



ARTIFICIAL INTELLIGENCE

Self-Learning & Online Training

Duration: 40+ (Hours)

✓ Is artificial intelligence in demand?

Demand for workers with artificial intelligence (AI) skills has rapidly increased in the past 18 months, according to a new report from job search site Indeed. However, job seeker interest in these roles has leveled off, suggesting that competition for tech talent in this area is going to heat up quickly.



+91 988 502 2027

(WhatsApp Available)

✓ What are the basic requirements for learning artificial intelligence?

The course offers an excellent opportunity for students to dive into Python while solving AI problems and learning its applications. • Linear algebra (vectors, matrices, derivatives) • Calculus. • Basic probability theory. • Python programming.



info@svrtechnologies.com



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✓ What is the salary of AI engineer?

An artificial intelligence engineer earns an average of \$171,715, ranging from \$124,542 at the 25th percentile to \$201,853 at the 75th percentile, with top earners earning more than \$257,530.



Practicle Training

About SVR Technologies

Our certified faculty focused on IT industry based curriculum for Datapower Training Online. Hands-on training with tutorial videos real-time scenarios and certification guidance that helps you to enhance your career skills.

Real-time Working Faculty | Real-time Scenarios

INTRODUCTION TO DATA SCIENCE DEEP LEARNING & ARTIFICIAL INTELLIGENCE

Introduction to Deep Learning & AI

Deep Learning: A revolution in Artificial Intelligence

- Limitations of Machine Learning

What is Deep Learning?

- Need for Data Scientists
- Foundation of Data Science
- What is Business Intelligence
- What is Data Analysis
- What is Data Mining

What is Machine

Learning? Analytics

vs. Data Science

- Value Chain
- Types of Analytics
- Lifecycle Probability
- Analytics Project Lifecycle
- Advantage of Deep Learning over Machine learning
- Reasons for Deep Learning
- Real-Life use cases of Deep Learning
- Review of Machine Learning



Data

- Basis of Data Categorization
- Types of Data
- Data Collection Types
- Forms of Data & Sources
- Data Quality & Changes
- Data Quality Issues
- Data Quality Story
- What is Data Architecture
- Components of Data Architecture
- OLTP vs. OLAP
- How is Data Stored?

Big Data

- What is Big Data?
- 5 Vs of Big Data
- Big Data Architecture
- Big Data Technologies
- Big Data Challenge
- Big Data Requirements
- Big Data Distributed Computing & Complexity
- Hadoop
- Map Reduce Framework
- Hadoop Ecosystem



Data Science Deep Dive

- What Data Science is
- Why Data Scientists are in demand
- What is a Data Product
- The growing need for Data Science
- Large Scale Analysis Cost vs Storage
- Data Science Skills
- Data Science Use Cases
- Data Science Project Life Cycle & Stages
- Data Acquisition
- Where to source data
- Techniques
- Evaluating input data
- Data formats
- Data Quantity
- Data Quality
- Resolution Techniques
- Data Transformation
- File format Conversions
- Anonymization



PYTHON

- Python Overview
- About Interpreted Languages
- Advantages/Disadvantages of Python pydoc.
- Starting Python
- Interpreter PATH
- Using the Interpreter
- Running a Python Script
- Using Variables
- Keywords
- Built-in Functions
- Strings Different Literals
- Math Operators and Expressions
- Writing to the Screen
- String Formatting
- Command Line Parameters and Flow Control.
- Lists
- Tuples
- Indexing and Slicing
- Iterating through a Sequence
- Functions for all Sequences



Operators and Keywords for Sequences

- The xrange() function
- List Comprehensions
- Generator Expressions
- Dictionaries and Sets.

Numpy & Pandas

- Learning NumPy
- Introduction to Pandas
- Creating Data Frames
- Grouping Sorting
- Plotting Data
- Creating Functions
- Slicing/Dicing Operations.



Deep Dive – Functions & Classes & Oops

- Functions
- Function Parameters
- Global Variables
- Variable Scope and Returning Values. Sorting
- Alternate Keys
- Lambda Functions
- Sorting Collections of Collections
- Classes & OOPs

STATISTICS

- What is Statistics
- Descriptive Statistics
- Central Tendency Measures
- The Story of Average
- Dispersion Measures
- Data Distributions



ARTIFICIAL INTELLIGENCE SYLLABUS

- Central Limit Theorem
- What is Sampling
- Why Sampling
- Sampling Methods
- Inferential Statistics
- What is Hypothesis testing
- Confidence Level
- Degrees of freedom
- what is pValue
- Chi-Square test
- What is ANOVA
- Correlation vs Regression
- Uses of Correlation & Regression

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MACHINE LEARNING, DEEP LEARNING & AI USING PYTHON

Introduction

- ML Fundamentals
- ML Common Use Cases
- Understanding Supervised and Unsupervised Learning Techniques

Clustering

- Similarity Metrics
- Distance Measure Types: Euclidean, Cosine Measures
- Creating predictive models
- Understanding K-Means Clustering
- Understanding TF-IDF, Cosine Similarity and their application to Vector Space Model
- Case study

Implementing Association rule mining

- What is Association Rules & its use cases?
- What is Recommendation Engine & it's working?
- Recommendation Use-case
- Case study



Understanding Process flow of Supervised

Learning Techniques Decision Tree Classifier

- How to build Decision trees
- What is Classification and its use cases?
- What is Decision Tree?
- Algorithm for Decision Tree Induction
- Creating a Decision Tree
- Confusion Matrix
- Case stud

Random Forest Classifier

- What is Random Forests
- Features of Random Forest
- Out of Box Error Estimate and Variable Importance
- Case study

Naive Bayes Classifier.

- Case study



Project Discussion

Problem Statement and Analysis

- Various approaches to solve a Data Science Problem
- Pros and Cons of different approaches and algorithms.

Linear Regression

- Case study
- Introduction to Predictive Modeling
- Linear Regression Overview
- Simple Linear Regression
- Multiple Linear Regression

Logistic Regression

- Case study
- Logistic Regression Overview
- Data Partitioning
- Univariate Analysis
- Bivariate Analysis
- Multicollinearity Analysis
- Model Building
- Model Validation



- Model Performance Assessment AUC & ROC curves
- Scorecard

Support Vector Machines

- Case Study
- Introduction to SVMs
- SVM History
- Vectors Overview
- Decision Surfaces
- Linear SVMs
- The Kernel Trick
- Non-Linear SVMs
- The Kernel SVM

Time Series Analysis

- Describe Time Series data
- Format your Time Series data
- List the different components of Time Series data
- Discuss different kind of Time Series scenarios
- Choose the model according to the Time series scenario
- Implement the model for forecasting
- Explain working and implementation of ARIMA model
- Illustrate the working and implementation of different ETS models
- Forecast the data using the respective model



- What is Time Series data?
- Time Series variables
- Different components of Time Series data
- Visualize the data to identify Time Series Components
- Implement ARIMA model for forecasting
- Exponential smoothing models
- Identifying different time series scenario based on which different Exponential Smoothing model can be applied
- Implement respective model for forecasting
- Visualizing and formatting Time Series data
- Plotting decomposed Time Series data plot
- Applying ARIMA and ETS model for Time Series forecasting
- Forecasting for given Time period
- Case Study

Machine Learning Project

Machine learning algorithms Python

- Various machine learning algorithms in Python
- Apply machine learning algorithms in Python



Feature Selection and Pre-processing

- How to select the right data
- Which are the best features to use
- Additional feature selection techniques
- A feature selection case study
- Preprocessing
- Preprocessing Scaling Techniques
- How to preprocess your data
- How to scale your data
- Feature Scaling Final Project

Which Algorithms perform best

- Highly efficient machine learning algorithms
- Bagging Decision Trees
- The power of ensembles
- Random Forest Ensemble technique
- Boosting – Adaboost
- Boosting ensemble stochastic gradient boosting
- A final ensemble technique



Model selection cross validation score

- Introduction Model Tuning
- Parameter Tuning GridSearchCV
- A second method to tune your algorithm
- How to automate machine learning
- Which ML algo should you choose
- How to compare machine learning algorithms in practice

Text Mining& NLP

- Sentimental Analysis
- Case study

PySpark and MLlib

- Introduction to Spark Core
- Spark Architecture
- Working with RDDs
- Introduction to PySpark
- Machine learning with PySpark – MLlib



DEEP LEARNING & AI USING PYTHON

Deep Learning & AI

- Case Study
- Deep Learning Overview
- The Brain vs Neuron
- Introduction to Deep Learning

Introduction to Artificial Neural Networks

- The Detailed ANN
- The Activation Functions
- How do ANNs work & learn
- Gradient Descent
- Stochastic Gradient Descent
- Backpropagation
- Understand limitations of a Single Perceptron
- Understand Neural Networks in Detail
- Illustrate Multi-Layer Perceptron
- Backpropagation – Learning Algorithm
- Understand Backpropagation – Using Neural Network Example
- MLP Digit-Classifer using TensorFlow
- Building a multi-layered perceptron for classification



- Why Deep Networks
- Why Deep Networks give better accuracy?
- Use-Case Implementation
- Understand How Deep Network Works?
- How Backpropagation Works?
- Illustrate Forward pass, Backward pass
- Different variants of Gradient Descent

Convolutional Neural Networks

- Convolutional Operation
- Relu Layers
- What is Pooling vs Flattening
- Full Connection
- Softmax vs Cross Entropy
- " Building a real world convolutional neural network for image classification"

What are RNNs – Introduction to RNNs

- Recurrent neural networks rnn
- LSTMs understanding LSTMs
- long short term memory neural networks lstm in python



Restricted Boltzmann Machine (RBM) and Autoencoders

- Restricted Boltzmann Machine
- Applications of RBM
- Introduction to Autoencoders
- Autoencoders applications
- Understanding Autoencoders
- Building a Autoencoder model

Tensorflow with Python

- Introducing Tensorflow
- Introducing Tensorflow
- Why Tensorflow?
- What is tensorflow?
- Tensorflow as an Interface
- Tensorflow as an environment
- Tensors
- Computation Graph
- Installing Tensorflow
- Tensorflow training
- Prepare Data
- Tensor types
- Loss and Optimization
- Running tensorflow programs



Building Neural Networks Using

Tensorflow

- Tensors
- Tensorflow data types
- CPU vs GPU vs TPU
- Tensorflow methods
- Introduction to Neural Networks
- Neural Network Architecture
- Linear Regression example revisited
- The Neuron
- Neural Network Layers
- The MNIST Dataset
- Coding NIST NN

Deep Learning using Tensorflow

- Deepening the network
- Images and Pixels
- How humans recognise images
- Convolutional Neural Networks
- ConvNet Architecture
- Overfitting and Regularization
- Max Pooling and ReLU activations
- Dropout
- Strides and Zero Padding
- Coding Deep ConvNets demo



- Debugging Neural Networks
- Visualising NN using Tensorflow
- Tensorboard

Transfer Learning using Keras and TFLearn

- Transfer Learning Introduction
- Google Inception Model
- Retraining Google Inception with our own data demo
- Predicting new images
- Transfer Learning Summary
- Extending Tensorflow
- Keras
- TFLearn
- Keras vs TFLearn Comparison



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