Complexity

Special Issue on

Recent Advances in Modeling, Analysis, and Synchronization of Chaotic Systems

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CALL FOR PAPERS

Chaotic systems emerge in a plethora of disciplines, from physics to engineering, biology, chemistry, medicine, and economics. The appearance of chaotic behavior in such a wide spectrum of applications makes the analysis and control of chaotic systems a cutting edge field of study. Furthermore, chaotic behavior can appear in continuous and discrete time, as well as in fractional order systems. In order to exploit all possible engineering applications, open problems about chaotic systems need to be addressed, by proposing novel theoretical and practical approaches focused on modeling, simulation, synthesis, design, control, and circuit implementation. The complexity analysis of chaotic systems is also an important aspect of their behavior, since the need to develop chaotic systems with higher complexity, such as hyperchaotic systems or systems with hidden attractors, is becoming essential for applications.

A major issue that arises in the control of chaotic systems, which has been extensively studied the last two decades, is the problem of synchronization. This problem appears when two or more systems are coupled. Due to the sensitivity of chaotic systems to initial conditions, achieving synchronization is a very difficult task and has been a subject of ongoing research due to its innumerable applications, including but not limited to secure communications, image encryption, lasers, human pathology, neurobiology, epidemiology, robotics, and engineering. Many synchronization techniques have been developed over the years, including active control, sliding mode control, backstepping control, adaptive control, and observer design.

The aim of this special issue is to explore recent trends and developments in the modeling, analysis, and synchronization of chaotic systems. Contributions can address all types of chaotic systems, their bifurcation analysis, and different synchronization methods, as well as their practical applications. Review articles focused on a specific system type or specific synchronization methods are also welcome.

Potential topics include but are not limited to the following:

- Modeling and analysis of chaotic systems
- Continuous and discrete time chaotic systems
- Fractional order chaotic systems
- Chaotic systems with self-excited and hidden attractors
- Chaotic systems with delay
- Chaos synchronization and antisynchronization methods
- Applications of chaos synchronization in biology, engineering, physics, and economics

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/complexity/ramas/.

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

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