A Project Report On

Smart Attendance System (via OpenCV-Python)

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Department- IT, Semester- 8th
Subject: Project-III (CS881)

Under the guidance of
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A Project Report
To be submitted in the partial fulfillment of the requirements
For the degree of
Bachelor of Technology in Information Technology

Department of Information Technology,
Academy of Technology

Affiliated to

Maulana Abul Kalam Azad University of Technology,
West Bengal
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CERTIFICATE

This is to certify that the project entitled: **Smart Attendance System (via OpenCV-Python)** submitted to MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY in the partial fulfillment of the requirement for the award of the B.TECH degree in INFORMATION TECHNOLOGY of **Project-III (CS881)** is carried out by

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under my guidance. The matter embodied in this project is genuine work done by the students and has not been submitted whether to this University or to any other University/Institute for the fulfillment of the requirement of any course of study.

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We hereby state that the Project Report entitled **Smart Attendance System (via OpenCV-Python)** has been prepared by us to fulfill the requirements of **Project-III (CODE)** during the period January 2022 to June 2022.

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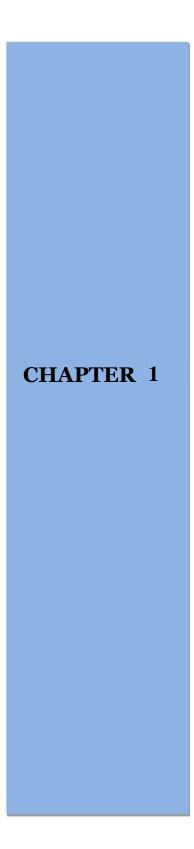_Pratik kumar_
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Abstract

Abstract - Face is the crucial part of the human body that uniquely identifies a person. Using the face characteristics as biometric, the face recognition system can be implemented. The most demanding task in any organization is attendance marking. In the traditional attendance system, the students are called out by the teachers and their presence or absence is marked accordingly. However, these traditional techniques are time consuming and tedious. In this project, 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 and converting it into excel file. The training database is created by training the system with the faces of the authorized students. The cropped images are then stored as a database with respective labels.

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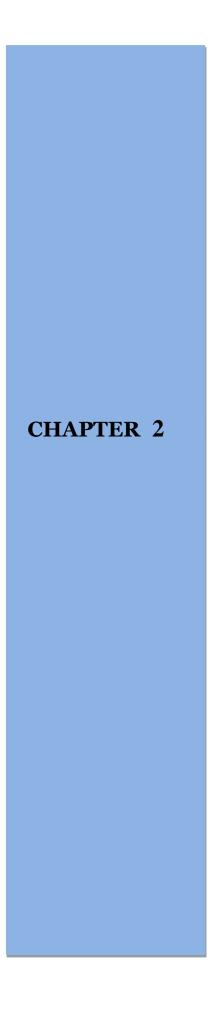| Contents		Page No

CHAPTER 1

INTRODUCTION

Introduction

Attendance maintenance is a significant function in all the institutions 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 biometric techniques. A facial recognition system is a computerized biometric 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 the attendance system. It is widely used in security systems and it can be compared with other biometrics 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.
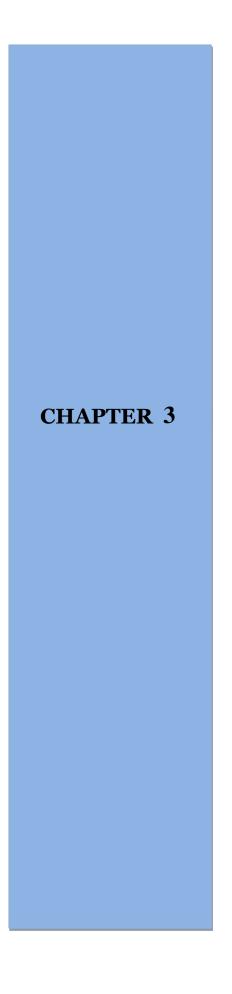
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CHAPTER 2

LITERATURE OVERVIEW

Literature Overview

Attendance Management System basically has two main modules for proper functioning: - First module is admin which has right for creating space for new batch. Any entry of new faculty, Updating in subject if necessary, and sending notice. Second module is handled by the user which can be a faulty or an operator. User has a right of making daily attendance, generating report. The product Attendances Management system is an independent product and does not depend on any other product or system. The product will automate various tasks associated with handling student details and better organizing the stored information and optimum performance, thus helping the Colleges to ensure smooth working of these processes.

Attendance Management System is software developed for daily student attendance in schools, colleges and institutes. It facilitates to access the attendance information of a particular student in a particular class. The information is sorted by the operators, which will be provided by the teacher for a particular class. This system will also help in evaluating attendance eligibility criteria of a student. The purpose of developing attendance management system is to computerized the tradition way of taking attendance. Another purpose for developing this software is to generate the report automatically at the end of the session or in the between of the session.

CHAPTER 3

PROBLEM DEFINITION & OBJECTIVES

Problem Definition & Objectives
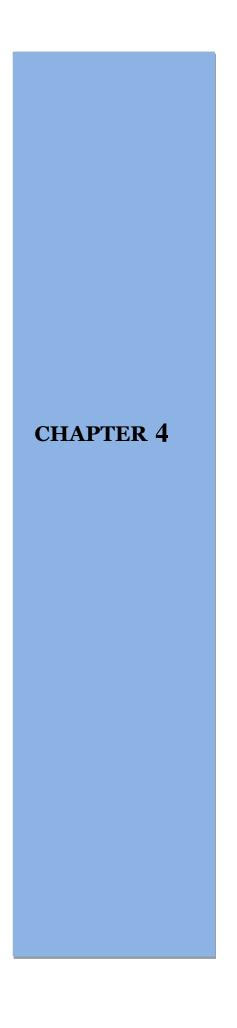
Problem Definition

Taking and tracking students' attendance manually, losing attendance sheets, dishonesty, wasted time and high error scales are problems facing the lecturers use the existing attendance system. It is a hard process, take time and cause a lot of paper-based work. As a result, in order to solve these problems and avoid errors we suggest to computerize this process by providing a system that record and manage students' attendance automatically without needing to lecturers' interference.

Our primary goal is to help the lecturers, improve and organize the process of track and manage student attendance and absenteeism. Additionally, we seek to:

- ✓ Provides a valuable attendance service for both teachers and students.
- ✓ Reduce manual process errors by provide automated and a reliable attendance system uses face recognition technology.
- ✓ Increase privacy and security which student cannot presenting himself or his friend while they are not.
- ✓ Produce monthly reports for lecturers.
- ✓ Flexibility, Lectures capability of editing attendance records.
- ✓ Calculate absenteeism percentage and send reminder messages to students.

Objectives

In this project we are going to learn how to perform Facial recognition with high accuracy. We will first briefly go through the theory and learn the basic implementation. Then we will create an Attendance project that will use webcam to detect faces and record the attendance live in an excel sheet.

CHAPTER 4

FEASIBILITY STUDY

Feasibility Study

FEASIBILITY STUDY

A feasibility study is a high-level capsule version of the entire System analysis and Design Process. The study begins by classifying the problem definition. Feasibility is to determine if it's worth doing. Once an acceptance problem definition has been generated, the analyst develops a logical model of the system. A search for alternatives is analyzed carefully. There are 3 parts in feasibility study.

1) Operational Feasibility

2) Technical Feasibility

3) Economical Feasibility

OPERATIONAL FEASIBILITY

Operational feasibility is the measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development.The operational feasibility assessment focuses on the degree to which the proposed development projects fits in with the existing business environment and objectives with regard to development schedule, delivery date, corporate culture and existing business processes.To ensure success, desired operational outcomes must be imparted during design and development. These include such design-dependent parameters as reliability, maintainability, supportability, usability, producibility, disposability, sustainability, affordability and others. These parameters are required to be considered at the early stages of design if desired operational behaviours are to be realised. A system design and development requires appropriate and timely application of engineering and management efforts to meet the previously mentioned parameters. A system may serve its intended purpose most effectively when its technical and operating characteristics are engineered into the design. Therefore, operational feasibility is

a critical aspect of systems engineering that needs to be an integral part of the early design phases.

TECHNICAL FEASIBILITY

This involves questions such as whether the technology needed for the system exists, how difficult it will be to build, and whether the firm has enough experience using that technology. The assessment is based on outline design of system requirements in terms of input, processes, output, fields, programs and procedures. This can be qualified in terms of volume of data, trends, frequency of updating inorder to give an introduction to the technical system. The application is the fact that it has been developed on windows XP platform and a high configuration of 1GB RAM on Intel Pentium Dual core processor. This is technically feasible .The technical feasibility assessment is focused on gaining an understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and how it meets the need of the proposed system.

ECONOMICAL FEASIBILITY

Establishing the cost-effectiveness of the proposed system i.e. if the benefits do not outweigh the costs then it is not worth going ahead. In the fast paced world today there is a great need of online social networking facilities. Thus the benefits of this project in the current scenario make it economically feasible. The purpose of the economic feasibility assessment is to determine the positive economic benefits to the organization that the proposed system will provide. It includes quantification and identification of all the benefits expected. This assessment typically involves a cost/benefits analysis.

CHAPTER 5

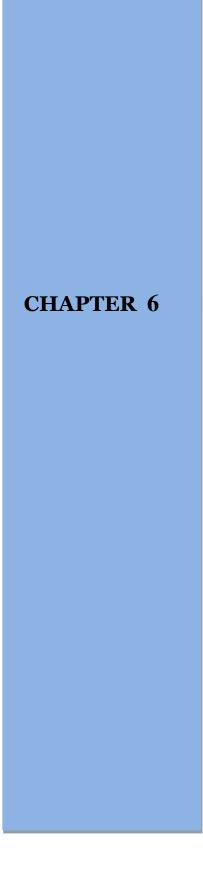**System Analysis
OR
Proposed
Scheme**

System Analysis/ Proposed Scheme

EXISTING SYSTEM

The existing system largely consists of physical register where the supervisor manually inputs the attendance record of all students. Other technologies which have been developed to replace this manual system include fingerprint,retina scan, voice recognition etc. The problem with existing system is that the manual system is time consuming and the advanced technologies are too expensive to be implemented on a large scale in any organization.

PROPOSED SYSTEM

The following system eliminates the tedious task of manually maintaining the attendance records by automating it. The administrator fills up the details of the teachers and students at the start of the semester. Class list is generated automatically. These details can be used for further semesters with little changes

CHAPTER 6

Software and Hardware Requirement Specifications

Software and Hardware Requirement Specifications
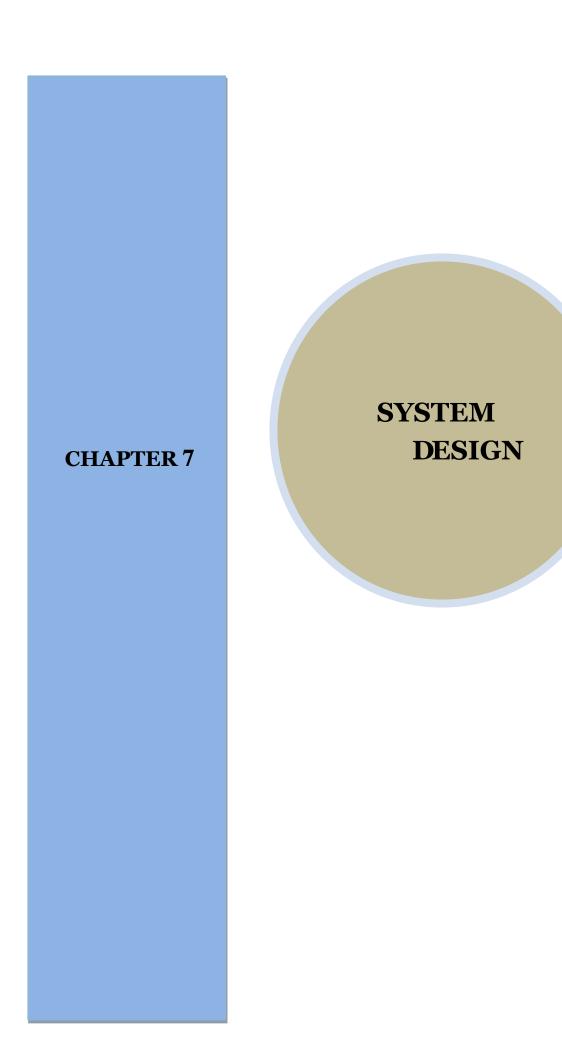
Hardware Requirement
Number Description
- PC with 250 GB or more Hard disk.
- PC with 2 GB RAM.
- PC with Pentium 1 and Above.
- WebCam

Software Requirements
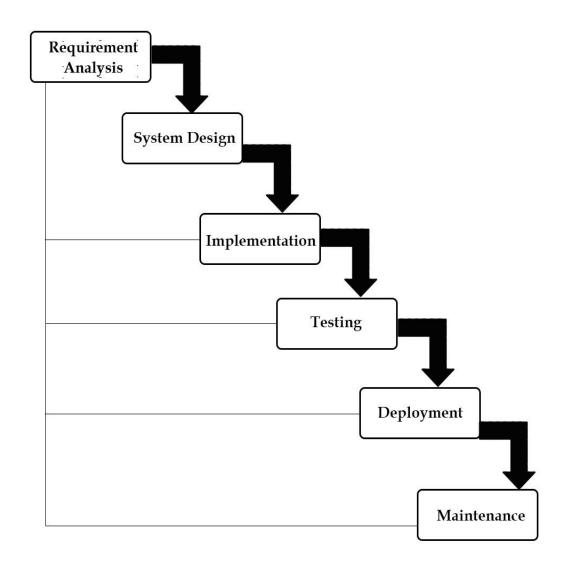### Number Description Type
- Operating System   Windows XP / Windows
- Language Python
- IDE   PyCharm
  - ✓ cmake
  - ✓ dlib
  - ✓ face_recognition
  - ✓ numpy
  - ✓ opencv-python

CHAPTER 7

SYSTEM DESIGN

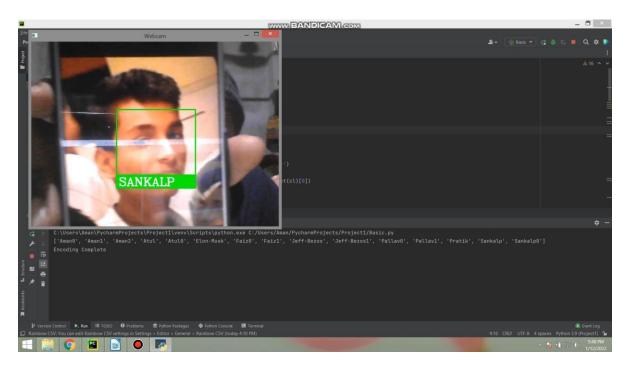| System Design |
| --- |

1. Requirements were very well documented, clear and fixed.

2. Technology was adequately understood.

3. Simple and easy to understand and use.

4. There were no ambiguous requirements.

5. Easy to manage due to the rigidity of the model.

6. Each phase has specific deliverables and a review process.

7. Clearly defined stages.

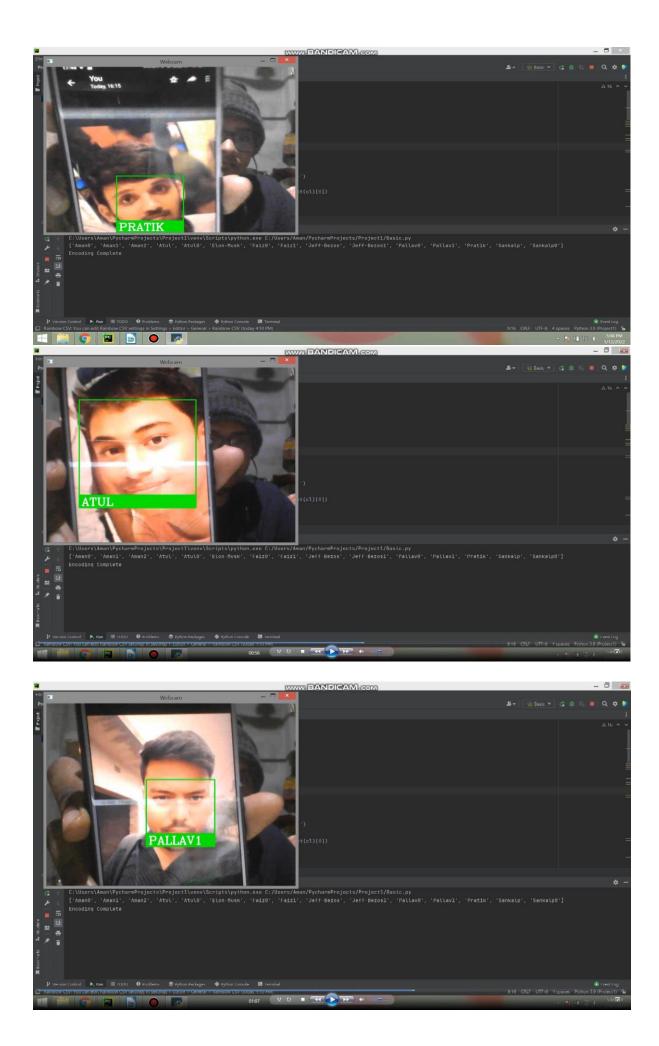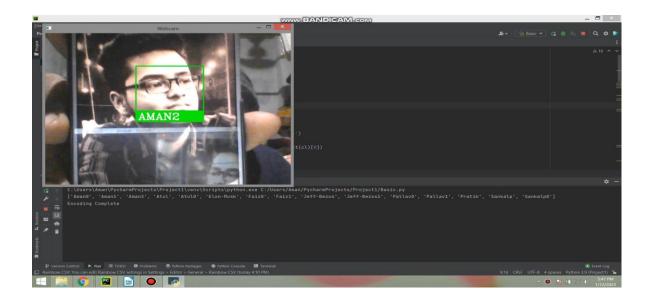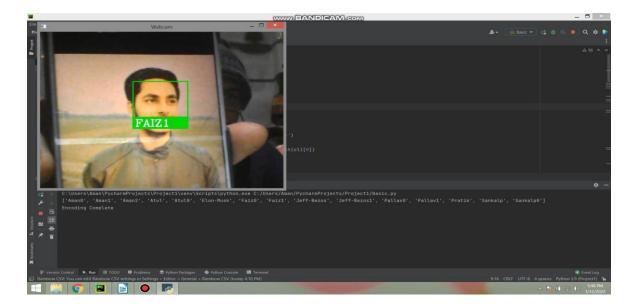8. Well understood milestones. Easy to arrange tasks.

Discussion

To maintain a discipline and let students grasp utmost knowledge in schools, colleges and universities the attendance system was introduced. There are two conventional techniques to mark attendance of students in a particular class. One of them is by calling the roll number and the second is to take students sign on a piece of paper against their roll number. Hence there was a need to evolve this system in such a way that it could become user friendly, less time consuming and efficient. This is an automated system to assist the faculty in taking attendance of the whole class without any disturbance or time waste. The idea can encompass a large number application one of which include face identification, it will help save time and efficiently identifies and eliminates the chances of proxy attendance. The main purpose of this project is to built automated attendance system using OpenCV/Python libraries and recognizer algorithm have been implemented. The proposed system can be implemented in any field where attendance system is present and plays a vital role. In addition, as the project objectives and the design criteria all met, it's greatest to say this project is an engineering solution for all university and colleges to track and manage the attendance.
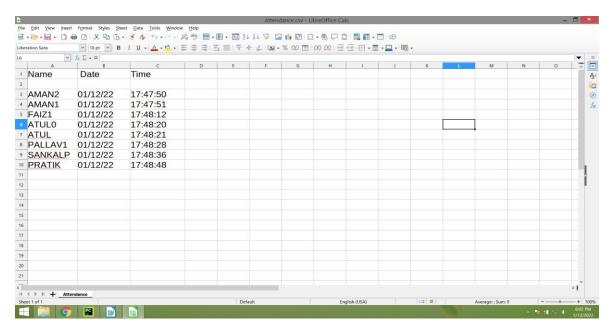
Testing

Attendance Excel Sheet

Name	Date	Time
AMAN2	01/12/22	17:47:50
AMAN1	01/12/22	17:47:51
FAIZ1	01/12/22	17:48:12
ATUL0	01/12/22	17:48:20
ATUL	01/12/22	17:48:21
PALLAV1	01/12/22	17:48:28
SANKALP	01/12/22	17:48:36
PRATIK	01/12/22	17:48:48

Conclusion

Automated attendance monitoring system was the project chosen by us by keeping in view of the demand's of day to day needs and wants of the society. The advancements in technology lead us to think out of the box and come up with some idea that could be future changing. Education is the most important thing which every person should acquire as it is the basis for a better lifestyle and will surely alleviate the standard of a living community. What our education system lacks is the involvement of students in the schools, colleges and universities. Instead of attending lectures and studying they prefer staying away from class and keep engaged in using these gadgets. Low attendance means that the students and not there to acquire the knowledge which they are supposed get and is of immense importance for them and can lead them to a better future.

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- ✓ **https://www.youtube.com/watch?v=sz25xxF_AVE**