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An after Shannon measure of the amount of information stored in an associative noiselike coding memory*

Using convolution and correlation operations, a model of a memory which is associative in its character can be built (Bottini, 1979). The central point of the model is a noiselike distributed coding of the information items being stored. Memory traces formed in this way can be superimposed on a common discrete substratum without crosstalk interference in the recall. This property is also plausibly shared by the neural memory traces. The amount of information stored in this model has been calculated by means of an after Shannon measure. This is possible because the problem of calculating the storage capacity for an associative memory formally resembles the problem of calculating the information transmission rate in a noisy channel.

The results obtained are relevant to any other memory system using noiselike keys or items, even if described in terms of neural network components.

Biography:

Sergio Bottini received the M.D. in physics from the University of Padova in 1977; the title of the thesis was "Modeling of biological associative memory". Then he had a grant from the Consiglio Nazionale delle Ricerche (C.N.R.) to continue his studies on memory at the Istituto di Elaborazione della Informazione C.N.R. of Pisa, where now he is a scientific researcher. Other interests concern the visual system and some topics in theoretical physics, namely atom energy levels and particle physics.

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