Rule Insertion Technique for Dynamic Cell Structure Neural Network

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Abstract : This paper discusses the idea of capturing an expert’s knowledge in the form of human understandable rules and then inserting these rules into a dynamic cell structure (DCS) neural network. The DCS is a form of self-organizing map that can be used for many purposes, including classification and prediction. This particular neural network is considered to be a topology preserving network that starts with no pre-structure, but assumes a structure once trained. The DCS has been used in mission and safety-critical applications, including adaptive flight control and health-monitoring in aerial vehicles. The approach is to insert expert knowledge into the DCS before training. Rules are translated into a pre-structure and then training data are presented. This idea has been demonstrated using the well-known Iris data set and it has been shown that inserting the pre-structure results in better accuracy with the same training.