

MACHINE LEARNING WITH PYTHON

Introduction to Machine Learning

- ✓ What is Machine Learning?
- ✓ Why Machine Learning?
- ✓ Introduction to Big Data and Machine Learning

Introduction to Artificial Intelligence and Machine Learning

- ✓ Artificial Intelligence
- ✓ Machine Learning
- ✓ Machine learning algorithms
- ✓ Applications of Machine Learning

Python Ecosystem for Machine Learning

- ✓ SciPy
- ✓ NumPy
- ✓ Matplotlib
- ✓ Pandas
- ✓ Scikit-learn

Machine Learning Techniques

- ✓ Types of Learning
- ✓ Supervised learning
- ✓ Unsupervised learning
- ✓ Semi-supervised and Reinforcement learning
- ✓ Advice for Applying Machine Learning
- ✓ Bias and variance trade-off
- ✓ Machine Learning System Design

Data Preprocessing

- ✓ Data preparation
- ✓ Feature engineering
- ✓ Feature scaling
- ✓ Datasets
- ✓ Dimensionality reduction

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Math Refresher

- ✓ Concepts of linear algebra
- ✓ Eigenvalues, eigenvectors, and eigen decomposition
- ✓ Introduction to Calculus
- ✓ Probability and statistics

Supervised Learning

- ✓ Regression
- ✓ Classification

Supervised Learning – Regression

- ✓ Linear Regression
- ✓ Simple Linear Regression
- ✓ Cost Functions
- ✓ Sum of Least Squares
- ✓ Variable Selection
- ✓ Model Development and Improvement
- ✓ Predicting house prices: A case study in Regression
- ✓ Linear Regression & Logistic: A Model-Based Approach
- ✓ Regression fundamentals: Data and Models
- ✓ Feature selection in Model building
- ✓ Evaluating over fitting via training/test split

Classification Logistic Regression

- ✓ Analyzing the sentiment of reviews
- ✓ Meaning and types of classification
- ✓ Logistic regression
- ✓ K-nearest neighbors (K-NN Classifier)
- ✓ Support vector machines
- ✓ Kernel support vector machines
- ✓ Naive Bayes
- ✓ Decision tree classifier
- ✓ Random forest classifier

Decision Trees

- ✓ Rule Based Learning
- ✓ Construction of rules

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- ✓ The Basics of Decision Trees
- ✓ Regression Trees
- ✓ Classification Trees

Bagging and Random Forests

- ✓ Resampling Methods
- ✓ Resampling Methods with replacements
- ✓ Resampling Methods with-out replacements
- ✓ Random Forests

Boosting

- ✓ Adaboost
- ✓ Gradient Boosting-GBM
- ✓ Extreme Gradient Boosting –Xgboost

Cross Validation

- ✓ K-Fold Cross Validation
- ✓ Cross Validation Usage
- ✓ Bias and Variance

Machine Learning-Un-Supervised Learning

- ✓ Clustering algorithms
- ✓ K-means clustering
- ✓ Clustering System Overview
- ✓ Clustering fundamentals: Data and Models
- ✓ Feature selection in Model building
- ✓ Unsupervised Learning – Recommendation

Dimensionality Reduction Techniques

- ✓ Principal Component Analysis
- ✓ Using Software-Real Time Problems

Forecasting

- ✓ Time Series
- ✓ Time Series Analysis
- ✓ Components of time Series
- ✓ Arch and Garch

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- ✓ Moving Averages
- ✓ Exponential Smoothing
- ✓ Arima and Arimax
- ✓ Additive and Multiplicative

Text Mining

- ✓ Cleaning Text Data
- ✓ Pre Processing
- ✓ Sentiment Analysis
- ✓ Text Classification
- ✓ Natural Language Processing(NLP)

Recommending Products

- ✓ Recommender systems overview
- ✓ Collaborative filtering
- ✓ Understanding Collaborative Filtering and Support Vector Machine
- ✓ Effect of popular items
- ✓ Normalizing co-occurrence
- ✓ Matrices and leveraging purchase histories
- ✓ The matrix completion task
- ✓ Recommendations from known user/item features
- ✓ Recommender systems ML block diagram

Introduction to Deep Learning

- ✓ Meaning and importance of Deep Learning
- ✓ Artificial Neural Networks
- ✓ Tensor Flow

Unsupervised Learning – Deep Learning

- ✓ Deep Learning: Searching for Images
- ✓ Searching for images: A case study in deep learning
- ✓ Learning very non-linear features with neural networks
- ✓ Application of deep learning to computer vision
- ✓ Deep learning performance

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