Research on Adaptive Synchronization Based on Complex Network with Multi-weights

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Abstract On the basis of traditional modeling approaches of single weight, a new complex network model was established. According to the weight nature difference and the idea of network split, we split the complex networks with multi-weights into several different sub-networks with single weight. Then we investigate the globally adaptive synchronization of the complex networks with multi-weights, and give the general conditions of adaptive synchronization. At last, taking Lorenz system as example, we prove the validity of the presented method.

Keywords Complex networks, Multi-weights, Network split, Network synchronization

Abstract

Introduction

1. Background and Motivation

2. Related Work

3. System Description

4. Theoretical Analysis

5. Numerical Simulations

6. Conclusion

Acknowledgments

References

Diagram

Diagram Description
\[ \dot{x} = f(x) + \varepsilon \sum_{i=1}^{N} a_i^1 H_i x_i + \varepsilon t \sum_{i=1}^{N} a_i^2 H_i x_j + \ldots + \varepsilon \sum_{i=1}^{N} a_i^r \] 

\[ H_i x_i + v_i (1 \leq i \leq N) \]

\[ x = f(x) + \varepsilon \sum_{i=1}^{N} a_i^1 H_i x_i + \varepsilon t \sum_{i=1}^{N} a_i^2 H_i x_j + \ldots + \varepsilon \sum_{i=1}^{N} a_i^r \]

\[ H_i x_i + v_i (1 \leq i \leq N) \]

\[ A = (a_1, a_2, \ldots, a_r) \]

\[ \dot{x} = f(x(t)) \]
\[ V(t) = -d \sum_{i=1}^{N} x_i^T(t) e_i(t) + a \sum_{i=1}^{N} \sum_{j \neq i} \delta_{ij} (t) h_i(x_i(t)) + \sigma_i \sum_{j=1}^{N} \sum_{j \neq i} \delta_{ij}^* (t) h_j(x_j(t)) + \varepsilon_i(t) e_i(t), \]

\[ (i = 1, 2, \ldots, N) \]

\[ \| e_i(t) \| = 0, 1 \leq i \leq N \]

\[ \varepsilon_i(t) < 0, a > 0, \delta_{ij}^* \geq 0 (i \neq j) \]

\[ V(t) \leq 0 \]

\[ a^T \eta_i^* (t) e_i(t) \]

\[ a^T d > 0, a > 0, \eta_i^* \geq 0 (i \neq j) \]

\[ v_i = \begin{cases} -d & (1 \leq i \leq 3) \\ -k_i e_i & (k_i \| e_i \|) \end{cases} \]

\[ i = 1, 2, \ldots, N \]

\[ v_i = \begin{cases} -d & (1 \leq i \leq 3) \\ -k_i e_i & (k_i \| e_i \|) \end{cases} \]

\[ a_i = 3, a_i = 4, a_i = 5, a_i = 5, a_i = 6, a_i = 7, a_i = 4, a_i = 5, a_i = 6 \]

\[ (7) \]

\[ a_i^* = a_i (i = 1, 2, 3, j = 1, 2, 3, k = 1, 2, 3) \]

\[ v_i = -d, e_i (1 \leq i \leq 3), d_i = k_i e_i, \| e_i \| \]

\[ i = 1, 2, \ldots, N \]

\[ v_i = \begin{cases} -d & (1 \leq i \leq 3) \\ -k_i e_i & (k_i \| e_i \|) \end{cases} \]

\[ a_i = 3, a_i = 4, a_i = 5, a_i = 5, a_i = 6, a_i = 7, a_i = 4, a_i = 5, a_i = 6 \]

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\[ (7) \]
数值模拟到端的可靠传输是节点密度稀疏的郊区野外场景还是节点密集的城市。算法的整体性能较好，给出了同步的准则。本文建立了一种新的多重权重复杂网络模型并按网络拆分的原则。复杂网络分析激酶底物信号传递机制。如果节点数量和权重能按一定比例分配，其应用挑战。最后用它的应用。

参考文献


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