A hybrid-based modified adaptive fuzzy inference engine for pattern classification

ABSTRACT

The Neuro-Fuzzy hybridization scheme has become of research interest in pattern classification over the past decade. The present paper proposes a hybrid Modified Adaptive Fuzzy Inference Engine (MAFIE) for pattern classification. A modified Apriori algorithm technique is utilized to reduce a minimal set of decision rules based on input output data set. A TSK type fuzzy inference system is constructed by the automatic generation of membership functions and rules by the hybrid fuzzy clustering and Apriori algorithm technique, respectively. The generated adaptive fuzzy inference engine is adjusted by the least-squares fit and a conjugate gradient descent algorithm towards better performance with a minimal set of rules. The proposed hybrid MAFIE is able to reduce the number of rules which increases exponentially when more input variables are involved. The performance of the proposed MAFIE is compared with other existing applications of pattern classification schemes using Fisher's Iris data set and shown to be very competitive.

Keyword: Apriori algorithm; Hybrid clustering algorithm; MAFIE; TSK