

SPECIAL ISSUE ON ADVANCED FRACTIONAL MATHEMATICS, ALGORITHMS AND ARTIFICIAL INTELLIGENCE WITH APPLICATIONS IN COMPLEX CHAOTIC SYSTEMS

THEORY AND APPLICATIONS

CALL FOR PAPERS

Chaos, a long-term aperiodic and random-like behavior manifested by many nonlinear complex dynamic systems requires the unveiling of representative paths into richness of complexity and the plethora of experimental processes. There exist numerous attribute properties and patterns which cannot be described only by theory, so the internal complexity of systems involves chaos theory, chaos of fractional nonlinear dynamics and artificial phenomena. Consistently, fractional mathematics and application of fractional calculus techniques to problems are capable of describing the existence characteristics of complex natural, physical, medical, scientific and engineering-related systems more accurately, reflecting the actual state properties, co-evolving entities observations and patterns of such systems in a truer manner regarding nonlinear dynamic systems and modeling complexity evolution and order of fractional chaotic as well as complex systems.

Complexities, chaotic conditions and nonlinear elements have gained a prominent position through dynamical, causalities distribution, chaotic and neural intelligent systems, it is possible to attain feasible solutions, designed simulations, optimization processes, along with technical analyses and related computing processes and some interesting areas of applications.

Our special issue aims to provide a novel direction towards thought-provoking innovative inter-, multi- and transdisciplinary as well as model-based and data-driven research based on advanced mathematical modeling and computational foundations in conjunction with chaos-inspired model training and optimization methods. We expect to receive studies on the theoretical and applied dimensions of nonlinear dynamics and complex systems, merging mathematical analysis, advanced methods and computational technologies to be presented in order to exhibit the implications of applicable approaches in real systems and other related domains.

Potential topics include but are not limited to the following:

- Many and multi-objective optimization of evolutionary computation
- Fractional-order chaotic signals with machine learning
- Data-driven forecasting of high-dimensional chaotic processes
- Fractional entropy-based / wavelet-based image enhancement for deep segmentation for image / signal analyses
- Neuroimaging and whole-brain modeling
- Evolutionary computation with fractional methods
- Soft computing-based applications for modeling dynamic nonlinear systems
- Complexity analysis and visualization of fractional information
- Chaos in physical, chemical and biologically inspired fractional-order systems
- Fractal structure and hidden attractors in modeling multistability phenomena
- Fuzzy modeling and chaos control of partial differential systems
- Mathematical analysis and modeling in complex systems
- Bifurcations in a class of complex differential equations
- Nonlinear Artificial Intelligence and applications with big data in complex systems
- Computational (algorithmic) complexity
- Stochastic synchronization, identification, control and communication of chaotic neurons

Authors are kindly requested to submit their manuscripts through the Manuscript Tracking System at <https://dergipark.org.tr/en/pub/chaos>

Papers are published upon acceptance following the reviewing processes, regardless of the Special Issue publication date.

Important deadlines for submission:

Closing date for initial submission: August 1, 2023

Deadline for final decision notification: October 1, 2023 (Part I)

Publication Date: December 2023

Subsequent continuing parts are being planned as Part II and more parts.

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