Artificial Intelligence & Machine Learning using Python

"AI Enabled Vision & Speech based Personal Assistant"

AI & ML are technique, code or algorithm that enables machines to develop, demonstrate and mimic human cognitive behavior or intelligence and hence the name "Artificial Intelligence". Some of the most successful applications of AI around us can be seen in Robotics, Computer Vision, Virtual Reality, Speech Recognition, Automation, Gaming and so on…

Artificial Intelligence is constantly pushing the boundaries of what machines are capable of. The Main purpose of training real time smart machine is to use their speed and capability. Most importantly machine can think and perform task like humans. By this course student will be able to design and develop an advance AI System.

In this program, one would get to learn about Building Artificially Intelligent systems including computer vision and natural language processing techniques. Machine Learning & Deep Learning are the key part of this course, and, are implemented using Python Scripting. Various Libraries like numpy, pandas, matplotlib, scikit-learn, keras, tensorflow, pytorch etc. were used and discussed in detail.

Why should you learn from us?

- A Team built with Professional Trainers having an experience of delivering for more than 20K students
- An outreach of 300+ colleges pan India
- Associated with multiple Corporate as hiring partners
- Daily 15 minutes Query Solving Session at the end of the class.
- And very affordable never-before fees

The Fee structure is mentioned below:

DURATION	**90 Hours**
FEES	**INR 12500/-** + 18% GST (INR 14750/-)

Who can attend this program?

- Engineering Undergraduates/Computer Programming Pursuing
- Python/AI Hobbyists and Students willing to kick-start their career in AI/Machine Learning
- Knowledge of any computer programming is advantageous

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Project Titles

Final Project (1)

"AI Enabled Vision & Speech based Personal Assistant Bot"

Capstone Projects (7)

1. *Real Time Face Recognition based Music Player*
2. *A Web-chatbot application*
3. *Customer Review Segmentation on Flipkart/Amazon*
4. *Find Potential Client for YAATRA Package*
5. *Object Recognition System*
6. *Hand Gesture Recognition System*
7. *Human Recognition and Analysis Model*

Mini Projects (10+)

1. *Moving Object Detector*
2. *My Selfie Machine*
3. *Detecting People and Vehicles violating Covid Protocol*
4. *Movie Recommendation System*
5. *Email SPAM Detection Application*
6. *Real-estate Price Predictor Model*
7. *Building Churn Prediction System for Customers"*
8. *Handwritten Digits Classification*
9. *Stock Market Price Prediction*
10. *Cat/Dog Classifier Model*

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MACHINE LEARNING & ARTIFICIAL INTELLIGENCE

Duration – 45 Days/6 Weeks (90 Hours)

WEEK-1 (15 Hours)	**Introduction** (2.5 Hours)	• Introduction with **AI & Machine Learning** • Data Science vs Data Engineering vs Data Analysis vs AI • Use of Data in the world of AI • Connecting with Upflairs Community • Basic Linux/Windows Commands • Setting Up GITHUB & Google Colab/Kaggle
	Python Overview (5+2.5 Hours)	• Command Line & Script based Python Programming • Python Quicker: Keywords, Data Types, Operators • Conditional/Looping/Error Handling in Python • Comprehensions • Python User Defined Functions • Python Generators • Lambda Expressions • Python Modules: Usage and Installation • Understanding the OOP of Python • **GUI Development** with Python
	Data in Python (1 Hour)	• *Types of DATA?* • **Numpy Arrays**: Creating, Accessing, Manipulating • Array Attributes; Data Operations • The file handling in python • Dealing with Excel/Json/CSV/txt files
	Image Processing (4 Hours)	• About Digital Images & Processing • Concept of Computer Vision in AI • Working on Digital Images (skimage, opencv, pillow, imutils) • Use of Matplotlib library for Images & Graphs • Changing Color-spaces, Geometric Transformations • Image Thresholding, Filtering, Morphology
WEEK-2 (15 Hours)	**Computer Vision & Image Processing** (2.5 Hours)	• Live Image Capturing • Color Feature Detection in Images • Image Feature Detection, Extraction and Matching
	Mini Project (2.5 Hours)	• ***"Moving Object Detector"*** • ***"My Selfie Machine"*** • ***"Detecting People and Vehicles violating Covid Protocol"***
	Capstone Project (2.5 Hour)	• ***"Real Time Face Recognition based Music Player"***
	Natural Language Processing (2.5 Hours)	• What is NLP? Linguistic to Natural Language! • NLTK in Python for Text Processing • **Text to Speech** and **Speech to Text** Modules in Python • Morphological Analysis; Syntactic Analysis • Generating Word Clouds • SMTP with Python; Reading and Sending Mail from Python
	Chatbot (2.5 Hours)	• What is Chatbot • How to create query-response pairs

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		• Use of Regular Expressions • Interacting with Web-based Services • **API Integration** • Introduction with Flask • **Deploying AI Applications over Web/Cloud**
	Capstone Project (2.5 Hour)	• ***"A Web-chatbot application"***
WEEK-3 (15 Hours)	**Pandas** (5 Hours)	• **Pandas:** The Series and DataFrame • Creating, Accessing, Manipulating Pandas Data • Series and DataFrame Attributes & Basic Functions • Arithmetic and Statistical Methods; Sort, Search, Count • Data Grouping, Missing Data Handling • Merging & Joining of Data • **File Handling with Pandas**
	Mini Project (2.5 Hours)	• ***"Movie Recommendation System"***
	Data Visualization (2.5 Hours)	• Data is Beautiful…!!! • Visualization Libraries in Python • MATPLOTLIB PYPLOT: line, scatter, pie, box, area etc • Decorating the plots using Matplotlib (labels, colors, markers, legend, grids, figure sizes etc) • The Subplots and axes in matplotlib; Showing Images • Pandas Visualization: Basic Plots • bar, barh, hist, box, kde, density, area, scatter, hexbin, pie plots • Plotting with Missing Data • Easy and advanced Data Visualization from Seaborn • Categorical, Distributive, Regression, Matrix, Grid Plots • ***Exercise***
	Mini Project (2.5 Hours)	• ***"Descriptive Analytic Model of Treadmill Users"***
	Introduction with Machine Learning (2.5 Hours)	• Understanding the concept of Machine Learning • The Flow of Machine Learning • Types of Learning and their sub-categories • **Linear Regression**: The Line Equation; Fitting Data in Model • Performance Evaluation of Model • ***Exercise***
WEEK-4 (15 Hours)	**Mini Project** (1.5 Hours)	• ***"Real-estate Price Predictor Model"***
	Machine Learning – Regression (1 Hour)	• **Polynomial Regression:** The Non-linearity in Data • Performance Evaluation of Regression Model • ***Exercise***
	ML – Naïve Bayes (0.5 Hours)	• The Bayes Theorem • **Naïve Bayes** Algorithm for Machine Learning
	Mini Project (2 Hours)	• ***"Email SPAM Detection Application"***
	Web Scrapping (2.5 Hours)	• What are web servers and how HTML look-like?

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		• Scrapping the Live Data • ***Exercise***
	Capstone Project (2.5 Hours)	• ***"Customer Review Segmentation on Flipkart/Amazon"***
	Supervised ML – Classification (5 Hours)	• **Logistic Regression:** Concept & Need • Performance Evaluation of Classifications Models • **Support Vector Machines (SVM)** • **Kernel Nearest Neighbors (KNN)** • The Information Theory • **Decision Trees Classifier** • **Random Forest Classifier** • Biases versus variances • Data Overfitting & Underfitting • The Concept of Cross-validation • ***Exercise***
WEEK-5 (15 Hours)	**Capstone Project** (2.5 Hours)	• ***"Find Potential Client for YAATRA Package"***
	Data Visualization Plotly (2.5 Hours)	• The Real-time challenges of Data Visualization • The Front End of ML - PLOTLY • Plotly Express for Quick and Fiery Interactive Graphs • Scatter, Pie, Line, Bubble, Bar, Error, Box, Histograms • Heatmaps, Distribution Plots, Maps • User Instructiveness with User Controller • ***Exercise***
	Unsupervised Machine Learning (2.5 Hours)	• K-Means Clustering • ***Exercise***
	Artificial Neural Network (2.5 Hour)	• Concept of Deep Learning & Neural Network • What is **ANN**? • The basic terminology – Layers, weights, biases, activation functions, losses, optimizers, learning rate • The Concept of Forward & Backward Propagation • Using **Keras** Library for ANN • Building and Compiling Sequential Neural Network Model
	Mini Project (3.5 Hours)	• ***"Building Churn Prediction System for Customers"*** • ***"Handwritten Digits Classification"***
	Recurrent Neural Network (0.5 Hour)	• What is RNN • How RNN is different from ANN • The Concept of Long-Short-Term Memory (LSTM) • LSTM based Neural Networks for Future Prediction!!
	Mini Project (1 Hour)	• ***"Stock Market Price Prediction"***
WEEK-6 (15 Hours)	**Convolutional Neural Network – Keras** (1.5 Hour)	• The Convolution Theory – Filters, Pools, Averaging etc. • Generating Convolution Neural Network Models • Image Augmentation
	Mini Project (1 Hour)	• ***"Cat/Dog Classifier"***

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	Transfer Learning (2.5 Hours)	• About the Architectures: AlexNet, VGGNet, ResNet, UNet, EfficientNet • Yolo Model
	Capstone Project (2.5 Hours)	• ***"Object Recognition System"***
	Capstone Project (2.5 Hours)	• ***"Hand Gesture Recognition System"***
	AutoML & PyTorch (2.5 Hours)	• Introduction with PyTorch • Implementation of AutoML • The Cloud AI Platforms
	Capstone Project (2.5 Hours)	• ***"Human Recognition and Analysis Model"***

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