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Synchronization and Desynchronization in a Delayed Discrete Neural Network

We consider a delayed discrete neural network of two identical neurons with excitory interactions. After investigating the stability of the given system, we establish a new scheme and use the scheme to analyze the possible bifurcations occurring in the model. The process from its stable equilibrium to its multiple periodic patterns is explored clearly. A clarification for the asymptotically synchronous/asynchronous regions of such a system with $\mathbb{Z}_2$ symmetry is included.