Reg. No. :

Question Paper Code: 92072

M.E. DEGREE EXAMINATION, MAY 2014.

Elective

VLSI Design

01PVL516 - NEURAL COMPUTING

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Draw the back propagation model of the network.

2. Develope a perceptron network to implement an AND function.

3. What is Simulated Annealing?

4. List the advantages of AN associative memory.

5. What is SOM?

6. Is it acceptable to initialize the weight vectors on an SOM unit to random, unnormalized values? Validate the answer.

7. State the significance of resonance in ART network.

8. Write the activation function in ART2 network.

9. What is the function of optical neural network?

10. Distinguish between simple cells and complex cells, in a Neo - cognitron architecture.

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Explain in detail about the biological neuron and state the important characteristics of Artificial Neural Networks. (10)

    (ii) Derive the back propagation algorithm. (4)

Or

    (b) (i) Discuss briefly the various types of activation function and learning rule in neural networks. (10)

    (ii) Optimize the weight value and solve the XOR problem using multilayer perceptron. (4)

12. (a) (i) Assume the three memories of five dimensions as follows are to be stored in a Hopfield model. Find the weight structure.

    $I1 = \{1, 1, 1, 1, 1\}$, $I2 = \{1, -1, -1, 1, -1\}$ and $I3 = \{-1, 1, -1, -1, -1\}$ (10)

    (ii) How Hopfield networks differ from other neural networks. (4)

Or

    (b) Describe how simulated annealing concept is used in Boltzmann machine to reach global minimum. (14)

13. (a) Describe Instar and Outstar model and explain how the CPN can be used to classify images into categories. (14)

Or

    (b) Illustrate with an example the SOM learning algorithm and give its applications. (14)

14. (a) How do ART systems solve the stability plasticity dilemma? Also explain the architecture of ART – 1 model and its computation. (14)

Or

    (b) Explain the structure and the training algorithm of ART 2 neural network. (14)

15. (a) With neat diagram explain the Neo - cognitron architecture. (14)

Or

2

92072

(b) (i) What is Cognitron and Neo – cognitron? (4)

(ii) With suitable diagram explain the S - cell and C-cell processing algorithm of Neo - cognitron. (10)

PART - C (1 x 10 = 10 Marks)

16. (a) Illustrate with suitable example the Bidirectional Associative memory model. (10)

Or

(b) Explain any one of the applications of neural network with real world problems. (10)

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