Building RBF Neural Network Topology Through Potential Functions

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Abstract. In this paper we propose a strategy to shape adaptive radial basis functions through potential functions. DYPOF (DYnamic POtential Functions) neural network (NN) is designed based on radial basis functions (RBF) NN with a two-stage training procedure. Static (fixed number of RBF) and dynamic (ability to add or delete one or more RBF) versions of our learning algorithm are introduced. We investigate the change of cluster shape with the dimension of the input data, the choice of univariate potential function, and the construction of multivariate potential functions. Several data sets are considered to demonstrate the classification performance on the training and testing exemplars as well as compare DYPOF with other neural networks.