Abstract

Feature subset selection is a data preprocessing step for pattern recognition, machine learning and data mining. In real world applications an excess amount of features present in the training data may result in significantly slowing down of the learning process and may increase the risk of the learning classifier to over fit redundant features. Fuzzy rough set plays a prominent role in dealing with imprecision and uncertainty. Some problem domains have motivated the hybridization of fuzzy rough sets with kernel methods. In this paper, the Exponential kernel is integrated with the fuzzy rough sets approach and an Exponential kernel approximation based fuzzy rough set method is presented for feature subset selection. Algorithms for feature ranking and reduction based on fuzzy dependency and exponential kernel functions are presented. The performance of the Exponential kernel approximation based fuzzy rough set is compared with the Gaussian kernel approximation and the neighborhood rough sets for feature subset selection. Experimental results demonstrate the effectiveness of the Exponential kernel based fuzzy rough sets approach for feature selection in improving the classification accuracy in comparison to Gaussian kernel approximation and neighborhood rough sets approach.
An Exponential Kernel based Fuzzy Rough Sets Model for Feature Selection

References

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Index Terms

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Rough set  Fuzzy rough set  Exponential kernel  Feature selection