

Probabilistic Characterization of Neural Model Computations

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Abstract:

Information retrieval in a neural network is viewed as a procedure in which the network computes a "most probable" or MAP estimate of the unknown information. This viewpoint allows the class of probability distributions, P , the neural network can acquire to be explicitly specified. Learning algorithms for the neural network which search for the "most probable" member of P can then be designed. Statistical tests which decide if the "true" or environmental probability distribution is in P can also be developed. Example applications of the theory to the highly nonlinear back-propagation learning algorithm, and the networks of Hopfield and Anderson are discussed.