PVP 22

ARTIFICIAL NEURAL NETWORKS

22ECMC1T5C **Credits: 4**
Lecture: 4 periods/week **Internal Assessment: 40 marks**
Semester end examination: 60 marks

Prerequisites: Linear Algebra, Statistics and Probability

Course Outcomes:
At the end of the course student will be able to:

- Understand fundamentals principles of artificial neural networks
- Develop back propagation algorithm for various neural networks problems
- Apply the principles and techniques of artificial neural networks for implementation of different digital systems using various neural network models
- Analyze the given pattern to match with the one of the patterns stored in the memory

UNIT I

Artificial Neural Networks: Basic Concepts: Introduction, Computation in terms of patterns, The McCulloch-Pitts Neural Model, The Perceptron, Neural Network Architectures, Activation Functions, Learning by Neural Nets

UNIT II

Pattern Classifiers: Hebb Nets, Perceptrons, Adaline, Madaline

Patern Associators: Auto-associative Nets, Hetero-Associative Nets, Hopfield Networks, Bi-directional Associative Memory

UNIT III

Competitive Neural Nets: The MAXNET, Kohonen's Self Organizing Map (SOM), Learning Vector Quantization (LVQ), Adaptive Resonance Theory (ART)

Back propagation: Multilayer Feed Forward Net, Generalized Delta Rule, Back Propagation Algorithm

UNIT IV

Applications Of Neural Networks: Applications of Neural Networks in Forecasting, Applications of Neural Networks in Healthcare, Applications of Neural Networks in Business, Applications of Neural Networks in image processing and compression, Applications of Neural Networks in control systems, Applications of Neural Networks in pattern recognition

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Learning Recourses

Text Book

1. Samir Roy and Udit Chakraborty, “Introduction to Soft Computing”, Pearson Publications, 2013
2. S N Sivanandam, S Sumathi, S N Deepa, “Introduction to Neural Networks using Matlab 6.0”, Tata McGraw Hill Publications, 2008

References

1. Jang J.S.R., Sun C.T., Mizutani E., “Neuro-Fuzzy and Soft Computing”, Prentice Hall, 1997
2. Hertz J., “Introduction to the Theory of Neural Computing”, Addison-Wesley, 1991

Web Resources

1. https://nptel.ac.in/courses/117/105/117105084/

2. https://ocw.mit.edu/courses/brain-and-cognitive-sciences/9-641j-introduction-to-neural-networks-spring-2005/