Delay Independent Stability of Co-operative and Supportive Neural Networks

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Abstract: In this paper a cooperative and supportive neural network proposed recently is considered. Time delays both in transmission of information from subsystems to main system as well as processing of information in subsystem itself are introduced into the network. Criteria on parameters of the system are obtained that establish the stability of the system independent of time delays. Examples are provided for illustration of results.

Keywords: *cooperative and supportive networks; time delays; equilibria; global stability.*

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1 Introduction

Neural networks has been a subject of research for decades with growing popularity ([2], [6-11]), for its extensive application in several real world situations ([1], [3], [12-17], [21]). In [20], a new class of networks designated as co-operative and supportive neural network (CSNN, for short) was introduced. The model is suitable for explaining the dynamics of systems exhibiting hierarchy in which the collective capabilities of components involved are utilized for better performance of the system. Such systems find application in industrial information management, financial and economic systems which involve distribution

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