



Proposal

For Third

Year Project

Bachelor of Science in Information Technology

Attendance Management System using Face Recognition

Submitted by

SONAM PELKI(12200081)

SONAM TSHERING(12200082)

TSHEWANG NORBU(12200093)

UGYEN LHAMO(12200095)

UGYEN TASHI(12190103)

Gyalpozhing College of Information Technology

Read carefully before filling the form.

1. Please do not alter the layout of the application form. Information must be filled in the spaces provided, under set format.
2. Guidance notes in various fields should not be deleted.
3. Required information should be duly filled in the specified fields.

Guidelines and Forms

Submission Procedure

Duly filled proposal forms completed in all respects should be submitted in form of soft copy in the VLE. On receipt of the applications the proposals will be evaluated by the examiner and proposal would then be defended by student groups. The project group may need to revise the proposal in light of the examiner's recommendations.

For further information, please contact:

Module Coordinator

Tshering

tshering.gcit@rub.edu.bt

Table of Contents

Application for the Project	4
1. <i>Project Identification</i>	4
2. Aims, Goals, Objectives and scope of the Project.....	7
3. Project Feature.....	9
3.1 Background	9
3.2 Literature Review:.....	9
3.3 Requirements	10
3.4 Technology.....	11
3.5 System Architecture	12
3.5.1 System Design	12
3.5.2 Workflow	13
3.6 Deployment.....	14
4. Team Members Role	16
5. Examiner Comments.....	18
6. Project Schedule / Milestone Chart /Work plan	19
7. Bibliography.....	20

Application for the Project

1. Project Identification

1.1 Reference **Number:**

2023_PRJ303_10(Year_Module_groupNo)

(for office use only)

1.2 **Problem statement**

(Please refer [here](#) on how to write a problem statement.)

The current attendance system in educational institutions and workplaces involves manual methods which is time-consuming and prone to mistakes. With the increasing number of students and employees, the traditional way of taking attendance that is paper-based is less efficient. Hence there must be a more precise and efficient attendance system.

1.3 Project **Title:**

(Provide a concise, accurate and informative title which immediately orientates your reader to the focus of your project.)

Attendance Management System using Face Recognition

1.4 **Key Words:**

(Please provide a maximum of 5 key words that describe the project. The key words will be incorporated in our database.)

1.5 Project Guide:

Name: Namgay Dema

Designation:

Mobile # :

Tel. # :

Email:

1.4.1. Project examiner 1:

Name:

Designation:

Mobile # :

Tel. # :

Email:

1.4.2. Project examiner 2:

Name:

Designation:

Mobile # :

Mobile #

:

Email:

1.6 Project **Duration:**

Starting Date:

Completion Date:

2. Aims, Goals, Objectives and scope of the Project

2.1 Aims of the Project: The aim of this project is to develop an attendance system that uses machine learning algorithms to recognize the faces of students and mark their attendance automatically. The system should also have the capability to detect and prevent proxy attendance. The system should be easy to use and implement, scalable, and affordable, making it accessible to schools, universities, and organizations of various sizes.

2.2 Goals of the Project: The goal of the project is to develop a web application that can automatically recognize the faces of students and record their attendance.

2.3 Objectives of the Project

Objective 1: Develop a face recognition algorithm

The first objective of the project is to develop an accurate and reliable face recognition algorithm using machine learning techniques. The algorithm should be able to detect and recognize human faces in real-time, even under varying lighting conditions and different facial expressions.

Objective 2: Design a user-friendly interface

The second objective of the project is to design a user-friendly interface that enables easy interaction with the attendance system. The interface should be intuitive, responsive, and able to display real-time attendance data.

Objective 3: Integrate with existing attendance system

The third objective of the project is to integrate the face recognition attendance system with the existing attendance management system of the organization. This will enable the system to seamlessly process attendance data and generate reports.

Objective 4: Ensure security and privacy

The fourth objective of the project is to ensure the security and privacy of the attendance data. The system should comply with data protection regulations and only authorized personnel should have access to the data.

Objective 5: Test and optimize the system

The fifth objective of the project is to test and optimize the system to ensure its reliability and accuracy. The system should be tested under various conditions, and any issues identified

should be addressed promptly. The optimization process should also improve the system's performance, such as reducing false positives and false negatives.

2.4 Scope of the Project:

Scope of the project is limited within BSc IT third year group B

3. Project Feature

3.1 Background

(Explains why you are doing the project. It provides a brief overview of the background to the project and establishes a particular area, or problem, that needs to be investigated further. It provides a clear statement of the topic of the proposed work.)

Attendance plays an important role in education sectors be it schools or colleges all over the world. A proper attendance system not only brings students success but also for the institutions.

At present, taking attendance is done by the tutors. Some methods of taking attendance are calling roll number or calling name of each student, signing on the attendance sheet or headcounts which is challenging as it is time -consuming and problematic. Moreover, in the traditional method, students can copy the signature of other friends and sign in the attendance sheet when he or she is not present in the class. In addition, with the increasing number of students studying it would be hectic for both teachers and students to wait in queue just to take attendance. Hence most students end up not coming to class and getting the attendance easily.

Therefore, in order to overcome the problems of time-consuming and proxy approaches of taking attendance, we are developing an attendance managed system using face recognition which is automated, less time consuming and less cheating while taking attendance. The system will help teachers by reducing the work and it should be scalable for the large number of students.

3.2 Literature Review:

(Detailed review of what all has been done internationally in the proposed area quoting references and bibliography. This section demonstrates the evolution of Technology, the depth of the project team literature search and builds the confidence of the evaluators about capability of the team in achieving the stated objectives.)

The paper titled 'Face Recognition based attendance system' by International Research Journal of Engineering and Technology (IRJET) has developed a web-based attendance management system using face recognition. They used unique characteristics of the face and

used Haar Cascade machine learning algorithm which uses biometric facial recognition including following steps that are capturing the pictures, extraction from sample, comparison of extraction step collected data is compared with existing templates and lastly matching. Haar Cascade is a machine learning object detection algorithm in which a cascade function is trained from a large number of positive and negative pictures(positive images are those in which the object to be detected is present, negative images are those in which the object to be detected is not present).

An automatic attendance system has been developed by Nilesh D. Veer in which a video is collected as input. frames are captured when there is human presence detected. For face detection, Viola Jones algorithm is used, and Principal Component Analysis(PCA) is used for face recognition, which also uses LBP for threshold purposes. The facial recognition rate is nearly 100% for a small number of students and the attendance of the student is recorded along with the entry time of the student. They have used two different data samples, one consisting of images of 56 students and another dataset with images of 20 students. Using these two data samples they have derived the output in which the average recognition rate for dataset1 and dataset2 are 69.21% and 92.87% respectively

The Smart Attendance System was developed by a group of senior students of GCIT. In their project they have used the Haar Cascade algorithm for face detection and Local Binary Pattern Histogram (LBPH) for face recognition. But then in their project, they can only capture one person's image at a time.

3.3 Requirements

3.3.1 Functional Requirements

- Taking and tracking student attendance in real time using facial recognition
- Sending the names of the absent student directly to the lecturer
- Allowing the lecturer to modify the student absent or late.
- Showing the names of who is absent or late in the screen to avoid errors.

3.3.2 Non-functional requirements

- **Accuracy and Precision:** The system must perform its process that is recognition of face and detection of face precisely to avoid problems.
- **Flexibility:** The user especially lecturers must have the privilege to change the attendance details of particular student
- **Security:** The system should be secure while also protecting students' privacy.
- **Speed and Responsiveness:** Execution of operations should be fast.

3.3.3 Software Requirements

- **Python:** Python is a widely used programming language

- **Open CV:** It is an image processing library required to perform image processing tasks such as face detection.
- **Version control:** Version control software like Git is recommended to manage the source code and collaborate with other developers.
- **VS Code:** It is a popular code editor that can be used for developing the applications.

3.3.4 Hardware Requirements

- **Processor:** A multicore processor with a clock speed of at least 2 GHz is recommended. This will allow the system to process large amounts of data quickly and efficiently.
- **RAM:** At least 8 GB of RAM is recommended for running machine learning algorithms and handling large datasets. More RAM will be beneficial for larger datasets and more complex algorithms.
- **Graphics card:** A dedicated graphics card is recommended for running deep learning algorithms, as this will significantly speed up the training process. Nvidia GPUs are commonly used for deep learning.

3.4 Technology

3.4.1. Front-end Technology

- **HTML/CSS:** HTML and CSS can be used to create the user interface for the emotion-based music recommendation system. The UI can include buttons or sliders to select the desired mood or emotion.
- **JavaScript:** JavaScript can be used to add interactivity to the UI, such as dynamically updating the recommended music based on the user's mood selection. JavaScript can also be used to implement the machine learning algorithm that powers the recommendation system.
- **Bootstrap:** Bootstrap is a popular front-end framework that can be used in emotion-based music recommendation systems to create responsive and

mobile-first user interfaces. Bootstrap provides a set of pre-designed CSS styles and JavaScript plugins that can be used to quickly build and customize UI components like buttons, forms, and modal windows.

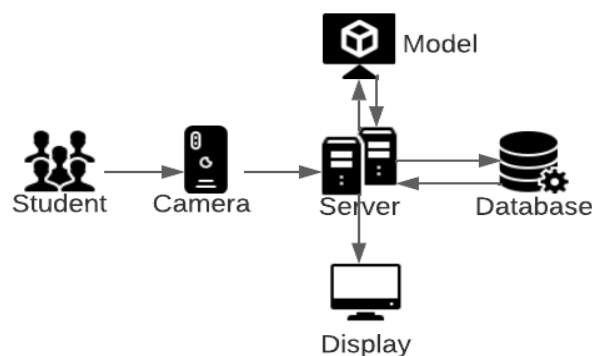
3.4.2. Backend-end Technology

- **Python:** Python is a popular programming language used for developing web Applications.
- **Django:** It is a popular open-source web framework for building web applications in Python. Django supports a wide range of databases, both relational and non-relational, making it flexible and versatile for different types of applications.
- **MySQL:** It is an open source widely used relational database management system. They store data in tables with predefined columns and rows.
- **Google Cloud Storage:** It is a highly scalable and flexible cloud storage service that can be used to store and access large amounts of data.

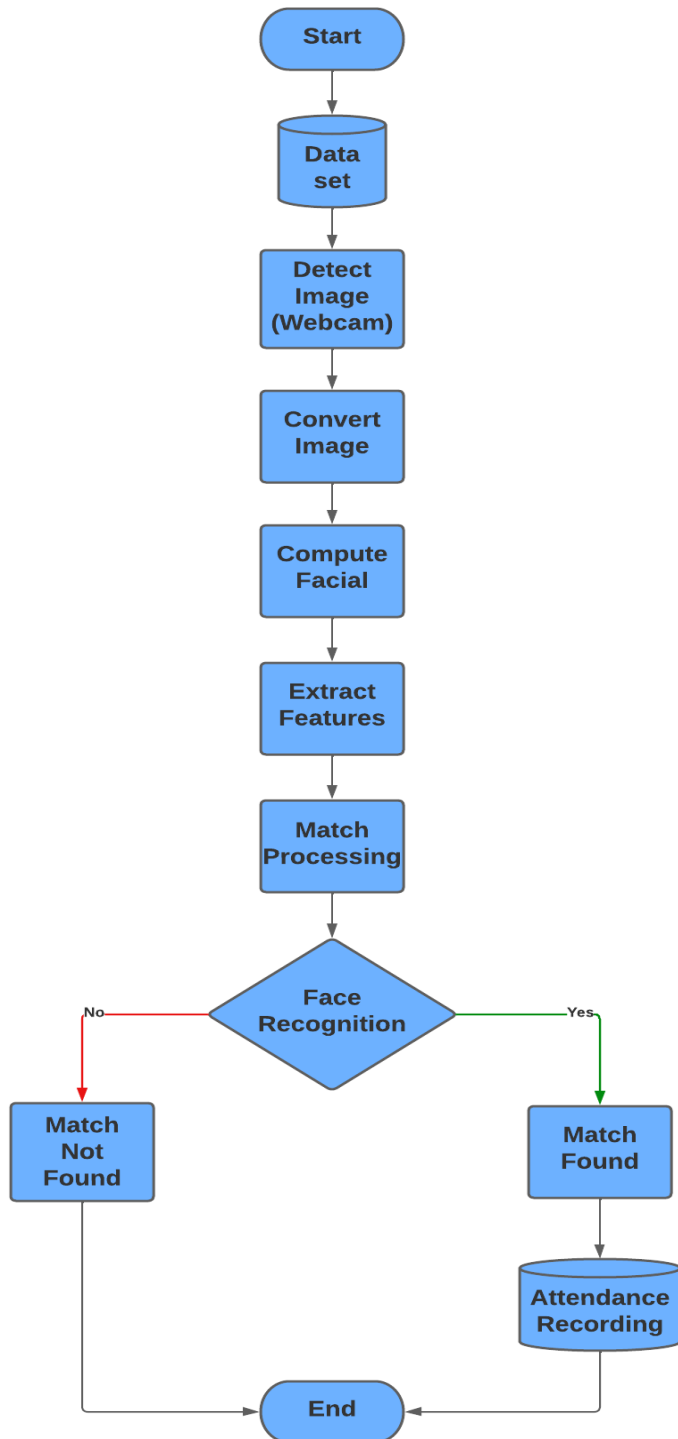
3.5 System Architecture

3.5.1 System Design

Three-tier architecture is a well-established software application architecture that organizes applications into three logical and physical computing tiers: the presentation tier, or user interface; the application tier, where data is processed; and the data tier, where the data associated with the application is stored and managed.

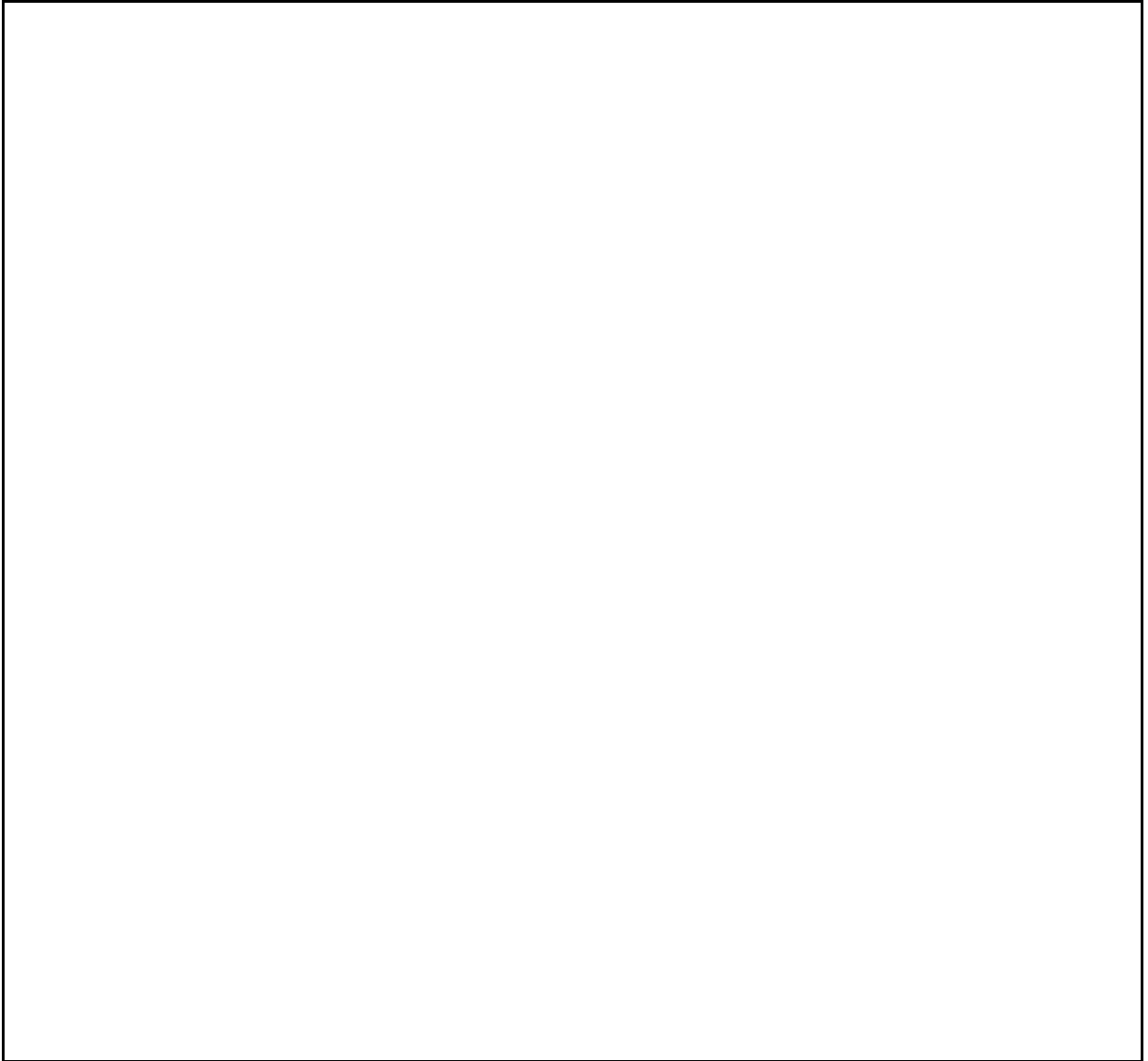


3.5.2 Workflow



3.6 Deployment

The proposed system will be developed, integrated with web applications and hosted on Heroku platform or Railway server.



4. Team Members Role

4.1 Member 1 Name and Role

Sonam Tshering (Team leader)

- Frontend Developer

4.2 Member 2 Name and Role

Sonam Pelki

- Backend Developer

4.3 Member 3 Name and Role

Tshewang Norbu

- UI & UX Designer

4.4 Member 4 Name and Role

Ugyen Tashi

- Data Scientist
- DevOps Engineer

4.5 Member 5 Name and Role

Ugyen Lhamo

- Project manager
- Data Scientist

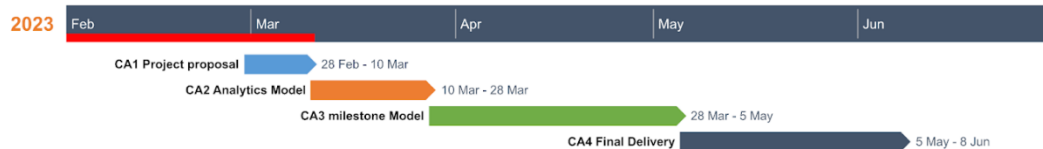
5. Examiner Comments

6. Project Schedule / Milestone Chart /Work plan

[describes what you will do. It is a plan of the tasks which will enable you to achieve the stated aims of your project. To devise a plan, you need to break the project down into a series of steps or stages, and you then outline the tasks within each stage. The project plan should also include a timetable in which you plan the timing for the main tasks. This timetable can help to keep you on track throughout the project. The plan may also include a list of the resources required to do the project.]

(Project schedule using MS-Project (or similar tools) with all tasks, deliverables, milestones, clearly indicated are preferred. Task should be measured in terms of hours)

Project Timeline



7. Bibliography

Disha Giriyan, C. V. (n.d.). Investigation of Camera placement and Face Detection Methods for Automated Camera-Based Attendance Systems. 8(11). doi:10.17577/IJRET CONV8 11022

Mrunal Aware, P. L. (2021). Attendance Management System using Face-Recognition. 7(3). doi:10.32628/CSEIT217370

Neha Savakhande, V. S. (2020). Face Recognition based Attendance System. 07(02). Retrieved from <https://www.irjet.net/archives/V7/i2/IRJET-V7I2360.pdf>

Neha Savakhande, V. S. (2020). Face Recognition based Attendance System. 07(02). Retrieved from <https://www.irjet.net/archives/V7/i2/IRJET-V7I2360.pdf>