E-Attendance Through Face Recognition

A Minor Synopsis Report

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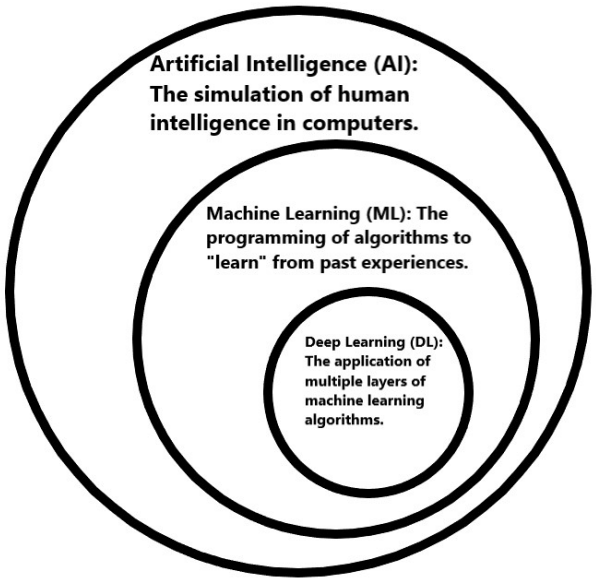
1 Introduction

The technology aims in imparting a tremendous knowledge oriented technical innovations these days. Deep Learning is one among the interesting domain that enables the machine to train itself by providing some datasets as input and provides an appropriate output during testing by applying different learning algorithms. Nowadays Attendance is considered as an important factor for both the student as well as the teacher of an educational organization. With the advancement of the deep learning technology the machine automatically detects the attendance performance of the students and maintains a record of those collected data.

Machine learning involves the programming of algorithms that can learn from themselves and even make their own predictions. This allows machines to learn from past experiences – much as humans do – by analysing their output and using it as an input for the next operation. ML algorithms learn from data to solve problems that are too complex to solve with conventional programming.

Deep learning is a subset of machine learning which is derived from running multiple layers of ML algorithms together at the same time. Note: The terms machine learning and deep learning are often used interchangeably. Most machine learning today is actually conceived at the deep learning level. Attendance maintenance is a significant function in all the insti-



tutions to monitor the performance of the students. Every institute does this in its own way. Some of these institutes use the old paper or file based systems and some have adopted strategies of automatic attendance using some bio-metric techniques. A facial recognition system is a computerized bio-metric software which is suited for determining or validating a person by performing comparison on patterns based on their facial appearances. Face recognition systems have upgraded appreciably in their management over the recent years and this technology is now vastly used for various objectives like security and in commercial operations. Face recognition is a powerful field of research which is a computer based digital technology. Face recognition for the intent of marking attendance is a resourceful application of attendance system. It is widely used in security systems and it can be compared with other bio-metrics

such as fingerprint or eye iris recognition systems. As the number of students in an educational institute or employees at an organization increases, the needs for lecturers or to the organization also increase the complication of attendance control. This project may be helpful for the explanation of these types of problems. The number of students present in a lecture hall is observed, each person is identified and then the information about the number of students who are present I maintained.The expected system engages the face recognition approach for the automating the attendance procedure of students or employees without their involvement. A web cam is used for capturing the images of students or employees. The faces in the captured images are detected and compared with the images in database and the attendance is marked.

2 Objectives

- to develop an automated system that records the student's attendance by using facial recognition technology.
- to make the attendance marking and management system efficient, time saving, simple and easy.
- To Automated update in the database without human intervention.
- To manage reports

3 Feasibility study

A feasibility study evaluates the project's potential for success; therefore, perceived objectivity is an important factor in the credibility of the study for potential investors and lending institutions. . It must therefore, be conducted with an objective, unbiased approach to provide information upon which decisions can be based. Here, we discuss 3 major feasibility studies required for our project.

3.1 Operational Feasibility :

The project is operationally feasible for the users as nowadays almost all the teachers/staffs are familiar with digital technology. In this system we train the machine through some data-set after the machine is able to recognise the faces with data set if the face matches with the data set then it will mark attendance. If the humans can understand faces then machines can also .

3.2 Economic Feasibility :

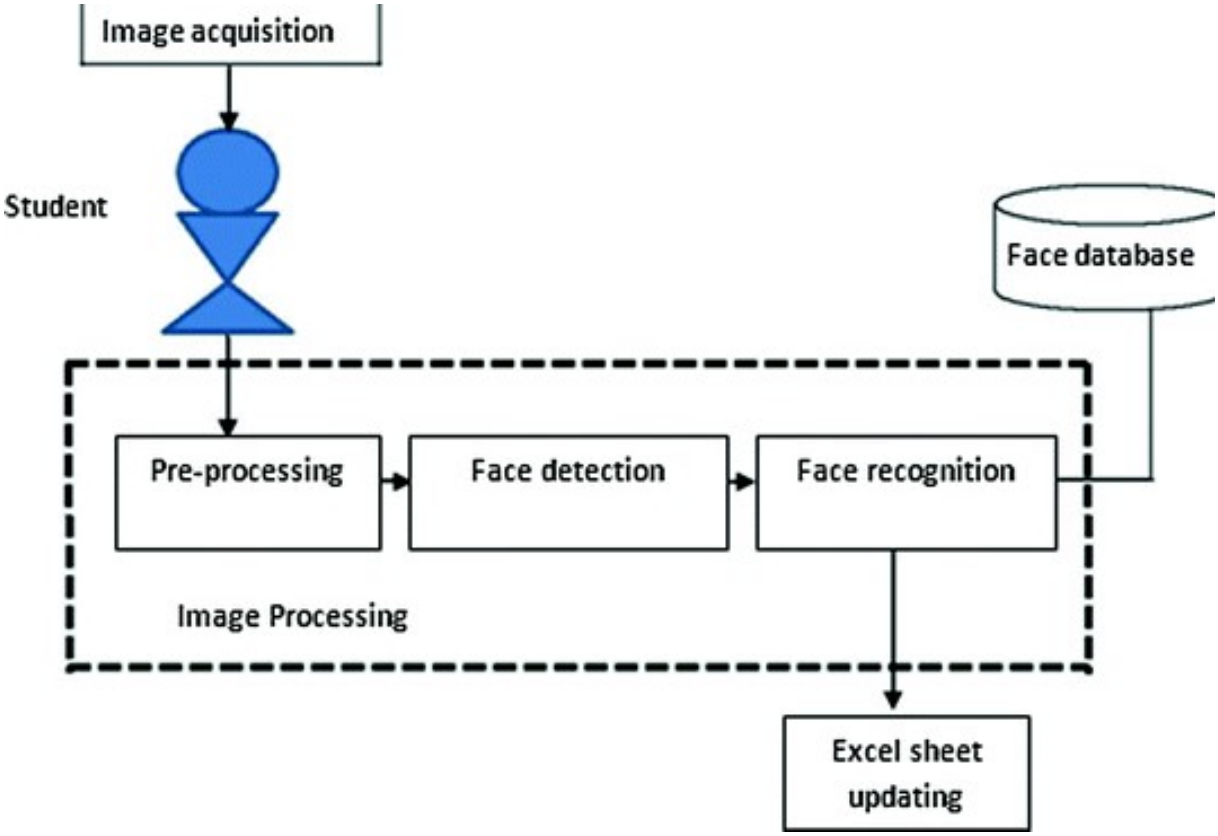
The sensing image of the camera is also displayed on the computer and TV screen for checking. The interface of the system is clean and smooth, and the control is simple, without a lot of complex operations.where in manual attendance often use no of copies and also takes time to for making attendance it leads to time and paper loss both . This is a small project with very minimal cost which is only for camera for development. The system is easy to understand and use. This system has the potential to grow by adding functionalities for students as well as teachers. This can Hence, the project could have economic benefits in the future.

3.3 Technical Feasibility :

As the system is developed using python, it is platform independent. Therefore, the users of the system can have average processing capabilities, running on any platform. The technology is one of the latest hence the system is also technically feasible.

4 Methodology / Planning of work

In this proposed system, the system is instantiated .After it triggers then the system starts processing the image for which we want to mark the attendance. Image Capturing phase is one in which we capture the image. This is basic phase from which we start initializing our system. This detects only faces and removes every other parts since we are exploring the features of only faces. These detected faces are stored in the test database for further enquiry.Features are extracted in this extraction phase. Face is recognized once we completed extracting features. The feature which is already trained with every individual is compared with the detected faces feature and if both features match then it is recognised. Once, it recognizes it is going to update in the student attendance database. Once, the process is completed the testing images gets deleted since, we are trying to design it for both the accuracy as well as efficiency co-efficient.



5 Facility Required for proposed Work

5.1 Open CV (Open Source Computer Vision Library)

is a open source computer vision software library for the purpose of machine learning. Open CV was developed to serve the purpose of computer vision applications and to stimulate the usage of machine perception in the commercially viable products. Open CV is a BSD- licensed product which is easy for the utilization and modification of the code. The library contains more than 2500 advanced algorithms including an extensive set of both typical and state-of-the-art computer vision and machine learning algorithms. These algorithms can be employed for the detection and recognition of faces, identification of objects, extraction of 3 D models of objects, production of 3 D point clouds from stereo cameras, stitching images together for production of a high resolution image of an entire scene, finding similar images from an image database, removing red eyes from images taken using flash, following eye movements, recognition of scenery and establishing markers to overlay it with intensified reality etc. It includes C++, Python, Java and MAT LAB interfaces and supports Windows,Linux,Android and Mac,OS.

5.2 Microsoft Excel

Microsoft Excel is a spreadsheet program incorporated in Microsoft Office suite of applications. Spreadsheets prompt tables of values arranged in rows and columns that can be mathematically manipulated using both basic and complex arithmetic functions and operations. Apart from its standard spreadsheet features. Excel being electronic spreadsheet program can be used to store, organize and manipulate the data. Electronic spreadsheet programs were formerly based on paper spreadsheets used for accounting purpose. The basic layout of computerized spreadsheets is more or less same as the paper ones. Related data can be stored in tables - which are a group of small rectangular boxes or cells that are standardized into rows and columns.

5.3 Install Libraries :

We need to install libraries in order to implement face recognition.

Pandas : Pandas is an open source Python package that caters diverse tools for data analysis. The package contains various data structures that can be used for many diverse data manipulation tasks. It also includes a range of methods that can be invoked for data analysis, which becomes feasible when working on data science and machine learning problems in Python.

dlib : Dlib is a modern C++ toolkit containing machine learning algorithms and tools for creating complex software in C++ to solve real-world problems.

installing dlib

pip install dlib

face recognition : The face recognition library, created and maintained by Adam Geitgey, wraps around dlib facial recognition functionality.

installing face recognition

pip install face recognition

6 References

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