CLOUD x LAB

eict
IIT Roorkee

CERTIFICATE PROGRAM

Machine Learning Specialization

Online Self Paced Course | 130+ Hours of Training

CloudxLab & Course

At Cloudxlab, we are building one of the best gamified learning environments to make technology learning fun and for life. More than 50,000 users across the world have been benefited by our signature courses on Machine Learning and Big Data. Our vision is to upskill people on high-end technologies like Deep Learning, Machine Learning, Big Data and make them employable.

Every domain of computing such as data analysis, software engineering, and artificial intelligence is going to be impacted by Machine Learning. Therefore,every engineer, researcher, manager or scientist would be expected to know Machine Learning.

So naturally, you are excited about Machine learning and would love to dive into it. This specialization is designed for those who want to gain hands-on experience in solving real-life problems using machine learning and deep learning. After finishing this specialization, you will find creative ways to apply your learning to your work like building a robot which can recognize faces or change the path after discovering obstacles on the path.

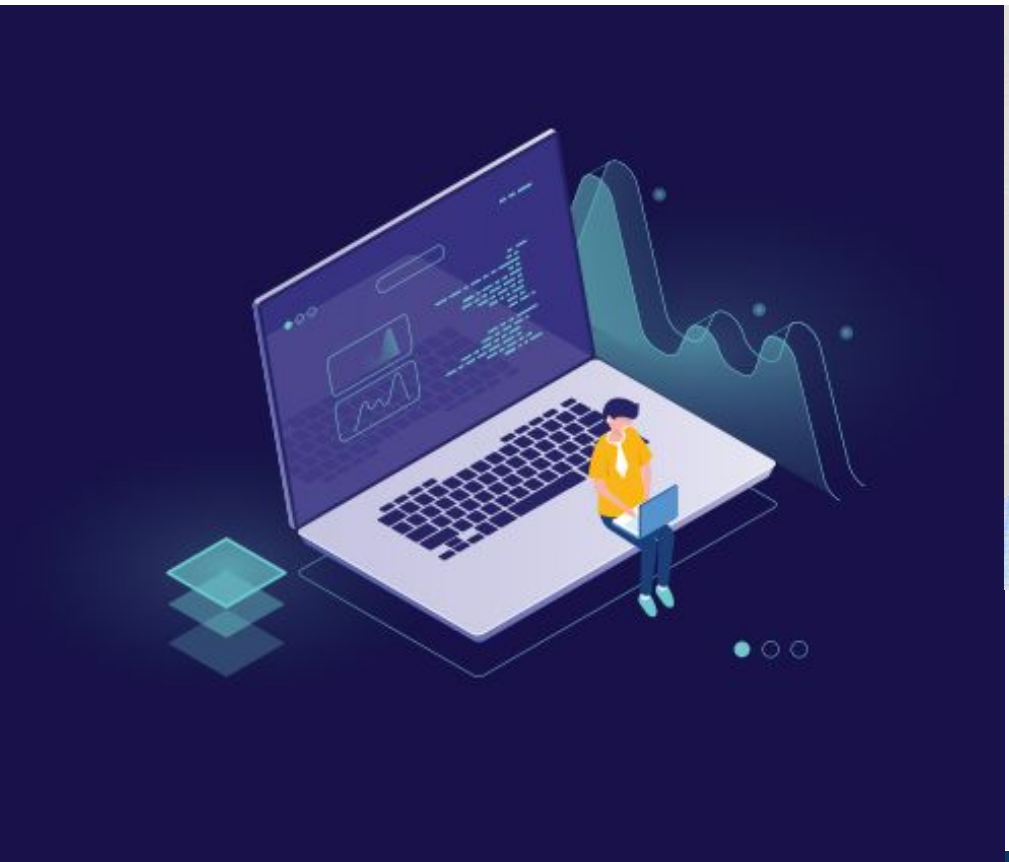
Sandeep Giri

Founder at CloudxLab

About E&ICT Academy, IIT Roorkee

E&ICT Academy, IIT Roorkee provides training programs with an emphasis on hands-on learning in basic/advanced topics and emerging technologies. Then project is sponsored by the Ministry of Electronics and Information Technology, Govt. of India. E&ICT Academy courses are at par with Quality Improvement Program (QIP) for recognition/credits.

The programs are conducted by well-known industry partners, researches and experts from leading academic and renowned R&D organizations. For this, the Academy has signed MoUs with Industry/ R&D partners in different domains, who collaborate and work with them in conducting the training programs. Academy also facilitates the interaction between beneficiaries and industry experts to enable collaboration and finding opportunities for parent institutions.

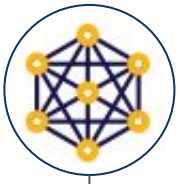


Sanjeev Manhas

Associate Professor IIT Roorkee

Why CloudxLab

Earn a certificate from E&ICT Academy, IIT Roorkee.



Learn Machine Learning from industry experts and become expert in Machine Learning domain

Online cloud lab for hands-on for real-world experience

Best-in-class support Throughout your learning journey

Lifetime course access

Work on real-world projects.

Interact with the international community of peers via the discussion forum.

Course Creators

Sandeep Giri

Founder at CloudxLab

Past: Amazon, InMobi, D.E.Shaw

Course Developer

Know More

Sanjeev Manhas

Associate Professor,

IIT Roorkee

Course Advisor

Know More

R. Balasubramanian

Professor,

IIT Roorkee

Course Developer

Know More

Partha Pratim Roy

Assistant Professor,

IIT Roorkee

Course Developer

Know More

Abhinav Singh

Co-Founder at CloudxLab

Past: Byjus

Course Developer

Know More

Course Curriculum

Course 1: Python For Machine Learning

1. Introduction to Linux
2. Introduction to Python
3. Hands-on using Jupyter on CloudxLab
4. Overview of Linear Algebra
5. Introduction to NumPy & Pandas
6. Quizzes, gamified assessments & projects

Course Curriculum

Course 2: Machine Learning

1. Introduction to Statistics

Statistical Inference, Types of Variables, Probability Distribution, Normality, Measures of Central Tendencies, Normal Distribution

2. Machine Learning Applications & Landscape

Introduction to Machine Learning, Machine Learning Application, Introduction to AI, Different types of Machine Learning - Supervised, Unsupervised, Reinforcement

3. Building end-to-end Machine Learning Project

Machine Learning Projects Checklist, Frame the problem and look at the big picture, Get the data, Explore the data to gain insights, Prepare the data for Machine Learning algorithms, Explore many different models and short-list the best ones, Fine-tune model, Present the solution, Launch, monitor, and maintain the system

4. Classifications

Training a Binary classification, Performance Measures, Confusion Matrix, Precision and Recall, Precision/Recall Tradeoff, The ROC Curve, Multiclass Classification, Multilabel Classification, Multioutput Classification

5. Training Models

Linear Regression, Gradient Descent, Polynomial Regression, Learning Curves, Regularized Linear Models, Logistic Regression

6. Support Vector Machines

Linear SVM Classification, Nonlinear SVM Classification, SVM Regression

Course Curriculum

Course 2: Machine Learning

7. Decision Trees

Training and Visualizing a Decision Tree, Making Predictions, Estimating Class Probabilities, The CART Training Algorithm, Gini Impurity or Entropy, Regularization Hyperparameters, Regression, Instability

8. Ensemble Learning and Random Forests

Voting Classifiers, Bagging and Pasting, Random Patches and Random Subspaces, Random Forests, Boosting, Stacking

9. Dimensionality Reduction

The Curse of Dimensionality, Main Approaches for Dimensionality Reduction, PCA, Kernel PCA, LLE, Other Dimensionality Reduction Techniques

10. Quizzes, gamified assessments & projects

Course Curriculum

Course 3: Deep Learning

1. Introduction to Deep Learning

Deep Learning Applications, Artificial Neural Network, TensorFlow Demo, Deep Learning Frameworks

2. Up and Running with 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

3. 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

4. Training Deep Neural Nets

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

5. Convolutional Neural Networks

The Architecture of the Visual Cortex, Convolutional Layer, Pooling Layer, CNN Architectures

Course Curriculum

Course 3: Deep Learning

6. Recurrent Neural Networks

Recurrent Neurons, Basic RNNs in TensorFlow, Training RNNs, Deep RNNs, LSTM Cell, GRU Cell, Natural Language Processing

7. Autoencoders

Efficient Data Representations, Performing PCA with an Under Complete Linear Autoencoder, Stacked Autoencoders, Unsupervised Pre Training Using Stacked Autoencoders, Denoising Autoencoders, Sparse Autoencoders, Variational Autoencoders

8. 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

9. Quizzes, gamified assessments & projects

Projects

1. Analyze Emails

Churn the mail activity from various individuals in an open source project development team.

2. Predict the median housing prices in California

We start Machine Learning course with this end-to-end project. Learn various data manipulation, visualization and cleaning techniques using various libraries of Python like Pandas, Scikit-Learn and Matplotlib.

3. Classify handwritten digits in MNIST dataset

The MNIST dataset is considered as "Hello World!" of Machine Learning. Write your first classification logic. Starting with Binary Classification learn Multiclass, Multilabel, Multi-output classification and different error analysis techniques.

4. Noise removal from the images

Build a model that takes a noisy image as an input and outputs the clean image.

5. Predict the class of flower in IRIS dataset

IRIS dataset contains 3 classes of 50 instances each, where each class refers to a type of iris plant. The three classes in this dataset are Setosa, Versicolor, and Verginica. Learn Decision Trees, CART algorithm and Ensemble method. Then use Random Forest classifier to make predictions.

6. Predict which passengers survived in the Titanic shipwreck

The sinking of the RMS Titanic is one of the most infamous shipwrecks in history. In this project, you build a model to predict which passengers survived the tragedy.

Projects

7. Predict bikes rental demand

Build a model to predict the bikes demand given the past data.

8. 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.

9. 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.

10. 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.

11. Classify clothes using TensorFlow

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

12. 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.

Course Details and Fees

Please find more information about the course and fees here:
https://cloudxlab.com/course/71/machine-learning-specialization-eict-iitr

Mode of Learning

Online Self-Paced Learning

Our Esteemed Customers

For Further Details

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