



APJESS

Journal of Engineering  
and **Smart Systems**

Volume : 11

Issue : 3

Year : 2023

## Volume 11 / Issue 3

*Academic Platform Journal of Engineering and Smart Systems*

### Editor in Chief (Owned By Academic Perspective)

Dr. Mehmet SARIBIYIK, Sakarya University of Applied Sciences, Türkiye

### Editors

Dr. Caner ERDEN, Sakarya University of Applied Sciences, Türkiye

Dr. John YOO, Bradley University, USA

### Editorial Board

Dr. Abdullah Hulusi KÖKÇAM, Sakarya University, Türkiye

Dr. Ali Tahir KARAŞAHİN, Karabuk University, Türkiye

Dr. Aydın MÜHÜRÇÜ, Kırklareli University, Türkiye

Dr. Ayşe Nur AY, Sakarya University of Applied Sciences, Türkiye

Dr. Cengiz KAHRAMAN, Istanbul Technical University, Türkiye

Dr. Elif Elçin GÜNAY, Sakarya University, Türkiye

Dr. Erkan ÇELİK, Istanbul University, Türkiye

Dr. Fatih VARÇIN, Sakarya University of Applied Sciences, Türkiye

Dr. Gürcan YILDIRIM, Abant İzzet Baysal University, Türkiye

Dr. Hacı Mehmet ALAKAŞ, Kirikkale University, Türkiye

Dr. Huseyin SEKER, Birmingham City University, Birmingham, United Kingdom

Dr. Kerem KÜÇÜK, Kocaeli University, Türkiye

Dr. Marco A. ACEVES-FERNÁNDEZ, Universidad Autónoma De Queréta, Mexico

Dr. Mazin MOHAMMED, University Of Anbar, Iraq

Dr. Mehmet Emin AYDIN, University of The West Of England, United Kingdom

Dr. Muhammet KURULAY, Yıldız Technical University, Türkiye

Dr. Muhammed Maruf ÖZTÜRK, Suleyman Demirel University, Türkiye

Dr. Ömer AYDIN, Celal Bayar University, Türkiye

Dr. Rakesh PHANDEN, Amity University Uttar Pradesh, India

Dr. Uğur Erkin KOCAMAZ, Bursa Uludağ University, Türkiye

Dr. Tuğba TUNACAN, Abant İzzet Baysal University, Türkiye

Dr. Turgay Tugay BİLGİN, Bursa Technical University, Türkiye

Dr. Tülay YILDIRIM, Yıldız Technical University, Türkiye

Dr. Valentina E. BALAS, Aurel Vlaicu University of Arad, Romania

### Language Editor

Dr. Hakan ASLAN, Sakarya University, Türkiye

### Editorial Assistants

Selim İLHAN, Sakarya University, Türkiye

İbrahim MUCUK, Sakarya University, Türkiye

### Correspondence Address

Academic Platform Journal of Engineering and Smart Systems

Akademik Perspektif Derneği, Tığcılar Mahallesi Kadir Sokak No:12

Kat:1 Adapazarı SAKARYA

+90 551 628 9477 (WhatsApp only)

<https://dergipark.org.tr/tr/pub/apjess>

**Issue Link:** <https://dergipark.org.tr/tr/pub/apjess/issue/80086>

## Aim and Scope

Academic Platform Journal of Engineering and Smart Systems (APJESS) is a peer reviewed open-access journal which focuses on the research and applications related to smart systems and artificial intelligence. APJESS accepts both **original research papers** and **review articles** written in **English**. It is essential that the information created in scientific study needs to be new, suggest new method or give a new dimension to an existing information. Articles submitted for publication are evaluated by at least two referees in case the editor finds potential scientific merit, and final acceptance and rejection decision are taken by editorial board. The authors are not informed about the name of referees who evaluate the papers. In similar way, the referees are not allowed to see the names of authors. The papers which do not satisfy the scientific level of the journal can be refused with unexplained reason.

There are two key principles that APJESS was founded on: Firstly, to publish the most exciting, novel, technically sound, and clearly presented researches with respect to the subjects of smart systems and artificial intelligence. Secondly, to provide a rapid turn-around time possible for reviewing and publishing, and to disseminate the articles freely for research, teaching and reference purposes.

Any information about a submitted manuscript cannot be disclosed by the editor and any other editorial staff to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher. No confidential information or ideas obtained through peer review can be used for personal advantage.

## Journal History

The journal was published between 2013-2021 with the title of "Academic Platform - Journal of Engineering and Science". It will be published under its new title "Academic Platform Journal of Engineering and Smart Systems" after 2022.

**Former Title:** Academic Platform - Journal of Engineering and Science

**Years:** 2013-2021

## Scope

APJESS aims to publish research and review papers dealing with, but not limited to, the following research fields:

- Knowledge Representation and Reasoning,
- Data Mining & Data Science,
- Supervised, Semi-Supervised and Unsupervised Learning,
- Machine Learning (ML) and Neural Computing,
- Evolutionary Computation,
- Natural Language Processing, Internet of Things, Big Data
- Fuzzy Systems,
- Intelligent Information Processing,
- AI Powered Robotic Systems,
- Multi-agent Systems and Programming for Smart Systems

## Author Guidelines

### Article Types

Manuscripts submitted to APJESS should neither be published previously nor be under consideration for publication in another journal.

The main article types are as follows:

**Research Articles:** Original research manuscripts. The journal considers all original research manuscripts provided that the work reports scientifically sound experiments and provides a substantial amount of new information.

**Review Articles:** These provide concise and precise updates on the latest progress made in a given area of research.

### Checklist for Submissions

Please,

- read the [Aims & Scope](#) to see if your manuscript is suitable for the journal,
- use the [Microsoft Word template](#) to prepare your manuscript;
- Download [Copyright Transfer Form](#) and signed by all authors.
- make sure that issues about [Ethical Principles and Publication Policy](#), [Copyright and Licensing](#), [Archiving Policy](#), [Repository Policy](#) have been appropriately considered;
- Ensure that all authors have approved the content of the submitted manuscript.

The main text should be formed in the following order:

**Manuscript:** The article should start with an introduction written in scientific language, putting thoughts together from diverse disciplines combining evidence-based knowledge and logical arguments, conveying views about the aim and purpose of the article. It must address all readers in general. The technical terms, symbols, abbreviations must be defined at the first time when they are used in the article. The manuscript should be formed in the following order:

Introduction,

Material and Method,

Findings,

Discussion and Conclusion.

**References:** At the end of the paper provide full details of all references cited in-text. The reference list should be arranged in the order of appearance of the in-text citations, not in an alphabetical order, beginning with [1], and continuing in an ascending numerical order, from the lowest number to the highest. In the reference list, only one resource per reference number is acceptable.

References must be numbered in order of appearance in the text (including citations in tables and legends) and listed individually at the end of the manuscript. We recommend preparing the references with a bibliography software package, such as EndNote, Reference Manager or Zotero to avoid typing mistakes and duplicated references. Include the digital object identifier (DOI) for all references where available. Please use IEEE style.

IEEE Sample Reference List

[1] R. E. Ziemer and W. H. Tranter, Principles of Communications: Systems, Modulation, and Noise, 7th ed. Hoboken, NJ: Wiley, 2015.

[2] J. D. Bellamy et al., Computer Telephony Integration, New York: Wiley, 2010.

- [3] C. Jacks, *High Rupturing Capacity (HRC) Fuses*, New York: Penguin Random House, 2013, pp. 175–225.
- [4] N. B. Vargafik, J. A. Wiebelt, and J. F. Malloy, "Radiative transfer," in *Convective Heat*. Melbourne: Engineering Education Australia, 2011, ch. 9, pp. 379–398.
- [5] H. C. Hottel and R. Siegel, "Film condensation," in *Handbook of Heat Transfer*, 2nd ed. W. C. McAdams, Ed. New York: McGraw-Hill, 2011, ch. 9, pp. 78–99.
- [6] H. H. Gaynor, *Leading and Managing Engineering and Technology, Book 2: Developing Managers and Leaders*. IEEE-USA, 2011. Accessed on: Oct. 15, 2016. [Online]. Available: <http://www.ieeeusa.org/communications/ebooks/files/sep14/n2n802/Leading-and-Managing-Engineering-and-Technology-Book-2.pdf>
- [7] G. H. Gaynor, "Dealing with the manager leader dichotomy," in *Leading and Managing Engineering and Technology, Book 2, Developing Leaders and Managers*. IEEE-USA, 2011, pp. 27–28. Accessed on: Jan. 23, 2017. [Online]. Available: <http://www.ieeeusa.org/communications/ebooks/files/sep14/n2n802/Leading-and-Managing-Engineering-and-Technology-Book-2.pdf>
- [8] M. Cvijetic, "Optical transport system engineering," in *Wiley Encyclopedia of Telecommunications*, vol. 4, J. G. Proakis, Ed. New York: John Wiley & Sons, 2003, pp. 1840–1849. Accessed on: Feb. 5, 2017. [Online]. Available: <http://ebscohost.com>
- [9] T. Kaczorek, "Minimum energy control of fractional positive electrical circuits", *Archives of Electrical Engineering*, vol. 65, no. 2, pp.191–201, 2016.
- [10] P. Harsha and M. Dahleh, "Optimal management and sizing of energy storage under dynamic pricing for the efficient integration of renewable energy", *IEEE Trans. Power Sys.*, vol. 30, no. 3, pp. 1164–1181, May 2015.
- [11] A. Vaskuri, H. Baumgartner, P. Kärhä, G. Andor, and E. Ikonen, "Modeling the spectral shape of InGaAlP-based red light-emitting diodes," *Journal of Applied Physics*, vol. 118, no. 20, pp. 203103–203103-7, Jul. 2015. Accessed on: Feb. 9, 2017. [Online]. Available: doi: 10.1063/1.4936322
- [12] K. J. Krishnan, "Implementation of renewable energy to reduce carbon consumption and fuel cell as a back-up power for national broadband network (NBN) in Australia," Ph.D dissertation, College of Eng. and Sc., Victoria Univ., Melbourne, 2013.
- [13] C. R. Ozansoy, "Design and implementation of a Universal Communications Processor for substation integration, automation and protection," Ph.D. dissertation, College of Eng. and Sc., Victoria Univ., Melbourne, 2006. [Online]. Accessed on: June 22, 2017. [Online]. Available: <http://vuir.vu.edu.au/527/>
- [14] M. T. Long, "On the statistical correlation between the heave, pitch and roll motion of road transport vehicles," Research Master thesis, College of Eng. and Sc., Victoria Univ., Melb., Vic., 2016.
- [15] *Safe Working on or Near Low-voltage Electrical Installations and Equipment*, AS/NZS 4836:2011, 2011.

## Ethical Principles and Publication Policy

### Peer Review Policy

Academic Platform Journal of Engineering and Smart Systems (APJESS) applies double blind peer-review process in which both the reviewer and the author are anonymous. Reviewer selection for each submitted article is up to area editors, and reviewers are selected based on the reviewer's expertise, competence, and previous experience in reviewing papers for APJES.

Every submitted article is evaluated by area editor, at least, for an initial review. If the paper reaches minimum quality criteria, fulfills the aims, scope and policies of APJES, it is sent to at least two reviewers for evaluation.



The reviewers evaluate the paper according to the Review guidelines set by editorial board members and return it to the area editor, who conveys the reviewers' anonymous comments back to the author. Anonymity is strictly maintained.

The double-blind peer-review process is managed using “ULAKBİM Dergi Sistemleri”, namely Dergipark platform.

## **Open Access Policy**

APJESS provides immediate open access for all users to its content on the principle that making research freely available to the public, supporting a greater global exchange of knowledge.

## **Archiving Policy**

APJESS is accessed by Dergipark platform which utilizes the LOCKSS system to create a distributed archiving system among participating libraries and permits those libraries to create permanent archives of the journal for purposes of preservation and restoration.

## **Originality and Plagiarism Policy**

Authors by submitting their manuscript to APJESS declare that their work is original and authored by them; has not been previously published nor submitted for evaluation; original ideas, data, findings and materials taken from other sources (including their own) are properly documented and cited; their work does not violate any rights of others, including privacy rights and intellectual property rights; provided data is their own data, true and not manipulated. Plagiarism in whole or in part without proper citation is not tolerated by APJESS. Manuscripts submitted to the journal will be checked for originality using anti-plagiarism software.

## **Journal Ethics and Malpractice Statement**

For all parties involved in the publishing process (the author(s), the journal editor(s), the peer reviewers, the society, and the publisher) it is necessary to agree upon standards of expected ethical behavior. The ethics statements for APJESS are based on the Committee on Publication Ethics (COPE) Code of Conduct guidelines available at [www.publicationethics.org](http://www.publicationethics.org).

### **1. Editor Responsibilities**

#### **Publication Decisions & Accountability**

The editor of APJESS is responsible for deciding which articles submitted to the journal should be published, and, moreover, is accountable for everything published in the journal. In making these decisions, the editor may be guided by the journal's editorial board and/or area editors, and considers the policies of the journal. The editor should maintain the integrity of the academic record, preclude business needs from compromising intellectual and ethical standards, and always be willing to publish corrections, clarifications, retractions, and apologies when needed.

#### **Fair play**

The editor should evaluate manuscripts for their intellectual content without regard to race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the author(s).

### **Confidentiality**

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

### **Disclosure, conflicts of interest, and other issues**

The editor will be guided by COPE's Guidelines for Retracting Articles when considering retracting, issuing expressions of concern about, and issuing corrections pertaining to articles that have been published in APJES.

Unpublished materials disclosed in a submitted manuscript must not be used in an editor's own research without the explicit written consent of the author(s). Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage.

The editor should seek so ensure a fair and appropriate peer-review process. The editor should recuse himself/herself from handling manuscripts (i.e. should ask a co-editor, associate editor, or other member of the editorial board instead to review and consider) in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or (possibly) institutions connected to the papers. The editor should require all contributors to disclose relevant competing interests and publish corrections if competing interests are revealed after publication. If needed, other appropriate action should be taken, such as the publication of a retraction or expression of concern.

## **2. Reviewer Responsibilities**

### **Contribution to editorial decisions**

Peer review assists the editor in making editorial decisions and, through the editorial communication with the author, may also assist the author in improving the manuscript.

### **Promptness**

Any invited referee who feels unqualified to review the research reported in a manuscript or knows that its timely review will be impossible should immediately notify the editor so that alternative reviewers can be contacted.

### **Confidentiality**

Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except if authorized by the editor.

### **Standards of objectivity**

Reviews should be conducted objectively. Personal criticism of the author(s) is unacceptable. Referees should express their views clearly with appropriate supporting arguments.

### **Acknowledgement of sources**

Reviewers should identify relevant published work that has not been cited by the author(s). Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. Reviewers should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published data of which they have personal knowledge.

### **Disclosure and conflict of interest**

Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. Reviewers should not consider evaluating manuscripts in which they have

conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or institutions connected to the submission.

### **3. Author Responsibilities**

#### **Reporting standards**

Authors reporting results of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the manuscript. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behavior and are unacceptable.

#### **Originality and plagiarism**

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.

#### **Multiple, redundant, or concurrent publication**

An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Parallel submission of the same manuscript to more than one journal constitutes unethical publishing behavior and is unacceptable.

#### **Acknowledgement of sources**

Proper acknowledgment of the work of others must always be given. Authors should also cite publications that have been influential in determining the nature of the reported work.

#### **Authorship of a manuscript**

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be named in an Acknowledgement section. The corresponding author should ensure that all appropriate co-authors are included in the author list of the manuscript, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication. All co-authors must be clearly indicated at the time of manuscript submission. Request to add co-authors, after a manuscript has been accepted will require approval of the editor.

#### **Hazards and human or animal subjects**

If the work involves chemicals, procedures, or equipment that has any unusual hazards inherent in their use, the authors must clearly identify these in the manuscript. Additionally, manuscripts should adhere to the principles of the World Medical Association (WMA) Declaration of Helsinki regarding research study involving human or animal subjects.

#### **Disclosure and conflicts of interest**

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or their interpretation in the manuscript. All sources of financial support for the project should be disclosed.

#### **Fundamental errors in published works**

In case an author discovers a significant error or inaccuracy in his/her own published work, it is the author's obligation to promptly notify the journal's editor to either retract the paper or to publish an appropriate correction statement or erratum.



#### **4. Publisher Responsibilities**

##### **Editorial autonomy**

Academic Perspective Foundation is committed to working with editors to define clearly the respective roles of publisher and of editors in order to ensure the autonomy of editorial decisions, without influence from advertisers or other commercial partners.

##### **Intellectual property and copyright**

We protect the intellectual property and copyright of Academic Perspective Foundation, its imprints, authors and publishing partners by promoting and maintaining each article's published version of record. Academic Perspective Foundation ensures the integrity and transparency of each published article with respect to: conflicts of interest, publication and research funding, publication and research ethics, cases of publication and research misconduct, confidentiality, authorship, article corrections, clarifications and retractions, and timely publication of content.

##### **Scientific Misconduct**

In cases of alleged or proven scientific misconduct, fraudulent publication, or plagiarism the publisher, in close collaboration with the editors, will take all appropriate measures to clarify the situation and to amend the article in question. This includes the prompt publication of a correction statement or erratum or, in the most severe cases, the retraction of the affected work.

## Contents

Research Articles		
Title	Authors	Pages
Human Activity Recognition with Smartwatch Data by using Mahalanobis Distance-Based Outlier Detection and Ensemble Learning Methods	Ensar Arif SAĞBAŞ, Serkan BALLI	95 - 106
Optimizing PID Gains of a Vehicle using the state-of-the-art Metaheuristic Methods	Hilal ARSLAN, Mustafa Atakan AFŞAR	107 - 117
Is ChatGPT Leading Generative AI? What is Beyond Expectations?	Ömer AYDIN, Enis KARAARSLAN	118 - 134
Home Healthcare Routing Problem for Multiple Hospitals with Balanced Workload	Gülçin DİNÇ YALÇIN, Tuğçe YAVUZ, Şüheda ALTINTAŞ	135 - 150
A Novel Clustering-based Forecast Framework: The Clusters with Competing Configurations Approach	Gökhan DEMİRKIRAN, Miray ALP	151 - 162
Artificial Neural Networks-Based Route Selection Model for Multimodal Freight Transport Network During Global Pandemic	Elif CESUR, Yaşanur KAYIKCI	163 - 173
An Explorative Analysis of Tweets Sentiments for Investment Decision in Stock Markets	Aysun GÜRAN, Emine ATEŞ	174 - 183
Synchronization of Incommensurate Fractional-Order King Cobra Chaotic System	Abdullah GÖKYILDIRIM, Haris ÇALGAN	184-190