

TENSORFLOW COURSE CONTENTS (5 DAYS)

By Dr. Vishwanath Rao

Introduction to Deep Learning

- Deep Learning: A revolution in Artificial Intelligence
- Limitations of Machine Learning
- What is Deep Learning?
- Advantage of Deep Learning over Machine learning
- 3 Reasons to go for Deep Learning
- Real-Life use cases of Deep Learning
- Review of Machine Learning: Regression, Classification, Clustering, Reinforcement Learning,

Underfitting and Overfitting, Optimization

Understanding Neural Networks with TensorFlow

- How Deep Learning Works?
- Activation Functions

Illustrate Perceptron

- Training a Perceptron
- Important Parameters of Perceptron
- What is TensorFlow?
- TensorFlow code-basics
- Graph Visualization
- Constants, Placeholders, Variables
- Creating a Model

Deep dive into Neural Networks with TensorFlow

- Understand limitations of a Single Perceptron
- Understand Neural Networks in Detail
- Illustrate Multi-Layer Perceptron
- Backpropagation – Learning Algorithm
- Understand Backpropagation – Using Neural Network Example
- MLP Digit-Classifer using TensorFlow
- TensorBoard

Master Deep Networks

- Why Deep Networks
- Why Deep Networks give better accuracy?
- Use-Case Implementation on SONAR dataset
- Understand How Deep Network Works?
- How Backpropagation Works?
- Illustrate Forward pass, Backward pass
- Different variants of Gradient Descent
- Types of Deep Networks

Convolutional Neural Networks (CNN)

- Introduction to CNNs
- CNNs Application
- Architecture of a CNN
- Convolution and Pooling layers in a CNN
- Understanding and Visualizing a CNN

Recurrent Neural Networks (RNN)

- Introduction to RNN Model
- Application use cases of RNN
- Modelling sequences
 - Training RNNs with Backpropagation
 - Long Short-Term Memory (LSTM)
 - Recursive Neural Tensor Network Theory
 - Recurrent Neural Network Model

Restricted Boltzmann Machine (RBM) and Autoencoders

- Restricted Boltzmann Machine
- Applications of RBM
- Collaborative Filtering with RBM
- Introduction to Autoencoders
- Autoencoders applications
- Understanding Autoencoders

Keras API

- Define Keras
- How to compose Models in Keras
- Sequential Composition
- Functional Composition
- Predefined Neural Network Layers
- What is Batch Normalization
- Saving and Loading a model with Keras
- Customizing the Training Process
- Using TensorBoard with Keras
- Use-Case Implementation with Keras

TFLearn API

- Define TFLearn
- Composing Models in TFLearn
- Sequential Composition
- Functional Composition
- Predefined Neural Network Layers
- What is Batch Normalization
- Saving and Loading a model with TFLearn
- Customizing the Training Process
- Using TensorBoard with TFLearn
- Use-Case Implementation with TFLearn