CS 571

NEURAL NETWORKS

UNIT -I

Introduction: Concept of a Neural Network. Human Brain. Models of a Neuron. Neural Networks Viewed as Directed Graphs. Feedback. Neural Network Architectures. Knowledge Representation. Artificial Intelligence and Neural Networks. History of Neural Networks.

UNIT-II

Learning processes: Introduction. Error-Correction Learning. Memory-Based Learning. Hebbian Learning, Competitive Learning. Boltzmann Learning. Credit Assignment Problem. Learning with a Teacher. Learning without a Teacher.

UNIT-III

Single Layer Perceptrons: Introduction. Least-Mean-Square Algorithm. Learning Curves. Learning Rate Annealing Schedules Perceptron. Perceptron Convergence Theorem.

UNIT-IV

Multilayer Perceptrons: Introduction. Some Preliminaries. Back-Propagation Algorithm. Summary of the. Back-Propagation Algorithm. XOR Problem. Virtues and limitations of Back-Propagation learning.

UNIT -V

Neurodynamics' Introduction. Dynamical Systems. Stability of eqilibrium States. Attractors Neurodynamical Models. Manipulation of Attractors as a Recurrent Network Paradigm. Hopfield Models. Cohen-Grossberg Theorem.

Suggested Reading :

1. Simon Haykin: "Networks Networks - A Comprehensive Foundation", Pearson Education 2nd Edition, 2001.
2. Jacek M.Zurada "Introduction to Artificial Neural Systems", Jaico Publishing House.