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FACULTY OF EGINEERING AND TECHNOLOGY

LECTURE -28

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OUTLINE

- Application of soft computing
- Application of Soft Computing in Forecasting Wave Height
- Optimization of travelling salesman problem using Genetic Algorithm
- References
- MCQ

1. Application of Soft Computing in Forecasting Wave Height

Wave height forecasting is very important for coastal management and offshore operations. In this case study, the accuracy and performance of three soft computing techniques [i.e., Multi-Layer Perceptron (MLP), Radial Basis Function Neural Network (RBFNN) and Adaptive Neuro Fuzzy Inference System (ANFIS)] were assessed for predicting significant wave height. Using different combinations of parameters, the prediction was done over a few or a two days' time steps from measured buoy variables in the Caspian Sea (case study: Anzali). The data collection period was from 03.01.2017 to 06.01.2017 with 30-minute intervals.

1. Application of Soft Computing in Forecasting Wave Height

The performance of different models was evaluated with statistical indices such as root mean squared error (RMSE), the fraction of variance unexplained (FVU), and coefficient of determination (R2). Different simulations of performance assessment showed that the ANFIS techniques with requirements of past and current values of atmospheric pressures and height waves has more accuracy than the other techniques in the specified time and location. Meanwhile, in high lead times, the friction velocity decreases the accuracy of wave height forecasting.

2. Optimization of travelling salesman problem using Genetic Algorithm

Genetic algorithms are heuristic search algorithms inspired by the process that supports the evolution of life.

Phases of genetic algorithm

I. Creating initial population.

II. Calculating fitness.

III. Selecting the best genes.

IV. Crossing over.

V. Mutating to introduce variations.

2. Optimization of travelling salesman problem using Genetic Algorithm

1. Initialize the population randomly.
2. Determine the fitness of the chromosome.
3. Until done repeat:

- ✓ Select parents.
- ✓ Perform crossover and mutation.
- ✓ Calculate the fitness of the new population.
- ✓ Append it to the gene pool.

MULTIPLE CHOICE QUESTION

1. Choose the correct statement for the lambda ZAP vector.

a) It is not based on bacteriophage lambda

b) It contains a region that can be excised in vivo

c) The excision leads to the formation of bluescript plasmids and it contains an initiator region only

d) The multiple cloning site is not flanked by the initiator and the terminator region

2. The initiator is recognized by which gene?

a) Gene I

b) Gene I and II

c) Only gene II

d) Gene III

3. Choose the incorrect statement for the replication process.

a) The initiator site is nicked and replication of one strand is started

b) Replication takes place in both the directions

c) Replication continues through the bluescript

d) It is stopped at the terminator and then again a nick is made

4. Which of the following doesn't takes place after replication?

a) The single stranded sequence is generated

b) It is circularized to form closed single stranded molecule

c) It may circularize or remain linear

d) The double stranded molecule can be synthesized by cellular DNA synthesis

View Answer

5. Choose the correct statement for cosmids.

a) It can be regarded as lambda substitution vector

b) Less amount of phage DNA is deleted

c) Only cos packaging sites are left

d) It doesn't contains a origin of replication

View Answer

REFERENCES

- http://ijcoe.org/article-1-136-en.html
- https://shodhganga.inflibnet.ac.in/bitstream/10603/41504/12/12_chapter%202.pdf