Existence and Exponential Stability of Almost Periodic Solutions for a Class of Neural Networks with Variable Delays

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Abstract: In this paper, some sufficient conditions for the existence and exponential stability of almost periodic solutions for Cohen–Grossberg neural networks with variable delays are obtained by applying Banach fixed point theory and differential inequality techniques. Some previous results are improved and extended. Moreover, an example is given to illustrate that our results are feasible.

Keywords: Cohen–Grossberg neural networks; almost periodic solutions; exponential stability.


1 Introduction

Recently, the behavior of dynamical systems has been widely investigated [1, 2, 3, 4]. Cohen–Grossberg neural networks, which were first proposed by Cohen and Grossberg in [5] are typical dynamical systems and have received increasing interesting due to their promising potential applications in many fields such as optimization, associative memory, pattern recognition, signal and image processing. The stability of Cohen–Grossberg neural network with or without delays has been widely studied by many researchers [6, 7, 8, 9]. Moreover, many sufficient conditions on the stability of equilibrium point for Cohen–Grossberg neural networks with constant coefficients have been available [10, 11, 12].

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