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Neural Network Syllabus - AKTU 2019

Unit 1 - **Neurocomputing & Neuroscience**

1. Historical notes
2. Human brain
3. Neuron models
4. Knowledge representation
5. AI and NN
6. Learning process: Supervised and Unsupervised
7. Error correction learning
8. Competitive learning
    - Adaptive Resonance Theory
    - Self-organising map and SOM algorithm

Unit 2 - **Data Processing Scaling**

1. Normalisation
2. Principle Component Analysis
3. Regression
4. Eigven values and eigen vectors
5. Basic models of artificial neurons
6. Activation functions
7. Multilayer perceptron
8. LMS algorithm
9. Delta learning rule & Gradient descent rule
10. Nonlinearly seperable problems in NN

Unit 3 - **Multilayered Network Architecture**

1. Backpropagation algorithm
2. Approximation properties of RBF networks
3. Comparison of RBF network with multilayer perceptron
4. Adaline network
5. Madeline network

Unit 4 - **RNN & Temporal Feedforward Network**

1. Independent component analysis
2. Associative memory

    - Hetero-associative
    - Auto-associative
3. Hopfield network

Unit 5 - **Complex valued NN & Complex valued BP**

1. Soft computing
2. Fuzzy logic
3. Genetic algorithm

Combined notes:

- Link 1
- Link 2

Separate notes:

Unit 1 - **Neurocomputing & Neuroscience**

Topic Name	Links
Human brain	Link 1
Neuron models	Link 1
Knowledge representation	Link 1
Learning process: Supervised and Unsupervised	Link 1
Error correction learning	Link 1
Competitive learning	Link 1 Link 2 Link 3

Unit 2 - **Data Processing Scaling**

Topic Name	Links
Principle Component Analysis	Link 1
Regression	Link 1
Eigven values and eigen vectors	Link 1
Basic models of artificial neurons	Link 1
Activation functions	Link 1
Multilayer perceptron	Link 1
LMS algorithm	Link 1

Topic Name	Links
Delta learning rule & Gradient descent rule	Link 1 Link 2

Unit 3 - **Multilayered Network Architecture**

Topic Name	Links
Backpropagation algorithm	Link 1
Approximation properties of RBF networks	Link 1
Comparison of RBF network with multilayer perceptron	Link 1
Adaline network	Link 1 Link 2
Madeline network	Link 1 Link 2

Unit 4 - **RNN & Temporal Feedforward Network**

Topic Name	Links
Independent component analysis	Link 1 Link 2
Associative memory	Link 1
Hopfield network	Link 1 Link 2

Unit 5 - **Complex valued NN & Complex valued BP**

Topic Name	Links
Soft computing	Link 1
Fuzzy logic	Link 1
Genetic algorithm	Link 1 Link 2