



ISSN 2255-9140 print
ISSN 2255-9159 online

Electrical, Control and Communication Engineering

Scientific Journal of
Riga Technical University

Editor-in-Chief Ilya Galkin

2017/12–13

RTU Press
Riga 2017

Editor-in-Chief

Ilya Galkin (Riga Technical University, Latvia)

Editorial Board

Section Editors

Electrical Machines and Apparatus (EMA) –

Anouar Belahcen (Aalto University, Finland)

Alexey Kolganov (Ivanovo Power State University, Russian Federation)

Electrical Drives, Mechatronics and Robotics (EDR) –

Valeriy Vodovozov (Tallinn University of Technology, Estonia)

Leonids Ribickis (Latvian Academy of Science, Latvia)

Power Electronic Converters (PEC) –

Dmitri Vinnikov (Tallinn University of Technology, Estonia)

Ivars Rankis (Riga Technical University, Latvia)

Power Electronic Technologies (PEL) –

Enrique Romero-Cadaval (University of Extremadura, Spain)

Ilya Galkin (Riga Technical University, Latvia)

Electromagnetic Compatibility (EMC) –

Ryszard Strzelecki (Gdynia Maritime Academy, Poland)

Electrical Materials, Reliability of and Diagnostics Electrical Equipment (REL) –

Yury Paerand (Donbas State Technical University, Ukraine)

Electric Power Supply (EPS) –

Enrique Romero-Cadaval (University of Extremadura, Spain)

Control Engineering and IT (CTL) –

Mohammad Pourmahmood Aghababa (Urmia University of Technology, Iran)

Literary Editor

Daina Ostrovska

Elīna Tenase

Editorial Board Address

Faculty of Power and Electrical Engineering

Riga Technical University

E-mail: ecce@rtu.lv

Phone: +371 67 08 99 18

Fax: +371 67 08 99 41

Cover picture from: <https://www.shutterstock.com>

Electrical, Control and Communication Engineering is a peer-reviewed scientific journal.

Co-published with *De Gruyter Open*.



Abstracted&Indexed: *Astrophysics Data System (ADS), Baidu Scholar, Celdes, Clarivate Analytics – Emerging Sources Citation Index, Clarivate Analytics – Web of Science, CNKI Scholar (China National Knowledge Infrastructure), CNPIEC, DOAJ, EBSCO (relevant databases), EBSCO Discovery Service, Genamics JournalSeek, Google Scholar, J-Gate, JournalTOCs, KESLI-NDSL (Korean National Discovery for Science Leaders), Microsoft Academic, Naviga (Softweco), Primo Central (ExLibris), ProQuest (relevant databases), Publons, ReadCube, ResearchGate, Sherpa/RoMEO, Summon (Serials Solutions/ProQuest), TDNet, TEMA Technik und Management, Ulrich's Periodicals Directory/ulrichsweb, WanFang Data, WorldCat (OCLC) and VINITI database.*



Authors contributing to the Open Access titles agree to publish their articles under the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Published by RTU Press, Riga Technical University, 1 Kaļķu iela, Riga, LV-1658, Latvia

Printed by RTU Digitalas Drukas Centrs

Table of Contents

<i>Y. I. Sokol, V. V. Zamaruiev, V. V. Ivakhno, Y. S. Voitovych</i> Electronic Phase Shifting in Multipulse Rectifier	5
<i>D. Brodņevs, A. Kutins</i> An Experimental Study of Ground-Based Equipment Real Time Data Transfer Possibility by Using Cellular Networks	11
<i>O. Bondarenko, I. Verbytskyi, V. Prokopets, O. Kaloshyn, D. Spitsyn, T. Ryzhakova, Y. Kozhushko</i> Modular Power Supply for Micro Resistance Welding.....	20
<i>A. Armstorfer, H. Biechl, A. Rosin</i> Energy Scheduling of Battery Storage Systems in Micro Grids	27
<i>L. Shi</i> An Object Detection and Pose Estimation Approach for Position Based Visual Servoing	34
<i>E. Kldiashvili, A. Romānovs, N. Shakulashvili, A. Burduli, G. Ghortlishvili, D. Agladze</i> Organization and Implementation of Online Cytology Quality Assurance Program – Georgian Experience.....	40
<i>V. V. Romanuke</i> Classifying Scaled-Turned-Shifted Objects with Optimal Pixel-to-Scale-Turn-Shift Standard Deviations Ratio in Training 2-Layer Perceptron on Scaled-Turned-Shifted 4800-Featured Objects under Normally Distributed Feature Distortion	45
<i>N. A. Elkhateeb, R. I. Badr</i> Novel PID Tracking Controller for 2DOF Robotic Manipulator System Based on Artificial Bee Colony Algorithm.....	55
<i>A. Serackis, D. Matuzevičius, D. Navakauskas, E. Šabanovič, A. Katkevičius, D. Plonis</i> A Robust Identification of the Protein Standard Bands in Two-Dimensional Electrophoresis Gel Images	63
<i>A. Kumar, P. Vardhan</i> Design, Simulation & Concept Verification of 4×4 , 8×8 MIMO With ZF, MMSE and BF Detection Schemes	69
<i>A. Litvinenko, A. Āboltiņš</i> Computationally Efficient Chaotic Spreading Sequence Selection for Asynchronous DS-CDMA	75
List of Authors.....	81
List of Keywords	82