**Attendance Taking System**

The goal of this System is to reduce the time taken and simplify the process of attendance taking, increase efficiency and preventing any falsification during this process. In order to accomplish this, we identified 3 core technology that comprises of this product.

In order for one’s attendance to be taken, we implemented 2 conditions that the System must follow:

* Card MUST be detected, and its info pushed to a database
* Face MUST match against the dataset provided

If one of the conditions is not fulfilled, the System WILL NOT mark the attendance of the User (Eg. Student Face is Recognized but the System is unable to locate the Card Information of the user in the database)

1. RFID
2. Facial Recognition
3. Web Application
4. **RFID**

We made use of the base code that was provided to us during one of the practical lessons and improved on it. We registered the cards that we are using and included functions to push specific information to a database.

To better understand, this means that whenever the RFID System detects a card (Which meant the user entered the room physically), it will transmit its information (Card user Name, Date and Time its detected) to a database (Temp Firebase) where the Facial Recognition program will scan and check for before taking the user attendance.

To accomplish this, we made use of a high level and general-purpose programming language: Python.

1. **Facial Recognition**

We followed a tutorial for to create a simple facial recognition program that is able to detect any faces through the camera. We then trained a simple model with the dataset (images) of Me and my Partner, as well as faces of other people which are labelled as “Unknown” and applied it to the facial recognition program. This allows the program to be able to differentiate between both of our faces against the remaining dataset of other people provided.

We then made some improvements later on with more dataset provided and we are then able to see a high level of accuracy it has. Finally, we added the ability to push information to a database (Which will store the user’s Name, Class, Time the card is detected and Time its face is recognized.) whenever a correct face is detected after running some validation checks against another database (Temp Firebase - RFID).

Once all checks have been done and its attendance taken, it will lastly send a notification to the User’s phone stating its attendance have been taken.

This program made use of multiple libraries and to accomplish this, we made use of a high level and general-purpose programming language: Python.

With these 2 core components set up, all that is left is for end users to understand and make us of the System with a UI, which brings us to:

1. **Web Application**

In order for end users to be able to see what is going on, we created a Web Application for both Staff and Students.

**For Staff:**

After the user’s Card is detected and its Face recognized, the Facial Recognition program will then send out one more push to another database (StudentDetails).

We needed the WebApp to interact with a database. In order accomplish this, we made use of PHP, a server-side scripting language, to 1) Establish the connection 2) Interact, and Retrieve data.

Once that is completed, the WebApp will now be able to display the information of those whose attendance is taken successfully.

**For Students:**

We anticipated a scenario where the student is late due to traffic jam, accidents, miscellaneous encounters or is sick. We wanted them to be able to inform the staff directly officially with the System that is in place, hence we created:

* **A login page**

Students will login with their Name and Student ID, which will create a session in their browser under the credentials. This credentials will then be pushed to a database (Notification). This is accomplished using Javascript (To push data)

* **A comments page**

Students in this page will be able to send their message here to a database (Notification) where its Date and Time will be logged and will be reflected in the page where a staff is able to see how many messages it has receives.

Students are required to submit a photo to back up their message (Proof).

After some research, we finally decided to convert the image uploaded, to a base64 format. This base64 details will be pushed to a database (Notification). We then placed an image tag on the column of the page that shows the messages the staff receives. This way, the base64 format will then be converted back into the original image which the student send automatically, intact. Its Date and Time will also be logged and reflected.

**Conclusion**

Taking attendance traditionally takes up way too much time for staffs. This results like lesser productivity as the students have lesser time for lessons. Sometimes, the staff will simply just pass the attendance list around, which will result in some cases where a student will mark for other students who are not present without the staff being aware. This System will aim to reduce all of the above mentioned. I believe with further improvements, time and resources, it can become an almost fool proof way to take attendance, and usher in an era of convenience and efficiency.