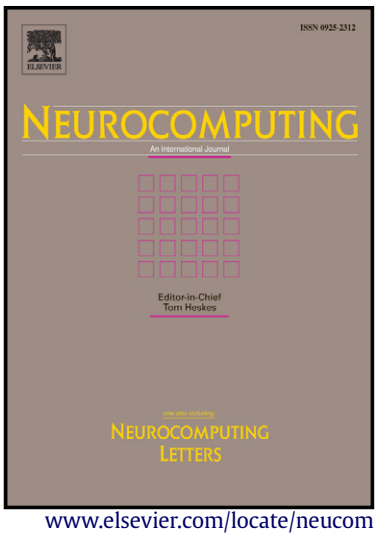

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Stability of inertial BAM neural network with time-varying delay via impulsive control

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Abstract

In this paper, a class of inertial BAM neural networks with time-varying delays is considered. By choosing proper variable transformation, the inertial BAM neural networks can be rewritten as first-order differential equations. Based on the Lyapunov functional method and the comparison principle, we derive some sufficient conditions guaranteeing the exponential stability of the neural networks under impulsive control. For different equilibrium point, the different impulsive controller can be obtained. Moreover, less conservatism impulsive controller will be designed to stabilize the zero equilibrium point. Simulation results finally demonstrate the effectiveness of the theoretical results.

Keywords: Global exponential, Inertial BAM neural network, impulsive effects,time-varying delays.

1. Introduction

Recurrent neural networks (RNNs), especially Hopfield neural networks [1], cellular neural networks (CNNs) [2], [3], Cohen-Grossberg neural networks (CGNNs) [4], bidirectional associative memory (BAM) neural netwroks [5] have been extensively investigated in recent years because of their poenetial application in the ares of signal and image processing, financial industry, parallel computation, and optimization problems and so on. In the design of RNNs, the dynamical properties of networks, such as the stability of the networks, play important roles. And there have been many literatures to investigate the stability of equilibrium points for neural networks [6]-[12].

Noticing that lots of previous studies mainly focused on neural networks with only first derivative of the states, whereas it is also of significant importance to introduce an inertial term, or