

Face Recognition Based Smart Attendance System

Prepared by:

Nour Ghsaier
Junior IT/ BA

Supervised by:

Prof Dr.Manel Abdel Kader

IT360: Information Assurance & Security

1-Development Phases and Tools:

1-Collect User Data(face and name)

- Create a web camera.
- Detect the face of the person using the Haar Cascade classifier.
- Extract the detected face from the webcam frame.
- Store face images in RGB dimensions in a list and then convert it to a single pickle file for data serialization.

2-Test Data Using ML Algorithm

- Face Recognition using a machine learning algorithm for face recognition; K-nearest neighbors (KNN) the clustering algorithm, which is available in scikit-learn library.
- KNN for Image Classification to train the KNN algorithm with the stored face images and corresponding names.

3-Use Web App to Store User Attendance in a CSV File:

- Store in CSV: Save the attendance data in a CSV file format for easy management and analysis.
- Web Application: Build a web application using Streamlit (Python library for building interactive web apps).
- Attendance Recording: Record user attendance based on time and date through the web app.

2-Tools:

- Python: The primary programming language used for development.
- OpenCV: An open-source computer vision library.
- Scikit-learn: A machine learning library in Python.
- Streamlit: A web application framework for Python.
- Pickle file: Used for serializing Python objects.

2-Dependencies:

- **OpenCV (*cv2*)**: Used for accessing the webcam, face detection, and image manipulation.
- **Pickle (*pickle*)**: Utilized for serializing and deserializing Python objects, particularly for storing face data.
- **NumPy (*numpy*)**: Employed for handling numerical arrays and computations used alongside OpenCV for image processing tasks.
- **Streamlit (*streamlit*)**: A Python library for building interactive web applications easily.
- **Pandas (*pandas*)**: Used for data manipulation and analysis in order to handle CSV files.
- **Time (*time*) and Datetime (*datetime*)**: Utilized for managing timestamps and time-related operations.
- **Scikit-learn (*sklearn.neighbors.KNeighborsClassifier*)**: A machine learning library in Python, used for implementing the K-nearest neighbors algorithm for face recognition.
- **CSV (*csv*)**: Python's built-in library for reading and writing CSV files.

