

## Fractional Order Control And Synchronization Of Chaotic

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### **Fractional Order Control And Synchronization**

The book reports on the latest advances in and applications of fractional order control and synchronization of chaotic systems, explaining the concepts involved in a clear, matter-of-fact style. It consists of 30 original contributions written by eminent scientists and active researchers in the field that address theories, methods and applications in a number of research areas related to fractional order control and synchronization of chaotic systems, such as: fractional chaotic systems, ...

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### **Fractional Order Control and Synchronization of Chaotic ...**

This was the seed that started the long use of chaotic systems in the field of communications. Throughout the years, many studies have considered the synchronization of integer-order chaotic and hyperchaotic maps including [25,26,27,28,29] but very few can be found for those of fractional-order [30,31,32,33,34].

### **Chaos, control, and synchronization in some fractional ...**

The lowest order for exhibiting chaos in the fractional-order system is obtained. Adaptive schemes are proposed for control and synchronization of the fractional-order chaotic sys- tem based on the stability theory of fractional-order dynamic systems.

### **Adaptive control and synchronization of a fractional-order ...**

The main objective of this paper is to design an adaptive control methodology to synchronize electrically coupled neurons with weak coupling, given a fractional- order FHN model. A Model Reference Adaptive System (MRAS) is formulated by fractional derivative of Lyapunov function candidate with respect to time.

### **Adaptive Fractional-order Control for Synchronization of ...**

order linear system are utilized to control chaotic behaviour exhibited by fractional order differential equation based phase locked loop. Furthermore, chaos synchronization is obtained by employing the nonlinear state observer method. Finally, numerical simulations verify the effectiveness and applicability of our approaches. Keywords: Fractional order equation, Phase locked loop, Chaos control, Chaos synchronization. 1 Introduction

### **Control and Synchronization of Fractional Order Di ...**

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### **Fractional Order Control And Synchronization Of Chaotic**

It is shown that chaos appears in the fractional-order Chen system when the order is less than 3. A linearizing feedback has successfully been applied on this chaotic system. In , synchronization of fractional-order chaotic systems has been studied. Utilizing an approximation approach of fractional operator drives the system to behave chaotic, when the order is less than number of the state, i.e. 3.

### **Chaotic fractional-order Couplet system: Synchronization ...**

In addition, this paper presents the concept of synchronization of different fractional order chaotic systems using active control technique. Four different synchronization cases are introduced based on the switching parameters.

### **Control and switching synchronization of fractional order ...**

Based on the stability theory of fractional-order discrete maps, a stabilization controller is proposed to control the chaos of the map. The synchronization between the proposed map and a fractional-order discrete Loren map is studied and realized. 2.

### **A Fractional-Order Discrete Noninvertible Map of Cubic ...**

The synchronization of the fractional-order chaotic systems has just begun to attract some attentions due to its potential applications in secure communications and control processing . A variety of approaches have been proposed for the synchronization of fractional-order chaotic systems [25–28]. However, numerical solutions of the above reports are obtained by employing the Adams-Bashforth-Moulton algorithm and the frequency-domain method.

### **Complex Dynamics of the Fractional-Order Rössler System ...**

Fractional-order calculation for stability analysis and controller design. Abstract. The main goal in this article is synchronization of fractional-order uncertain chaotic systems in the finite time. For this aim, a terminal sliding mode controller with fractional sliding surface is employed to synchronize the states of two different fractional order chaotic systems with parameter uncertainties and external disturbances.

### **Adaptive terminal sliding mode control scheme for ...**

Abstract. The paper mainly deals with the optimization of synchronization for fractional-order memristive neural networks (FOMNNs) with a time delay. Based on synchronization conditions, an optimization model for control parameters is designed and computed.

### **The Optimization of Synchronization Control Parameters for ...**

Abstract In this paper, a novel fractional-integer integral type sliding mode technique for control and generalized function projective synchronization of different fractional-order chaotic systems with different dimensions in the presence of disturbances is presented.

### **Synchronization of fractional-order chaotic systems with ...**

Usefulness of fractional order controllers has been reported in many practical applications . Recently numerous works have been reported on the fractional order Rossler control and synchronization. For instance [22-25] have considered the fractional order Rossler system. However, their control and synchronization methodologies had two important limitations: considering the commensurate fractional order system, and controlling via multiple input.

### **Chaotic incommensurate fractional order Rössler system ...**

In this article, an adaptive nonlinear controller is designed to synchronize two uncertain fractional-order chaotic systems using fractional-order sliding mode control. The controller structure and adaptation laws are chosen such that asymptotic stability of the closed-loop control system is guaranteed.

### **Adaptive synchronization of uncertain fractional-order ...**

Besides, the combination of quaternion-valued adaptive and impulsive control is intended to realize the asymptotically synchronization between two fractional order quaternion-valued neural networks. Ultimately, two numerical simulations are provided to check the accuracy and validity of our obtained theoretical results.