A New Learning Algorithm for a Fully Connected Fuzzy Inference System (F-CONFIS) with its Application for Computing Learning Capacity

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PLENARY TALK

Abstract—This talk discusses a new neural-fuzzy network architecture in which a traditional neuro-fuzzy system is transformed into an equivalent fully connected three layer neural network, namely, the Fully Connected Neuro-Fuzzy Inference Systems (F-CONFIS). The F-CONFIS differs from traditional neural networks by its dependent and repeated weights between input layer and hidden layer and can be considered as the variation of a kind of multilayer neural network. Therefore, an efficient learning algorithm for F-CONFIS to cope these repeated weights is derived. Furthermore, a dynamic learning rate is proposed for neuro-fuzzy systems via F-CONFIS where both premise (hidden) and consequent portions should be considered. Several simulation results indicate that the proposed approach achieves much better accuracy and fast convergence. In addition the bounded capacity for the learning for a fuzzy neural network via the proposed F-CONFIS and its applications will be discussed.