

CHAOS

THEORY AND APPLICATIONS

IN APPLIED SCIENCES AND ENGINEERING

Chaos Theory and Applications (CHTA)

Volume: 4- Issue No:3(November 2022)

<https://dergipark.org.tr/en/pub/chaos/issue/73033>

Honorary Editorial Board

Otto E. ROSSLER, University of Tuebingen, GERMANY, oeross00@yahoo.com

Julien C. SPOTT, University of Wisconsin-Madison, USA, csprott@wisc.edu

Guanrong CHEN, City University of Hong Kong, HONG KONG, eegchen@cityu.edu.hk

José A. Tenreiro MACHADO, Polytechnic Institute of Porto, PORTUGAL, jtm@isep.ipp.pt

Editor-in-Chief

Akif AKGUL, Hitit University, TURKEY, akifakgul@hitit.edu.tr

Associate Editors

Miguel A. F. SANJUAN, Universidad Rey Juan Carlos, SPAIN, miguel.sanjuan@urjc.es

Chunbiao LI, Nanjing University of Information Science & Technology, CHINA, goontry@126.com

J. M. MUÑOZ PACHECO, Benemérita Universidad Autónoma de Puebla, MEXICO, jesusm.pacheco@correo.buap.mx

Karthiekeyan RAJAGOPAL, Defence University, ETHIOPIA, rkarthiekeyan@gmail.com

Nikolay V. KUZNETSOV, Saint Petersburg State University, RUSSIA, n.v.kuznetsov@spbu.ru

Sifeu T. KINGNI, University of Maroua, CAMEROON, stkingni@gmail.com

Fahrettin HORASAN, Kirikkale University, TURKEY, fhorasan@kku.edu.tr

Vinod PATIDAR, Sir Padampat Singhania University, INDIA, vinod.patidar@spsu.ac.in

Hijaz AHMAD, International Telematic University, ITALY, hijaz555@gmail.com

Editorial Board Members

Jun MA, Lanzhou University of Technology, CHINA, hyperchaos@lut.edu.cn

Herbert Ho-Ching LU, The University of Western Australia, AUSTRALIA, herbert.iu@uwa.edu.au

Alexander PCHELINTSEV, Tambov State Technical University, RUSSIA, pchelintsev.an@yandex.ru

Wesley Joo - Chen THIO, The Ohio State University, USA, wesley.thio@gmail.com

Mustafa Zahid YILDIZ, Sakarya University of Applied Sciences, TURKEY, mustafayildiz@sakarya.edu.tr

Anastasios (Tassos) BOUNTIS, University of Patras, GREECE, anastasios.bountis@nu.edu.kz

Marcelo MESSIAS, São Paulo State University, BRAZIL, marcelo.messias1@unesp.br

Sajad JAFARI, Ton Duc Thang University, VIETNAM, sajadjafari83@gmail.com

Jesús M. SEOANE, Universidad Rey Juan Carlos, SPAIN, jesus.seoane@urjc.es

G. Cigdem YALCIN, Istanbul University, TURKEY, gcyalcin@istanbul.edu.tr

Marcelo A. SAVI, Universidade Federal do Rio de Janeiro, BRAZIL, savi@mecanica.coppe.ufrj.br

Christos K. VOLOS, Aristotle University of Thessaloniki, GREECE, volos@physics.auth.gr

Charalampos (Haris) SKOKOS, University of Cape Town, SOUTH AFRICA, haris.skokos@uct.ac.za
Ihsan PEHLIVAN, Sakarya University of Applied Sciences, TURKEY, ipehlivan@sakarya.edu.tr
Olfa BOUBAKER, University of Carthage, TUNUSIA, olfa_insat@yahoo.com
Binoy Krishna ROY, National Institute of Technology Silchar, INDIA, bkr_nits@yahoo.co.in
Jacques KENGNE, Université de Dschang, CAMEROON, kengnemozart@yahoo.fr
Fatih KURUGOLLU, University of Derby, UK, F.Kurugollu@derby.ac.uk
Denis BUTUSOV, Petersburg State Electrotechnical University, RUSSIA, butusovdn@mail.ru
Iqtadar HUSSAIN, Qatar University, QATAR, iqtadarqau@qu.edu.qa
Irene M. MOROZ, University of Oxford, UK, Irene.Moroz@maths.ox.ac.uk
Serdar CICEK, Tarsus University, TURKEY, serdarcicek@gmail.com
Zhouchao WEI, China University of Geosciences, CHINA, weizhouchao@163.com
Qiang LAI, East China Jiaotong University, CHINA, laiqiang87@126.com
Viet-thanh PHAM, Phenikaa University, VIETNAM, pvt3010@gmail.com
Jay Prakash SINGH, Rewa Engineering College, INDIA, jp4ssm@gmail.com
Yilmaz UYAROĞLU, Sakarya University, TURKEY, uyaroglu@sakarya.edu.tr
Shaobo HE, Central South University, CHINA, hshaobo_123@163.com
Esteban Tlelo CUAUTLE, Instituto Nacional de Astrofísica, MEXICO, etlelo@inaoep.mx
Dan-gheorghe DIMITRIU, Alexandru Ioan Cuza University of Iasi, ROMANIA, dimitriu@uaic.ro
Jawad AHMAD, Edinburgh Napier University, UK, jawad.saj@gmail.com
Engin CAN, Sakarya University of Applied Sciences, TURKEY, ecan@subu.edu.tr
Metin VARAN, Sakarya University of Applied Sciences, TURKEY, mvaran@sakarya.edu.tr
Sadaqat Ur REHMAN, Namal Institute, PAKISTAN, engr.sidkhan@gmail.com
Murat TUNA, Kırklareli University, TURKEY, murat.tuna@klu.edu.tr
Orhan Ozgur AYBAR, Piri Reis University, TURKEY, oaybar@pirireis.edu.tr
Mehmet YAVUZ, Necmettin Erbakan University, TURKEY, mehmetyavuz@erbakan.edu.tr

Editorial Advisory Board Members

Ayhan ISTANBULLU, Balıkesir University, TURKEY, ayhanistan@yahoo.com
Ismail KOYUNCU, Afyon Kocatepe University, TURKEY, ismailkoyuncu@aku.edu.tr
Fatih OZKAYNAK, Firat University, TURKEY, ozkaynak@firat.edu.tr
Sezgin KACAR, Sakarya University of Applied Sciences, TURKEY, skacar@subu.edu.tr
Ugur Erkin KOCAMAZ, Bursa Uudag University, TURKEY, ugurkocamaz@gmail.com
Erdinc AVAROĞLU, Mersin University, TURKEY, eavaroglu@mersin.edu.tr
Ali DURDU, Social Sciences University of Ankara, TURKEY, ali.durdu@asbu.edu.tr
Hakan KOR, Hitit University, TURKEY, hakankor@hitit.edu.tr

Language Editors

Muhammed Maruf OZTURK, Suleyman Demirel University, TURKEY, muhammedozturk@sdu.edu.tr
Mustafa KUTLU, Sakarya University of Applied Sciences, TURKEY, mkutlu@subu.edu.tr
Hamid ASADI DERESHGI, Istanbul Arel University, TURKEY, hamidasadi@arel.edu.tr
Emir AVCIOGLU, Hitit University, TURKEY, emiravciogluhitit.edu.tr

Technical Coordinator

Muhammed Ali PALA, Sakarya University of Applied Sciences, TURKEY, pala@subu.edu.tr
Murat Erhan CIMEN, Sakarya University of Applied Sciences, TURKEY, muratcimen@sakarya.edu.tr
Harun Emre KIRAN, Hitit University, TURKEY, harunemrekiran@hitit.edu.tr