Synchronization of Discrete-Time Hyperchaotic Systems Through Extended Kalman Filtering

A. Y. Aguilar-Bustos [1] and C. Cruz-Hernández [2*]

[1] *Electronics & Telecommunications Department*
[2] *Telematics Direction*
Scientific Research and Advanced Studies of Ensenada (CICESE)
Km. 107 Carretera Tijuana-Ensenada, 22860 Ensenada, B.C., México

Abstract: In this paper, we use an extended Kalman filter (EKF) to sinchronize discrete-time hyperchaotic systems. In particular, we consider unidirectionally coupled maps corrupted by noise. Approximate synchronization is obtained between master and slave maps in case that the slave is designed as an EKF which is driven by a noisy drive signal from a noisy master dynamics. Two numerical examples are provided to illustrate the efficiency of the proposed approach.

Keywords: *Synchronization; hyperchaotic maps; discrete-time systems; extended Kalman filter; Lyapunov stability; convergence analysis.*

Mathematics Subject Classification (2000): 34C15, 34C28, 37B25, 37D45, 60G35, 93C55, 93E11.