Nadolschi Chaotic Systems’ Synchronization by Generalized Predictive Control

Abstract

Nadolschi chaotic system is a system with intense non-linear behavior; chaotic systems are stable systems with unique behavioral characteristics. Very high sensitivity to parameters, the initial conditions and pseudo-random behavior while having a simple structure are examples of these features. Considering numerous applications in various fields, including the issue of encryption and secure communication, and also due to the interesting mathematical aspect of this topic, chaos synchronization has been focused by many researchers in the past two decades.[9,10]

The aim of this article is Nadolschi chaotic systems’ synchronization. To achieve this goal, differences resulting from the synchronization of two similar Nadolschi chaotic systems are obtained. By obtaining this system, synchronization problem is converted into stabilization of fault system resulting from synchronization of two Nadolschi chaotic systems. To achieve this purpose, controller is designed at two levels; first some statements of fault system related to the internal variables are removed by a controller and in the second level, generalized predictive
controller will be designed for other variables in the fault system.

The obtained simulation results show that the generalized predictive control has well-managed the operation of tracking with minimum error and so it is very convenient to be used in systems where tracking is important.

**References**


**Index Terms**

Computer Science

Control Systems
Keywords

Synchronization, Nadolschi Chaotic System, Generalized Predictive Control.