



## Deep Learning Course

### **COURSE DESIGN**

High-quality videos, slides, hands-on examples, quizzes, automated assessments, case studies, and real-world projects.

### **COURSE MATERIAL**

Lifetime access to cutting-edge self-paced learning content.

### **LAB**

90 days Lab

### **SUPPORT**

Email support to answer your queries and we've also launched Discussions - a Q&A site for Artificial Intelligence, Machine Learning, Deep Learning, Big Data & Data Science professionals.

### **CERTIFICATE**

Earn a certificate in Deep Learning.

### **SELF PACED LEARNING**

Lifetime access to the recordings of a previous batch of instructor-led training, assessments, quizzes, and projects



## Course Syllabus

### **Introduction to Deep Learning**

- Deep Learning Applications,
- Artificial Neural Network,
- Tensorflow Demo,
- Deep Learning Frameworks

### **Tensorflow**

- Installation,
- Creating Your First Graph and Running it in a Session,
- Managing Graphs,
- Lifecycle of a Node Value,
- Linear Regression With Tensorflow,
- Implementing Gradient Descent,
- Feeding Data to the Training Algorithm,
- Saving and Restoring Models,
- Visualizing the Graph and Training Curves Using Tensorboard,
- Name Scopes, Modularity,
- Sharing Variables

### **Introduction to Artificial Neural Networks**

- from Biological to Artificial Neurons,
- Training an Mlp With Tensorflow's High-level Api,

- Training a Dnn Using Plain Tensorflow,
- Fine-tuning Neural Network Hyperparameters

### **Training Deep Neural Nets**

- Vanishing / Exploding Gradients Problems,
- Reusing Pretrained Layers,
- Faster Optimizers,
- Avoiding Overfitting Through Regularization,
- Practical Guidelines

### **Convolutional Neural Networks**

- the Architecture of the Visual Cortex,
- Convolutional Layer,
- Pooling Layer,
- Cnn Architectures

### **Recurrent Neural Networks**

- Recurrent Neurons,
- Basic Rnns in Tensorflow,
- Training Rnns,
- Deep Rnns,
- Lstm Cell,
- Gru Cell,
- Natural Language Processing

### **Autoencoders**

- Efficient Data Representations,
- Performing Pca With an Undercomplete Linear Autoencoder,
- Stacked Autoencoders,

- Unsupervised Pre-training Using Stacked Autoencoders,
- Denoising Autoencoders,
- Sparse Autoencoders,
- Variational Autoencoders

## **Reinforcement Learning**

- Learning to Optimize Rewards,
- Policy Search,
- Introduction to Openai Gym,
- Neural Network Policies,
- Evaluating Actions: the Credit Assignment Problem,
- Policy Gradients,
- Markov Decision Processes,
- Temporal Difference Learning and Q-learning,
- Learning to Play Ms. Pac-man Using Deep Q-learning

## **Projects**

### 1. Build a spam classifier

Build a model to classify email as spam or ham. First, download examples of spam and ham from Apache SpamAssassin's public datasets and then train a model to classify email.

### 2. Build cats classifier using neural network

In this project, you will build a basic neural network to classify if a given image is of cat or not.

### 3. Classify large images using Inception v3

Download images of various animals and then download the latest pretrained Inception v3 model. Run the model to classify downloaded images and display the top five predictions for each image, along with the estimated probability.

#### 4. Classify clothes using TensorFlow

Build a model to classify clothes into various categories in Fashion MNIST dataset.

#### 5. Predict the hourly rain gauge total

This is a time series prediction task: you are given snapshots of polarimetric radar values and asked to predict the hourly rain gauge total.