Dynamics of Continuous, Discrete and Impulsive Systems
Series **A:** *Mathematical Analysis* **14 (2007)** 487-496
 http://www.watam.org

DYNAMICAL PROPERTIES OF IMPULSIVE PERIODIC DELAYED NEURAL NETWORKS[1]

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Abstract: This paper investigates the dynamical properties such as the existence of periodic solutions and global exponential stability of a class of impulsive periodic delayed neural networks. Some new criteria on the boundedness, global exponential stability and existence of periodic solutions are established by applying impulsive integral inequalities and Hale-Yoshizawa type criteria for impulsive functional differential equations.
Keywords: Impulsive; delayed neural network; Boundedness; Global exponential stability; Periodic solution.
AMS (MOS) subject classification: 34K13; 34K20; 92B20

1 Introduction

In many evolutionary systems there are two common phenomena: delay effects and impulsive effects. In implementation of electronic networks, for example, delays frequently appear because of the finite switching speed of amplifiers, see [1-2] and references cited therein. On the other hand, the state of electronic networks is often subject to instantaneous perturbations and experiences abrupt change at certain instants which may be caused by switching phenomenon, frequency change or other sudden noise, that is, do exhibit impulsive effects (cf. [3-4]). Even in biological networks, impulsive effects are likely to exist. Therefore, neural networks model with delays and impulsive effects should be more accurate to describe the evolutionary process of the systems. Since delays and impulses can affect the dynamical behaviors of the systems by creating oscillatory and unstable characteristics (cf. [3-6]), it is necessary to investigate both delays and impulsive effects on the neural networks.

In recent years, neural networks architectures have been intensively studied and developed, a large number of the criteria on the existence of periodic

[1]Supported by the NNSF of China (No. 10571050) and Key Project of Hunan Province Education Department (No. 03A023)