

SEMINAR

Grupo de Análise Funcional e Aplicações Functional Analysis and Applications Group

Global exponential stability criterion for a general system of difference equations with unbounded delays and applications to discrete-time neural network models

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Abstract

In this presentation, first, a discretization process is described to obtain a discrete-time neural network model from a continuous-time neural network model. Then a phase space for a multidimensional nonautonomous general system with unbounded delays is presented and an exponential stability criterion of its zero solution is given. Based on the M-matrix theory, we establish sufficient conditions to ensure the global exponential stability of the zero equilibrium of low-order, and high-order, discrete-time Hopfield neural network models with unbounded delays and delay in the leakage terms. At the end, a numerical example is given, illustrating the effectiveness of the new results.

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