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Capacity for Patterns and Sequences in Kanerva's SDM as Compared to Other Associative Memory Models

Authors:

James Keeler

Abstract:

The information capacity of Kanerva's Sparse, Distributed Memory (SDM) and Hopfield-type neural networks is investigated. Under the approximations used here,

it is shown that the total information stored in these systems is proportional to the number connections in the network. The proportionality constant is the same for the SDM and Hopfield-type models independent of the particular model,

or the order of the model. The approximations are checked numerically. This same analysis can be used to show that the SDM can store sequences of spatiotemporal patterns, and the addition of time-delayed connections allows the retrieval of context

dependent temporal patterns. A minor modification of the SDM can be used to store correlated patterns.

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