

**Inoue, Junichi****Retrieval phase diagrams of non-monotonic Hopfield networks.** (English) Zbl 0897.68084  
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Summary: We investigate the retrieval phase diagrams of an asynchronous fully connected attractor network with non-monotonic transfer function by means of a mean-field approximation. We find for the noiseless zero-temperature case that this non-monotonic Hopfield network can store more patterns than a network with monotone transfer function investigated by *D. J. Amit, H. Gutfreund* and *H. Sompolinsky* [*Ann. Phys.* 173, 30 (1987)]. Properties of retrieval phase diagrams of non-monotonic networks agree with the results obtained by Nishimori and Opris who treated synchronous networks. We also investigate the optimal storage capacity of the non-monotonic Hopfield model with state-dependent synaptic couplings introduced by *F. Zertuche, R. López* and *H. Waelbroeck* [*J. Phys. A, Math. Gen.* 27, No. 5, 1575-1583 (1994; [Zbl 0842.68063](#))]. We show that the non-monotonic Hopfield model with state-dependent synapses stores more patterns than the conventional Hopfield model. Our formulation can be easily extended to a general transfer function.

**MSC:**

[68T05](#) Learning and adaptive systems in artificial intelligence  
[82C41](#) Dynamics of random walks, random surfaces, lattice animals, etc. in time-dependent statistical mechanics

Cited in **3** Documents**Keywords:**[retrieval phase diagrams](#)**Full Text:** [DOI](#) [arXiv](#)