## **Ensemble-Based SVM Classification Approach for miRNA Prediction**

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**Abstract :** In this paper, an ensemble-based Support Vector Machine (SVM) classification approach is proposed. It is used for miRNA prediction. Three problems, commonly associated with previous approaches, are alleviated. These problems arise due to impose assumptions on the secondary structural of premiRNA, imbalance between the numbers of the laboratory checked miRNAs and the pseudo-hairpins, and finally using a training data set that does not consider all the varieties of samples in different species. We aggregate the predicted outputs of three well-known SVM classifiers; namely, Triplet-SVM, Virgo and Mirident, weighted by their variant features without any structural assumptions. An additional SVM layer is used in aggregating the final output. The proposed approach is trained and then tested with balanced data sets. The results of the proposed approach outperform the three base classifiers. Improved values for the metrics of 88.88% f-score, 92.73% accuracy, 90.64% precision, 96.64% specificity, 87.2% sensitivity, and the area under the ROC curve is 0.91 are achieved.

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Keywords : MiRNAs, SVM classification, ensemble algorithm, assumption problem, imbalance data

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