

Abstract

In the present paper, Linear Quadratic Regulator (LQR) and dual properties are employed to solve the observer-based synchronization problem. The synchronization is designed for nominal chaotic system, then it is applied to systems with uncertain parameters and systems with time-delays to investigate its tolerance to such systems. Moreover, to solve the nonlinear problem, which exist in chaotic systems, the optimal linearization technique is adopted to transform the nonlinear system into equivalent linear models. By linearizing the chaotic system and constructing linear models at every operating point, and then applying algebraic Riccati equation, the observer design problem is solved and chaotic synchronization is established. Numerical Simulations are used to demonstrate the effectiveness and feasibility of this design.