



Project Abstract

Software Engineering

UE21CS341A

Name	SRN
Vijayraj G	PES2UG21CS605
Yaman Gupta	PES2UG21CS619
Y.Revanth Kumar Reddy	PES2UG21CS624
Vishal S	PES2UG21CS609

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Project Title:

Advanced Face Recognition Student Attendance System

In the era of rapid technological advancements, the integration of Software Engineering(SE) principles and technologies has become necessary to enhance various aspects of our lives. The Advanced Face Recognition Student Attendance System Project is an application of modern technology designed to streamline and enhance the attendance taking process in educational institutions. This project leverage the facial recognition techniques and integrates seamlessly with MySQL database, offering a reliable and efficient solution for monitoring student attendance.

Traditional attendance systems, like student roll call often suffer from inaccuracies, time-consuming, manual processes and the potential for manipulation. In response to these challenges, our project utilises Python to implement a facial recognition algorithm. This algorithm identifies students based on their unique facial features, ensuring precise attendance records.

Key features of this system are:

1. **Student Details Management:** The system collects and maintains comprehensive student information, including names, unique identifiers, and photographs, ensuring a well organised database of student data.
2. **Face Detection and Recognition:** The system employs computer vision techniques to detect and recognize student's faces, even in varying lighting conditions and angles.
3. **Attendance Using Face Recognition:** The ability to mark student attendance seamlessly through facial recognition. The SE aspect comes into play during the development phase, ensuring robust software architecture and efficient algorithm implementation.
4. **Training Data:** To improve recognition accuracy, the system incorporates a machine learning component that continuously updates and enhances its recognition capabilities. This requires the collection and training of data, showcasing the iterative nature of SE in system improvement.

5. **Photo Integration:** Student Photos serve a crucial role for face recognition. The SE aspect focuses on image processing, storage and retrieval mechanisms, ensuring that the system functions optimally.

The Face Recognition Student Attendance System Project in Python with MySQL Database represents a significant advancement in attendance management, offering a reliable, accurate, and efficient solution that benefits both the educators and students. This project demonstrates the potential of technology to simplify administrative tasks in educational settings for enhancing accountability and efficiency.

Plan of Work

1. Development of the UI
 - Design the graphical user interface (GUI) components using a library like tkinter.
2. Designing different windows
 - Specifying the different windows/screens needed (e.g., login, student management, attendance).
 - Create detailed designs for each window, including layout, color schemes, and fonts.
3. Designing the OpenCV Model - Haarcascade
 - Fine-tune the model if necessary for better accuracy in face detection.
 - Integrate the selected model into the code.
4. Integration of the code with MySQL
 - Write code to establish a connection to the MySQL database.
 - Implement functions for data retrieval, storage, and manipulation.
5. Attendance Management
 - Generating attendance reports and storing them in Excel format as well as in the MySQL database.

Team Division:

1. UI Development and functional features
 - Vijayraj G
 - Revanth Reddy
2. Model Development
 - All 4
3. MySQL integration
 - Revanth Reddy
4. Testing and Documentation
 - All 4

Functional Features:

- Real time face detection
- Login
- Student management
- Training Photo sample
- Taking attendance with Face Detection
- Attendance report

Product Ownership:

Each team member is assigned specific responsibilities and contributions to the project. This ensures that everyone plays a defined role and contributes to the successful development of the system. The division of tasks is aligned with the functional features and qualitative properties that need to be implemented, tested, and documented. By clearly defining roles and responsibilities, we ensure efficient collaboration and a well-rounded approach to building the advanced face recognition student attendance system.

The model we are using is:

Software engineering model: Waterfall model

We have opted for the Waterfall model as the nature of our project demands a set of well-defined and unchanging requirements. The Waterfall Model excels in situations where the specifications are clear from the outset.

Advantages:

1. In our project, 'Advanced Face Recognition Student Attendance System,' the requirements are rigid, making it easy to manage with a small team.
2. In our project, we use familiar technology, so it is easier to manage in terms of the duration, and we can deliver the project within a specific timeframe.
3. Our project has clearly identified phases that can be facilitated by the Waterfall Model."