ARTIFICIAL NEURAL NETWORKS

UNIT I :INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS : Introduction, Artificial Neural Networks, Historical Development of Neural Networks, Biological Neural Networks, Comparison Between Brain and the Computer, Comparison Between Artificial and Biological Neural Networks, Network Architecture, Setting the Weights, Activation Functions, Learning Methods.

UNIT II :FUNDAMENTAL MODELS OF ARTIFICIAL NEURAL NETWORKS: Introduction, McCulloch Pitts Neuron Model, Architecture, Learning Rules, Hebbian Learning Rule, Perceptron Learning Rule, Delta Learning Rule (Widrow-Hoff Rule or Leastmean Squre (LMS) rule, Competitive Learning Rule, Out Star Learning Rule, Boltzmann Learning, Memory Based Learning.

UNIT III :FEED FORWARD NETWORKS : Introduction, Single Layer Perceptron Architecture, Algorithm, Application Procedure, Perception Algorithm for Several Output Classes, Perceptron Convergence Theorem, Brief Introduction to Multilayer Perceptron networks, Back Propagation Network (BPN), Generalized Delta Learning Rule, Back Propagation rule, Architecture, Training Algorithm, Selection of Parameters, Learning in Back Propagation, Application Algorithm, Local Minima and Global Minima, Merits and Demerits of Back Propagation Network, Applications, Radial Basis Function Network (RBFN), Architecture, Training Algorithm for an RBFN with Fixed Centers.

UNIT IV: ADALINE AND MADALINE NETWORKS: Introduction, Adaline Architecture, Algorithm, Applications, Madaline, Architecture, MRI Algorithm, and MRII Algorithm.

UNIT V :COUNTER PROPAGATION NETWORKS : Winner Take all learning, out star learning, Kohonen Self organizing network, Grossberg layer Network, Full Counter Propagation Network (Full CPN), Architecture, Training Phases of Full CPN, Training Algorithm, Application Procedure, Forward Only counter Propagation Network, Architecture, Training Algorithm, Applications, Learning Vector Quantizer (LVQ).

UNIT VI: ASSOCIATIVE MEMORY NETWORKS - I: Types, Architecture, Continuous and Discrete Hopfield Networks, Energy Analysis, Storage and Retrival Algorithms, Problems with Hopfield Networks.

UNIT VII: ASSOCIATIVE MEMORY NETWORKS II : Boltzman Machine, Bidirectional Associative Memory, Adaptive Resonance Theory Networks Introduction, Architecture, Algorithm.

UNIT VIII: APPLICATIONS OF NEURAL NETWORKS: Implementation of A/D Converter using Hopfield Network, Solving Optimization Problems, Solving Simultaneous Linear Equation, Solving Traveling Salesman Problems uses Hopfield Networks, Application in Pattern Recognition, Image Processing.

TEXTBOOKS: 1.Introduction to Artificial Neural Systems - J.M.Zurada, Jaico Publishers, 3rd Edition.

2. Introduction to Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa, TMH.

REFERENCES:

1. Elements of Artificial Neural Networks - Kishan Mehrotra, Chelkuri K. Mohan, and Sanjay Ranka, Penram International.

2. Artificial Neural Network Simon Haykin, Pearson Education, 2nd Ed.

3. Fundamental of Neural Networks Laurene Fausett, Pearson, 1st Ed.





























































 















 











 









