

Implementation of an Associative Memory Using a Restricted Hopfield Network

Authors : Tet H. Yeap

Abstract : An analog restricted Hopfield Network is presented in this paper. It consists of two layers of nodes, visible and hidden nodes, connected by directional weighted paths forming a bipartite graph with no intralayer connection. An energy or Lyapunov function was derived to show that the proposed network will converge to stable states. By introducing hidden nodes, the proposed network can be trained to store patterns and has increased memory capacity. Training to be an associative memory, simulation results show that the associative memory performs better than a classical Hopfield network by being able to perform better memory recall when the input is noisy.

Keywords : restricted Hopfield network, Lyapunov function, simultaneous perturbation stochastic approximation

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