

Special Issue on
Control Applications for Chaotic and Hyperchaotic Systems

CALL FOR PAPERS

Chaos theory has been a very important and active research field for the last few decades. It has many applications in different disciplines like physics, chemistry, biology, ecology, engineering, and economics, among others. Its scope is based on scientific studies associated with the search on the behavior of nonlinear dynamical systems, which are highly sensitive to their initial conditions and are known as chaotic systems. The sensitivity to initial conditions of a chaotic system is usually referred to as the *butterfly effect*. In due course of time, several kinds of subworking fields have also been introduced within the context of research studies on chaos theory.

Chaos control and chaos synchronization are some subworking fields that can be examined within the mentioned content. They are especially remarkable and important research fields aiming to affect the dynamics of chaotic systems in order to use them for different kinds of applications that can be examined within many different fields like computer sciences, mechanics, communication, economics and finance, biology, chemistry, medicine, and geology, among others.

Hyperchaotic systems are developed on state-space descriptions of chaotic systems of lower dimensionality and through the inclusion of additional state variables. The new state-space description of higher dimensionality exhibits also chaotic dynamics. Due to their complexity and unpredictable behavior, hyperchaotic systems have many applications in areas such as secure communications and cryptosystems. Circuit realization and memristive devices are also associated with the study of chaotic and hyperchaotic systems.

Currently, there are different kinds of approaches or methods that have been proposed for performing chaos control and chaos synchronization tasks such as active control, adaptive control, backstepping control, fuzzy logic control, sliding mode control, and time-delayed feedback control.

This special issue is focused upon the modeling, applications, and control of chaotic dynamics in various fields, such as cryptography, secure communications, mechanics, and finance.

We encourage submissions that offer an insight into various control methods for chaotic and hyperchaotic systems such as modeling, design, stabilization, regulation, synchronization, circuit design, memristors, memristive devices, and various control applications of chaotic and hyperchaotic systems. This special issue also welcomes papers on control methodologies for the discrete chaotic dynamics with control applications.

The focus of this special issue is on the real applications of chaos theory with control techniques and not on the theoretical advances of chaos theory. Authors are welcome to submit papers highlighting the innovations and control applications of their works on chaotic and hyperchaotic systems.

Potential topics include but are not limited to the following:

- ▶ Applications of chaos theory
- ▶ Applications of discrete chaotic systems
- ▶ Approximate linearization for the control of chaotic systems
- ▶ Bifurcation analysis of chaotic systems
- ▶ Business chaotic processes
- ▶ Chaos and biology
- ▶ Chaos and chemical reactions
- ▶ Chaos and control
- ▶ Chaos and finance
- ▶ Chaos and hidden attractors
- ▶ Chaos-based communication
- ▶ Chaos-based cryptosystems
- ▶ Chaotic oscillators
- ▶ Chaotic systems
- ▶ Chemical chaotic attractors
- ▶ Control methodologies for chaotic systems
- ▶ Cryptosystems using chaotic systems
- ▶ Discrete chaotic systems
- ▶ Encryption using chaotic systems
- ▶ Global linearization methods for control of chaotic systems
- ▶ Hidden chaotic attractors
- ▶ Hyperchaotic systems
- ▶ Intelligent control techniques for chaos
- ▶ Lyapunov methods for the control of chaotic systems
- ▶ Memristors and memristive devices
- ▶ Nonlinear control for chaotic systems
- ▶ Nonlinear oscillators and chaos
- ▶ Secure communication and chaotic systems
- ▶ State estimation and filtering in chaotic systems
- ▶ Synchronization in chaotic systems

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/jcse/acdsc/>.

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

Lead Guest Editor

Sundarapandian Vaidyanathan, Vel Tech University, Chennai, India
sundarvtu@gmail.com

Guest Editors

Ahmad Taher Azar, Benha University, Benha, Egypt
ahmad_t_azar@ieee.org

Adel Ouannas, University of Larbi Tebessi, Tébessa, Algeria
ouannas.a@yahoo.com

Ahmed Rhif, Higher Institute of Applied Sciences and Technology of Kairouan, Kairouan, Tunisia
ahmed.rhif@gmail.com

Submission Deadline

Friday, 29 December 2017

Publication Date

May 2018