2/ 4-Weeks Online Live
FDP | Internship Training | Industrial Training
on
AI, Machine Learning, Deep Learning, Computer Vision, NLP & Chat GPT)

Training Duration:

Duration	Training Hours per day	Total Training Hours
4-Weeks	3-hours (Mon-Friday)	60 Hours
2-Weeks	3-hours (Mon-Friday)	30 Hours

Training Highlights:

10+ AI Projects
will be covered during the training.

Total 60+ Hours (4-weeks)
online Live Training.

Training includes: Assignments, Projects with Code, Training PPT's & Recording.

The certificate of completion will be provided to each participant by Eduxlabs in asscoaition with Mechanica IIT Madras

Certifications:

We offer following type of training certificates

- 2/4 Weeks Training **Completion** Certificate from Eduxlabs in association with Mechanica IIT-M

- 2/4 Weeks **FDP** Certificate of Completion from Eduxlabs association with Mechanica IIT-M

- 2/4 Weeks **Industrial** Certificate of Completion from Eduxlabs association with Mechanica IIT-M

- 2/4 Weeks **Internship** Completion Letter from Eduxlabs (Only for Internship Participants)

2 / 4-WEEKS TRAINING PROGRAM:

4-WEEKS	MODULE	HOURS
1ST-WEEK	• Python Programming from scratch • Data Processing using Python • Data Science fundamental	15-HRS
2ND-WEEK	• Data Analysis using Python • Data Visualisation using Python • Machine Learning Foundation	15-HRS
3RD- WEEK	• Machine Learning Intermediate • Machine Learning Advance • Recommendation Systems • Deep Learning Foundation • Deep Learning Advanced	15-HRS
4TH - WEEK	• Computer Vision • Natural language processing (NLP) • Chat Bots • Time Series	15-HRS

To Know More Visit:

https://www.eduxlabs.com/machinelearning

4-WEEKS - TRAINING PROJECTS COVERED

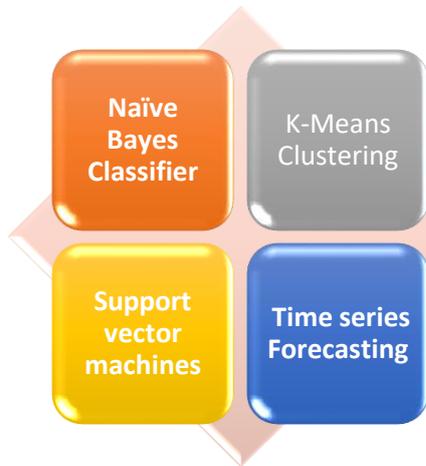|	
2-weeks **MACHINE LEARNING PROJECTS**	**Project 1:** House price prediction using Linear Regression **Project 2:** Diabetics prediction **Project 3:** Customer churn prediction using Decision tree & Random Forest
2-weeks **DEEP LEARNING PROJECTS**	**Project 1:** Bike Sharing Predication of bike rental count hourly or daily based on the environmental and seasonal settings. **Project 2:** Time Series Forecasting (LSTM) and Prediction Curve-Global **Project 3:** ECG Heart Beat Analysis, Visualization and Heart Beat Classification using ANN Classification **Project 4:** Classification of Devanagari Handwritten Characters Classify handwritten Devanagari characters using Neural Network.
COMPUTER VISION PROJECTS **+** **DEEP LEARNING PROJECTS**	**Project 1:** Face and Eye Detection – Using Haar Cascade and Cascade Classifier **Project 2:** Face Recognition using Computer Vision and Deep Learning **Project 3:** Time Series on Flights Passengers Forecasting.
NLP PROJECT **+** **CHABOT PROJECT**	**Project 1:** Amazon Product Reviews Sentiment Analysis **Project 2:** Zomato Restaurant Reviews Sentiment Analysis using LSTM Algorithm **Project 3:** Conventional Chatbot using Open AI, GPT. (Built your ChatBot with OpenAI GPT3)

2/ 4-WEEKS COURSE CONTENT
ON
AI & Machine Learning, Deep Learning, Computer Vison ,NLP & Chabot

2/ 4-Weeks	MODULES
1st – Week **Data Analysis Fundamentals with Python** Python • Pandas • Matplotlib Seaborn	**Module 1: Data Science Fundamentals** • Introduction to Data Science • Introduction to Machine Learning • Artificial Intelligence vs Machine Learning • Benefits of Machine Learning w.r.t. traditional methodologies • Deep Learning - Introduction • How DL is different from all other Machine Learning methods • Supervised and Unsupervised learning • Reinforcement Learning • AI Training & testing flow • Classification and Regression in Supervised Learning • Clustering and Association in Unsupervised Learning • Types of Algorithms • Data Science Flow & Essentials **Module 2: Python Fundamentals [CORE]** • Overview of Python- Starting with Python • Python data types: Primitive • Core built-in data structures – Lists, Tuples, Dictionaries • String, String built-in methods • Data manipulation tools (Operators, Functions, Packages, control structures, Loops, arrays etc) • Loops and Conditional statements • Python UDFs – def keywords • Reading and writing files **Module 3: Data Manipulation With PANDAS** • Concept of Packages/Libraries - Important packages (NumPy, SciPy, Pandas) • Importing Data from various sources (CSV, txt, excel, access etc) • Exporting Data to various formats • Data Manipulation steps (Sorting, filtering, duplicates, merging, appending, sub setting, derived variables, sampling, Data type conversions, renaming, formatting etc) • Scaling and Normalizing data • Pre-processing and Feature Selection.
Data Visualization & EDA	**Module 1: Data Visualization** • Seaborn • Matplotlib • Time series Plot of Covid19 Data • Coronavirus 2019-20 Visualization on World Map

	Module 2: IMPLEMENTATION OF STATS METHODS
	• Basic Statistics - Measures of Central Tendencies and Variance
	• Building blocks - Probability Distributions - Normal distribution
	• Central Tendency, Standard Deviation
	• Quartiles, IQR, Boxplot, Outliers
	• Skewness, Kurtosis

2nd – Week

MACHINE LEARNING FOUNDATION REGRESSION

•LINEAR REGRESSION	LOGISTIC REGRESSION
DECISION TREE	K- Nearest Neighbours

Module 1: LINEAR REGRESSION
- Regression Problem Analysis
- Mathematical modelling of Regression Model
- L1 & L2 Regularization
- Cost Function
- Optimizers - Gradient Descent Algorithm
- Parameters & Hyperparameters
- Cost Function & Cost Optimizer: Gradient Descent Algorithm
- R Squared & Adj. Squared
- Univariate Linear Regression Model
- Polynomial Linear Regression
- Multivariate Regression Model
- Model Predictions, Model Accuracy, Graphical Plotting

Module 2: LOGISTIC REGRESSION
- Assumptions
- Logit Transformation
- Hypothesis – Sigmoid Equation, Logistic Equation
- Odds Ratio and Interpretation
- Model Specification
- Prediction Probability
- Model Parameter Significance Evaluation
- Model Optimization of threshold value
- Confusion Matrix, Precision, Recall, F1-Score, ROC Curve, Classification report

Module 3: DECISION TREE & RANDOM FOREST ALGORITHM
- Concept and Working Principle
- Mathematical Modelling
- Optimization Function Formation
- Analysis of Classification Problem case
- Math: Role of Entropy, Gini Index and Information Gain in Decision Trees
- Decision Trees – ID3
- Overfitting and Pruning
- Plotting Tree
- Random Forest

Module 4: KNN (K- Nearest Neighbours)
- K- Nearest Network – Introduction
- How does the KNN algorithm work?
- Methods of calculating distance between points
- Methods to choose the K
- GridSearchCV

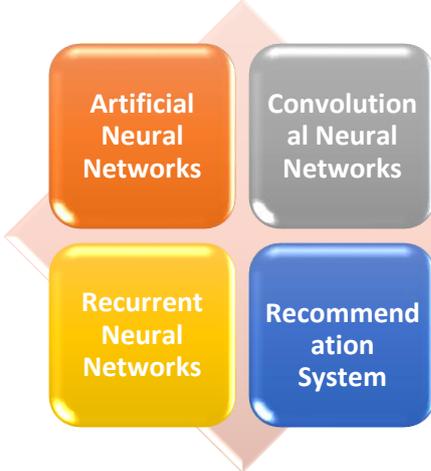|	
3rd – Week: **MACHINE LEARNING INTERMEDIATE** Naïve Bayes Classifier — K-Means Clustering Support vector machines — Time series Forecasting	**Module 1: Naïve Bayes Classifier** • Bayesian Classification • How Naive Bayes algorithm works? • Naive Bayes Application – Binary Class & Multi-Class Classification • Gaussian Naive Bayes • Multinomial Naive Bayes **Module 2: CLUSTERING – K-MEANS and Hierarchical** • Unsupervised Learning • Clustering Introduction • K-Means Clustering • Handling K-Means Clustering • Maths behind KMeans Clustering – Centroids • Mean shift Introduction • Elbow Method – Picking K in K-Means • Hierarchical Clustering • Types – Agglomerative and Divisive • Dendrogram **Module 3: Support vector machines (S V M)** • Concept and Working Principle • Mathematical Modelling • Linear Support Vector Machine • Hyperplanes • Optimal separating hyperplane • Drawing Margins • Optimization Function Formation • The Kernel Method and Nonlinear Hyperplanes
MACHINE LEARNING ADVANCE	**Module 1: Time series Forecasting** • Time Series - Introduction • Techniques and applications • Components of Time Series Forecasting • Moving average, Smoothing • ARIMA Model • Seasonality in Time Series • Prophet Model **Module 2: Recommendation System** • Association Rule Learning • Components of Apriori algorithm: Support, Confidence, Lift • Market Basket Analysis • Collaborative Filtering **Module 3. Advanced Ensemble Learning** • Random Forest • Bagging • Boosting • Adaboost • XGboost

Artificial Intelligence Foundation	**Module 1: Artificial Neural Networks** • MP Neuron • Perceptron • Logic gates • ANN & Working • Single Layer Perceptron Model • Multilayer Neural Network • Feed Forward Neural Network • Cost Function Formation • Activation Function • Cost Function • Applying Gradient Descent Algorithm • Stochastic Gradient Descent • XOR Logic using MLP **Module 2: TensorFlow** • TensorFlow library for AI • Keras – High Level TensorFlow API • Getting started with TensorFlow • Installation & Setting up TensorFlow • TensorFlow Data Structures • Tensor board – Visualization **Module 3: Regression with ANN** • Learning Algorithm • Linear Regression – Theory • Feature selection - Correlation • Input Matrix & Output Labels • Activation Function • Training A single perceptron • Model Optimizers - Parameters and Hyperparameters • Multiple Linear Regression **Module 4: Classification with ANN** • Logistic Regression – Theory • Classification Problems • Training the model • Binary Class and Multi-Class Classification • Hypothesis, Parameters & Hyperparameters, Cost Function, Model Optimization – Optimizers • Activation Function
4ᵗʰ – Week **Deep Learning**	**Module 1: CNNs (Convolutional Neural Networks)** • Convolutional Neural Network • Understanding the architecture and use-cases of CNN • Pooling Layer • How to visualize using CNN • How to fine-tune a convolutional neural network • What is transfer learning • Kernel filter, Feature maps, and pooling • Deploying convolutional neural networks in TensorFlow

The diagram in the left column shows four boxes: **Artificial Neural Networks**, **Convolutional Neural Networks**, **Recurrent Neural Networks**, **Recommendation System**.

Module 2: RNNs (Recurrent Neural Networks)
- Introduction to the RNN model
- Modelling sequences
- Unfolded RNN
- Types of RNN & Use Case
- Training RNNs with back propagation
- Backward Propagation
- Problems in Traditional RNN
- Long short-term memory (LSTM)
- Forget Gate, Input Gate, Output Gate

COMPUTER VISION
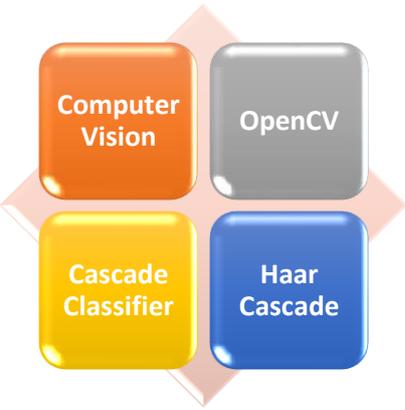
Module 1: Introduction to OpenCV
- Introduction to OpenCV
- Image Processing
- Working & implementation with Image
- Edge Detection & smoothing of image
- Working with resolution
- Colour filtering on Image
- Image Contour
- Feature Extraction
- Reading Video using Computer Vision
- Implementation of color filter on video
- Modifying Video resolution
- OpenCV gradients

Module 2: Cascade Classifier and HaarCascade
- Cascade Classifiers
- Haar Cascades
- Detect Multiscale
- Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade

-

NLP-I
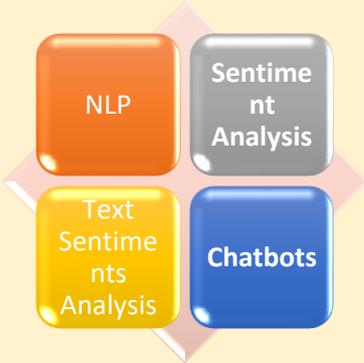
Module 1: Introduction to NLP & Word Vectors
- NLP
- NLTK Package
- Tokenization
- Lemmatization and Stemming
- Stop Words
- Regex
- Bag-of-Words
- TF-IDF

Module 2: NLP - Sentiment Analysis
- NLP Text Analysis
- Frequency Distribution
- Text Sentiments Analysis

Chatbots and OpenAI	Module 1: Chatbots
	• Chatbot Introduction • Chatbot Flow and Architecture • OpenAI Introduction • GPT3 • Built your ChatBot with OpenAI GPT3

Participant Eligibility & Prerequisite:

- The program is open to the Faculty/ Research Scholars/ Students of science & Engineering institutes and working IT professionals are also, eligible.
- There are no prerequisites for this training, you will learn AI from scratch.

To Know More Visit:

https://www.eduxlabs.com/machinelearning

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