

Iranian Association of Electrical and Electronics Engineers

Journal of Applied Research in Electrical Engineering E-ISSN: 2783-2864 P-ISSN: 2717-414X



Journal of Applied Research in Electrical Engineering (JAREE), Volume 1, Number 2, Summer and Autumn 2022

Publisher: Shahid Chamran University of Ahvaz, Iran

This magazine is the result of a formal partnership of **Shahid Chamran University** of **Ahvaz** and **Iranian Association of Electrical and Electronics Engineers**

Website: https://jaree.scu.ac.ir

E-mails: jaree@scu.ac.ir; jaree.scu@gmail.com



Address: Department of Electrical Engineering, Faculty of Engineering, Shahid Chamran University of Ahvaz, Golestan Street, Ahvaz, Iran
P.O. Box: 61357-85311
Tel: +986133226600-14, Ext. 5632 & 5630, +989122876375
Fax: +986133226597



Editorial Board

Editor-in-Chief

Prof. Mahmood Joorabian Shahid Chamran University of Ahvaz, Ahvaz, Iran Power System Planning, Renewable Energy and Smart grid, FACTS Devises mjoorabian@scu.ac.ir

Managing Editor

(Associate Professor) Dr. Alireza Saffarian Shahid Chamran University of Ahvaz, Ahvaz, Iran Power System Protection, Power System Stability, Power Quality, Distribution Systems a.saffarian@scu.ac.ir

Associate Editor

Dr. Yousef Seifi Kavian (Associate Professor) Shahid Chamran University of Ahvaz, Ahvaz, Iran Electronics and Telecommunications v.s.kavian@scu.ac.ir

Editorial Board

Prof. Saeedallah Mortazavi Shahid Chamran University of Ahvaz, Ahvaz, Iran Intelligent Control Systems, Power system Control, Automation, Fuzzy logic, Neural Networks mortazavi s@scu.ac.ir

Editorial Board



Shahid Chamran University of Ahvaz, Ahvaz, Iran Analog and Digital Integrated Circuits, Data Converters, Microelectronics farshidi@scu.ac.ir

Editorial Board Dr. Yousef Seifi Kavian (Associate Professor) Shahid Chamran University of Ahvaz, Ahvaz, Iran Digital Circuits and Systems, Communication Networks and Distributed Systems v.s.kavian@scu.ac.ir

Editorial Board



Prof. Abbas Zarifkar Shiraz University, Shiraz, Iran **Optical Electronics** zarifkar@shirazu.ac.ir

Prof. Ebrahim Farshidi

Editorial Board

Prof. Reza Ghaderi Shahid Baheshti University, Tehran, Iran Control Theory, System Identification, Control Systems, Fuzzy Engineering r_ghaderisbu.ac.ir

Editorial Board



Prof. Majid Sanaye-pasand University of Tehran, Tehran, Iran Power Systems Protection, Digital Protective Relays, Power Systems Automation, Power System Transients msanaye@ut.ac.ir



Director-in-Charge

Prof. Seyed Ghodratolah Seifossadat Shahid Chamran University of Ahvaz, Ahvaz, Iran Power System Protection, Power Electronics, Power Quality seifossadatyahoo.com

Executive Assistant

Dr. Mohammad Nabipour (Assistant Professor) Shahid Chamran University of Ahvaz, Ahvaz, Iran Power Electronics and Drive mo.nabipour@scu.ac.ir

Associate Editor

Dr. Mohsen Saniei (Associate Professor) Shahid Chamran University of Ahvaz, Ahvaz, Iran Power and Control m.saniei@scu.ac.ir

Editorial Board

Prof. Abdolnabi Kosarian Shahid Chamran University of Ahvaz, Ahvaz, Iran Solid State Electronic Devices, Solar Cell Fabrication Technology a.kosarian@scu.ac.ir

Editorial Board Prof. Naser Pariz

Ferdowsi University of Mashhad, Mashhad, Iran Nonlinear Control, Hybrid Systems, Aeronautics, Industrial Control, Applied Mathematics n-pariz@um.ac.ir

Editorial Board

Dr. Mohsen Saniei (Associate Professor) Shahid Chamran University of Ahvaz, Ahvaz, Iran Power System Dynamics, High Voltage Engineering, Electricity Market, Microgrid m.saniei@scu.ac.ir

Editorial Board

Dr. Edris Pouresmaeil (Associate Professor) Aalto University, Espoo, Finland Integration of renewable energies into the power grid

edris.pouresmaeil@aalto.fi

Editorial Board

Prof. Fushuan Wen Tallinn University of Technology, Tallinn, Estonia Power systems and power economics fushuan.wen@taltech.ee

Editorial Board

Prof. Zabih (Fary) Ghassemlooy North Umbria University, Newcastle upon Tyne, United Kingdom Optical Communications, Visible Light, Communication Systems z.ghassemlooy@northumbria.ac.uk











ii



Editorial Board (Continued)



Prof. Mahdi Tavakoli University of Alberta, Alberta, Canada Robotics and Telerobotics, Haptics and Teleoperation Control, Surgical and Therapeutic Robotics, Image-Guided Surgery mahdi.tavakoli@ualberta.ca

Editorial Board

Prof. Mohammad Shahidehpour Illinois Institute of Technology, Chicago, USA Power Systems, Microgrids, Power System Operation, Power System Planning

ms@iit.edu





Editorial Board

Prof. Mohamad Hassan Modir Shanechi Illinois Institute of Technology, Chicago, USA Nonlinear and intelligent systems, Power system dynamics and security, Power system planning and maintenance scheduling shanechi@iit.edu

Language Editor

Majid Sadeghzadeh Hemayati English Language Editing m_s_hemayatiyahoo.com





Dr. Mahyar Abasi

Shahid Chamran University of Ahvaz, Ahvaz, Iran mahyarabasi1368@yahoo.com

About Journal

Journal of Applied Research in Electrical Engineering (J. Appl. Res. Electr. Eng.) is a singleblind peer-reviewed, open access and free of charge international journal published by Shahid Chamran University of Ahvaz in cooperation with Iranian Association of Electrical and Electronics Engineers (IAEEE). The JAREE is a medium for global academics to exchange and spread the latest discoveries and advances in their applied research in electrical engineering. The JAREE aims at presenting important results of analytical, computational and experimental works within all specialized fields of electrical engineering (electronics, power, control and telecommunications). It welcomes high quality original research papers from contributors throughout the world. All papers are subject to a peer reviewing procedure. Submission, processing and publication of the papers in JAREE is free of charge.

Types of accepted papers include:

- Research articles
- Review articles
- Applied articles

Research papers are expected to present innovative solutions, novel concepts, or creative ideas that can help to address existing or emerging technical challenges in electrical engineering.

Application papers are expected to share valuable industry experiences on dealing with challenging technical issues, developing/adopting new standards, applying new technologies or solving complex problems. JAREE welcomes application papers that can have a significant impact on industry practices in the coming years.

Review papers are expected to provide insightful and expert reviews, tutorials, or study cases on an important, timely and widely-interested topic in electrical engineering.

All researchers in the fields of electrical science are invited to publish their scientific and research achievements in this journal. Interested authors can submit their manuscripts in the journal's website. More information is available in the website on how to prepare and submit the manuscripts.

Amis and Scope

The *Journal of Applied Research in Electrical Engineering* aims to provide a medium for dissemination of innovative and consequential papers that present analytical, computational and experimental works within all specialized fields of electrical engineering (electronics, power, control and telecommunications). The scope of the journal includes, but is not limited to, the following topic areas:

Electronics:

- Optical electronics, photonics and solar cells
- Integrated analog circuits and mixed signals
- Integrated radio frequency circuits
- Digital electronics (VLSI)
- Semiconductor devices
- Sensor technology

Power:

- Dynamics and stability of the power systems
- Power system protection
- Electric power quality
- Operation and planning of the power systems
- High voltage insulation technology
- Flexible AC Transmission Systems (FACTS)
- Electric power distribution systems
- Smart grids, micro-grids, renewable energies and distributed generation
- Reliability of electrical energy systems
- Energy management and electricity market
- Electric machines and transformers
- Power electronic and electric drives

Control:

- Linear and non-linear control systems
- Adaptive, optimal and stochastic control
- Fuzzy systems, neural networks and intelligent control
- Robotic and mechatronic
- Modeling, Identification and optimization of systems
- Guidance and navigation systems
- Automation, industrial control and instrumentation

Telecommunications:

- Signal and image processing
- Wireless and cellular communication systems
- Telecommunication networks
- Radar and sonar
- Information theory and coding
- Cognitive radio
- Antenna design
- Microwave devices
- Wave propagation and electromagnetic compatibility

Indexing Databases and Social Networks

Directory of Open Access Journals (DOAJ):

https://doaj.org/toc/2783-2864

Google Scholar:

https://scholar.google.com/citations?user=F7KQPtYAAAAJ&hl=en&authuser=1

Directory of Open Access Scholarly Resources (ROAD):

https://portal.issn.org/resource/ISSN/2783-2864

LinkedIn:

https://www.linkedin.com/in/journal-of-applied-research-in-electrical-engineering-jaree-7540871b2/

Academia:

https://shahidchamranahwaz.academia.edu/JournalAppledResearchinElectricalEngineering

Mendeley:

https://www.mendeley.com/profiles/journal-of-applied-res-in-electrical-engineer/

Twitter:

https://twitter.com/jaree_scu

Facebook:

https://www.facebook.com/jaree.scu

Researchgate: https://www.researchgate.net/profile/Jaree_Engineering

Telegram: https://t.me/jareescu

Instagram: https://www.instagram.com/jaree.scu/

Journal homepage: http://jaree.scu.ac.ir

Journal emails: jaree@scu.ac.ir, jaree.scu@gmail.com

Guide for Authors

How to submit a manuscript

For the initial submission, the authors have to just send the main manuscript file and the signed <u>Copyright Form</u> of the journal. While preparing manuscripts for initial submission, authors are kindly requested to follow the guidelines, described below:

- The manuscript should be written in a Microsoft Word file (.doc or .docx).
- The file should include text (preferably in 10 points, "Times New Roman" font) and all figures (figures can be placed within the text at the appropriate point or at the end of the text).
- The manuscript pages should be prepared either using a double-column single-line spacing layout or a single-column double-line spacing layout. A margin of at least 1.5 cm on each side is required.
- All papers should be composed of Title, Author Name, Affiliation, Corresponding author email, Abstract, Keywords, Body, and References.
- The manuscript should be written in good English. It should have been carefully checked for clarity, conciseness, the correctness of grammar, and typographical errors.
- The corresponding author should sign the journal copyright form on behalf of any and all coauthors and upload it to the Journal's Submission System when submitting the manuscript. The journal copyright form can be downloaded from <u>here</u>.
- The corresponding author can use the <u>JAREE Template for Cover Letter</u> as a default text for the cover letter when submitting the manuscript.
- It is recommended that the title of the paper does not contain abbreviations or formulae.
- The abbreviations used in the abstract should be introduced both in the abstract and again on first use in the body.
- References should be numbered in the order they are mentioned in the text.

Manuscript Submission

Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. All correspondence, including notification of the Editor's decision and requests for revision, takes place by e-mail. To submit your manuscript, click on the <u>Submit Manuscript</u> link on the journal's homepage. Then, click on <u>Register</u> to create an author account. A message is sent to your email address containing your username and password. Then, login to the Journal's Submission System at the <u>User's login</u> page using the username and password to submit your new manuscript. Once you have logged in, you can change your password by clicking on the My Home link at the top menu.

Copyright and Open Access License

An author submitting a paper should ensure that he or she has the right to publish the paper and that it contains nothing defamatory. The JAREE will assume that all co-authors have agreed to the submission of any paper received. The corresponding author should sign the journal copyright form on behalf of any and all co-authors and upload it to the Journal's Submission System when submitting the manuscript.

Contents

Article Title and Authors	Page No.
RTWSM: Real-Time Ad Hoc Wireless Sensor System Monitoring of Local Air Particle Pollution Reza Ghanavati, Yousef Seifi Kavian, and Abdolnabi Kosarian	112
Reactive Power Coordination Between Solid Oxide Fuel Cell and Battery for Microgrid Frequency Control Saeed Aminzadeh, Mehrdad Tarafdar Hagh, and Heresh Seyedi	121
On the Cramer-Rao Lower Bound Based Analysis of Direct Position Determination and DOA Position Finding for Co-Channel Emitter Localization Ali Eshkevari, and Seyed Mohammad Sajad Sadough	131
Influence of Gas Insulated Switchgear Configuration Components on UHF PD Signals Reza Rostaminia, Mehdi Vakilian, and Keyvan Firuzi	139
Optimal Switch Placement in Radial Distribution Networks to Reduce Energy Loss and Improve Network Security in Khuzestan Province Conditions Ali Rouhipour, Elaheh Mashhour, and Mohsen Saniei	149
A New Approach for the Transformer Differential Protection Based on S-Transform and Fuzzy Expert System Saeid Hasheminejad	159
Investigating the Effects of Phosphorene Nanotubes (PNTs)-on-Gold Substrates on the Enhancements of the Sensitivity of SPR Biosensors Amir Davami, and Mohammad Hadi Shahrokh Abadi	169
Designing of the Controller for Shipboard Microgrid Based on Linear Matrix Inequality Farhad Amiri, and Mohammad Hassan Moradi	175
Energy Management in Distribution Systems Considering Consumer Behavior and Internet of Things Moaiad Mohseni, Mahmood Joorabian, and Afshin Lashkarara	186
Design of Tunable Low-Power Band-Stop Filter for Elimination of 50 Hz Power-Line Noise Amirreza Solaymanpour, and Shahbaz Reyhani	197
A Novel 2-D BWA-MEM FPGA Accelerator for Short-Read Mapping of the Whole Human Genome Mahdi Taheri, and Ali Mahani	203
A Fourth-order MASH DDSM for Accurate Fractional Frequency Synthesizers Seyed Ali Sadatnoori	211

Copyrights © 2022 Licensee Shahid Chamran University of Ahvaz, Ahvaz, Iran. This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution -Non-Commercial 4.0 International (CC BY-NC 4.0) License (http://creativecommons.org/licenses/by-nc/4.0/).

