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A Hybrid Fuzzy Clustering Approach for Fertile and Unfertile Analysis

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Abstract : Diagnosis of male infertility by the laboratory tests is expensive and, sometimes it is intolerable for patients. Filling out the questionnaire and then using classification method can be the first step in decision-making process, so only in the cases with a high probability of infertility we can use the laboratory tests. In this paper, we evaluated the performance of four classification methods including naive Bayesian, neural network, logistic regression and fuzzy c-means clustering as a classification, in the diagnosis of male infertility due to environmental factors. Since the data are unbalanced, the ROC curves are most suitable method for the comparison. In this paper, we also have selected the more important features using a filtering method and examined the impact of this feature reduction on the performance of each methods; generally, most of the methods had better performance after applying the filter. We have showed that using fuzzy c-means clustering as a classification has a good performance according to the ROC curves and its performance is comparable to other classification methods like logistic regression.

Keywords : classification, fuzzy c-means, logistic regression, Naive Bayesian, neural network, ROC curve
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