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# A New Method for Classification of Imprecise Data using Fuzzy Rough Fuzzification

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## Abstract

In this paper, fuzzy rough sets are introduced as a new solution to the problem of handling imprecise input information in classification tasks. The proposed method is shown as an dispensable way to non-singleton fuzzification. Both methods are applied in neuro–fuzzy classifiers and are extended to be applied with logical-type as well as conjunction-type of fuzzy inference. Several theorems describe how to embed non-singleton fuzzification in antecedent fuzzy sets of the logical-type and conjunction-type fuzzy systems. Likewise, fuzzy rough fuzzification embeds in alike the logical-type and conjunction-type fuzzy systems. With reference to classification, the proposed neuro–fuzzy–rough structure may be considered as an extension of the neuro-rough–fuzzy structure by fuzzification of an input space, performed by fuzzy rough sets. The investigations processed for a wide range of fuzzification spread allow to observe the behavior of fuzzification methods under consideration and to verify the common certitude about the meaning of the spread.

*Keywords:* Classifier design, uncertainty reasoning, fuzzy set, rough set,  
imprecise data

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