



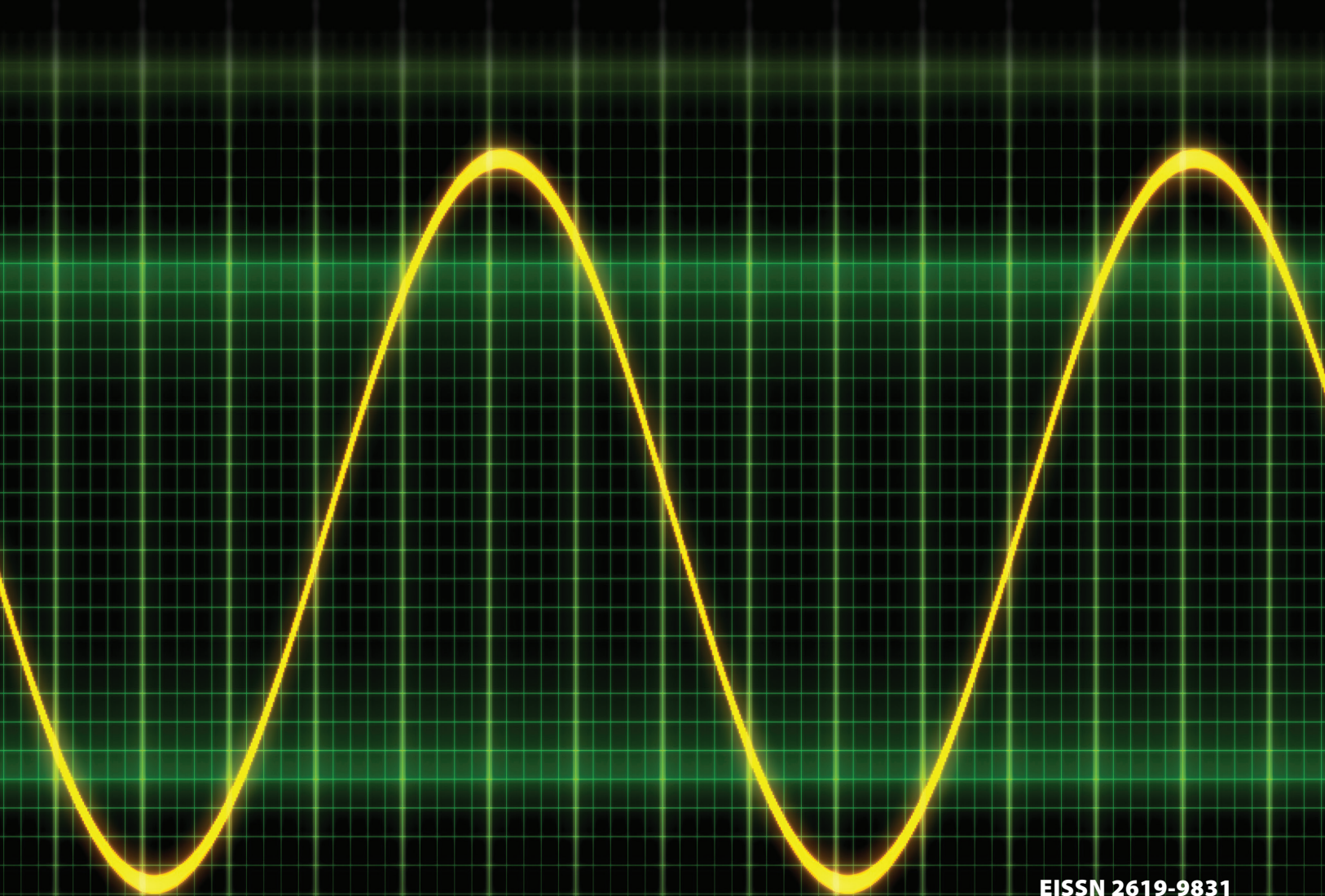
İSTANBUL UNIVERSITY
CERRAHPAŞA



ELECTRICA

electricajournal.org

Official journal of İstanbul University-Cerrahpaşa Faculty of Engineering



AVES

EISSN 2619-9831

VOLUME 22 » ISSUE 1 » January 2022

Editorial Board

Editor in Chief

Firat KAÇAR

Department of Electrical-Electronics, Istanbul University - Cerrahpasa Faculty of Engineering, Istanbul, Turkey

Associate Editors

Aysel ERSOY

Department of Electrical-Electronics, Istanbul University - Cerrahpasa Faculty of Engineering, Istanbul, Turkey

Cengiz Polat UZUNOĞLU

Department of Electrical-Electronics, Istanbul University - Cerrahpasa Faculty of Engineering, Istanbul, Turkey

Assistant Editor

Abdurrahim

AKGÜNDOĞDU
Department of Electrical-Electronics, Istanbul University - Cerrahpasa Faculty of Engineering, Istanbul, Turkey

Advisory Board

Aydın AKAN

Department of Electrical-Electronics, İzmir Ekonomi University, İzmir, Turkey

Aysen B. ARSOY

Department of Electrical-Electronics, Kocaeli University Faculty of Engineering, Kocaeli, Turkey

Alinur BUYUKAKSOY

Department of Electrical-Electronics, Okan University Faculty of Engineering, Istanbul, Turkey

Luis F. CHAPARRLO

Department of Electrical Engineering, University of Pittsburg, Pittsburg, USA

Oğuzhan ÇİÇEKOĞLU

Department of Electrical Engineering, Boğaziçi University Faculty of Engineering, Istanbul, Turkey

Gregory M. DIMIROVSKI

SSC. and Methodius University, Skopje, Macedonia

Emrah DOKUR

Department of Electrical-Electronics, Bilecik Şeyh Edebali University Faculty of Engineering, Bilecik, Turkey

Alain FABRE

IMS-ENSEIRB, Bordeaux, France

I. Cem GÖKNAR

Department of Electrical and Electronics Engineering, Doguş University Faculty of Engineering, Istanbul, Turkey

Rachid HARBA

LESI, France

Hüseyin HIZIROĞLU

Department of Electrical and Electronics Engineering, Kattering University Faculty of Engineering, Michigan, USA

Nihat KABAOĞLU

Department of Electrical and Electronics Engineering, Istanbul Medeniyet University Faculty of Engineering and Natural Sciences, Istanbul, Turkey

Özcan KALENDERLİ

Department of Electrical and Electronics Engineering, Istanbul Technical University Faculty of Electrical-Electronic, Istanbul, Turkey

Mukden UĞUR

Department of Electrical and Electronics Engineering, Türk-Alman University, Istanbul, Turkey

Hülya KIRKICI

Department of Electrical and Computer Engineering, Auburn University, Auburn, USA

Ayten KUNTMAN

Emeritus, Istanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Istanbul, Turkey

Hakan KUNTMAN

Emeritus, Istanbul, Istanbul Technical University Faculty of Electrical-Electronic, Istanbul, Turkey

Mehmet KURBAN

Department of Electrical-Electronics, Bilecik Şeyh Edebali University, Faculty of Engineering, Bilecik, Turkey

Bilgin METİN

Department of Electrical-Electronics, Boğaziçi University Faculty of Engineering, Istanbul, Turkey

Onur OSMAN

Department of Electrical-Electronics, Istanbul Arel University Faculty of Engineering, Istanbul, Turkey

Emel ÖNAL

Department of Electrical-Electronics, Istanbul Technical University Faculty of Electrical-Electronic, Istanbul, Turkey

Raj, SENANI

Department of Electrical-Electronics, NSIT University Electronics and Communications Engineering, Delhi, India

Ahmet SERTBAŞ

Department of Computer Engineering, Istanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Engineering, Istanbul, Turkey

Metin ŞENGÜL

Department of Electrical and Electronics Engineering, Kadir Has University Faculty of Engineering and Natural Sciences, Istanbul, Turkey

Vedat TAVSANOGU

Department of Electrical and Electronics Engineering, Işık University Faculty of Engineering, Istanbul, Turkey

Michail TSATSANIS

Voya Technology Institute, USA

B. Emre TÜRKAY

Department of Electrical Engineering, Istanbul Technical University Faculty of Electrical-Electronic, Istanbul, Turkey

Osman N. UÇAN

Department of Electrical and Electronics Engineering, Kemerburgaz University Faculty of Engineering and Natural Sciences, Istanbul, Turkey

Gökhan UZGÖREN

Department of Electrical and Electronics Engineering, Gedik University Faculty of Engineering, Istanbul, Turkey

Reyat YILMAZ

Department of Electrical and Electronics Engineering, Dokuz Eylül University Faculty of Engineering, İzmir, Turkey

Web Coordinator

Fatih ATALAR

Department of Electrical-Electronics, Istanbul University - Cerrahpasa School of Engineering, Istanbul, Turkey



Founder
İbrahim KARA

General Manager
Ali ŞAHİN

Publishing Director
Gökhan ÇİMEN

Editor
Hira Gizem FİDAN

Publications Coordinator
Defne DOĞAN

Web Coordinator
Doğan ORUÇ

Finance Coordinator
Osman YALÇIN

Contact
Address: Büyükdere Street
No: 105/9 34394
Mecidiyeköy, Sisli, Istanbul,
TURKEY
Phone: +90 212 217 17 00
E-mail : info@avesyayincilik.com

Aims and Scope

Electrica is an international, scientific, open access periodical published in accordance with independent, unbiased, and double-blinded peer-review principles. The journal is the official online-only publication of İstanbul University-Cerrahpaşa Faculty of Engineering, and it is published biannually on January, May, and September. The publication language of the journal is English.

Electrica aims to contribute to the literature by publishing manuscripts at the highest scientific level on all fields of electrical and electronics engineering. The journal publishes original research and review articles that are prepared in accordance with ethical guidelines.

The scope of the journal includes but not limited to; electronics, microwave, transmission, control systems, electrical machines, energy transmission and high voltage.

The target audience of the journal includes specialists and professionals working and interested in all disciplines of electrical and electronics engineering.

The editorial and publication processes of the journal are shaped in accordance with the guidelines of the Institute of Electrical and Electronics Engineers (IEEE), the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), Council of Science Editors (CSE), Committee on Publication Ethics (COPE), European Association of Science Editors (EASE), and National Information Standards Organization (NISO). The journal is in conformity with the Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice).

The journal is currently indexed in Web of Science- Emerging Sources Citation Index, Scopus, Compendex, Gale, EBSCO and TUBITAK ULAKBİM TR Index.

All expenses of the journal are covered by İstanbul University-Cerrahpaşa. Processing and publication are free of charge with the journal. No fees are requested from the authors at any point throughout the evaluation and publication process. All manuscripts must be submitted via the online submission system, which is available at electricajournal.org. The journal guidelines, technical information, and the required forms are available on the journal's web page.

Statements or opinions expressed in the manuscripts published in the journal reflect the views of the author(s) and not the opinions of the Electrica editors, editorial board, and/or publisher; the editors, editorial board, and publisher disclaim any responsibility or liability for such materials.

Electrica is an open access publication and the journal's publication model is based on Budapest Open Access Initiative (BOAI) declaration. Journal's archive is available online, free of charge at electricajournal.org. Electrica's content is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.



Editor in Chief : Fırat KAÇAR
Address : Department of Electrical-Electronics, İstanbul University - Cerrahpaşa Faculty of Engineering, Avcılar, İstanbul, Turkey
Phone : +90 212 473 7070
Fax : +90 212 473 7064
E-mail : fkacar@istanbul.edu.tr

Publisher : İstanbul University-Cerrahpaşa
Address : Üniversite Mahallesi, Bağlariçi Caddesi No: 7, İstanbul, Turkey

Publishing Service : AVES
Address : Büyükdere Caddesi, 105/9 34394 Şişli, İstanbul, Turkey
Phone : +90 212 217 17 00
E-mail : info@avesyayincilik.com
Web page : www.avesyayincilik.com

Instructions for Authors

Context

Electrica is an international, scientific, open access periodical published in accordance with independent, unbiased, and double-blinded peer-review principles. The journal is the official online-only publication of Istanbul University-Cerrahpaşa Faculty of Engineering, and it is published biannually on January, May, and September. The publication language of the journal is English.

Electrica aims to contribute to the literature by publishing manuscripts at the highest scientific level on all fields of electricity. The journal publishes original research and review articles that are prepared in accordance with ethical guidelines.

The scope of the journal includes but not limited to; electronics, microwave, transmission, control systems, electrical machines, energy transmission and high voltage.

The target audience of the journal includes specialists and professionals working and interested in all disciplines of electrical and electronics engineering.

Editorial and Publication Process

The editorial and publication processes of the journal are shaped in accordance with the guidelines of the Institute of Electrical and Electronics Engineers (IEEE), the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), Council of Science Editors (CSE), the Committee on Publication Ethics (COPE), the European Association of Science Editors (EASE), and National Information Standards Organization (NISO). The journal conforms to the Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice).

Originality, high scientific quality, and citation potential are the most important criteria for a manuscript to be accepted for publication. Manuscripts submitted for evaluation should not have been previously presented or already published in an electronic or printed medium. The journal should be informed of manuscripts that have been submitted to another journal for evaluation and rejected for publication. The submission of previous reviewer reports will expedite the evaluation process. Manuscripts that have been presented in a meeting should be submitted with detailed information on the organization, including the name, date, and location of the organization.

Peer-review Process

Manuscripts submitted to Electrica will go through a double-blind peer-review process. Each submission will be reviewed by at least two external, independent peer reviewers who are experts in their fields in order to ensure an unbiased evaluation process. The editorial board will invite an external and independent editor to manage the evaluation processes of manuscripts submitted by editors or by the editorial board members of the journal. The Editor in Chief is the final authority in the decision-making process for all submissions.

Ethical Principles and Plagiarism

Electrica is extremely sensitive about plagiarism. All submissions are screened by a similarity detection software (iThenticate by CrossCheck) at any point during the peer-review or production process. Even if you are the author of the phrases or sentences, the text should not have unacceptable similarity with the previously published data.

When you are discussing others' (or your own) previous work, please make sure that you cite the material correctly in every instance.

The authors are expected to submit researches that comply with the general ethical principles which include; scientific integrity, collegiality, data integrity, institutional integrity and social responsibility.

In the event of alleged or suspected research misconduct, e.g., plagiarism, citation manipulation, and data falsification/fabrication, the Editorial Board will follow and act in accordance with COPE guidelines.

The Editorial Board of the journal handles all appeal and complaint cases within the scope of COPE guidelines. In such cases, authors should get in direct contact with the editorial office regarding their appeals and complaints. When needed, an ombudsperson may be assigned to resolve cases that cannot be resolved internally. The Editor in Chief is the final authority in the decision-making process for all appeals and complaints.

Authorship

Being an author of a scientific article mainly indicates a person who has a significant contribution to the article and shares the responsibility and accountability of that article. To be defined as an author of a scientific article, researchers should fulfil below criteria:

- Making a significant contribution to the work in all or some of the following phases: Research conception or design, acquisition of data, analysis and interpretation.
- Drafting, writing or revising the manuscript
- Agreeing on the final version of the manuscript and the journal which it will be submitted
- Taking responsibility and accountability of the content of the article

Outside the above mentioned authorship criteria, any other form of specific contribution should be stated in the Acknowledgement section.

In addition to being accountable for the parts of the work he/she has done, an author should be able to identify which co-authors are responsible for specific other parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors.

If an article is written by more than one person, one of the co-authors should be chosen as the corresponding author for handling all the correspondences regarding the article. Before submission, all authors should agree on the order of the authors and provide their current affiliations and contact details. Corresponding author is responsible for ensuring the correctness of these information.

Electrica requires corresponding authors to submit a signed and scanned version of the authorship contribution form (available for download through <http://electricajournal.org>

during the initial submission process in order to act appropriately on authorship rights and to prevent ghost or honorary authorship. If the editorial board suspects a case of “gift authorship,” the submission will be rejected without further review. As part of the submission of the manuscript, the corresponding author should also send a short statement declaring that he/she accepts to undertake all the responsibility for authorship during the submission and review stages of the manuscript.

Conflict of Interest Declarations

Electrica requires and encourages the authors and the individuals involved in the evaluation process of submitted manuscripts to disclose any existing or potential conflicts of interests, including financial, consultant, and institutional, that might lead to potential bias or a conflict of interest. Any financial grants or other support received for a submitted study from individuals or institutions should be disclosed to the Editorial Board. Cases of a potential conflict of interest of the editors, authors, or reviewers are resolved by the journal’s Editorial Board within the scope of COPE guidelines.

Copyright and Licencing

Electrica requires each submission to be accompanied by a Copyright Agreement and Acknowledgement of Authorship (available for download at <http://electricajournal.org>). When using previously published content, including figures, tables, or any other material in both print and electronic formats, authors must obtain permission from the copyright holder. Legal, financial and criminal liabilities in this regard belong to the author(s). By signing the Copyright Agreement and Acknowledgement of Authorship, authors agree that the article, if accepted for publication by Electrica, will be licensed under a Creative Commons Attribution-NonCommercial 4.0 International License (CC-BY-NC).

By publishing their content in Electrica, authors retain copyright of their work.

Disclaimer

Statements or opinions expressed in the manuscripts published in Electrica reflect the views of the author(s) and not the opinions of the editors, the editorial board, or the publisher; the editors, the editorial board, and the publisher disclaim any responsibility or liability for such materials. The final responsibility in regard to the published content rests with the authors.

MANUSCRIPT PREPARATION

Manuscripts can only be submitted through the journal's online manuscript submission and evaluation system, available at <http://electrica-journal.org>. Manuscripts submitted via any other medium will not be evaluated.

Manuscripts submitted to the journal will first go through a technical evaluation process where the editorial office staff will ensure that the manuscript has been prepared and submitted in accordance with the journal's guidelines. Submissions that do not conform to the journal's guidelines will be returned to the submitting author with technical correction requests.

Authors are required to submit the following:

- Copyright Agreement and Acknowledgement of Authorship, and during the initial submission. These forms are available for download at <http://electrica-journal.org>

Preparation of the Manuscript

Title page: A separate title page should be submitted with all submissions and this page should include:

- The full title of the manuscript as well as a short title (running head) of no more than 50 characters,
- Name(s), affiliations highest academic degree(s) and ORCID iD's of the author(s),
- Grant information and detailed information on the other sources of support,
- Name, address, telephone (including the mobile phone number) and fax numbers, and email address of the corresponding author,
- Acknowledgment of the individuals who contributed to the preparation of the manuscript but who do not fulfill the authorship criteria.

Biography page: A separate page should be submitted providing short biographies of the contributing authors with their photographs included.

Abstract: An abstract should be submitted with all submissions except for Letters to the Editor. The abstract of articles should be structured without subheadings. Please check Table 1 below for word count specifications.

Keywords: Each submission must be accompanied by a minimum of three to a maximum of six keywords for subject indexing at the end of the abstract. The keywords should be listed in full without abbreviations.

Manuscript Types

Original Articles: This is the most important type of article since it provides new information based on original research. The main text of original articles should be begun with an Introduction section and finalized with a Conclusion section. The remaining parts can be named relevantly to the essence of the research. Please check Table 1 for the limitations for Original Articles.

Review Articles: Reviews prepared by authors who have extensive knowledge on a particular field and whose scientific background has been translated into a high volume of publications with a high citation potential are welcomed. These authors may even be invited by the journal. Reviews should describe, discuss, and evaluate the current level of knowledge of a topic in the field and should guide future studies. sections Please check Table 1 for the limitations for Review Articles.

Letters to the Editor: This type of manuscript discusses important parts, overlooked aspects, or lacking parts of a previously published article. Articles on subjects within the scope of the journal that might attract the readers' attention, may also be submitted in the form of a "Letter to the Editor." Readers can also present their comments on the published manuscripts in the form of a "Letter to the Editor." Abstract, Keywords, and Tables, Figures, Images, and other media should not be included. The text should be unstructured. The manuscript that is being commented on must be properly cited within this manuscript.

Table 1. Limitations for each manuscript type

Type of manuscript	Word limit	Abstract word limit	Reference limit	Table limit	Figure limit
Original Article	3500	250 (Structured)	30	6	7 or total of 15 images
Review Article	5000	250	50	6	10 or total of 20 images
Letter to the Editor	500	No abstract	5	No tables	No media

Tables

Tables should be included in the main document, presented after the reference list, and they should be numbered consecutively in the order they are referred to within the main text. A descriptive title must be placed above the tables. Abbreviations used in the tables should be defined below the tables by footnotes (even if they are defined within the main text). Tables should be created using the “insert table” command of the word processing software and they should be arranged clearly to provide easy reading. Data presented in the tables should not be a repetition of the data presented within the main text but should be supporting the main text.

Figures and Figure Legends

Figures, graphics, and photographs should be submitted as separate files (in TIFF or JPEG format) through the submission system. The files should not be embedded in a Word document or the main document. When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system. Images should not be labeled (a, b, c, etc.) to indicate figure subunits. Thick and thin arrows, arrowheads, stars, asterisks, and similar marks can be used on the images to support figure legends. Like the rest of the submission, the figures too should be blind. Any information within the images that may indicate an individual or institution should be blinded. The minimum resolution of each submitted figure should be 300 DPI. To prevent delays in the evaluation process, all submitted figures should be clear in resolution and large in size (minimum dimensions: 100 × 100 mm). Figure legends should be listed at the end of the main document.

Equations

The equations must be stated separated from the text by a blank line. They should be numbered consecutively in parenthesis at the right side of the equation. Symbols and variables as well as in the main text should be written in italics while vectors and matrices should be written in bold type.

All acronyms and abbreviations used in the manuscript should be defined at first use, both in the abstract and in the main text. The abbreviation should be provided in parentheses following the definition.

When a product, hardware, or software program is mentioned within the main text, product information, including the name of the product, the producer of the product, and city and the country of the company (including the state if in USA), should be provided in parentheses in the following format: “Discovery St PET/CT scanner (General Electric, Milwaukee, WI, USA)”

All references, tables, and figures should be referred to within the main text, and they should be numbered consecutively in the order they are referred to within the main text.

References

While citing publications, preference should be given to the latest, most up-to-date publications. Authors are responsible for the accuracy of references. Both in-text citations and the references must be prepared according to IEEE Citation Style. In the main text of the manuscript, references should be cited using Arabic numbers in square brackets. The reference styles for different types of publications are presented in the following examples.

Journal Article: J.K. Author, “Name of the article”, *Abbrev. Title of Periodical*, vol. x, no. x, pp. xxx-xxx, Abbrev. Month, year.

Book Section: J. K. Author, “Title of chapter in the book,” in Title of His Published Book, xth ed. City of Publisher, Country: Abbrev. of Publisher, year, ch. x, sec. x, pp. xxx-xxx.

Books with a Single Author: J.K. Author, "Title of the Book", Abbrev. Of Publisher, City of Publisher, Country, Year.

Conference Proceedings: J. K. Author, "Title of paper," in Unabbreviated Name of Conf., City of Conf., Abbrev. State (if given), year, pp. xxx-xxx.

Report: J. K. Author, "Title of report," Abbrev. Name of Co., City of Co., Abbrev. State, Rep. xxx, year.

Thesis: J. K. Author, "Title of thesis," M.S. thesis, Abbrev. Dept., Abbrev. Univ., City of Univ., Abbrev. State, year.

Standards: *Title of Standard*, Standard number, date.

Manuscripts Accepted for Publication, Not Published Yet: J. K. Author, "Title of paper," unpublished.

Manuscripts Published in Electronic Format: J. K. Author. (year, month). Title. Journal [Type of medium]. volume(issue), paging if given.
Available: site/path/file

REVISIONS

When submitting a revised version of a paper, the author must submit a detailed "Response to the reviewers" that states point by point how each issue raised by the reviewers has been covered and where it can be found (each reviewer's comment, followed by the author's reply and line numbers where the changes have been made) as well as an annotated copy of the main document. Revised manuscripts must be submitted within 30 days from the date of the decision letter. If the revised version of the manuscript is not submitted within the allocated time, the revision option may be cancelled. If the submitting author(s) believe that additional time is required, they should request this extension before the initial 30-day period is over.

Accepted manuscripts are copy-edited for grammar, punctuation, and format by professional language editors. Once the publication process of a manuscript is completed, it is published online on the journal's webpage as an ahead-of-print publication before it is included in its scheduled issue. A PDF proof of the accepted manuscript is sent to the corresponding author and their publication approval is requested within 2 days of their receipt of the proof.

Editor in Chief : Fırat KAÇAR
Address : Department of Electrical-Electronics, Istanbul University - Cerrahpaşa Faculty of Engineering, Avcılar, İstanbul, Turkey
Phone : +90 212 473 7070
Fax : +90 212 473 7064
E-mail : fkacar@istanbul.edu.tr

Publisher : İstanbul University-Cerrahpaşa
Address : Üniversite Mahallesi, Bağlariçi Caddesi No: 7, İstanbul, Turkey

Publishing Service : AVES
Address : Büyükdere Caddesi, 105/9 34394 Şişli, İstanbul, Turkey
Phone : +90 212 217 17 00
E-mail : info@avesyayincilik.com
Web page : www.avesyayincilik.com

Contents

1 Acknowledgement of Reviewers

RESEARCH ARTICLES

- 7 **Additional Pulses in the Time Response of a Modal Filter on a Double-Sided Printed Circuit Board**
Maria A. Samoylichenko, Talgat R. Gazizov
- 16 **Estimation of Induction Motor Equivalent Circuit Parameters from Manufacturer's Datasheet by Particle Swarm Optimization Algorithm for Variable Frequency Drives**
Mehmet Onur Gülbahçe, Muhammed Emin Karaaslan
- 27 **Minimized Total Harmonic Distortion of a Multi-level Inverter of a Wind Power Conversion Chain Synchronized to the Grid-LCL Filter Optimization and Third Harmonic Cancellation**
Wijdane El Maataoui, Soukaina El Daoudi, Loubna Lazrak, Mustapha Mabrouki
- 41 **Ultra-Wide-Band Microstrip Patch Antenna Design for Breast Cancer Detection**
Adel AlOmairi, Doğu Çağdaş Atilla
- 52 **Analysis of Wind Speed Data Using Finsler, Weibull, and Rayleigh Distribution Functions**
Emrah Dokur, Salim Ceyhan, Mehmet Kurban
- 61 **Robust Position Control of a Levitating Ball via a Backstepping Controller**
Fatih Adıgüzel, Türker Türker
- 70 **Quasi ZSI-Fed Sliding Mode Control-based Indirect Field-Oriented Control of IM Using PI-Fuzzy Logic Speed Controller**
Rekha Tidke, Anandita Chowdhury
- 84 **Using a Turn of a Meander Microstrip Line for ESD Protection**
Roman S. Surovtsev, Alexander V. Nosov, Talgat R. Gazizov
- 92 **Design and Analysis of Printed Monopole Antenna With and Without CSRR in the Ground Plane for GSM 900 and Wi-Fi**
Prasanna G. Paga, H. C. Nagaraj, K. S. Shashidhara, Veerendra Dakulagi, Kim Ho Yeap
- 101 **Current Reconstruction for PMSM Drives Using a DC-Link Single Current Sensor**
Mustafa Aktaş, Barış Çavuş
- 109 **Low Power Square Root Carry Select Adder Using AVLS-TSPC-Based D Flip-Flop**
Premananda Belegahalli Siddaiah, Nikhil Kiran Jayanthi, Samana Hanumanth Managoli
- 119 **Erratum**