

Academy of Information Technology

Enhance your Data Science Carrer

Tools

Covered





Objective :

The objective of Data Science is to extract actionable insights and knowledge from large and complex datasets.

It employs statistical analysis, machine learning algorithms, and data visualization techniques.

- ◆ Data science aims to uncover patterns, trends, and relationships in the data. The goal is to drive informed decision-making and solve real-world problems.
 - ◆ The objective is to transform raw data into valuable information. This information can be used to optimize processes, improve efficiency, and gain a competitive advantage.
 - ◆ Data Science bridges the gap between data and knowledge.
 - ◆ It enables organizations to make data-driven decisions and predictions.
 - ◆ This can lead to better outcomes and innovation.
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◎ Key Features in the Training Duration:

- ◆ 6 Months Class Duration: 1.30-Hrs (Monday to Saturday)
- ◆ Help on Doubt Clearance, Monitoring Session, Career Guidance, Interview preparation & Mock interviews Projects materials are provided with Lab Exercises, Data sets, Codes, Quizzes, Case studies on real data.

Modules

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- 1) Database (SQL, Excel)
 - 2) Data Analysis
 - 3) Python
 - 4) Tableau
 - 5) Power BI
 - 6) Machine Learning
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Python Introduction and Setting Up the Environment

- ✓ Introduction to programming
- ✓ R or Python?
- ✓ Why Python for Data Science?
- ✓ Different job roles with Python
- ✓ Different Python IDEs
- ✓ Downloading and setting up the Python environment

Hands-On - Installing Python - IDLE



Python Basic Syntax and Data Types

- ✓ Python input and output operations.
- ✓ Comments
- ✓ Variables, rules for naming variables
- ✓ Basic Data Types in Python
- ✓ Typecasting in python

Hands-On - Using comments, variables, data types, and typecasting in python program



Operators in Python

- ✓ Arithmetic operators
- ✓ Assignment operators
- ✓ Comparison operators
- ✓ Logical operators
- ✓ Identity operators
- ✓ Membership Operators
- ✓ Bitwise Operators

Hands-On - Working with different data types in a program



Strings in Python

- ✓ Creating strings
- ✓ String formatting
- ✓ Indexing
- ✓ Slicing
- ✓ String methods

Hands-On - Performing string operations



Lists

- ✓ Creating lists
- ✓ Properties of lists
- ✓ List indexing
- ✓ List slicing
- ✓ List of lists
- ✓ List Methods
- ✓ Adding, Updating & removing elements from lists

Hands-On - Slicing, Indexing, and using methods on lists



Tuples

- ✓ Syntax to create tuples
- ✓ Tuple properties
- ✓ Indexing on tuples
- ✓ Slicing on tuples
- ✓ Tuple methods

Hands-On - Working with Tuples



Sets

- ✓ The syntax for creating sets
- ✓ Updating sets
- ✓ Set operations and methods
- ✓ Difference between sets, lists, and tuples

Hands-On - Performing set operations in a program



Dictionaries

- ✓ The syntax for creating Dictionaries
- ✓ Storing data in dictionaries
- ✓ Dictionaries keys and values
- ✓ Accessing the elements of dictionaries
- ✓ Dictionary methods

Hands-On - Creating dictionaries and using dictionaries methods



Python Conditional Statements

- ✓ Setting logic with conditional statements
- ✓ If statements
- ✓ If -else statements
- ✓ If-elif-else statements

Hands-On - Setting logic in programs using conditional statements



Loops in Python

- ✓ Iterating with python loops
- ✓ while loop
- ✓ for loop
- ✓ range
- ✓ break
- ✓ continue
- ✓ pass
- ✓ enumerate
- ✓ zip
- ✓ assert

Hands-On - Iterating with loops in python

Getting Started with **HackerRank** use cases and working on them

- ✓ Solving Level by Level Challenges
- ✓ Assignments to acquire Bronze and Silver Level badges



List and Dictionaries comprehension

- ✓ Why List comprehension
- ✓ The syntax for list comprehension
- ✓ The syntax for dict comprehension

Hands-On - Using List and Dictionary comprehension



Functions

- | | |
|--|-------------------------------------|
| ✓ What are Functions | ✓ Modularity and code reusability |
| ✓ Creating functions | ✓ Calling functions |
| ✓ Passing Arguments | ✓ Positional Arguments |
| ✓ Keyword Arguments | ✓ Variable-length arguments (*args) |
| ✓ Variable Keyword length arguments (**kwargs) | ✓ Return keyword in python |
| ✓ Passing function as an argument | ✓ Passing function in return |
| ✓ Global and local variables | ✓ Recursion |



Anonymous Functions

- ☒ Lambda
- ☒ Lambda with filter
- ☒ Lambda with map
- ☒ Lambda with reduce

Hands-On - Working with lambda, filter, map, and reduce in python



Generators

- ☒ Creating and using generators

Hands-On - Creating and using generators



Modules

- ☒ Creating modules
- ☒ Importing functions from a different module
- ☒ Importing Variables from different modules
- ☒ Python built-in modules

Hands-On - Creating and importing Modules



Exceptions and Error handling

- ☒ Syntax errors
- ☒ Logical errors
- ☒ Handling errors using try, except and finally

Hands-On - Handling Errors with try and except



Classes and Objects (OOPS)

- ☒ Creating classes & Objects
- ☒ Understanding __init__ constructor method
- ☒ Different types of methods
- ☒ Class methods
- ☒ Inheritance
- ☒ Overriding parent methods
- ☒ Understanding Types of inheritance
- ☒ Multiple Inheritance
- ☒ Polymorphism
- ☒ Attributes and methods
- ☒ Class and instance attributes
- ☒ Instance methods
- ☒ Static methods
- ☒ Creating child and parent class
- ☒ The super() function
- ☒ Single inheritance
- ☒ Multilevel Inheritance
- ☒ Operator overloading

Hands-On - Creating classes, objects. Creating methods and attributes. Working with different methods. Using inheritance and polymorphism.



Date and Time

- ☒ date module
- ☒ time module
- ☒ datetime module
- ☒ time delta
- ☒ formatting date and time
- ☒ strftime()
- ☒ strptime()

Hands-On - working with date and time



Regex

- ☒ Understanding the use of regex
- ☒ re.search()
- ☒ re.compile()
- ☒ re.find()
- ☒ re.split()
- ☒ re.sub()
- ☒ Meta characters and their use

Hands-On - Using regular expression to search patterns



Files

- ✓ Opening file
- ✓ Opening different file types
- ✓ Read,write,close files
- ✓ Opening files in different modes

Hands-On - Reading, Writing, Appending, opening, and closing files.



APIs the Unsung Hero of the Connected World

- ✓ Introduction to APIs
- ✓ Accessing Public APIs

Hands-On – Accessing Public Weather APIs and People in Space API



Python for Web Development - Flask

- ✓ Introduction to Python Web Framework Flask
- ✓ Installing Flask
- ✓ Working on GET, POST, PUT, METHODS using Python Flask Framework
- ✓ Working on Templates, render_template function



Hands-On Projects

- ✓ Web Scraping- Dynamic Website with multiple pages along with Data Analysis
- ✓ Sending Automated Emails
- ✓ Building a Virtual Assistant with Frontend Interface



Module 2 : Data Analysis



Packages

- ✓ Creating packages
- ✓ Importing modules from the package
- ✓ Different ways of importing modules and packages
- ✓ Working on Numpy, Pandas, and Matplotlib

Hands-On - Creating and importing

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Web Scraping

- ✓ Introduction to web scraping: Tools, libraries, and ethical considerations
- ✓ Scraping data from websites using libraries like BeautifulSoup and requests: HTML parsing, locating elements, and extracting data
- ✓ Handling different types of data on websites: Tables, forms, etc.
- ✓ Storing scraped data in appropriate formats: CSV, JSON, or databases

Hands-On - Working on Scraping Data from Static Dynamic Websites



Exploratory data analysis (EDA) using Pandas and NumPy

- ✓ Introduction to Pandas, a Python library for data manipulation and analysis.
- ✓ Overview of NumPy, a fundamental package for scientific computing with Python.
- ✓ Explanation of key data structures in Pandas: Series and DataFrame.
- ✓ Hands-on exploration of data using Pandas to summarize, filter, and transform data.
- ✓ Data cleaning techniques, handling missing values, and dealing with outliers.
- ✓ Statistical analysis of data using NumPy functions



Data Visualization using Matplotlib, Seaborn, and Plotly

- ✓ Introduction to data visualization and its importance in data analysis.
- ✓ Overview of Matplotlib, a popular plotting library in Python.
- ✓ Exploring different types of plots: line plots, scatter plots, bar plots, histogram, etc.
- ✓ Customizing plots with labels, titles, colors, and styles.
- ✓ Introduction to Seaborn, a Python data visualization library based on Matplotlib.
- ✓ Advanced plotting techniques with Seaborn: heatmaps, pair plots, and categorical plots.
- ✓ Introduction to Plotly, an interactive plotting library for creating web-based visualizations.
- ✓ Creating interactive and dynamic visualizations with Plotly.

Hands-on: Instagram Reach Analysis



Database Access

- ✓ Introduction to databases.
- ✓ Why SQL?
- ✓ Execution of an SQL statement.
- ✓ Installing MySQL
- ✓ Load data.
- ✓ Use, Describe, Show table.
- ✓ Select.
- ✓ Limit, Offset.
- ✓ Order By.
- ✓ Distinct.
- ✓ Where, Comparison Operators, NULL.
- ✓ Logic Operators.
- ✓ Aggregate Functions: COUNT, MIN, MAX, AVG, SUM.
- ✓ Group By.
- ✓ Having.
- ✓ Order of Keywords.
- ✓ Join and Natural Join.
- ✓ Inner, Left, Right, and Outer Joins.
- ✓ Sub Queries/Nested Queries/Inner Queries.
- ✓ DML: INSERT
- ✓ DML: UPDATE, DELETE
- ✓ DML: CREATE, TABLE
- ✓ DDL: ALTER, ADD, MODIFY, DROP
- ✓ DDL: DROP TABLE, TRUNCATE, DELETE
- ✓ Data Control Language: GRANT, REVOKE

Hands-on - Working on SQL Queries



MS Excel

- ☒ Excel Introduction
- ☒ Workbook Window
- ☒ Create & Open Workbooks
- ☒ MS Excel Online
- ☒ Excel vs Google Sheets
- ☒ Office Button
- ☒ Ribbon and Tabs
- ☒ Features of Tabs
- ☒ Quick Access Toolbar
- ☒ Mini Toolbar
- ☒ Title, Help, Zoom, View



Excel Worksheet

- ☒ Worksheet, Row, Column
- ☒ Moving on Worksheet
- ☒ Enter Data
- ☒ Select Data
- ☒ Delete Data
- ☒ Move Data
- ☒ Copy Paste Data
- ☒ Spell Check
- ☒ Insert Symbols



Excel Calculation

- ☒ Addition
- ☒ Sigma Addition
- ☒ Subtraction
- ☒ Calculate Average
- ☒ Sigma Average



Excel Fill Handle

- ☒ Fill Handle
- ☒ Fill Handle with Text
- ☒ Text with Numbers
- ☒ Fill Handle with Dates



Excel Formula

- ☒ Create Formula open link
- ☒ Fill Handle in Formula
- ☒ Relative Referencing
- ☒ Absolute Referencing
- ☒ Instruction for Typing



Quick Excel Functions

- ☒ Excel IF
- ☒ If Function
- ☒ If with Calculations
- ☒ Excel COUNTIF
- ☒ Advanced If
- ☒ WHAT IF Analysis



Excel Charts and visualizations

- ☒ Introduction to Excel Charts
- ☒ Dynamic Advanced Charts
- ☒ Pivot Table with Dashboard
- ☒ Advanced Pivot Table Tips & Tricks



Excel Advanced

- ☒ Excel Macros
- ☒ Excel sumif
- ☒ Excel vlookup
- ☒ Excel ISNA
- ☒ Find & Remove Duplicates
- ☒ Create drop-down List
- ☒ Merge cells in Excel



Tableau

- ✓ Building bar charts and line charts
- ✓ Creating pie charts and scatter plots
- ✓ Designing basic maps and geographic visualizations
- ✓ Using filters to subset data
- ✓ Sorting data by different criteria
- ✓ Applying quick filters for interactive exploration
- ✓ Adding labels, tooltips, and colors to visualizations
- ✓ Formatting axes and gridlines
- ✓ Customizing visual elements for better presentation
- ✓ Combining multiple visualizations into a dashboard
- ✓ Adding interactivity with filters and actions
- ✓ Arranging and organizing dashboard elements
- ✓ Publishing dashboards to Tableau Public or Tableau Server
- ✓ Embedding dashboards in websites or presentations
- ✓ Presenting and sharing dashboards effectively



Power BI

- ✓ Overview of Power BI and its features
- ✓ Understanding the Power BI interface
- ✓ Connecting to data sources
- ✓ Importing and transforming data
- ✓ Creating bar charts and line charts
- ✓ Designing pie charts and scatter plots
- ✓ Building basic tables and matrices
- ✓ Using filters and slicers to subset data
- ✓ Adding interactivity to visualizations
- ✓ Sorting and formatting data
- ✓ Building interactive dashboards with multiple visualizations
- ✓ Adding filters and slicers for user interactivity
- ✓ Formatting and organizing dashboard elements
- ✓ Publishing reports to the Power BI Service
- ✓ Sharing reports and dashboards with others
- ✓ Configuring security and access controls



Module 3 : Statistics



Descriptive Statistics

- ☒ Data- types of data
- ☒ A measure of central tendency - Mean-Median-Mode
- ☒ A measure of shape - Variance- Standard deviation, Range, IQR
- ☒ The measure of shape - Skewness, and kurtosis
- ☒ Covariance
- ☒ Correlation - Pearson correlation & Spearman's rank correlation
- ☒ Probability - Events, Sample Space, Mutually exclusive events, Mutually exclusive events
- ☒ Classical and Conditional Probability
- ☒ Probability distribution - Discrete and Continuous
- ☒ Uniform Distribution
- ☒ Expected values, Variance, and means
- ☒ Gaussian/Normal Distribution
- ☒ Properties, mean, variance, empirical rule of normal distribution
- ☒ Standard normal distribution and Z-score



Inferential Statistics

- ☒ Central Limit Theorem
- ☒ Hypothesis testing - Null and Alternate hypothesis
- ☒ Type - I and Type - II error
- ☒ Critical value, significance level, p-value
- ☒ One-tailed and two-tailed test
- ☒ T-test - one sample, two-sample, and paired t-test
- ☒ f-test
- ☒ One way and two way ANOVA
- ☒ Chi-Square test



Module 4 : Machine Learning



Introduction to Machine Learning

- ✓ Introduction to Machine Learning and its types (supervised, unsupervised, reinforcement learning)
- ✓ Setting up the development environment (Python, Jupyter Notebook, libraries: NumPy, Pandas, Scikit-learn)
- ✓ Overview of the Machine Learning workflow and common data preprocessing techniques



Introduction to data science and its applications

- ✓ Definition of data science and its role in various industries.
- ✓ Explanation of the data science lifecycle and its key stages.
- ✓ Overview of the different types of data: structured, unstructured, and semi-structured.
- ✓ Discussion of the importance of data collection, data quality, and data preprocessing..



Data Engineering and Preprocessing

- ✓ Introduction to Data Engineering: Data cleaning, transformation, and integration
- ✓ Data cleaning and Handling missing values: Imputation, deletion, and outlier treatment
- ✓ Feature Engineering techniques: Creating new features, handling date and time variables, and encoding categorical variables
- ✓ Data Scaling and Normalization: Standardization, min-max scaling, etc.
- ✓ Dealing with categorical variables: One-hot encoding, label encoding, etc.



Model Evaluation and Hyperparameter Tuning

- ✓ Cross-validation and model evaluation techniques
- ✓ Hyperparameter tuning using GridSearchCV and RandomizedSearchCV
- ✓ Model selection and comparison



Supervised Learning - Regression

- ✓ Introduction to Regression: Definition, types, and use cases
- ✓ Linear Regression: Theory, cost function, gradient descent, residual analysis, Q-Q Plot, Interaction Terms, and assumptions
- ✓ Polynomial Regression: Adding polynomial terms, degree selection, and overfitting
- ✓ Lasso and Ridge Regression: Regularization techniques for controlling model complexity
- ✓ Evaluation metrics for regression models: Mean Squared Error (MSE), R-squared, and Mean Absolute Error (MAE)

Hands-On - House Price Prediction



Supervised Learning - Classification

- ✓ Introduction to Classification: Definition, types, and use cases
- ✓ Logistic Regression: Theory, logistic function, binary and multiclass classification
- ✓ Decision Trees: Construction, splitting criteria, pruning, and visualization
- ✓ Random Forests: Ensemble learning, bagging, and feature importance
- ✓ Evaluation metrics for classification models: Accuracy, Precision, Recall, F1-score, and ROC curves
- ✓ Implementation of classification models using scikit-learn library

Hands-On - Heart Disease Detection & Food Order Prediction



SVM, KNN & Naive Bayes

- ✓ Support Vector Machines (SVM): Study SVM theory, different kernel functions (linear, polynomial, radial basis function), and the margin concept. Implement SVM classification and regression, and evaluate the models.
- ✓ K-Nearest Neighbors (KNN): Understand the KNN algorithm, distance metrics, and the concept of K in KNN. Implement KNN classification and regression, and evaluate the models.
- ✓ Naive Bayes: Learn about the Naive Bayes algorithm, conditional probability, and Bayes' theorem. Implement Naive Bayes classification, and evaluate the model's performance

Hands-On - Contact Tracing & Sarcasm Detection



Ensemble Methods and Boosting

- ✓ AdaBoost: Boosting technique, weak learners, and iterative weight adjustment
- ✓ Gradient Boosting (XGBoost): Gradient boosting algorithm, Regularization, and hyperparameter tuning
- ✓ Evaluation and fine-tuning of ensemble models: Cross-validation, grid search, and model selection
- ✓ Handling imbalanced datasets: Techniques for dealing with class imbalance, such as oversampling and undersampling

Hands-On - Medical Insurance Price Prediction



Unsupervised Learning - Clustering

- ✓ Introduction to Clustering: Definition, types, and use cases
- ✓ K-means Clustering: Algorithm steps, initialization methods, and elbow method for determining the number of clusters
- ✓ DBSCAN (Density-Based Spatial Clustering of Applications with Noise): Core points, density reachability, and epsilon-neighborhoods
- ✓ Evaluation of clustering algorithms: Silhouette score, cohesion, and separation metrics

Hands-On - Credit Card Clustering



Unsupervised Learning - Dimensionality Reduction

- ✓ Introduction to Dimensionality Reduction: Curse of dimensionality, feature extraction, and feature selection
- ✓ Principal Component Analysis (PCA): Eigenvectors, eigenvalues, variance explained, and dimensionality reduction
- ✓ Implementation of PCA using scikit-learn library

Hands-On - MNIST Data



Recommendation Systems

- ✓ Introduction to Recommendation Systems: Understand the concept of recommendation systems, different types (collaborative filtering, content-based, hybrid), and evaluation metrics.
- ✓ Collaborative Filtering: Explore collaborative filtering techniques, including user-based and item-based approaches, and implement a collaborative filtering model.
- ✓ Content-Based Filtering: Study content-based filtering methods, such as TF-IDF and cosine similarity, and build a content-based recommendation system.
- ✓ Deployment and Future Directions: Discuss the deployment of recommendation systems and explore advanced topics in NLP and recommendation systems.

Hands-On - News Recommendation System



Reinforcement Learning

- ✓ Introduction to Reinforcement Learning: Agent, environment, state, action, and reward
- ✓ Markov Decision Processes (MDP): Markov property, transition probabilities, and value functions
- ✓ Q-Learning algorithm: Exploration vs. exploitation, Q-table, and learning rate
- ✓ Hands-on reinforcement learning projects and exercises

Hands-On - Working with OpenAI Gym



Developing API using Flask / Webapp with Streamlit

- ✓ Introduction to Flask / Streamlit web framework
- ✓ Creating a Flask / Streamlit application for ML model deployment
- ✓ Integrating data preprocessing and ML model
- ✓ Designing a user-friendly web interface



Deployment of ML Models

- ✓ Building a web application for Machine Learning models: Creating forms, handling user input, and displaying results
- ✓ Deployment using AWS (Amazon Web Services): Setting up an AWS instance, configuring security groups, and deploying the application
- ✓ Deployment using PythonAnywhere: Uploading Flask application files, configuring WSGI, and launching the application



Project Work and Consolidation

- ✓ Work on a real-world Machine Learning project: Identify a problem, gather data, and define project scope
- ✓ Apply the learned concepts and algorithms: Data collection, preprocessing, model building, and evaluation
- ✓ Deployment of the project on AWS or PythonAnywhere: Showcase the developed application and share the project with others
- ✓ Presentation and discussion of the project: Demonstrate the project, explain design decisions, and receive feedback



Module 5 : NLP



Natural Language Processing (NLP)

- ✓ Introduction to NLP: Understand the basics of NLP, its applications, and challenges.
- ✓ Named Entity Recognition (NER): Understand the various approaches and tools used for NER, such as rule-based systems, statistical models, and deep learning.
- ✓ Text Preprocessing: Learn about tokenization, stemming, lemmatization, stop word removal, and other techniques for text preprocessing.
- ✓ Text Representation: Explore techniques such as Bag-of-Words (BoW), TF-IDF, and word embeddings (e.g., Word2Vec, GloVe) for representing text data.
- ✓ Sequential Models: Introduction to RNN, LSTM, Hands on Keras LSTM
- ✓ Sentiment Analysis: Study sentiment analysis techniques, build a sentiment analysis model using supervised learning, and evaluate its performance.

Hands-On - Real Time Sentiment Analysis



Module 6 : Deep Learning



RISE OF THE DEEP LEARNING

- ✓ Introduction
- ✓ History of Deep Learning
- ✓ Perceptrons
- ✓ Multi-Level Perceptrons
- ✓ Representations
- ✓ Training Neural Networks
- ✓ Activation Functions



Artificial Neural Networks

- ✓ Introduction
- ✓ Deep Learning
- ✓ Understanding Human Brain
- ✓ In-Depth Perceptrons
- ✓ Example for perceptron
- ✓ Multi Classifier
- ✓ Neural Networks
- ✓ Input Layer
- ✓ Output Layer
- ✓ Sigmoid Function
- ✓ Introduction to Tensorflow and Keras
- ✓ CPU vs GPU
- ✓ Introduction to Google collaboratory
- ✓ Training Neural Network
- ✓ Understanding Notations
- ✓ Activation Functions
- ✓ Hyperparameter tuning in keras
- ✓ Feed-Forward Networks
- ✓ Online offline mode
- ✓ Bidirectional RNN
- ✓ Understanding Dimensions
- ✓ Back Propagation
- ✓ Loss function
- ✓ SGD
- ✓ Regularization
- ✓ Training for batches

Hands-On - Facial Emotion Recognition



Convolution Neural Networks

- ☒ Introduction to CNN
- ☒ Applications of CNN
- ☒ Idea behind CNN
- ☒ Understanding Images
- ☒ Understanding Videos
- ☒ Convolutions
- ☒ Striding and Padding
- ☒ Max Pooling
- ☒ Edges, Gradients, and Textures
- ☒ Understanding Channels
- ☒ Formulas
- ☒ Weight and Bias
- ☒ Feature Map
- ☒ Pooling
- ☒ Combining



CNN - Transfer Learning

- ☒ Introduction
- ☒ AlexNet
- ☒ GoogleNet
- ☒ ResNet
- ☒ Transfer learning using Keras

Hands-On - Face Mask Detection



RNN - Recurrent Neural Networks

- ✓ Introduction to RNNs
- ✓ Training RNNs
- ✓ RNN Formula
- ✓ Architecture
- ✓ Batch Data
- ✓ Simplified Notations
- ✓ Types of RNNs
- ✓ LSTM
- ✓ GRUs
- ✓ Training RNN
- ✓ One to many
- ✓ Vanishing Gradient problem

Hands-On - COVID-19 Cases Prediction



Generative Models and GANs

- ✓ Introduction to Generative Models:
- ✓ Understanding GANs (Generative Adversarial Networks)
- ✓ GAN Architecture
- ✓ GAN Training
- ✓ Evaluating GAN Performance
- ✓ GAN Variants and Applications



Module 7 : Computer Vision



Computer Vision

- ✓ Intro to OpenCV
- ✓ Reading and Writing Images
- ✓ Saving images
- ✓ Draw shapes using OpenCV
- ✓ Face detection and eye detection using OpenCV
- ✓ CNN with Keras
- ✓ VGG

Hands-On - Real Time Pose Estimator



Projects & Case Study



Real-Time Rain Prediction using ML

- ☒ Install necessary libraries
- ☒ Obtain an API key
- ☒ Fetch live weather data
- ☒ Preprocess the data
- ☒ Train a machine learning model
- ☒ Evaluate the model
- ☒ Integrate the model with Flask
- ☒ Display the results
- ☒ Test and debug
- ☒ Deploy the application
- ☒ Continuously update the weather data



Real Time Drowsiness Detection Alert System

- ☒ Dataset collection
- ☒ Data preprocessing
- ☒ Feature extraction
- ☒ Labeling
- ☒ Model selection
- ☒ Model training
- ☒ Model evaluation
- ☒ Real-time implementation
- ☒ Alert mechanism
- ☒ Continuous improvement



House Price Prediction using LSTM

- ✓ Identify a reliable source for house price data
- ✓ Understand the website structure
- ✓ Perform web scraping
- ✓ Preprocess the scraped data
- ✓ Explore and preprocess additional data sources (if applicable)
- ✓ Define the problem
- ✓ Split the data
- ✓ Train the model
- ✓ Evaluate the model
- ✓ Fine-tune the model (optional)
- ✓ Deploy the model
- ✓ Continuously update the dataset and retrain the model



Customizable Chabot using OpenAI API

- ✓ Define chatbot goals and scope
- ✓ Gather training data
- ✓ Data preprocessing
- ✓ API integration
- ✓ Model customization
- ✓ User input handling
- ✓ Response generation
- ✓ Post-processing and filtering
- ✓ Error handling and fallback mechanisms
- ✓ Continuous improvement



Fire and Smoke Detection using CNN

- ✓ Data collection
- ✓ Data preprocessing
- ✓ Dataset augmentation
- ✓ Model architecture
- ✓ Model architecture
- ✓ Training
- ✓ Model evaluation
- ✓ Fine-tuning
- ✓ Real-time inference
- ✓ Thresholding and alerts
- ✓ Model optimization