Tensorflow Training Course Content

SECTION 1: INTRODUCTION TO DEEP LEARNING WITH TENSORFLOW

- Deep Learning: A revolution in Artificial Intelligence
- Limitations of Machine Learning
- Discuss the idea behind Deep Learning
- An advantage of Deep Learning over Machine learning
- 3 Reasons to go Deep
- Real-Life use cases of Deep Learning
- Scenarios where Deep Learning is applicaScalarsble
- The Math behind Machine Learning: Linear Algebra
- Scalars
- Vectors
- Matrices
- Tensors
- Hyperplanes
- The Math Behind Machine Learning: Statistics
- Probability
- Conditional Probabilities
- Posterior Probability
- Distributions
- Samples vs Population
- Resampling Methods
- Selection Bias
- Likelihood
- Review of Machine Learning Algorithms
- Regression
- Classification
- Clustering
- Reinforcement Learning
- Underfitting and Overfitting
- Optimization
- Convex Optimization

SECTION 2: FUNDAMENTALS OF NEURAL NETWORKS

- Defining Neural Networks
- The Biological Neuron
- The Perceptron
- Multi-Layer Feed-Forward Networks
- Training Neural Networks
- Backpropagation Learning
- Gradient Descent
- Stochastic Gradient Descent
- Quasi-Newton Optimization Methods
- Generative vs Discriminative Models
- Activation Functions
- Linear
- Sigmoid
- Tanh
- Hard Tanh
- Softmax
- Rectified Linear
- Loss Functions
- Loss Function Notation
- Loss Functions for Regression
- Loss Functions for Classification
- Loss Functions for Reconstruction
- Hyperparameters
- Learning Rate
- Regularization
- Momentum
- Sparsity

SECTION 3: FUNDAMENTALS OF DEEP NETWORKS

- Defining Deep Learning
- Defining Deep Networks
- Common Architectural Principals of Deep Networks
- Reinforcement Learning application in Deep Networks
- Parameters
- Layers
- Activation Functions – Sigmoid, Tanh, ReLU
- Loss Functions
- Optimization Algorithms
- Hyperparameters

SECTION 4: INTRODUCTION TO TENSORFLOW

- What is TensorFlow?
- Use of TensorFlow in Deep Learning
- Working of TensorFlow
- How to install Tensorflow
- HelloWorld with TensorFlow
- Running a Machine learning algorithms on TensorFlow

SECTION 5: 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
- Transfer Learning and Fine-tuning Convolutional Neural Networks

SECTION 6: RECURRENT NEURAL NETWORKS (RNN)

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

SECTION 7: RESTRICTED BOLTZMANN MACHINE(RBM) AND AUTOENCODERS

- Restricted Boltzmann Machine
- Applications of RBM
- Collaborative Filtering with RBM
- Introduction to Autoencoders
- Autoencoders applications
- Understanding Autoencoders
- Variational Autoencoders
- Deep Belief Network

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