Wrapper based Feature Selection using Binary Flower Pollination Algorithm

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Abstract

Pattern recognition involves identifying a new instance as a member of a class based on the features extracted from problem space. Not all features contribute to increase in accuracy of classification. Wrapper based methodology selects an optimal subset of reduced features with no much loss in classification accuracy. Inspired by the bio evolutionary behaviour of flowers in optimal reproduction, a wrapper based optimal feature selection methodology is devised. In this paper, a Binary Flower Pollination Algorithm (BFPA) is proposed to address the combinatorial problem of feature selection. Support Vector machine (SVM) is used as a subset evaluator to calculate the fitness function to be optimized. Proposed algorithm is evaluated using 5 datasets from UCI repository. Switching probability is varied to achieve a fair tradeoff between exploration and exploitation. Feature subset chosen by the proposed method serves as input to 6 traditional classifiers to analyse the success of the algorithm. Experimental results are also compared with existing literature and observed that the proposed methodology identifies feature subset with reduced features and improved accuracy.

Keywords: BFPA, Computational Intelligence, Pattern recognition, SVM, Wrapper based feature selection.
References


