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论文

基于LMI方法的时滞BAM神经网络的全局稳定性分析

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摘要
对于时滞双向联想记忆(DBAM)神经网络的平衡点的稳定性问题，目前人们已经得到了很多富有意义的成果。该文提出一种新的神经网络模型——标准神经网络模型(SNNM)，通过状态的线性变换，将DBAM神经网络转化为时滞SNNM(DSNNM)，并利用有关DSNNM的稳定性的一些结论，得到DBAM神经网络平衡点的全局渐近稳定性的充分条件。这些条件都以线性矩阵不等式(LMI)的形式给出，容易验证，保守性低。该方法扩展了以前的稳定性结果，同时也适用于其它类型的递归神经网络(时滞或非时滞)的稳定性分析。

关键词 标准神经网络模型 时滞双向联想记忆神经网络 线性矩阵不等式 线性微分包含 全局渐近稳定性

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Globally Asymptotical Stability Analysis of BAM Neural Networks with Time Delays via LMI Approach

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Abstract
So far many fruitful results have been obtained for stability of equilibrium points of Bidirectional Associative Memory (BAM) neural networks with axonal signal transmission delays (DBAM). A novel neural network model named as Standard Neural Network Model (SNNM) is advanced. By using state affine transformation, the DBAM neural networks arc converted to SNNMs with time delays (DSNNMs). Based on some results of DSNNMs' stability, some sufficient conditions for the globally asymptotical stability of DBAM neural networks are derived, which are formulated as linear matrix inequalities (LMIs), which can be verified easily and whose conservativeness is lower. The approach proposed extends the known stability results, and can also be applied to other forms of Recurrent Neural Networks (RNNs) with (or without) time delays.

Key words Standard Neural Network Model（SNNM） Bidirectional Associative Memory （BAM） neural network Linear Matrix Inequality（LMI） Linear Differential Inclusion（LDI） Globally asymptotic stability

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