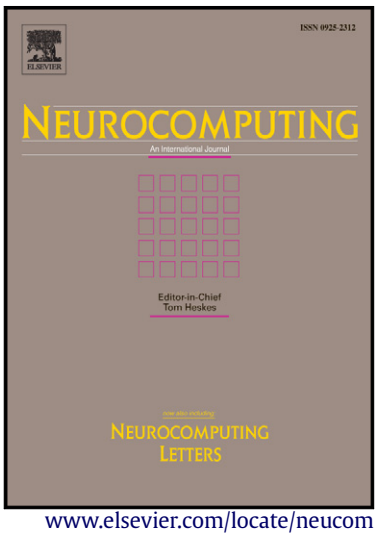

www.elsevier.com/locate/neucom

Less conservative stability criteria for neural networks with interval time-varying delay based on delay-partitioning approach

Jian-An Wang, Xiao-Hui Ma, Xin-Yu Wen

PII: S0925-2312(14)01702-0
DOI: http://dx.doi.org/10.1016/j.neucom.2014.12.038
Reference: NEUCOM14991

To appear in: *Neurocomputing*

Received date: 3 July 2014
Revised date: 22 October 2014
Accepted date: 18 December 2014

Cite this article as: Jian-An Wang, Xiao-Hui Ma, Xin-Yu Wen, Less conservative stability criteria for neural networks with interval time-varying delay based on delay-partitioning approach, *Neurocomputing*, http://dx.doi.org/10.1016/j.neucom.2014.12.038

Less conservative stability criteria for neural networks with interval time-varying delay based on delay-partitioning approach

Jian-An Wang[+], Xiao-Hui Ma, Xin-Yu Wen

School of Electronics Information Engineering, Taiyuan University of Science and Technology, Taiyuan 030024, China

E-mail: wangjianan588@163.com

Abstract: This paper is concerned with the problem of delay-dependent asymptotic stability for neural networks with interval time-varying delay. A delay-partitioning approach is used in this paper, in which the delay interval is partitioned into multiple equidistant subintervals and slightly different Lyapunov-Krasovskii functional is constructed on these intervals. By combining with reciprocally convex approach, several less conservative delay-dependent stability criteria are derived in terms of linear matrix inequality. Numerical examples are given to illustrate the effectiveness and less conservatism of the proposed method.

Keywords: neural networks, interval time-varying delay, delay-dependent stability, delay-partitioning approach, reciprocally convex approach

1. Introduction

In the past decades, neural networks (NNs) have been extensively investigated because of their successful applications in various fields such as signal processing, pattern recognition, image processing, associative memory design, and combinatorial optimization [1-4]. In those applications, the essential or the key feature of the designed NNs is to be globally stable. However, communication delays are inevitably encountered in the implementation of artificial NNs, which may lead to instability and oscillation. Thus, the issue of stability analysis of NNs with time delay has been received much attention in recent years.

In the field of stability for delayed neural networks (DNNs), the delay-dependent