INTERNATIONAL SCIENTIFIC JOURNAL

INDUSTRY 4.0

ISSN (PRINT) 2534-8582
ISSN (WEB) 2534-997X

YEAR IV ISSUE 4/2019



PUBLISHED BY
SCIENTIFIC TECHNICAL UNION OF MECHANICAL ENGINEERING
"INDUSTRY 4.0", BULGARIA

INTERNATIONAL SCIENTIFIC JOURNAL

INDUSTRY 4.0

YEAR IV, ISSUE 4 / 2019
ISSN (PRINT) 2543-8582, ISSN (WEB) 2534-997X

PUBLISHER

SCIENTIFIC TECHNICAL UNION OF MECHANICAL ENGINEERING "INDUSTRY 4.0"

108, Rakovski Str., 1000 Sofia, Bulgaria
tel. (+359 2) 987 72 90,
tel./fax (+359 2) 986 22 40,
office@stumejournals.com
WWW.STUMEJOURNALS.COM

EDITOR IN CHIEF

Prof. D.Sc. Georgi Popov, DHC, Technical University of Sofia, BG
Prof. Dr. Dr. Jivka Ovtcharova, DHC, Karlsruhe University of Technology, DE

EDITORIAL BOARD

Members:
Acad. Igor Bychkov, RU
Cor. member Alexey Beliy, BY
Cor. member Svetozar Margenov, BG
Prof. Alexander Afanasyev, RU
Prof. Alexander Guts, RU
Prof. Andrzej Golabczak, PL
Prof. Andrey Firsov, RU
Prof. Bobek Shuklev, MK
Prof. Boris Gordon, EE
Prof. Branko Sirok, SI
Prof. Claudio Melchiorri, IT
Prof. Cveta Martinovska, MK
Prof. Dale Dzemydiene, LT
Prof. Dimitar Yonchev, BG
Prof. Dimitrios Vlachos, GR
Prof. Dragan Perakovic, HR
Prof. Galina Nikolcheva, BG
Prof. Galina Zhavoronkova, UA
Prof. Gerard Lyons, IE
Dr. Giovanni Pappalettera, IT
Prof. Henrik Carlsen, DK
Prof. Idilia Bachkova, BG
Prof. Idit Avrahami, IL
Prof. Inocentiu Maniu, RO
Prof. Iurii Bazhal, UA
Prof. Jürgen Köbler, DE
Prof. Jiri Maryska, CZ
Prof. Katia Vutova, BG
Prof. Lappalainen Kauko, FI
Dr. Liviu Jalba, RO
Prof. Luigi del Re, AT
Prof. Majid Zamani, DE
Prof. Martin Eigner, DE
Dipl.-Kfm. Michael Grethler, DE
Prof. Michael Valasek, CZ
Prof. Milija Suknovic, RS
Prof. Miodrag Dashic, RS
Prof. Mladen Velev, BG
Prof. Murat Alanyali, TR
Prof. Nafisa Yusupova, RU
Prof. Nina Bijedic, BA
Prof. Ninoslav Marina, MK
Prof. Olga Zaborovskaia, RU
Prof. Pavel Kovach, RS
Prof. Petar Kolev, BG
Prof. Peter Korondi, HU
Prof. Peter Sincak, SK
Prof. Petra Bittrich, DE
Prof. Predrag Dasic, RS
Prof. Radu Dogaru, RO
Prof. Raicho Ilarionov, BG
Prof. Raul Turmanidze, GE
Prof. René Beigang, DE
Prof. Rozeta Miho, AL
Prof. Sasho Guergov, BG
Prof. Seniye Ümit Oktay Firat, TR
Prof. Sreten Savicevic, ME
Prof. Stefan Stefanov, BG
Prof. Svetan Ratchev, UK
Prof. Sveto Svetkovski, MK
Prof. Tomislav Šarić, HR
Prof. Vasile Cartofeanu, MD
Prof. Vidosav Majstorovic, RS
Prof. Vjaceslavs Bobrovs, LV
Prof. Vladyslav Alieksieiev, UA

C O N T E N T S

TECHNOLOGICAL BASIS OF "INDUSTRY 4.0"

MODELING AND SIMULATION OF CIRCULATING FLUIDIZED BED BIOMASS GASIFIERS IN VIEW OF INDUSTRY 4.0
M.Sc. Gungor A. PhD., M.Sc. Akyuz A.O. PhD., M.Sc. Tuncer A.D., Şirin C., M.Sc. Zaman M. PhD., Gungor C. 150

INDUSTRY 4.0 COMPETENCIES' GAP ANALYSIS
Prof. Dr. Eng. Dumitrescu A., Assoc. Prof. Dr. Lima R., Assoc. Prof. Dr. Chattinnawat W., Prof. Dr. Eng. Savu T. 153

MODELING OF THE NATURAL ENVIRONMENT THROUGH GEOGRAPHIC INFORMATION SYSTEMS
Assos. Prof. Milen Ivanov PhD 157

DOMINANT TECHNOLOGIES IN "INDUSTRY 4.0"

OCCURRENCE CHANNEL OF LEAKAGE OF THE ACOUSTIC DUE TO THE MODULATION OF THE VISIBLE LIGHT
Shvyrev B.A. PhD., Assoc. Prof. Vlasenko A.V. PhD. Makaryan A.S. PhD., PhD student Timonov D.A. 161

MULTI-CRITERIA OPTIMIZATION OF TRACKED VEHICLE TRANSMISSIONS
Oleksandr Ustynenko, Oleksiy Bondarenko, Illia Klochkov, Volodymyr Serykov 164

CREATING A 3D MODEL OF DENTAL SPLINT FOR BRUXISM
Tihomir Dovramadjiev, Diana Pavlova, Alexandrina Bankova 167

AUTOMATED SOFTWARE TESTING FRAMEWORK "STASSY"
Denislav Lefterov PhD student, Svetoslav Enkov assoc. professor 171

SUPER INKJET TECHNOLOGY MACHINE DEVELOPMENT FOR ADDITIVE 3D MANUFACTURING
PhD. Oleg Bochov, PhD. Petr Afanasev, Marcel Grooten, Henk van Broekhuyzen, Viktor Startsev, Ivan Mandrik,
Veronika Nikonova, Artem Smirnov 175

ANALYSIS OF THE SMART GRID CONCEPT FOR DC POWER SUPPLY SYSTEMS
PhD, Associate Professor, Nerubatskyi V., PhD, Associate Professor, Plakhtii O., Dr.Sc., Associate Professor, AnanievaO.,
PhD, Associate Professor, Zinchenko O. 179

THE AMBIENT TEMPERATURE INFLUENCE ON DEAERATOR EXERGY EFFICIENCY AND EXERGY LOSSES
PhD. Mrzljak Vedran, PhD. Orović Josip, PhD. Poljak Igor, PhD. Čulin Jelena 183

BUSINESS & "INDUSTRY 4.0"

ANALYSIS OF CROSS-COUNTRY DIFFERENTIATION OF CONFORMITY OF WAGES AND LEVEL OF EDUCATION
PhD in Economic, Associate Professor Pochekutova E. 187

GREEN BUILDING TRAINING THROUGH WEB MODULES - EXCHANGE OF GOOD PRACTICES
Lazov L.PhD., Prof., M.Sc.Teirumnieka E., M.Sc. Atanasova N. 191

SOCIETY & „INDUSTRY 4.0"

MASSIVE OPEN ONLINE COURSE "CS50 INTRODUCTION TO COMPUTER SCIENCE" BY HARVARD UNIVERSITY IMPLEMENTATION INTO UKRAINIAN EDUCATIONAL PROCESS
Ph.D., Associate Professor Segol R., Ph.D. student Parkhomenko A. 195

PROFESSIONAL-COGNITIVE INTERESTS – A WAY OF SUPPORT
Associate professor Doctor Sonya Georgieva 198

PROBLEMS WITH INFORMATION SECURITY ON MOBILE DEVICES
Veselka Stoyanova, PhD 200