Double Hyperchaotic Encryption for Security in Biometric Systems

E. Inzunza-González [1] and C. Cruz-Hernández [2*]

[1] *Faculty of Engineering, Architecture and Design, Baja California Autonomous University (UABC), Km. 103 Carret. Tijuana-Ensenada, Ensenada, B.C., 22860, México.*
[2] *Electronics and Telecommunications Department, Scientific Research and Advanced Studies of Ensenada (CICESE), Carretera Ensenada-Tijuana No. 3918, Zona Playitas, 22860 Ensenada, B.C. México.*

Abstract: In this paper, a novel method for double image encryption is proposed by using different hyperchaotic maps. The proposed algorithm is implemented in a biometric system. In particular, for face pattern recognition, the eigenfaces approach is used, and to encrypt biometric information the Rössler and Chen hyperchaotic maps are exploited. The simulation and experimental results show that the security analysis performed to the double encryption algorithm implemented, is strong against known different attacks, such as: brute force, statistical, differential, and information entropy. Therefore, the proposed double encryption algorithm is suitable for use in biometric systems based on face recognition which operate remotely.

---

    * Corresponding author: `mailto:ccruz@cicese.mx`