

Parameter Pliable Variational Mode Decomposition and Clustering Based Gravitational Search Algorithm Techniques for Bird Sound Classification

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Abstract— In the field of ecological monitoring, a significant aspect is bird sound classification. As different movements are observed by birds, classification of its sounds is quite important. The target information can be fully explained with the help of suitable feature extraction and selection schemes. In this paper, the first approach utilizes a parameter pliable Variational Mode Decomposition (PP-VMD) technique for extracting the features and then for feature selection Colliding Bodies Optimization (CBO) algorithm is utilized. The chosen features are then classified with the conventional machine learning classifiers. The second approach uses the concept of spectral clustering (SC) and K-means algorithm with clustering the initial centers (KIC) for feature extraction and Gravitational Search Algorithm (GSA) is used for feature selection before classifying it with machine learning classifiers. The proposed two strategies are implemented on publicly available bird sound classification dataset and the best results are obtained when PP-VMD with CBO and SVM classifier is used reporting an accuracy of 94.45%.

Keyword— *Feature Extraction, Feature Selection, Bird Sounds, Classification.*

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