Function Projective Synchronization of Discrete-Time Chaotic Systems

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First, a function projective synchronization is defined in discrete-time dynamical systems, in which the drive and response state vectors evolve in a proportional scaling function matrix. Second, based on backstepping design with three controllers, a systematic, concrete and automatic scheme is developed to investigate the function projective synchronization of discrete-time chaotic systems. With the aid of symbolic-numeric computation, we use the proposed scheme to illustrate the function projective synchronization between the 2D Lorenz discrete-time system and the Fold discrete-time system, as well as between the 3D hyperchaotic Rössler discrete-time system and the Hénon-like map. Numeric simulations are used to verify the effectiveness of our scheme. By choosing different scaling functions, the interesting attractor figures of the drive and response systems are showed in a proportional scaling function.