# Knowledge Representation Based on Interval Type-2 CFCM Clustering

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**Abstract :** This paper is concerned with knowledge representation and extraction of fuzzy if-then rules using Interval Type-2 Context-based Fuzzy C-Means clustering (IT2-CFCM) with the aid of fuzzy granulation. This proposed clustering algorithm is based on information granulation in the form of IT2 based Fuzzy C-Means (IT2-FCM) clustering and estimates the cluster centers by preserving the homogeneity between the clustered patterns from the IT2 contexts produced in the output space. Furthermore, we can obtain the automatic knowledge representation in the design of Radial Basis Function Networks (RBFN), Linguistic Model (LM), and Adaptive Neuro-Fuzzy Networks (ANFN) from the numerical input-output data pairs. We shall focus on a design of ANFN in this paper. The experimental results on an estimation problem of energy performance reveal that the proposed method showed a good knowledge representation and performance in comparison with the previous works.

**Keywords :** IT2-FCM, IT2-CFCM, context-based fuzzy clustering, adaptive neuro-fuzzy network, knowledge representation
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