

Abstract

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A New Multiple Classifiers Soft Decisions Fusion Approach for Exons Prediction in DNA Sequences

Prediction of exons locations in deoxyribonucleic acid (DNA) sequences is a significant issue for biologists. This paper proposes a new method to solve this problem. Unlike the published studies, in which the prediction of exons locations depends on hard decisions from a single classifier, the proposed prediction approach depends on fusion of soft decisions from two classifiers. In the proposed approach we utilize the sliding window discrete Fourier transform (DFT), which is normally used to detect exons 3-base periodicity feature, in a different manner. The novelty here depends on obtaining soft decisions, rather than hard decisions, from two classifiers using different numerical mapping schemes, and fuses them in a decision fusion center to obtain a final global decision about the prediction of exons locations. Simulation results based on real data performed on the HMR195 dataset showed that the proposed soft decisions fusion method achieves better prediction performance compared to the traditional hard decision single classifier method. Moreover the proposed method can easily be extended to more than two classifiers.