EXISTENCE AND GLOBALLY EXPONENTIAL STABILITY OF PERIODIC SOLUTION OF BAM NEURAL NETWORKS WITH MIXED DELAYS AND IMPULSES*

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Abstract. In this paper, a class of generalized bi-directional associative memory (BAM) neural networks with variable coefficient non-autonomous impulses and mixed delays is investigated. By using Lyapunov stability theory and fix point theorem, we derive sufficient conditions for the existence and globally exponential stability of periodic solution, which generalize and improve the previously known results. All results are new and different from the other papers. Examples are given to show the feasibility and effectiveness of our results.

Keywords. BAM neural networks, Impulses and mixed delays, Periodic solution, Existence, Globally exponential stability

1   Introduction

Recently, neural networks have been intensively studied and used in various applications, such as pattern recognition and automatic control. A class of two-layer hetero-associative networks called bi-directional associative memory (BAM) networks which were first proposed in 1987 by Kosko [1−3] and extended the unidirectional auto-association of Hopfield [14]. This class of neural networks has been showed to be a useful network model for applications in pattern recognition, solving optimization problems and automatic control engineering. Hence, they have been the object of intensive analysis by numerous authors in recent years [2−7,16]. In particular, there have been extensive results on the problem of the stability and other dynamical behaviours of impulsive BAM neural networks with constant time delays and time-varying

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