AN EFFICIENT ANALYSIS TECHNIQUE FOR DNA SEQUENCES USING MULTIWINDOW GABOR REPRESENTATIONS (WedAmOR10)

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Abstract :

In this paper, we develop a new technique to store, search, and compare DNA sequences. We utilize the concept of multiwindow Gabor representations and use these functions to handle the nucleotide sequences. We show specifically, that using multiwindow Gabor representations, it is possible to represent the sequences efficiently using very few terms. Further, we develop a search technique based on the correlation between multiwindow Gabor coefficients of the query sequence and sequences in the database and show that our method has a smaller computational complexity. Most importantly, we show that using multiwindow Gabor representations, we can examine the periodicity properties of sequences very easily, without need to resorting to the string matching techniques, the global Fourier techniques, or the statistical correlation techniques.

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