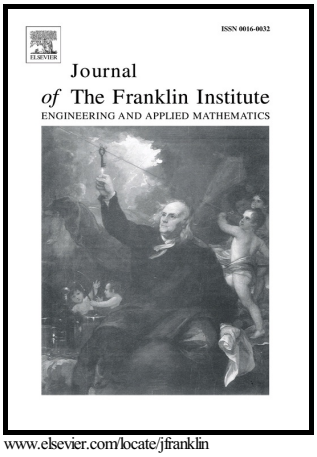

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Improved Delay-Dependent Stability Criteria for Neutral Systems with Mixed Interval Time-Varying Delays and Nonlinear Disturbances

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Abstract

It is well-known that the stability analysis of time-delay systems is a key step to design appropriate controllers and/or filters for those systems. In this paper, the problem of the delay-dependent stability analysis of neutral systems with mixed interval time-varying delays with/without nonlinear perturbations is revisited. Bounded derivatives of the discrete and neutral delays with upper-bounds not limited to be strictly less than one are considered. New stability criteria are developed using the Lyapunov Krasovskii methodology which are expressed in terms of linear matrix inequalities (LMIs). An augmented Lyapunov Krasovskii functional (LKF) utilizing triple integral terms and the descriptor transformation is employed to this aim. In addition, advanced techniques such as Wirtinger-based single and double-integral inequalities, delay decomposition technique combined with the reciprocally convex approach, as well as a few effective free-weighting matrices are employed to achieve less conservative stability conditions. Comprehensive benchmarking numerical examples and simulation studies demonstrate the effectiveness of the proposed stability criteria with respect to some recently published results. The efficacy of the modern integral

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