AURO UNIVERSITY
(INDIA)

The School of Information Technology

Program Handbook

Online Short-Term Certificate
in
Artificial Intelligence-Fuzzy Logic and Neural Networks

Module Leader
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Course Objective: This subject introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks. Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components. The Neural Network and Fuzzy Network system application

The principal objective of this subject is to introduce students to neural networks and fuzzy theory from an engineering perspective.

Fuzzy Logic Inference System can assessed for Identification and Prevention of Coronavirus (COVID-19). Nowadays Novel Coronavirus named COVID-19 becomes major health concern causing severe health issue in human beings and it becomes a pandemic. A kind of zoonotic means it can transmit animals to humans. It may spread via polluted hands or metals. No specific treatment is available so far for COVID-19, so initial identification and preventions for COVID-19 will be crucial to control or to break down the chain of COVID-19. For this purpose, we can have fuzzy inference system to diagnose the COVID-19 disease by taking six input factor like as; Ethanol, Atmospheric Temperature (AT), Body Temperature (BT), Breath Shortness (BS), Cough and Cold and the output factor has divided into three linguistic categories which denotes the severity level of the infected patients.

Subject learning objectives (SLOs)

Upon successful completion of this subject students should be able to:

1. Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.

2. Explore the functional components of neural network classifiers or controllers, and the functional components of fuzzy logic classifiers or controllers.

Develop and implement a basic trainable neural network or a fuzzy logic system for a typical control, computing application or biomedical application.

Curriculum:

Unit-I Fundamentals of Artificial Intelligence:

Overview of AI concepts and workflows , What is Intelligence , What do we need to be an Intelligent?,CAN MACHINES THINKS" ?
What does Machine need to be an Intelligent? , What's involved in Intelligence? , Goals in AI, AI vs Machine Learning vs Deep Learning vs Neural Network, Machine Learning Vs Deep Learning, Cool things AI is doing now. Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence ,Intelligent Agents, Structure of Intelligent Agents. Computer vision, Introduction to Natural Language Processing.

Unit-II Fundamentals of Artificial Intelligence :

Artificial Intelligence Intelligent Agents, Structure of Intelligent Agents. Computer vision, Introduction to Natural Language Processing.

Unit-III Introduction to Neural Network and ANN (1.5 Hours):

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, Historical Developments, Potential Applications of ANN.

Unit-IV Introduction to Neural Network and ANN:

Artificial Neuron Model, Operations of Artificial Neuron, Neural Dynamics (Activation and Synaptic) Learning Strategy (Supervised, Unsupervised, Reinforcement). Introduction to Fuzzy Logic :

Introduction to fuzzy logic, Fuzzy Logic - Classical Set Theory, Fuzzy Logic - Set Theory , Fuzzy Logic - Membership Function, Fuzzy relation- Fuzzification–Defuzzification, Fuzzy Logic - Inference System. **Introduction to Fuzzy Logic :**Fuzzy Logic database and queries, Fuzzy Logic - Control System, Fuzzy Logic Applications.

Course Plan:

Day	Topic	Duration	Assessment
1	**Fundamentals of Artificial Intelligence:** We will learn about AI for beginners provides an overview of AI concepts and workflows , What is Intelligence , What do we need to be an Intelligent? , CAN MACHINES THINKS" ? What does Machine need to be an Intelligent? , What's involved in Intelligence? , Goals in AI, AI vs Machine Learning vs Deep Learning vs Neural Network, Machine Learning Vs Deep Learning, Cool things AI is doing now.	1:30	**MCQ QUIZ**
2	**Fundamentals of Artificial Intelligence:** We will learn about Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence ,Intelligent Agents, Structure of Intelligent Agents. Computer vision, Introduction to Natural Language Processing.	1:30	
3	**Fundamentals of Artificial Intelligence:** Artificial Intelligence Intelligent Agents, Structure of Intelligent Agents. Computer vision, Introduction to Natural Language Processing	1:30	**MCQ QUIZ**
4	**Introduction to Neural Network and ANN:** Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, , Historical Developments, Potential Applications of ANN.	1:30	
5	**Introduction to Neural Network and ANN:** Artificial Neuron Model, Operations of Artificial Neuron, Neural Dynamics (Activation and Synaptic) Learning Strategy (Supervised, Unsupervised, Reinforcement).	1:30	**MCQ QUIZ**
6	**Introduction to Fuzzy Logic:** Introduction to fuzzy logic, Fuzzy	1:30	

	Logic - Classical Set Theory, Fuzzy Logic - Set Theory , Fuzzy Logic - Membership Function, Fuzzy relation- Fuzzification–Defuzzification, Fuzzy Logic - Inference System.		
7	**Introduction to Fuzzy Logic and Revision and Assessment:** Fuzzy Logic database and queries, Fuzzy Logic - Control System, Fuzzy Logic Applications.	1 hour	