Mathematical Physics

Identification of delays and discontinuity points of unknown systems by using synchronization of chaos

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In this paper we present an approach in which synchronization of chaos is used to address identification problems. In particular, we are able to identify: (i) the discontinuity points of systems described by piecewise dynamical equations and (ii) the delays of systems described by delay differential equations. Delays and discontinuities are widespread features of the dynamics of both natural and manmade systems. The foremost goal of the paper is to present a general and flexible methodology that can be used in a broad variety of identification problems.

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