Artificial Intelligence Project

Lie Detection using Eagle strategy

Team No - 5

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Problem Statement :

Given the values of the readings of the instruments used in a lie detector test, predict the truth value of the answer given by the user using eagle strategy.

Abstract:

Eagle strategy is a metaheuristic strategy for optimization.It uses a combination of crude global search and intensive local search employing

different algorithms to suit different purposes. The strategy first explores the search space globally using random walk, if it finds a promising solution, then an intensive local search is employed using a more efficient local search is employed. It provides a tradeoff between global search which is often slow and a fast local search.It also provides the ability to use different algorithms at different stages.

Implementation:

We have two implementations of the eagle strategy one using a combination of levy flight random exploration and hill climbing local search.The second using the mlrose library implementation of the random hill climbing and simulated annealing both with multiple repetitions with random weights.

(i) Exploration and exploitation :

In the first approach we initially assign random weights to the neural network. Then we do exploration by performing multiple iterations and at each iteration setting random weights to the model and checking the accuracy of the model. The set of weights with the best accuracy is then used for exploitation.

(ii) mlrose library

1.random hill climbing

We used the random hill climbing implementation of the mlrose and ran it multiple times with random weights. Provides 94% accuracy on test data and executes in under 15 secs

2.Simulated annealing:

We used the simulated annealing implementation of the mlrose library. Provides 94% test accuracy and executes in under 7 secs.

3. Gradient descent :

We used the Gradient descent implementation of the mlrose library.Provides 98% accuracy on the test data and executed in under 7 secs