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Double Hyperchaotic Encryption for Security in Biometric Systems

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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.

Keywords: chaotic encryption; hyperchaotic maps; biometric systems; eigenface; face recognition; information security.

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