Manivannan, R.; Samidurai, R.; Cao, Jinde; Alsaedi, Ahmed; Alsaadi, Fuad E.
Stability analysis of interval time-varying delayed neural networks including neutral time-delay and leakage delay. (English) Zbl 1415.34113

Summary: This paper addresses an improved stability criterion for an interval time-delayed neural networks (NNs) including neutral delay and leakage delay. By proposing a suitable Lyapunov-Krasovskii functionals (LKFs) together with the Auxiliary function-based integral inequality (AFBII) and reciprocally convex approach (RCC) approach. The major purpose of this research is put forward to the consideration of inequality techniques together with a suitable LKFs, and mixed with the Leibniz-Newton formula within the structure of linear matrix inequalities (LMIs). It is amazing that, the leakage delay has a disrupting impact on the stability behaviour of such system and they cannot be neglected. Finally, numerical examples have been demonstrated to showing feasibility and applicability of the developed technique. In addition, the developed stability criteria tested for feasibility of the benchmark problem to explore the real-world application in the sense of discrete time-delay and leakage delay as a process variable in the system model.

MSC:
34K20 Stability theory of functional-differential equations
34D05 Asymptotic properties of solutions to ordinary differential equations
34K60 Qualitative investigation and simulation of models involving functional-differential equations

Keywords:
stability; neural network; leakage delay; neutral delay; reciprocally convex approach; quadruple-tank process system

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