

## **The fundamental nature of interpretability in diagnosing diabetes using neuro-fuzzy classifier**

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### **Abstract :**

Interpretability represents the most important driving force behind the implementation of fuzzy-based classifiers for medical application problems. The expert should be able to understand the classifier and to evaluate its results. So it is preferable not to use black box approaches. Fuzzy rule based models are especially suitable, because they consist of simple linguistically interpretable rules. The majority of classifiers based on an adaptive neuro-fuzzy inference system (ANFIS) used in literature do not provide enough explanation of how their inference results have been obtained. This paper discusses the interpretability of ANFIS classifier. It is shown how a readable neuro-fuzzy classifier can be obtained by a learning process and how fuzzy rules extracted can enhance its interpretability. The diabetes disease dataset used in our work is retrieved from UCI Machine Learning Database. The experimental results have shown that our approach is simple and effective in clarifying the final decision of the classifier while preserving its accuracy at a satisfactory level.

**Key words :** interpretable classification, fuzzy rules, anfis, uci machine learning database.