Accepted Manuscript

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 PII:
 S0893-6080(15)00249-X

 DOI:
 http://dx.doi.org/10.1016/j.neunet.2015.11.006

 Reference:
 NN 3557

To appear in: *Neural Networks*

Received date:28 June 2015Revised date:29 October 2015Accepted date:10 November 2015



Please cite this article as: Lu, W., Zheng, R., & Chen, T. Centralized and decentralized global outer-synchronization of asymmetric recurrent time-varying neural network by data-sampling. *Neural Networks* (2015), http://dx.doi.org/10.1016/j.neunet.2015.11.006

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Centralized and Decentralized Global Outer-synchronization of Asymmetric Recurrent Time-varying Neural Network by Data-sampling¹

Wenlian Lu², Ren Zheng³, Tianping Chen⁴

Abstract

In this paper, we discuss outer-synchronization of the asymmetrically connected recurrent time-varying neural networks. By using both centralized and decentralized discretization data sampling principles, we derive several sufficient conditions based on three vector norms to guarantee that the difference of any two trajectories starting from different initial values of the neural network converges to zero. The lower bounds of the common time intervals between data samples in centralized and decentralized principles are proved to be positive, which guarantees exclusion of Zeno behavior. A numerical example is provided to illustrate the efficiency of the theoretical results.

Keywords: Outer-synchronization, Data sampling, Centralized principle, Decentralized principle, Recurrent neural networks

¹This work is jointly supported by the National Natural Sciences Foundation of China under Grant Nos. 61273211 and 61273309, and the Program for New Century Excellent Talents in University (NCET-13-0139)

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