

CONSISTENT SELECTION OF THE NUMBER OF HIDDEN NEURONS IN NEURAL NETWORKS

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The selection of the number of hidden neurons is a fundamental problem in the theory of neural networks, as it determines the model complexity and its generalization capability. In this talk, we present a model selection criterion for single-hidden-layer neural networks designed for binary classification problems, based on penalized maximum likelihood. Under suitable regularity assumptions on the parameter space and the activation functions, we show that the estimator of the number of hidden neurons is consistent and asymptotically recovers the minimum number of neurons required to represent the true model. Finally, we present simulation studies and applications to real datasets illustrating the practical performance of the proposed procedure. Joint work with Florencia Leonardi (USP) and Tiago P. Marques (USP).