

BMS INSTITUTE OF TECHNOLOGY & MANAGEMENT

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Department of Computer Science and Engineering



Academic Year 2020-21 Students Project Review and Assessment Committee

Intermediate Report-Phase II

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Project Category		Web development using python and machine learning

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Department of Computer Science and Engineering

Intermediate Report for the Project work

“Attendance system using facial recognition”

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2020-2021

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ABSTRACT

The Management of the Attendance can be a great burden on the teachers if it is done by hand. To resolve this problem, smart and auto attendance management system is being utilized. By utilizing this framework, the problem of proxies and students being marked present even though they are not physically present can easily be solved. The Open CV based face recognition approach has been proposed. This model integrates a camera that captures an input image, an algorithm for detecting face from an input image, encoding and identifying the face, marking the attendance in a spreadsheet. The Training dataset is created by training the system with the faces of the authorized students. The cropped images are then stored in a Folder. The features are extracted using HOG(Histogram Of Gradient) algorithm. This model will be a successful technique to manage the attendance of students. This system saves time of marking attendance. Attendance using facial recognition deals with the maintenance of the student's attendance details. It generates the attendance of the student on basis of presence in class. It is maintaining daily basis of attendance, the staff will be subject to responsible to make the attendance for all students. Only if the student present in particular date, the attendance will be calculated. The student attendance report based on monthly and controlled will be generated. Provide a separate username and password to make student attendance. The staff handling the particular student's attendance.

REQUIRMENT ANALYSIS

➤ **Model: Facial recognition**

Face recognition is the problem of identifying and verifying people in a photograph by their face. It is a task that is trivially performed by humans, even under varying light and when faces are changed by age or obstructed with accessories and facial hair. Nevertheless, it is remained a challenging computer vision problem for decades until recently. Deep learning methods are able to leverage very large datasets of faces and learn rich and compact representations of faces, allowing modern models to first perform as-well and later to outperform the face recognition capabilities of humans.

➤ **Method: Histogram of Gradient**

The histogram of oriented gradients (HOG) is a feature descriptor used in computer vision and image processing for the purpose of object detection. The technique counts occurrences of gradient orientation in localized portions of an image. This method is similar to that of edge orientation histograms, scale-invariant feature transform descriptors, and shape contexts, but differs in that it is computed on a dense grid of uniformly spaced cells and uses overlapping local contrast normalization for improved accuracy.

➤ **Library: HOG uses OpenCV**

The HOG feature descriptor counts the occurrences of gradient orientation in localized portions of an image. Implementing HOG using tools like OpenCV is extremely simple. It's just a few lines of code since we have a predefined function called hog in the skimage. feature library.

➤ **Operating System: Ubuntu**

Ubuntu (pronounced oo-BOON-too) is an open source Debian-based Linux distribution. Sponsored by Canonical Ltd., Ubuntu is considered a good distribution for beginners. The operating system was intended primarily for personal computers (PCs) but it can also be used on servers.

➤ **Coding Language: Python**

Recognize and manipulate faces from Python or from the command line with the world's simplest face recognition library. Built using dlib's state-of-the-art face recognition. built with deep learning. Face_recognition library in Python can perform a large number of tasks: Find all the faces in a given image. Find and manipulate facial features in an image. Identify faces in images.

➤ **Front-End: HTML, CSS, Javascript**

The front-end stack is made up of many different languages and libraries. While these vary from application to application, there are only a few generic languages understood by all web browsers. These three main front-end coding languages are HTML, CSS and JavaScript. Together, they create the underlying scaffolding that web browsers use to render the web pages that we interact with every day. All other libraries and front-end engineering are built upon these three main languages, which makes them must-have skills for any front-end developer.

➤ **Back-End: Django**

Django is a collection of Python libs allowing you to quickly and efficiently create a quality Web application, and is suitable for both frontend and backend. ... For the rest of the backend work Django doesn't help with, you just use regular Python. Business logic is a pretty broad term.

➤ **Database: SQL**

SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database.

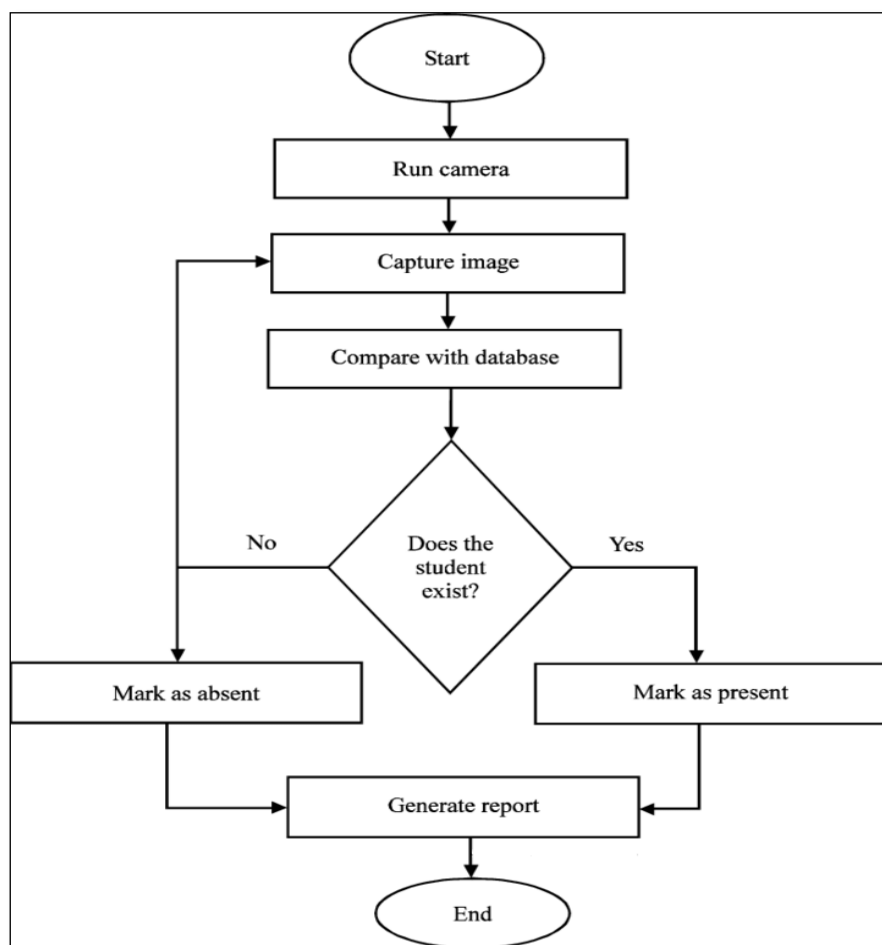
➤ **Tools: Camera**

The Camera is used to identify distinctive features on the surface of a face, such as the contour of the eye sockets, nose, and chin. All these cameras will work together so it can track a subject's face in real-time and be able to face detect and recognize.

SYSTEM DESIGN

Our system uses the face recognition approach for the automatic attendance of students in the classroom room environment without student intervention. Face recognition consists of two steps, in first step faces are detected in the image and then these detected faces are compared with the database for verification. The method been proposed for face detection i.e. Hog histogram of gradients, Support Vector Machines (SVM), and the Bayes classifier. The efficiency of face recognition algorithm can be increased with the fast face detection algorithm. Our system utilized this algorithm for the detection of faces in the office room image. Face recognition techniques can be Divided into two types Appearance based which use texture features that is applied to whole face or some specific Regions, other is Feature based which uses geometric features like mouth, nose, eyes, eye brows, cheeks and Relation between them.

➤ DATA FLOW DIAGRAM:



➤ ARCHITECTURAL DESIGN:

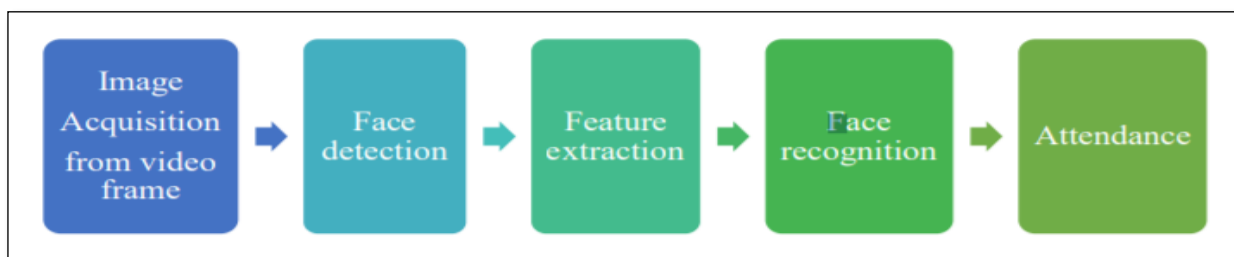
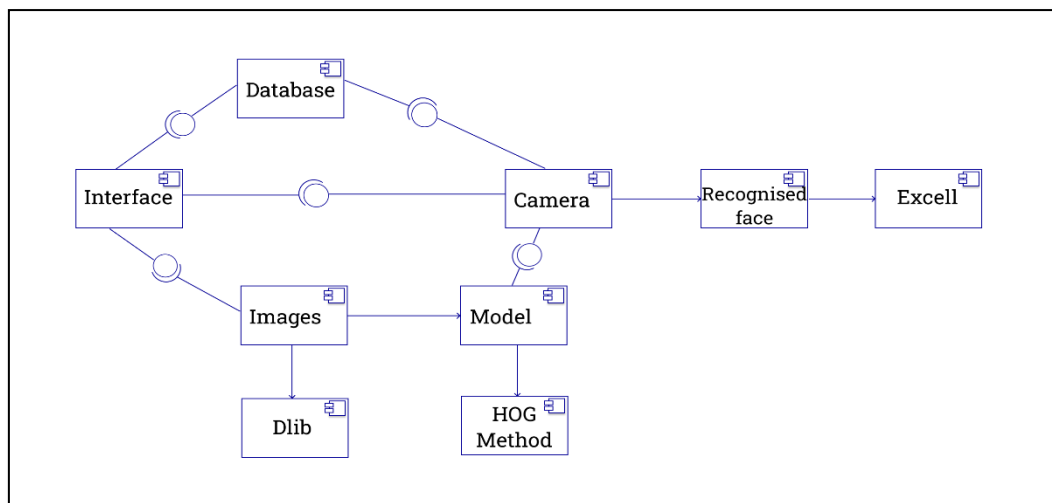
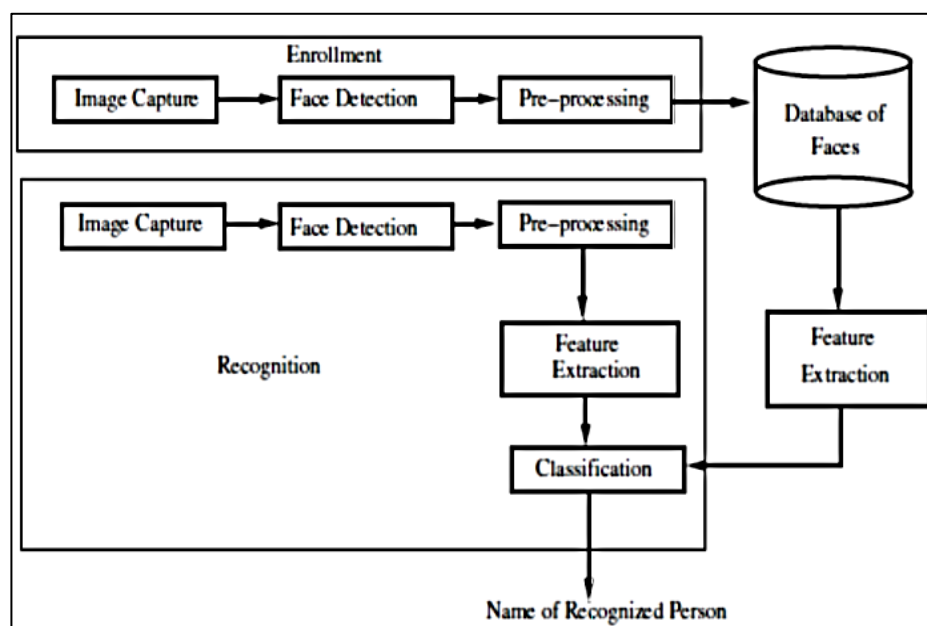


Fig. Block Diagram

➤ COMPONENT DESIGN:



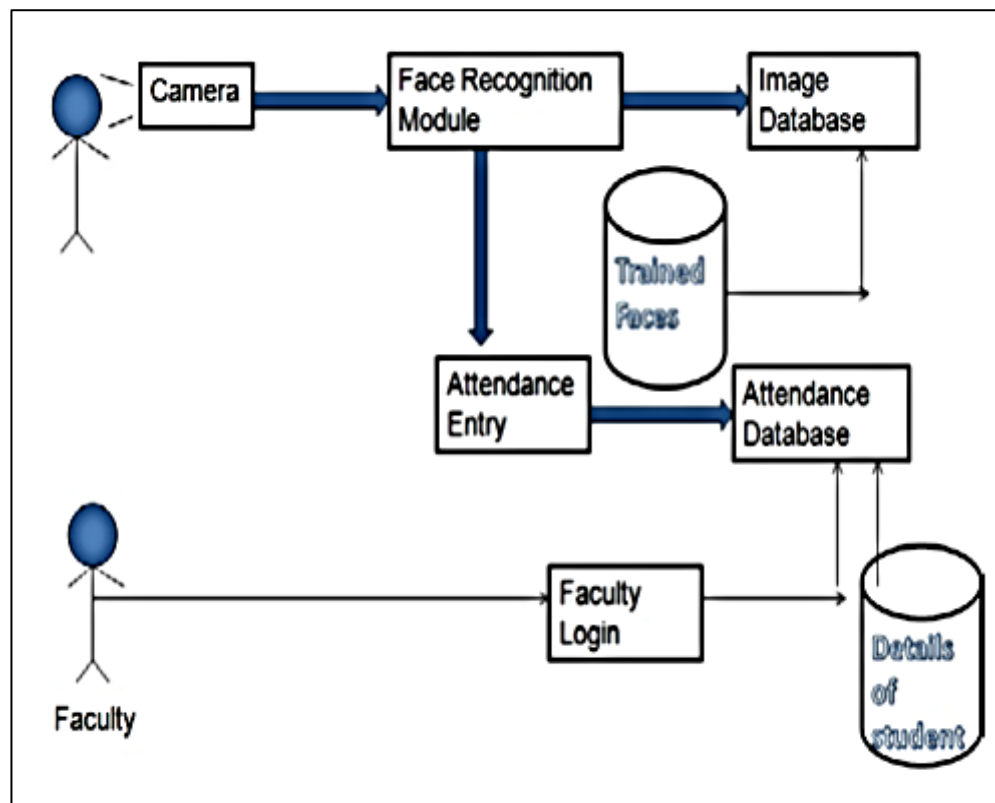


Fig. Component Diagram

➤ BEHAVIOURAL DESIGN:

The system consists of a camera that captures the images of the student and sends it to the image enhancement module. After enhancement the image comes in the Face Detection and Recognition modules and then the attendance is marked on the database server. At the time of enrolment, templates of face images of individual student are stored in the Face database. Here all the faces are detected from the input image and the algorithm compares them one by one with the face database. In this way a lot of time is saved and this is highly secure process no one can mark the attendance of other. Attendance is maintained on the server so anyone can access it for purposes like administration, students themselves.

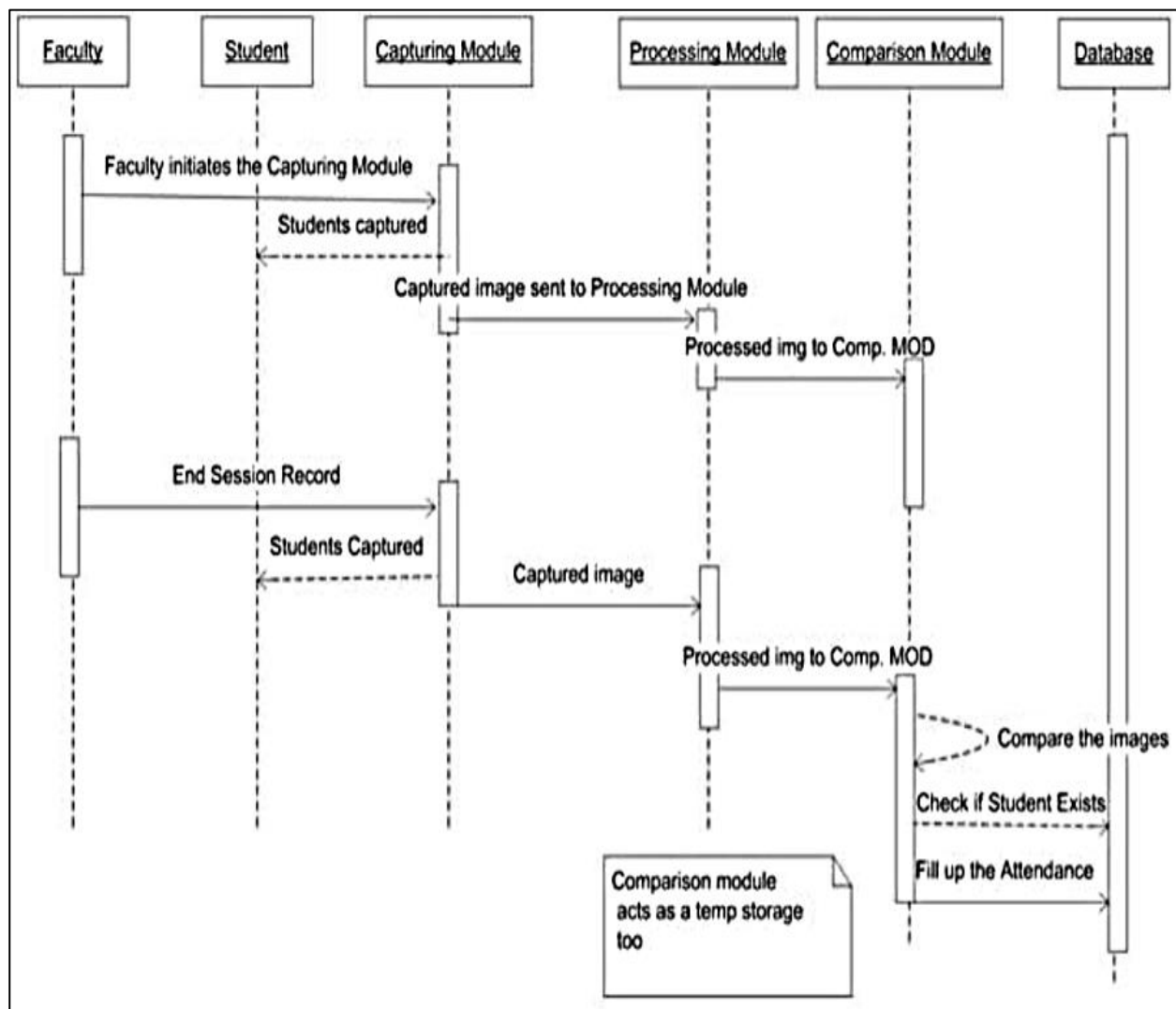


Fig. Sequence Diagram

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