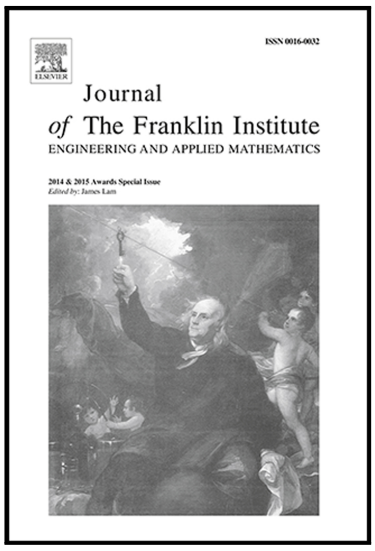

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Robust sampled-data control invariance for Boolean control networks

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Abstract

In this paper, we investigate the robust sampled-data control invariance of Boolean control networks (BCNs) via the semi-tensor product of matrices. Necessary and sufficient conditions are obtained to check whether a set is a robust sampled-data control invariant set through a given sampled-data state feedback control (SDSFC). Moreover, a SDSFC is designed to make a given set to be a robust sampled-data control invariant set. At last, the study of model about lac operon in the Escherichia coli shows the effectiveness of the main results.

Keywords: Boolean control network, robust sampled-data control invariance, semi-tensor product

1. Introduction

As a powerful tool for bio-genetic engineering, the Boolean networks (BNs) [1] has attracted the interest of many experts and scholars, which used for simulating the genetic regulatory networks and cellular networks [2]. In BNs, each node can represent a gene with two states by 0 or 1

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