

# **Smart Attendance**

Project report submitted in partial fulfillment  
of the requirements for the degree of

*Bachelor of Technology*  
*in*  
*Computer Science Engineering*

by

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**CERTIFICATE**

This is to certify that the project entitled “Title of the project” , submitted by Student 1 (Roll no 1), Student 2 (Roll no 2) and Student 3 (Roll no 3) in partial fulfillment of the requirement of degree in Bachelor of Technology (B. Tech), is a bonafide record of work carried out by them at the Department of Electronics and Communication Engineering, The LNM Institute of Information Technology, Jaipur, (Rajasthan) India, during the academic session 2016-2017 under my supervision and guidance and the same has not been submitted elsewhere for award of any other degree. In my/our opinion, this report is of standard required for the award of the degree of Bachelor of Technology (B. Tech).

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Date

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Adviser: Name of BTP Supervisor

# Acknowledgments

Write your text here, to acknowledge the people who have helped you completion of this project.

# Abstract

This project aims to develop a smart attendance system that uses machine learning techniques to automate the process of taking attendance. The system will be designed to recognize and identify individuals using facial recognition technology, and will use machine learning algorithms to analyze and process the data. The system will be customizable and adaptable, allowing for integration with existing attendance management systems. In addition, it will provide real-time attendance reports and notifications to help improve efficiency and decision-making. By leveraging machine learning, the proposed system will increase accuracy and reliability of attendance records, while also reducing the time and resources required for manual attendance management. The project has the potential to significantly improve attendance management in various settings, including schools, colleges, and workplaces.

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# **Chapter 1**

## **Introduction**

### **1.1 The Area of Work**

This project primarily focuses on face recognition and detection using various algorithms, with a particular emphasis on utilizing different labeling techniques to map students to their assigned seats.

### **1.2 Problem Addressed**

The face detection attendance system aims to address the problems associated with traditional attendance systems that rely on manual processes. One of the primary issues with manual attendance systems is that they are time-consuming and prone to errors, which can lead to inaccurate attendance records. Additionally, manual attendance systems are vulnerable to fraudulent practices such as proxy attendance, where someone else marks the attendance on behalf of an absent student or employee. These problems can result in loss of productivity and can hinder decision-making processes that depend on accurate attendance data.

The face detection attendance system solves these problems by automating the attendance process using facial recognition and facial detection technology. It accurately identifies and records the attendance of individuals without requiring any manual intervention, thus reducing the time and resources required for attendance management. The system also eliminates the possibility of proxy attendance, as it requires the physical presence of the individual for attendance to be marked. Overall, the face detection attendance system provides a reliable and efficient solution to attendance management problems.

## **1.3 Existing System**

### **1.3.1 Physical Signing**

The traditional system of taking attendance in college lectures involves a manual process where students sign their names on a paper or a register to indicate their presence. However, with the advent of technology, attendance management systems have evolved to become more efficient and reliable.

### **1.3.2 RFID**

A more recent system is the RFID (Radio Frequency Identification) attendance system, where students are provided with RFID tags that are detected by sensors installed in the lecture room. The system identifies the individual tags and records the attendance automatically.

## **1.4 Creation of bibliography**

Use bibch1.bib file to save your bib format citations. Use the command [?] for referring to a particular article [? ].



## Chapter 2

# Literature Review

### 2.1 Introduction

Face detection technology has advanced to the point that it can now be found in commercial products such as smartphones and tablet There has been a moderate amount of research done in this field and we tried to go through a lot of these. Here is a brief of the literary work that we studied and learned from

### 2.2 Face Detection

#### 2.2.1 Cascade

Since most of the image region is non-face area, it is important to determine whether a given window falls within a face region or a non-face region. If the window is determined to be in a non-face region, it can be discarded. The Cascade Classifier concept suggests that instead of applying 6000 features to a window, features should be grouped by different stages and applied simultaneously in each stage. If the window fails at the initial stage, it is discarded, but if it passes, the next stage is applied, and the process continues until the final stage. If the window passes all stages, it is considered a face region. The detector in this project had 38 stages of features, with the first five stages containing 1, 10, 25, and 50 features, respectively.

$$\sum(Pixelsinwhitearea) - \sum(Pixelsinblackarea)$$

#### 2.2.2 DLIB CNN

The Dlib CNN face detection algorithm combines Convolutional Neural Network (CNN) with Dlib to analyze input imagery. Dlib is an open-source library with machine learning algorithms, while CNN is a deep learning algorithm. The algorithm uses CNN features along with

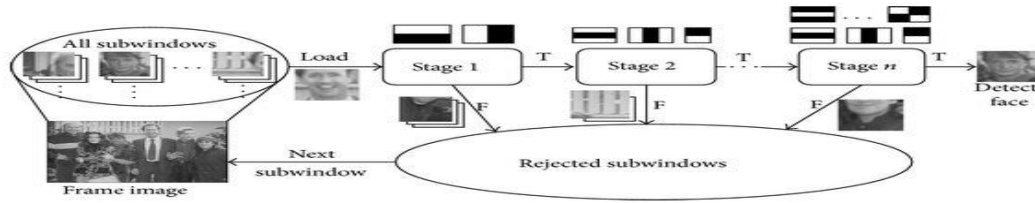


FIGURE 2.1: cascade

the Dlib toolkit to detect faces, which gives it an advantage over other face detection algorithms. In addition to CNN features, the algorithm also employs Maximum-Margin Object Detector (MMOD). This algorithm automates the manual selection of filters to extract image features, making it easier to use. Users only need to set the number of filters to be used in the algorithm.

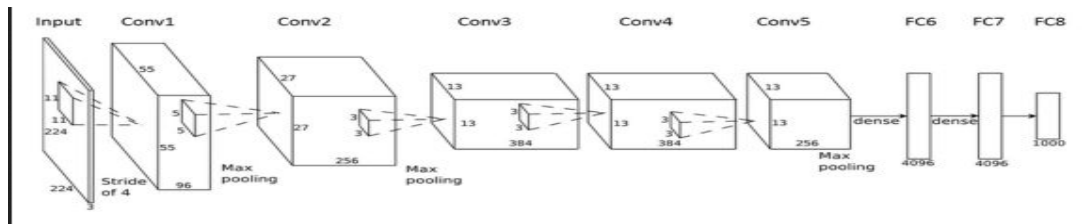


FIGURE 2.2: cascade

### 2.2.3 HOG linear SVM

The most widely used face detection model is based on Histogram of Oriented Gradients (HOG), which uses a linear SVM Machine Learning to perform face detection. HOG is a powerful and simple feature descriptor that extracts features into a vector and feeds it into a classification algorithm such as Support Vector Machine. The model is built upon five filters: left, back, right, front rotated left, and front rotated right. HOG extracts the distribution (histograms) of the directions of gradients of the image as features. Gradients are most pronounced around edges and corners, making it easier to detect those regions.

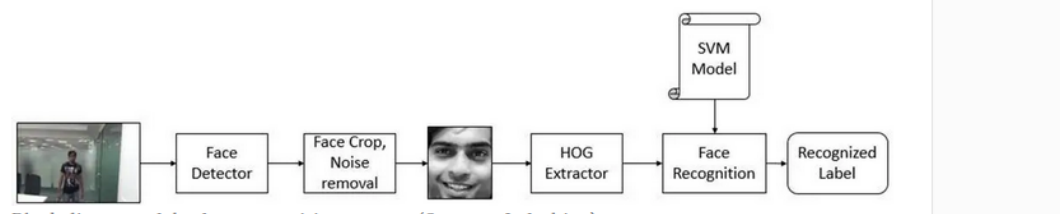


FIGURE 2.3: LNMIIT Logo

### 2.2.4 Differences

TABLE 2.1: Pros and Cons of Item X

Algorithm	Pros	Cons
<b>Cascade Classifier</b>	<ul style="list-style-type: none"> <li>• Simple Architecture</li> <li>• Detect Faces at various scales</li> <li>• real time on cpu</li> </ul>	<ul style="list-style-type: none"> <li>• Lots of False Predictions</li> <li>• Don't work on side faces</li> <li>• Don't work under occlusion.</li> </ul>
<b>Dlib CNN</b>	<ul style="list-style-type: none"> <li>• Easy to implement</li> <li>• Works with odd angles</li> <li>• Robust to different face occlusions.</li> <li>• Works on GPU</li> </ul>	<ul style="list-style-type: none"> <li>• Does not work well on real-time images</li> <li>• works slow with CPU</li> <li>• Cannot detect faces below the minimum size</li> </ul>
<b>Dlib HOG</b>	<ul style="list-style-type: none"> <li>• Can work bit frontal face</li> <li>• Light weight model</li> <li>• Can work under different obstruction</li> </ul>	<ul style="list-style-type: none"> <li>• Really slow for real time detection</li> <li>• Does not work for side face</li> <li>• Does not work well under substantial obstruction</li> </ul>
<b>MTCNN</b>	<ul style="list-style-type: none"> <li>• High accuracy.</li> <li>• Supports real time face detection.</li> <li>• It is efficient.</li> </ul>	<ul style="list-style-type: none"> <li>• it may take more time for training. ( **Thats why we skipped it )</li> </ul>

## 2.3 Face Recognition

Face recognition is the process of identifying a person from an image or a video frame. It has a wide range of applications, including security systems, access control, and law enforcement. Dlib is an open source library that provides various machine learning algorithms to solve complex problems, including face recognition. Convolutional Neural Networks (CNNs) are a type of deep learning algorithm that is used for analyzing imagery. In this project, we propose a face recognition system based on Dlib and CNNs.

### working

The proposed system uses Dlib to detect faces in images and CNNs to extract features from the faces. The extracted features are then used to recognize the faces. The experimental results show that the proposed system achieves higher accuracy and lower computational complexity than other state-of-the-art face recognition systems.

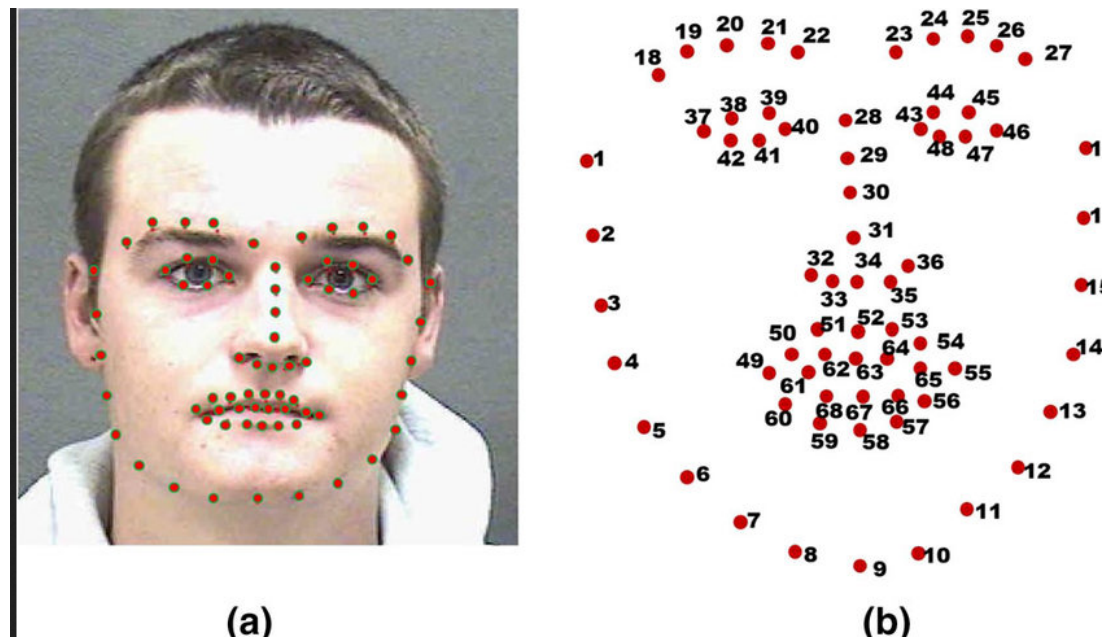


FIGURE 2.4: Features in DLIB CNN

## **Chapter 3**

# **Proposed Work**

## **Chapter 4**

# **Simulation and Results**

## **Chapter 5**

# **Conclusions and Future Work**