

# Attendance Management System Using Face Recognition

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## **Abstract**

*This work focus on Face recognition Attendance management System for Students. A face recognition attendance system identifies and verifies a student by image and marks attendance based on their facial recognition. In our project the Teacher only need to capture image of the whole class in his/her phone and needs to upload that image on application then the attendance of present students will be marked automatically. In this project the attendance marking and management system is proposed by making use of face detection and recognition algorithms. The entire process is automated, the need for human intervention is minimal. So, there is no need for added staff to do this work manually. The proposed system will be able to mark the attendance via face Id. As compared to other biometric systems, this is both cost-effective and convenient. Since the data received from the face recognition based student attendance system is real-time and accurate, the cost savings are even greater.*

## **I. INTRODUCTION**

The system is developed for deploying an easy and a secure way of taking down attendance. The software first captures an image of all the authorized persons and stores the information into database. The system then stores the image by mapping it into a face coordinate structure. Next time whenever the registered person enters the premises the system recognizes the person and marks his attendance

### Advantages

- The software can be used for security purposes in organizations and in secured zones.
- The software stores the faces that are detected and automatically marks attendance.
- The system is convenient and secure for the users.

- It saves their time and efforts.

#### Disadvantages

- The system don't recognize properly in poor light so may give false results.
- It can only detect face from a limited distance.

## II. EXISTING SYSTEM

In existing system of attendance management either the size of application is very high or the attendance is taken manually by teacher as it is very time consuming. It consist lot of confusion and time for taking attendance .It is the responsibility of teachers to maintain attendance of students and it is maintained manually .Also another way of taking attendance in existing system is by calling each and every Student to come infront of camera then the attendance will be marked. The simplicity of taking and maintaining attendance is not easy. Existing System is not so user Friendly but our Application is user-friendly and easy to use and easy to understand.

Drawbacks of existing system: -

- Time consuming as image of each and every students is taken by camera for attendance.
- Difficult to maintain.
- It is maintained manually also.
- No backup available of attendance if done manually.
- It is too confusing.
- No 100% accuracy is acheive if dome manually.
- Processing for each image is required if image will be captured separately.

## III. LITERATURE SURVEY

1. Rui Liao and S. Z. Li, "Face recognition based on multiple facial features proposed an automatic face recognition system based on multiple facial features is described. Each facial feature is represented by a Gabor-based complex vector and is localized by an automatic facial feature detection scheme. Two face recognition approaches, named two-layer nearest neighbor (TLNN) and modular nearest feature line (MNFL) respectively, are proposed. Both TLNN and MNFL are based on the multiple facial features detected for each image and their superiority in face recognition is demonstrated.

2) C. -Y. Chang and C. -S. Huang, "Application of active appearance model for dual-camera face recognition Author proposed face recognition is a very important topic in the field of pattern recognition. Traditional two-dimensional face recognition technologies using images taken by a single camera are easily influenced by expressions and poses resulting in low recognition accuracy. In this paper, a new three-dimensional face recognition technique is proposed. Author apply a dual camera module to extract two images of simulated human eyes. The active appearance model is applied to find facial feature points. The disparity between the images of the left eye and the right eye is calculated and used to reconstruct a 3D face model. Twenty-four geometric features are extracted from the 3D face models and a multi-class support vector machine is then applied to face recognition. The experimental results show that the proposed method can reduce the influence of facial expressions and the risk of photo fraud.

3) X. Bai, F. Jiang, T. Shi and Y. Wu, "Design of Attendance System Based on Face Recognition and Android Platform. In this aiming at the disadvantages of traditional manual attendance, this paper proposes a face recognition based attendance scheme. Through mobile platform and face recognition technology to optimize the manual attendance process. This design divides into the face recognition system of check on work attendance information input, attendance sign-in and attendance record three function module, and introduces a principle of face detection and classification, analyses the process of the construction of the face recognition classifier, the last on the Android platform design and implement a face recognition system of check on work attendance, by comparing the experiment results of face recognition accuracy, verify the feasibility of this scheme.

4) J. Vadlapati, S. Senthil Velan and E. Varghese, "Facial Recognition using the OpenCV Libraries of Python for the Pictures of Human Faces Wearing Face Masks during the COVID-19 Pandemic. In this research paper [4], we are going to see the profound scientific use of computer technology applied in the fields of AI and Machine Learning primarily focused on Image Processing and Pattern recognition. Techniques such as OURS are widely used to recognize real life objects including human faces etc. Thus, using such techniques, we can recognize a person from pictures. Using face recognition modules from python's huge collection of libraries, we are able to train the model to recognize people while wearing masks. Since when

masks are worn, half of the facial features are lost, therefore developing a technique to recognize faces in such way is crucial. This specific technology of face detection is used in biometrics, video surveillance, etc. Therefore it's at utmost importance to increase the security as well as efficiency whilst making the recognition faster.

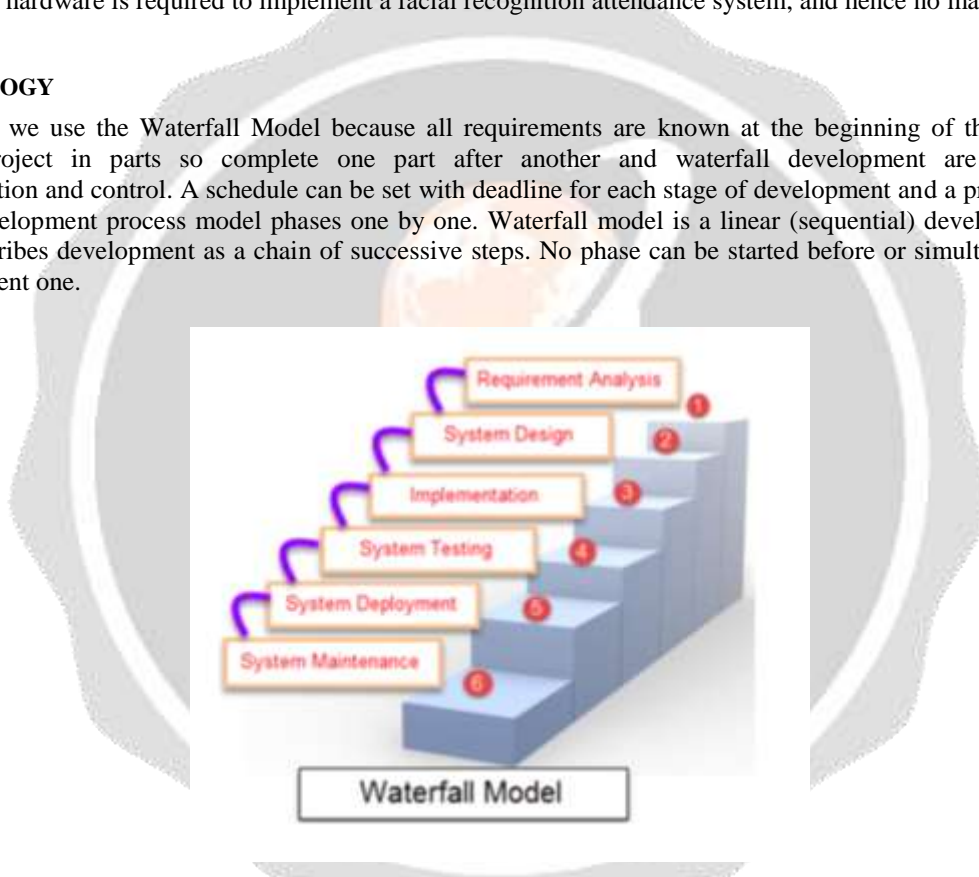
This work provide AI based platform .To identify the students which are present, this project come into the use. Provide easy way to take attendance. This technology can also be used effectively in various important examinations such as SSC, HSC, Medical, Engineering, MCA, MBA, B- Pharmacy, Nursing courses etc. The examinee can be identified and verified using Face Recognition Technique. It can also be deployed in police station to identify and verify the criminals. To identify and verify terrorists at airports, railway stations and malls the face recognition technology will be the best choice in India as compared with other biometric technologies since other technologies cannot be helpful in crowded places.

Features:

1. The project is more accurate and error-free since the tracking is done in real-time.
2. No human intervention is required for marking attendance.
3. It's easy to maintain and user-friendly
4. The entire process is automated, there is no need to do manual attendance.
5. No additional hardware is required to implement a facial recognition attendance system, and hence no maintenance cost.

#### IV. METHODOLOGY

For this project we use the Waterfall Model because all requirements are known at the beginning of the project and we divided our project in parts so complete one part after another and waterfall development are that allows for departmentalization and control. A schedule can be set with deadline for each stage of development and a product can proceed through the development process model phases one by one. Waterfall model is a linear (sequential) development life cycle model that describes development as a chain of successive steps. No phase can be started before or simultaneously with the previous or current one.



**System Requirements Phase** During the first phase, the requirements for the system are established. The process starts with eliciting blogs requirements, analyzing and prioritizing them, which ends with the creation of the Vision & Scope document. Vision is defined as a “long-term strategic concept of the ultimate purpose and form of a new system.” The scope is what “draws the boundary between what’s in and what’s out for the project.” In this phase we gathered the requirements of Blog Site. **2. Design Phase** The next phase in the model diagrams how precisely the requirements to the system will be technically implemented. This phase largely covers such components as a programming language, data layers, services, etc. we draw the use case diagrams, ER Diagram and Dataflow diagrams. **3. Implementation (Development) Phase** The actual source code is finally written in the third phase, implementing all models, business logic, and service integrations that were specified in the prior steps. The process of entire code creation subdivided into small units, and each unit is developed and tested for its functionality. We use android, python coding. Afterward, a whole system is built out of ready-made units, and the fourth phase starts. **4. Testing Phase** After the development phase, the product should experience a thorough quality assurance and website testing to discover defects in a system. Testers are involved in finding and reporting issues that need to be resolved so we test the all units of system. To store registered issues, a bug tracking system can be utilized with the goal that the issues could be handled during the maintenance life-cycle phase. The website can be conveyed when the code issues are fixed. **5. Maintenance Phase** As soon as the product is for placement to a live environment, it enters the ready maintenance phase of

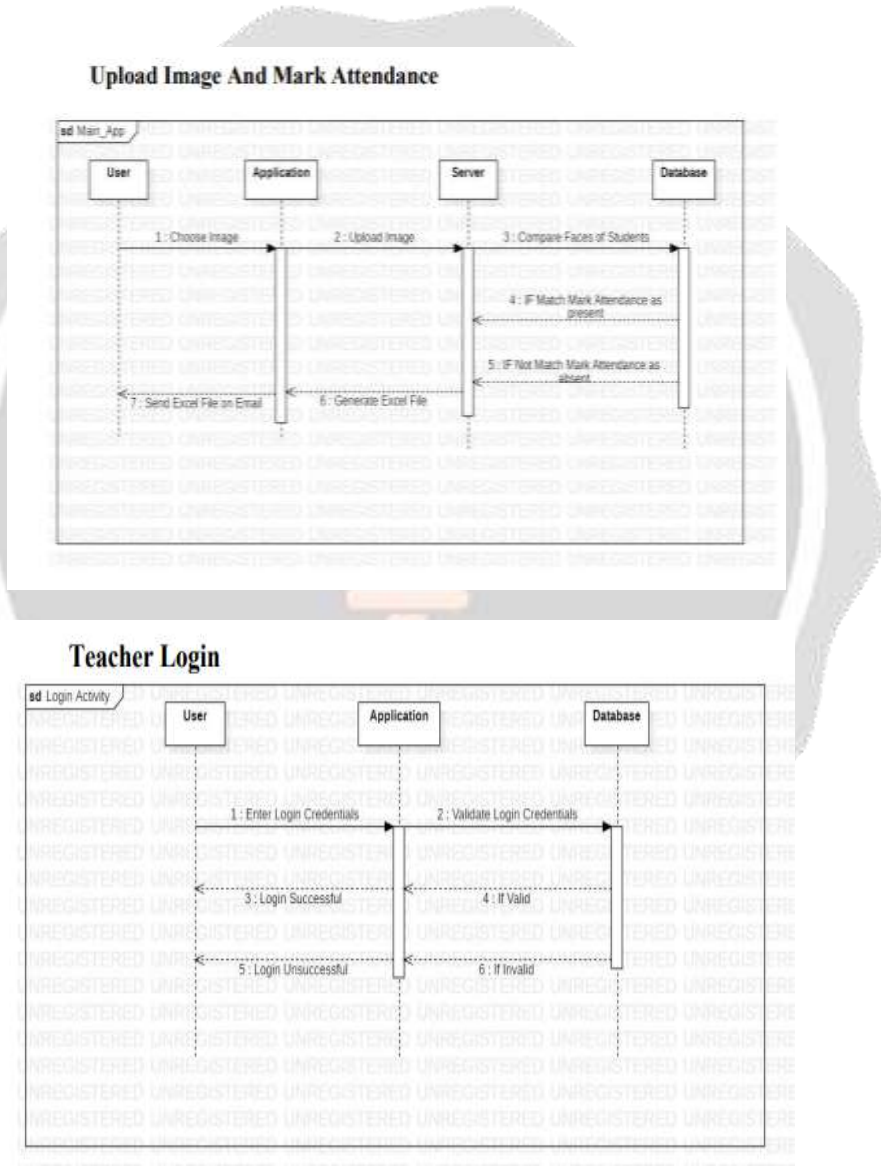
the development life cycle. The maintenance phase engages not just the deployment of the application, but also support and maintenance that may be required to keep it functional and up-to-date.

**A. Technologies Used**

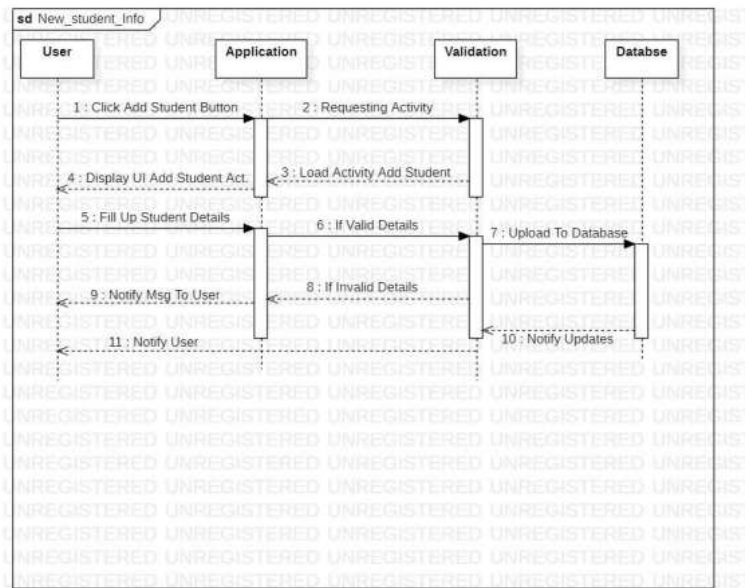
1. Android Android software development is the process by which applications are created for devices running the Android operating system. Android OS basic screen provides a beautiful and intuitive user interface. GSM/EDGE, IDEN, CDMA, EV-DO, UMTS, Bluetooth, Wi-Fi, LTE, NFC and WiMAX. SQLite, a lightweight relational database, is used for data storage purposes. In Our Project we used the android Concepts for creating app for user.

2. For Server side. Python Python has an extensive standard library available for anyone to use. This means that programmers don't have to write their code for every single thing unlike other programming languages. There are libraries for image manipulation, databases, unittesting, expressions and a lot of other functionalities. In our project we used python for face recognition.

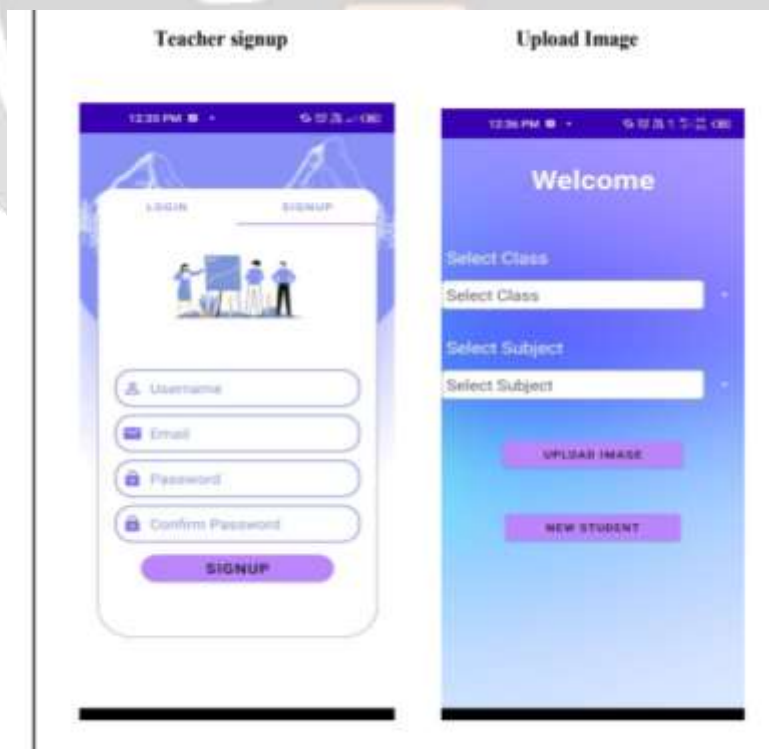
**V. SEQUENCE DIAGRAM**

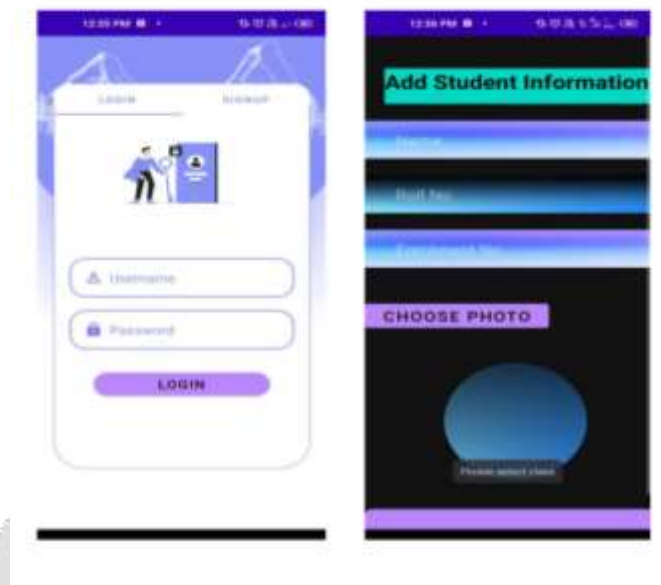


**Add New Student**



In the face detection and recognition system, the process flow is initiated by being able to detect the facial features from a camera or a picture store in a memory. The algorithm processes the image captured and identifies the number of faces in the image by analyzing from the learned pattern and compare them to filter out the rest. This image processing uses multiple algorithm that takes facial features and compare them with known database. The motivation behind this project is to simplify the means by which attendance is taken during lectures and how much time it takes. The use of ID cards or manually calling out attendance and writing it down on sheets is not productive and efficient. This system will detect the number of faces on the class and will also identify them from the store database. With the face detection and recognition system in place, it will be easy to tell if a student is actually present in the classroom or not.





## VI. EXPERIMENTAL RESULTS

We have evaluated the performance of the system considering 30 real time images. Some of the images form the dataset are as below





Table below depicts the performance of the system

Sr No	Number of Faces in Source Image	Number of Faces Correctly Detected	Number of Faces Not Detected
1	10	6	4
2	20	16	4
3	9	5	4
4	17	11	6
5	7	3	4
6	8	5	3
7	5	3	2
8	13	6	7
9	4	3	1
10	13	7	6

Currently the system is able to give accuracy upto 68.73%.

## VII. CONCLUSION

This work aims to build an effective class attendance management system using face recognition techniques. The proposed system will be able to mark the attendance via face image. It will detect faces and then recognize the face. After recognition, it will mark the attendance of the recognized student and update the attendance record. We wish to implement an efficient, time saving and easy to operate system which will in turn benefit both faculty and students.

### Future Recommendations

The system can be made more flexible and scalable using these recommendations. Please note that the system implemented here is just a prototype of idea presented via this project. The recommendations are as follows: • The system can be extended to more number of students with freedom to change list of students according to class changes. • The system can be made more flexible to allow updating of templates in case student incurs significant amount of change in his facial features. • The system can also be extended to allow better face recognition algorithm in which even rotational features of face can be detected efficiently

## VIII. REFERENCES

- [1] <https://www.w3schools.com/python/>
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- [4] <https://developer.android.com/studio/write/layout-editor>
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