Abstract

In Bioinformatics, Motif Finding is one of the most popular problems, which has many applications. Generally, it is to locate recurring patterns in the sequence of nucleotides or amino acids. As we can’t expect the pattern to be exact matching copies owing to biological mutations, the motif finding turns to be an NP-complete problem. By approximating the same in different aspects, scientists have provided many solutions in the literature. The most of the algorithms suffer with local optima. Particle swarm optimization (PSO) is a new global optimization technique which has wide applications. It finds the global best solution by simply adjusting the trajectory of each individual towards its own best location and towards the best particle of the swarm at each generation. We have adopted the features of the PSO to solve the Planted Motif Finding Problem and have designed a sequential algorithm. We have performed experiments with simulated data it outperforms MbGA and PbGA. The PMbPSO also applied for real biological data sets and observe that the algorithm is also able to detect known TFBS
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accurately when there are no mutations.

Reference


**Index Terms**

Computer Science

Evolutionary Computation

**Key words**

Motif Finding

Particle Swarm Optimization (PSO)

Swarm Intelligence (SI)

Transcriptional Factor Binding Sites (TFBS)

Planted Motifs