumo, Mundher A. Khaleel, Enahoro A. Owoloko, Hilary I. Okagbue and Abiodun A. Opanuga	

On Computing the Inverse of Vandermonde Matrix via Synthetic Divisions	121
Yiu-Kwong Man	
Application and Generation of the Univariate Skew Normal Random Variable	129
Dariush Ghorbanzadeh, Philippe Durand and Luan Jaupi	
Semi-analytical Methods for Higher Order Boundary Value Problems	139
A. A. Opanuga, H. I. Okagbue, O. O. Agboola, S. A. Bishop and P. E. Oguntunde	
Developing Indonesian Highway Capacity Manual Based on Microsimulation Model (A Case of Urban Roads)	153
Ahmad Munawar, Muhammad Zudhy Irawan and Andrean Gita Fitrada	
Natural Frequencies of an Euler-Bernoulli Beam with Special Attention to the Higher Modes via Variational Iteration Method	165
Olasunmbo O. Agboola, Jacob A. Gbadeyan, Abiodun A. Opanuga, Michael C. Agarana, Sheila A. Bishop and Jimevwo G. Oghonyon	
Learning Noise in Web Data Prior to Elimination	177
Julius Onyancha, Valentina Plekhanova and David Nelson	
Leveraging Lexicon-Based Semantic Analysis to Automate the Recruitment Process	189
Cernian Alexandra, Sgarciu Valentin, Martin Bogdan and Anghel Magdalena	
The Universal Personalized Approach for Human Knowledge Processing	203
Stefan Svetsky and Oliver Moravcik	
The Use of Scalability of Calculations to Engineering Simulation of Solidification	217
Elzbieta Gawronska, Robert Dyja, Andrzej Grosser, Piotr Jeruszka and Norbert Sczygiol	
Vision-Based Collision Avoidance for Service Robot	233
Mateus Mendes, A. Paulo Coimbra, Manuel M. Crisóstomo and Manuel Cruz	
Identity and Enterprise Level Security	249
William R. Simpson and Kevin E. Foltz	

Comprehensive Study for a Rail Power Conditioner Based on a Single-Phase Full-Bridge Back-to-Back Indirect Modular Multilevel Converter 263
 Mohamed Tanta, José A. Afonso, António P. Martins, Adriano S. Carvalho and João L. Afonso

Jitter and Phase-Noise in High Speed Frequency Synthesizer Using PLL 281
 Ahmed A. Telba

Detection of Winding (*Shorted-Turn*) Fault in Induction Machine at Incipient Stage Using DC-Centered Periodogram 289
 QdunAyo Imoru, M. Arun Bhaskar, Adisa A. Jimoh, Yskandar Hamam and Jacob Tsado

An Intra-vehicular Wireless Sensor Network Based on Android Mobile Devices and Bluetooth Low Energy 299
 José Augusto Afonso, Rita Baldaia da Costa e Silva and João Luiz Afonso

Extended Performance Research on 5 GHz IEEE 802.11n WPA2 Laboratory Links 313
 J. A. R. Pacheco de Carvalho, H. Veiga, C. F. Ribeiro Pacheco and A. D. Reis

Membrane and Resins Permeation for Lactic Acid Feed Conversion Analysis 325
 Edidiong Okon, Habiba Shehu, Ifeyinwa Orakwe and Edward Gobina

DNA Sequences Classification Using Data Analysis 341
 Bacem Saada and Jing Zhang

Managing Inventory on Blood Supply Chain 353
 Fitra Lestari, Ulfah, Ngestu Nugraha and Budi Azwar

Pore-Scale Modeling of Non-Newtonian Fluid Flow Through Micro-CT Images of Rocks 363
 Moussa Tembely, Ali M. AlSumaiti, Khurshed Rahimov and Mohamed S. Jouini

Study of Friction Model Effect on A Skew Hot Rolling Numerical Analysis 377
 Alberto Murillo-Marrodán, Eduardo García and Fernando Cortés

Residual Stress Simulations of Girth Welding in Subsea Pipelines 389
 Bridget Kogo, Bin Wang, Luiz Wrobel and Mahmoud Chizari

Index 405