AI Python Syllabus

Artificial Intelligence

- An Introduction to Artificial Intelligence
- History of Artificial Intelligence
- Future and Market Trends in Artificial Intelligence
- Intelligent Agents – Perceive-Reason-Act Loop
- Search and Symbolic Search
- Constraint-based Reasoning
- Simple Adversarial Search (Game-Playing)
- Neural Networks and Perceptrons
- Understanding Feedforward Networks & many more..

Data Preprocessing

- Python and Data preprocessing

- Python Fundamentals
- Numpy
- Pandas
- Data Visualization
- Scikit Learn
- Data Preprocessing

Using Git and GitHub

- Setting up Your GitHub Account
- Configuring Your First Git Repository
- Making Your First Git Commit
- Pushing Your First Commit to GitHub
- Git and GitHub Workflow Step-by-Step

Machine Learning

- Regression

- Simple Linear Regression
- Multiple Linear Regression
- Bias-Variance trade-off
- Classification

- Logistic Regression
- K-Nearest Neighbors (K-NN)
- SVM
- Decision Trees
- Random Forest
- Clustering

- K-means
- Hierarchical
- DBSCAN
- Dimensionality Reduction

- Linear discriminant analysis
- Principal component analysis

Natural Language Processing

Natural Language Processing

- NLTK

- NLP with NLTK
- NLTK extensions and exploration
- Sentiment Analyzer

- Description of Sentiment Analyzer
- Preprocessing: Tokenization
- Preprocessing: Tokens to Vectors
- Sentiment Analysis using Logistic Regression
- Sentiment Lexicons
- Regular Expressions
- Twitter Sentiment Analysis
- Twitter Sentiment Analysis - Regular Expressions
- Twitter Sentiment Analysis - KNN, Decision trees, Random forests and Sentiwordnet
- Latent Semantic Analysis

- Intro to Latent Semantic Analysis
- PCA and SVD - The underlying math behind LSA
- Latent Semantic Analysis in Python
- Advanced LSA
- Article spinner

- Article Spinning Introduction and Markov Models
- Trigram Model
- Article spinner in Python

Neural Networks

Tensorflow Networks

- Introducing TF
- Computation Graph
- Tensors

- Placeholders and Variables
- Neural Networks
- Perceptron
- Activation Functions
- Cost Functions
- Gradient Descent Backpropagation

Artificial Neural Networks

- Regression in TF
- Regression in TF and NN using Estimator
- Regression in TF and NN using Keras
- Classification in TF
- Classification in TF and NN using Estimator
- Classification in TF and NN using Keras

Computer Perception

Conventional Neural Networks

- Intro to CNN
- Convolution Operation
- Activation Layer
- Pooling
- Flattening
- Full Connection
- Softmax, Argmax & Cross-Entropy

Basics of Computer Perception and OpenCV

- Image Formation
- Getting Started with OpenCV
- Understanding Color Spaces
- Histogram representation of Images
- Image Manipulations
- Live Sketch App
- Identifying Shapes
- Counting Circles and Ellipses

Object Detection

- Object Detection Overview
- How SSD is different
- The Multi-Box Concept
- Predicting Object Positions
- The Scale Problem
- Feature Description Theory

- Finding Corners
- SIFT, SURF, FAST, BRIEF and ORB
- Histogram of Oriented Gradients
- Hands-on Object Detection

Face Detection

- Face and Eye Detection
- Viola-Jones Algorithm
- Haar-like Features
- Integral Image
- Training Classifiers
- Adaptive Boosting (Adaboost)
- Cascading
- Merging Faces (Face Swaps)
- Yawn Detector and Counter
- Facial Recognition

Motion Analysis and Object Tracking

- Filtering by Color
- Background Subtraction and Foreground Subtraction
- Using Meanshift for Object Tracking
- Using CAMshift for Object Tracking
- Optical Flow

"Programme can be customized as per your requirements"

Course Duration: 2 Months