## Kazimierz Pulaski University of Technology and Humanities in Radom



Volume 3

**Radom 2021** 

#### Reviewers

Prof. Piotr Bojarczak (Poland) Prof. Tomasz Ciszewski (Poland)

Prof. Waldemar Nowakowski (Poland)

Prof. Tomasz Perzyński (Poland) Prof. Roman Pniewski (Poland) Prof. Jerzy Wojciechowski (Poland)

### Editorial Committee Contact Journal of Automation, Electronics and Electrical Engineering Journal JAEEE

Kazimierz Pulaski University of Technology and Humanities in Radom Faculty of Transport, Electrical Engineering and Computer Science Malczewskiego 29, 26-600 Radom, Poland

email: jaeee@uthrad.pl www.jaeee.uniwersytetradom.pl

ISSN 2658-2058

Copyright@2021 by Publishing House Kazimierz Pulaski University of Technology and Humanities in Radom

All rights reserved. No part of this publication may be modified, reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without permission in writing from publisher.

# Journal of Automation, Electronics and Electrical Engineering Journal JAEEE

#### Scientific and Editorial Board

#### Prof. Zbigniew Łukasik - Chairman

Kazimierz Pulaski University of Technology and Humanities in Radom, Poland

#### Prof. Mirosław Luft - Editor\_in\_Chief

Kazimierz Pulaski University of Technology and Humanities in Radom, Poland

Prof. Andrzej Lewiński - Kazimierz Pulaski University of Technology and Humanities in Radom, Poland

Prof. Mareks Mezitis - Transport Academy, Latvia

Prof. Andrzej Wac-Włodarczyk - Lublin University of Technology, Poland

Prof. Waldemar Wójcik - Lublin University of Technology, Poland

Prof. Alexander A. Vygnanov - Russian University of Transport (RUT), Russia

Prof. Tadeusz Kaczorek - Bialystok University of Technology, Poland

Prof. Krzysztof Kluszczyński - Tadeusz Kościuszko University of Technology, Poland

Prof. Józef Lisowski - The Gdynia Maritime University, Poland

Prof. Erwin Smet - The University of Antwerp, Belgium

Prof. Aleš Janota - The University of Žilina, Slovakia

#### Daniel Pietruszczak, BEng, PhD - Science Secretary

Kazimierz Pulaski University of Technology and Humanities in Radom, Poland

#### **Layout Design**

Prof. Mariusz Dański - Kazimierz Pulaski University of Technology and Humanities in Radom, Poland

#### **Computer Formatting, Website Suport**

Wojciech Chamela, BEng, MSc

Kazimierz Pulaski University of Technology and Humanities in Radom, Poland

#### **Publishing House**

Kazimierz Pulaski University of Technology and Humanities in Radom Faculty of Transport, Electrical Engineering and Computer Science Malczewskiego 29, 26-600 Radom, Poland

email: wydawnictwo@uthrad.pl

**Printing and binding:** 

Printing department of the Kazimierz Pulaski University of Technology and Humanities in Radom

#### Contents

PREFACE		7
Jarosław BEDNARZ	APPLICATION OF ACTIVE THERMOGRAPHY IN STUDY OF THE ROTORS DYNAMICS	9
Tadeusz KACZOREK Łukasz SAJEWSKI	GLOBAL STABILITY OF POSITIVE DISCRETE-TIME TIME-VARYING NONLINEAR FEEDBACK SYSTEMS	17
Jan TARGOSZ Jarosław BEDNARZ Wojciech LISOWSKI	SIMULATION OF DYNAMIC RESPONSE OF A VIBROISOLATED OBJECT	21
Bartłomiej ULATOWSKI Marek GRÓBARCZYK Zbigniew ŁUKASIK	APPLICATION OF VIRTUALISATION ENVIRONMENT FOR DATA SECURITY IN OPERATIONAL DATA PROCESSING SYSTEMS	29
Piotr WOŁEJSZA Jolanta KOSZELEW Krzysztof MATUK Oskar ŚWIDA	VERIFICATION OF THE IMAGE PROCESSING SYSTEM IN REAL CONDITIONS	33

#### **PREFACE**

#### Dear Readers,

It is with a great pleasure that I announce the **Volume 3 (December, 2021)** of the **Journal of Automation, Electronics and Electrical Engineering JAEEE**. This is a scientific journal published by the Kazimierz Pulaski University of Technology and Humanities in Radom. It will comes out four times a year and will be contains original papers.

We are pleased to announce that the JAEEE Journal, in accordance with the announcement of the Minister of Education and Science of December 1, 2021 on the list of scientific journals and reviewed materials from international conferences, has a weight of 40 points.

It is a journal for researchers and specialists allowing them to share experiences, knowledge and research results concerning all aspects in the field of automation, electronics and electrical engineering. It is an open access journal. It means that research results are available for many readers and allow global exchange of knowledge.

The published papers were presented by the authors at the 24th International Conference TransComp 2021, which took place on December 6-8 in Zakopane. The presented papers are published in English and reviewed by two reviewers (the experts having academic title of a professor or Ph.D.) appointed by Editorial Committee for every paper.

I warmly encourage all the readers to send us their thougts and opinions on this issue. I also invite researchers to submit papers to be considered for publication by the Journal.

I do hope that the presented papers will pique the interest of the readers and encourage them to publish their research results in this journal.

I wish you a pleasant and useful reading.

Professor Zbigniew Łukasik
Chairman of the JAEEE

Radom, December 2021