

Global asymptotic stability for systems of delayed differential equations with applications to neural networks

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Abstract

For an n -dimensional delayed differential system in the general form $\dot{x}(t) = f(t, x_t)$, we give sufficient conditions for the global asymptotic stability of its zero solution. We apply the main result to several delayed neural networks models, as Cohen-Grossberg neural networks, bidirectional associative memory neural networks, and static neural networks with S-type distributed delays, generalizing known results in the literature.

We emphasize that, contrary to the usual, we do not use Lyapunov functionals to obtain our results, which can therefore be applied to a very general setting.