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**Junior Project Proposal**

**Face recognition-based attendance system for primary school and kindergarten kids**

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Project proposal for CS junior Project

Computer Science

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**Project Summary**

The main objective of this project is to provide a system based on Face Recognition (FR) technology. Unlike the manual attendance system, our system will simplify and automates the process of documenting and monitoring the attendance of students. Machine learning algorithms will be adopted for facial recognition to improve the limitations of the present systems, it requires a high-quality camera to record student images, a database, and a mobile application. Our project will be implemented using python and MySQL technologies.

1. **Introduction**

Technology has unquestionably changed the way we live. It has affected various aspects of daily routine and reclassified our experiencing. Without a doubt, technology assumes a significant part in each circle of life. A few manual errands can be robotized, because of technology. Likewise, numerous mind-boggling and basic cycles can be completed easily and more noteworthy proficiency with the assistance of current technology. On account of the utilization of technology, living has changed, and it has changed for the better. Technology has altered the field of schooling. The significance of technology in schools can't be overlooked. Indeed, with the beginning of PCs in instruction, it has gotten simpler for educators to bestow information and for understudies to secure it. The utilization of technology has made the way toward instructing and learning even more delightful.

Our task isn't something new it's more similar to advancement, we got this thought and placed it in a spot that tends to be more valuable, simple to utilize, and can secure ours underage kids who go to class each day. The venture is about the understudy riding the school transport. Throughout using face recognition, a face recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces, commonly utilized to verify clients through ID check administrations, works by pinpointing and estimating facial highlights from a given picture. Which takes the attendance of students while entering and leaving the school bus.

Our project is primarily tacking the participation rather than the manual way that schools utilize, the project has two cameras the primary one is set in Infront of the entrance which make sure that the understudy enters the transport and the sound one is set over the entrance that makes sure the student who entered the bus cleared out. The project features a system that's overhauled by the organization of the school. And the system has an app that is associated with it to send notices around the understudy participation.

1. **Motivation**

There are incidents of children being left behind on school buses that happen every year, which can result in their deaths, especially in summer, due to high temperatures. Research has shown that children's bodies appear to heat up three to five times faster than adults, while children are unable to cool down, too. Pediatric associations worldwide have further documented the negative effects of high temperature on kids, with children frequently falling victim to dehydration of hyperthermia and other risks that may be fatal.

With the evolution of technology, we aim to create a system that decreases the number of children dying after being left behind on buses. Since it is easier to take attendance using face recognition than a manual attendance system and to make sure parents feel safe about having their kids riding school buses, our system makes sure there is a communication between them and their child’s status of whether they entered or left the bus by receiving notifications.

1. **Project Details**
2. Architecture and Environment

This project proposes that the system takes attendance automatically using face recognition cameras, the cameras are placed inside the buses at several locations to capture the faces of the students from various angles. The faces of students are previously stored in the database system. After the capturing of the student's faces, the camera detects and recognizes the faces of the students from the images and compares it to the images stored in the database, if the face matched with the stored image then the student is marked as present and no notification is sent to the parents via the application made for the system, if the image is not a match or undetected then the student is marked as absent and a notification is sent to the parents and at the same time the image is stored in the database as a new image and marked as unknown before further calculations are done. Refer to architectural diagram in Figure 1.[3][2][1]

For the proposed system for the application, and database to communicate with each other, we will use Python to program the backend of the system, while using a tool like MySQL database to find, change and store all the needed data for the students, we will be using HTML, CSS and JavaScript programming as a frontend for the users, like the school or the parents. we will also be using some hardware like a high-quality camera and a mobile for testing. [2]

our system will perform the main services:

* consolidated student attendance in a day based on notifications sent to the parents via an application.
* monitoring school kids using facial recognition technology

Diagram

Description automatically generated

Figure 1: Data Flow Architecture

1. Implementation Issues and Challenges

Initially, we will create a dataset of the students before the recognition process, this includes the student's name, ID number, grade, and images in various poses, these images are given as an input to the system.[2]

Face recognition will detect a face and then identifies of those detected face images with the existing database looking for a match which then can be communicated with an external application that tells the school or parents if the student is present or absent.[2]

1. **Problem statement:**

* Since our project is built for school children, it could be difficult to get fingerprints from them, which is why it is easier for them to have a face recognition system.
* The database could possibly not handle a huge number of students in the system so their will be a limit for the number of students which is not ideal.
* The notification is sent by an application to parents and the school which is connect to a web page but is not supported by SMS.
* If the system did not work, teachers should overwrite attendance and mark as absent manually.
* The system cannot detect more than two faces at once so, if more than one student is facing the camera, it will detect only one of them and marks their attendance.

Since Artificial Intelligence is a new area for us, we will need to learn about machine learning methods and applications and get acquainted with deep learning algorithms to get the best possible outcome for our project, we will also spend a few weeks learning Python and how to use ML libraries.

1. **deliverables**

Our project will develop an application that will be capable to send data to guardians and taking participation at buses for kids by utilizing face recognition cameras, the ultimate application will be given within the last stage of the project. We favor that our application will be applied in many schools, Nurseries, and Colleges that we are going to utilize our approach to taking attendance, to assist little children that no one notices them if they were overlooked.

By utilizing python, we are going to be able to begin doing our application, we are going to get offer assistance and information with details from engineers to accomplish our face recognition system. Our framework makes a difference, ensures children are safe, and decreases the number of misfortunes, it empowers guardians to enlist their kids in schools safely.

1. **Timeline**

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| 1. From | To | Description |
| Jan. 23 | Jan.28 | Searching & choosing an idea |
| Jan.28 | Jan.31 | Submitting Team details |
| Feb. 2 | Feb. 14 | Reading articles and topics about sentiment analysis  and Learning python |
| Feb. 16 | Feb. 18 | Writing & submitting the Proposal |
| Feb. 24 | Feb. 29 | learn and explore more concepts about Python libraries |
| Mar. 1 | Mar. 7 | Progress Report 1. |
| Mar. 8 | Mar. 14 | Work on project |
| Mar. 15 | Mar. 22 | Work on Datasets |
| Mar. 23 | Mar.27 | Work on project |
| Mar.28 | Apr.1 | Spring break |
| Apr.1 | Apr.4 | Progress Report 2 |
| Apr. 5 | Apr.19 | Work on project |
| April20 | May .2 | Final Report + Presentation |

1. **Conclusion**

To conclude, our project is to supply a system that, through face recognition technology, facilitate and automates the proves of documenting and controlling the attendance of students, our technology uses facial recognition methods to estimate the limitation of the present systems, it progresses with the best type of cameras to be able to record student images perfectly, will provide a database and a mobile application. and finally, will be executed using python.

References

1.

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