



ISSN 1454-8518

**ANNALS
OF THE UNIVERSITY OF
PETROȘANI**
ELECTRICAL ENGINEERING

VOL. 21 (XLVIII)

**UNIVERSITAS PUBLISHING HOUSE
PETROȘANI - ROMANIA 2019**

EDITOR OF PUBLICATION

Prof. Sorin Mihai RADU Ph.D, Email: sorin_mihai_radu@yahoo.com

ADVISORY BOARD

Prof. Alexandru BITOLEANU, Ph.D. - University of Craiova, *Romania*; Full Professor Emeritus Stanislaw CIERPISZ – Silesian University of Technology, *Poland*; Prof. Tiberiu COLOȘI, Ph.D., - Member of the Academy of Technical Science of *Romania*, President of Cluj Branch; Prof. Dr Predrag DAŠIĆ - High Technological Technical School, Krusevac, *Serbia and Montenegro*; Dr. Eng. Nicolae DAN - Dessault Systems Simulia Corp., Provedence, *USA*; Assoc. Prof. Daniel DUBOIS, Ph.D. - University of Liège, *Belgium*; Eng. Emilian GHICIOI, Ph.D. - INCD INSEMEX Petrosani, *Romania*; Prof. Emerit Mircea EREMIA, Ph.D. – Member of the Academy of Technical Science of *Romania*; Prof. Dr. Vladimir KEBO – VSB, Technical University of Ostrava, *Czech Republic*; Assoc. prof. Ing. Vladimir CABLIK, Ph.D., VSB - Technical University of Ostrava. *Czech Republic*; Assoc. Prof. dr. Ernő KOVÁCS - University of Moskolc, *Hungary*; Prof. Gheorghe MANOLEA, Ph.D. - University of Craiova, *Romania*; Prof. Radu MUNTEANU, Ph.D. – Member of the Academy of Technical Science of *Romania*, *Vice President*; Assoc. Prof. Dan NEGRUT, Ph.D. - University of Wisconsin, Madison, *USA*; Acad. Prof. Dr. Genadiy PIVNYAK – National Mining University Dnepropetrovsk, *Ukraine*; Prof. Emil POP, Ph.D - University of Petroșani, *Romania*; Prof. Flavius Dan ȘURIANU, Ph.D. – “Politehnica” University of Timișoara, *Romania*; Prof. Willibald SZABO, Ph.D. – “Transilvania” University of Brașov, *Romania*; Prof. Alexandru VASILIEVICI, Ph.D. – “Politehnica” University of Timișoara, *Romania*.

EDITORIAL BOARD

Editor-in-chief:

Prof. Susana ARAD, Ph.D., University of Petroșani

Deputy Editor:

Assoc. Prof. Liliana Brana SAMOILĂ, Ph.D., University of Petroșani

Associate Editors:

Assoc. Prof. Nicolae PĂTRĂȘCOIU, Ph.D., University of Petroșani

Assoc. Prof. Ilie UȚU, Ph.D., University of Petroșani

Assoc. Prof. Dragoș PĂSCULESCU, Ph.D., University of Petroșani

Assoc. Prof. Olimpiu STOICUȚA, Ph.D., University of Petroșani

Editor Secretary:

Lecturer Florin Gabriel POPESCU, Ph.D., University of Petroșani

Lecturer Ioan Răzvan SLUSARIUC, Ph.D., University of Petroșani

Editorial office address: Ec. Radu Ioan, University of Petroșani, 20 University Street, 332006 Petroșani, Romania, Phone: (40) 254/54.29.94; 54.25.80; 54.25.81; 54.33.82; Fax: (40) 254/54.34.91; 54.62.38,

Contact person: **Susana ARAD**, e-mail: susanaarad@yahoo.com

This publication is spread in 28 countries.

CONTENTS

1. Mircea Risteiu, Susana Arad, Mihaela Aldea, Florin Samoila, Designing virtual learning environment for PLC applications development	5
2. Razvan Slusariuc, Liliana Samoila, Ilie Utu, Florin Gabriel Popescu, Alina Daniela Handra, SCADA systems analysis for industrial processes	17
3. Nicolae Patrascoiu, Cosmin Rus, Cecilia Rosulescu, A software solution for detection of motion direction	23
4. Maria Daniela Stochitoiu, Ilie Utu, Aspects about Romania energy features as part of sustainable development in the European Union	31
5. Florin Gabriel Popescu, Dragos Pasculescu, Marius Marcu, Titu Niculescu, Alina Daniela Handra, The technical and economic advantages of power factor correction	35
6. Ilie Utu, Maria Daniela Stochitoiu, Liliana Samoila, Simulation of the electric drive with asynchronous motors of the belt conveyors in order to increase their efficiency	43
7. Alexandru Avram, Liliana Samoila, Florin Samoila, Danait Afewerki, Designing virtual reality approach for PLC applications development	53
8. Claudia Isac, Procedural organization in eFulfillment	63
9. Liliana Samoila, Ilie Utu, Mihaela Aldea, Susana Arad, Dima Rotari, Module for studying the use of piezoelectric elements for generating electricity	71
10. Alina Daniela Handra, Maria Daniela Stochitoiu, Razvan Slusariuc, Susana Arad, Renewable energy resources -"the flammable ice or methane hydrate"	79
11. Maria Daniela Stochitoiu, Ilie Utu, Mining industry from traditional to intelligent industry in consistency of the European Union requirements	85

