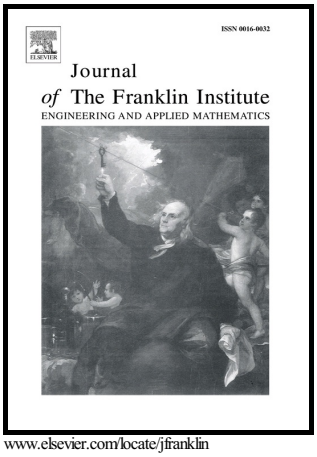

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Positivity and stability of positive singular Markovian jump time-delay systems with partially unknown transition rates

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Abstract

This paper is concerned with positivity and stochastic stability of a class of positive singular Markovian jump time-delay systems with partially unknown transition rates. First, a necessary and sufficient condition is established to check the positivity of singular Markovian jump time-delay systems. By constructing an appropriate linear co-positive Lyapunov-Krasovskii function, a sufficient condition of stochastic stability for positive singular Markovian jump time-delay systems is established, which can be solved in terms of linear programming. Based on the results obtained, we give a necessary and sufficient condition of stability for normal positive Markovian jump systems and build some relationships with some existing results. Finally, three numerical examples are used to demonstrate the effectiveness of the proposed results.

Keywords:
linear programming, positive systems, partially unknown transition rates, singular Markovian jump time-delay systems, stochastic stability

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