



# ÇANKAYA UNIVERSITY

## JOURNAL OF SCIENCE AND ENGINEERING

e-ISSN: 2564-7954



**Volume: 19 / Issue: 1 / May 2022**

**About the Journal**

Cankaya University Journal of Science and Engineering (CUJSE) is an international journal, providing an academic forum aiming to inform scientists of recent developments and research on various branches of Mathematics, Statistics and Engineering. CUJSE was established in May 2010 and partially covers the contents of the former Cankaya University Journal of Arts and Sciences, which has been continuously published since 2004.

**Aim and Scope**

Cankaya University Journal of Science and Engineering (CUJSE) is a biannual (May and November issues), electronic, peer-reviewed journal publishing high quality manuscripts in the fields of Mathematics, Statistics and Engineering. Manuscripts submitted to CUJSE should be prepared in English in the form of original research articles, short communication papers and review papers in the areas of Mathematics, Statistics and Computer, Electronic, Electrical, Communication, Industrial, Mechanical, Civil Engineering, Materials Science and Nanotechnology.

**Publishing Policies and Ethical Rules**

- Çankaya University Journal of Science and Engineering is an open access, double-blind peer-reviewed international journal and publishes original scholarly works such as articles, review articles and book reviews. Submissions should be the original work of their authors and should contribute to the literature. Manuscripts submitted to the Journal should not be previously published or under review elsewhere.
- Çankaya University Journal of Science and Engineering commits to the internationally accepted principles of publication ethics expressed in the recommendations of the Committee on Publication Ethics (COPE) <https://publicationethics.org>.
- Scientific and ethical rules must be adhered to in the design, preparation, production stages of the manuscript and in the analyses of data and use of materials. The editors, readers, reviewers, and manuscript authors are to adhere to ethical standards, rules and regulations and take any reasonable steps to prevent their violations. Manuscripts that do not adhere to publication ethics and/or citation conventions or display any form of plagiarism are rejected. All submissions are subjected to originality check on iThenticate program.
- The content and language of manuscripts and any legal liabilities are under the sole responsibility of their authors. All manuscripts sent for publication should meet academic writing conventions and publication ethics. Authors are responsible for their manuscripts. If authors use any material (photograph, drawing etc.) from other sources, they are responsible for getting the copyrights for these. No royalties are paid to authors, and manuscripts sent for publication cannot be withdrawn.
- Statements of fact and opinion in the articles submitted to the Journal are those of the respective authors and contributors and not of the Editors of Çankaya University Journal of Science and Engineering

- The Journal accepts manuscript submissions in English. For all references to quotations from and for the ideas and concepts taken from other sources, proper citation conventions specified in the Journal guidelines (IEEE Style) should be used.
- The Journal is published biannually in May and November.
- The copyright of manuscripts published in the Journal belongs to Çankaya University Journal of Science and Engineering. It is obligatory to fill in and send the copyright form to the Journal. Copyright is obtained by the written permission from Çankaya Üniversitesi, to whom all requests to reproduce copyright material should be directed, in writing. Works published in the Journal cannot be published elsewhere without the approval of the Editorial Board; or any part/parts of them cannot be reproduced without proper referencing.
- All submissions are examined first by the Editor-in-Chief and Field Editors, who send the anonymous manuscripts to at least two referees for their evaluation of format and content. If the referees ask for revisions in the manuscript, the manuscript is sent back to its author. The author is responsible for the timely completion of revisions and sending the revised manuscript to the Journal. When necessary, the revised manuscript is re-evaluated by the referees.
- Reviewers, readers, and authors who submit manuscripts should comply with the evaluation and review procedures set out by the Committee on Publication Ethics (COPE). Referees are entitled to evaluate the manuscript in a detailed and fair manner, and are expected to comply with scientific publication conventions and be objective in their decision. Referees should reject the invitation and inform the Editorial Board in cases which might risk the objectivity of their evaluation such as conflict of interests, prejudice or beliefs that might affect the objectivity of their decision, or if they think the scope of the work does not fall within their area of expertise. Confidentiality is crucial; and referees should pay utmost importance to this in review, revision and publication procedures. Once the referees accept the invitation to evaluate manuscripts, they declare and undertake the responsibility to submit their reviews in time allocated.
- The publication of any submitted manuscript is at the discretion of the Editorial Board. The whole publication process is bounded by the provisions set out by the Committee on Publication Ethics (<https://publicationethics.org/resources/guidelines-new/cope-ethical-guidelines-peer-reviewers>) along with “Üniversitelerarası Kurul Bilimsel Araştırma ve Yayın Etiği Yönergesi” (Interuniversity Board Directive on Scientific Research and Publication Ethics in Turkish).



Çankaya University

**Journal of Science and Engineering**

<https://dergipark.org.tr/cankujse>

**CUJSE**

**Volume: 19 / Issue: 1 / May 2022**

### **Owner**

Prof. Dr. Can Çoğun, On behalf of Çankaya University

### **Editorial Board**

Prof. Dr. Ziya ESEN, Editor in Chief  
Çankaya University, Graduate School of Natural and Applied Sciences/  
Inter-Curricular Courses Department

Phone: +90-312-284 45 00 /ext.: 334

Fax: +90-312-286 40 78

e-mail: [ziyaesen@cankaya.edu.tr](mailto:ziyaesen@cankaya.edu.tr)

Assist. Prof. Dr. Dumitru BALEANU, Co-editor in Chief  
Çankaya University, Department of Mathematics

Phone: +90-312-233 14 24

Fax: +90-312-286 40 78

e-mail: [dumitru@cankaya.edu.tr](mailto:dumitru@cankaya.edu.tr)

### **Publishing Manager**

Assist. Prof. Dr. Üyesi Dr. Ulaş Beldek  
Çankaya University, Mechatronics Engineering Department

Phone: +90-312-233 13 16

Fax: +90-312-286 40 78

e-mail: [u.beldek@cankaya.edu.tr](mailto:u.beldek@cankaya.edu.tr)



## Field Editors

### Computer Science and Engineering

- Prof. Dr. Erdoğan Dođdu, *Angelo State University /U.S.A.*
- Prof. Dr. Hayri Sever, *Çankaya University*
- Prof. Shan Suthaharan, *The University of North Carolina at Greensboro/ U.S.A.*
- Assoc. Prof. Hakan MARAŞ, *Çankaya University*
- Assoc. Prof. Dr. Reza Hassanpour, *Rotterdam University of Applied Sciences, Netherlands*

### Electrical, Electronics and Communication Engineering

- Prof. Dr. H. Selçuk Geçim, *Çankaya University*
- Prof. Dr. Yahya K. Baykal, *Çankaya University*
- Prof. Dr. İres İskender, *Çankaya University*
- Prof. Dr. Klaus Schmidt, *METU*

### Industrial Engineering

- Prof. Dr. Ferda Can ÇETİNKAYA, *Çankaya University*
- Assoc. Prof. Dr. M. Alp ERTEM, *Çankaya University*
- Prof. Dr. Serpil Erol, *Gazi University*
- Assoc. Prof. Dr. İsmail S. Bakal, *METU*

### Civil Engineering

- Prof. Dr. Mustafa Göğüş, *Çankaya University*
- Prof. Dr. Nevzat Yıldırım, *Çankaya University*
- Prof. Dr. Sinan Turhan Erdoğan, *METU*
- Assoc. Prof. Dr. Mustafa K. Koçkar, *Hacettepe University*

### Mechanical Engineering

- Prof. Dr. Kemal Sıtkı İder, *Çankaya University*
- Prof. Dr. Haşmet Türkođlu, *Çankaya University*
- Prof. Dr. M. Cemal Kuşhan, *Eskişehir Osmangazi University*
- Assist. Prof. Dr. -Ing. Okan Görtan, *Hacettepe University*

### Mathematics

- Prof. Dr. Fahd Jarad, *Çankaya University*
- Assoc. Prof. Dr. Ekin Uğurlu, *Çankaya University*
- Prof. Elvan AKIN, *Missouri University of Science and Technology/ U.S.A.*

### Materials Science and Nanotechnology

- Prof. Dr. Arcan F. Dericiođlu, *METU*
- Prof. Dr. Benat Koçkar, *Hacettepe University*
- Assoc. Prof. Dr. Z. Göknuur Cambaz Büke, *TOBB ETU*

### Mechatronics Engineering

- Prof. Dr. Müfit GÜLGEÇ, *Çankaya University*

e-ISSN: 2564-7954



Çankaya University

**Journal of Science and Engineering**

<https://dergipark.org.tr/cankujse>

**CUJSE**

**Volume: 19 / Issue: 1 / May 2022**

### **Scientific Advisory Board**

Prof. George A. Anastassiou, *University of Memphis, U.S.A.*  
Prof. Luis Vazquez, *Universidad Complutense de Madrid, Spain*  
Prof. Dr. Abdullah Uz Tansel, *Baruch College, U.S.A.*  
Prof. Dr. Mehmet Ali Kökpınar, *TED University*  
Prof. Dr. Aydın Doğan, *Eskişehir Technical University*  
Dr. Özgür Duygulu, *TÜBİTAK MAM*

Prof. Dr. Özgür Anıl, *Gazi University*  
Prof. Dr. Erdal Çokça, *METU*  
Prof. Dr. Oğuz Turgut, *Gazi University*  
Prof. Dr. Erkan Afacan, *Gazi University*  
Prof. Dr. Ömer KIRCA, *METU*

### **Language Editors**

Assist. Prof. Dr. Samet Akar, *Çankaya University*  
Assist. Prof. Dr. George Szkutko, *Çankaya University*

### **Technical Editor/Assistant**

Instructor Halil İbrahim Andiç, *Çankaya University*



Volume: 19 / Issue: 1 / May 2022

## CONTENTS

Articles	Pages	Type
<b>A Note on the Division of Multivariate Polynomial Matrices and Grobner Basis</b> <i>Kadda Noufa and Fatima Boudaoud</i> .....	1-12	Research Article
<b>Graph Translation Surface in the Lorentz-Heisenberg 3-space with constant curvatures</b> <i>Brahim Medjahdi and Zoubir Hanifi</i> .....	13-21	Research Article
<b>Minimization of Quadratic Functionals Through <math>\Gamma</math>-Hilbert Space</b> <i>Sahin Injamamul Islam, Nirmal Sarkar and Ashoke Das</i> .....	22-28	Research Article
<b>A precise analytical method to solve the nonlinear system of partial differential equations with the Caputo fractional operator</b> <i>Riabi Lakhdar and Mountassir Hamdi Cherif</i> .....	29-39	Research Article
<b>A Comparative Analysis of Modified Extended Fractional Derivative and Integral Operators Via Modified Extended Beta Function with Applications to Generating Functions</b> <i>Umar Muhammad Abubakar</i> .....	40-50	Research Article
<b>Dominant Sets Based Pre-Feature Selection Method for Hyperspectral Data</b> <i>Onur Haliloğlu and Orhan Gazi</i> .....	51-61	Research Article