

## **FACE RECOGNITION APPLICATION FOR SCHOOL**

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## **1. INTRODUCTION**

Our project is to create a face recognition software that can be used to recognise faces of users and indicate the doors to be opened. This software could be used for security purposes, to allow authorised people to enter the school premises.

### **How would our project come of significance?**

Firstly, this software makes it much safer and convenient for students without having to bring their card. Secondly, it also saves manpower as there need not be security guards standing around. Thirdly, the software makes it easier to allow access to students.

### **Overview of our program:**

When the program is executed, a window would appear with the image of the person before it from the webcam of the computer. After the picture is saved, the software would begin to classify the images in the picture. Once the face is recognised a blue rectangle will appear around the person's face with his/her name below, followed by the program saying a phrase and displaying "Open Gates!" in the command prompt. Then, the name of the people recognised and the time of execution of the program will be recorded in a HTML file. The details of the person recognised will also be shown as a tooltip. Likewise, If the face is not recognised, the name would appear as unknown in the command prompt and the voice line would say that the people identified are unknown. However, people using the software will have to save their faces and names in the same folder the program file so that the software would be able to learn and recognise the face to allow their entry.

## **2. LITERATURE REVIEW**

There have been a few companies who have already developed platforms like this to ensure security of their users. Companies include Google who created Nest Hello, a facial recognition and video camera which would be able to tell you who's already inside your house as well as tells you who's outside your house. Another company is Panasonic, who created Face Pro, a software that can recognise faces of repeat shoplifters and wanted criminals if they are registered in advance from data recorded in the past to send an alarm when they are detected.

Many countries have also begun using these facial recognition softwares. For example, China, which has facial recognition cameras in most metro stations, speeding up security checks in their overcrowded metro. A similar country with facial recognition abilities is Sweden, whose Data Protection Authority has allowed the country's police to use facial recognition technology for identifying criminal suspects.

### **How does face recognition benefit society?**

Security wise, face recognition systems are already radically reducing retail crime. According to our data, face recognition reduces external shrink by 34% and, more importantly, reduces violent incidents in retail stores by up to 91%.

The police in the Indian city of New Delhi have identified nearly 3,000 missing children within just four days of launching a trial of a new facial recognition system, recognising 2,930 children.

In 2016, the "man in the hat" responsible for the Brussels terror attacks was identified thanks to FBI facial recognition software.

Face recognition technologies were able to identify a mentally ill Chinese man who had been missing for over a year was reunited with his family after being identified by China's vast facial recognition surveillance network.

Also in China, surveillance cameras or smart glasses would capture people jaywalking, before AI-powered facial recognition technology would identify them. A fugitive was identified from a crowd of around 50,000 people at a pop concert in Nanchang in Jiangxi province.

In New York, police were able to apprehend an accused rapist using facial recognition technology within 24 hours of an incident where he threatened a woman with rape at knifepoint.

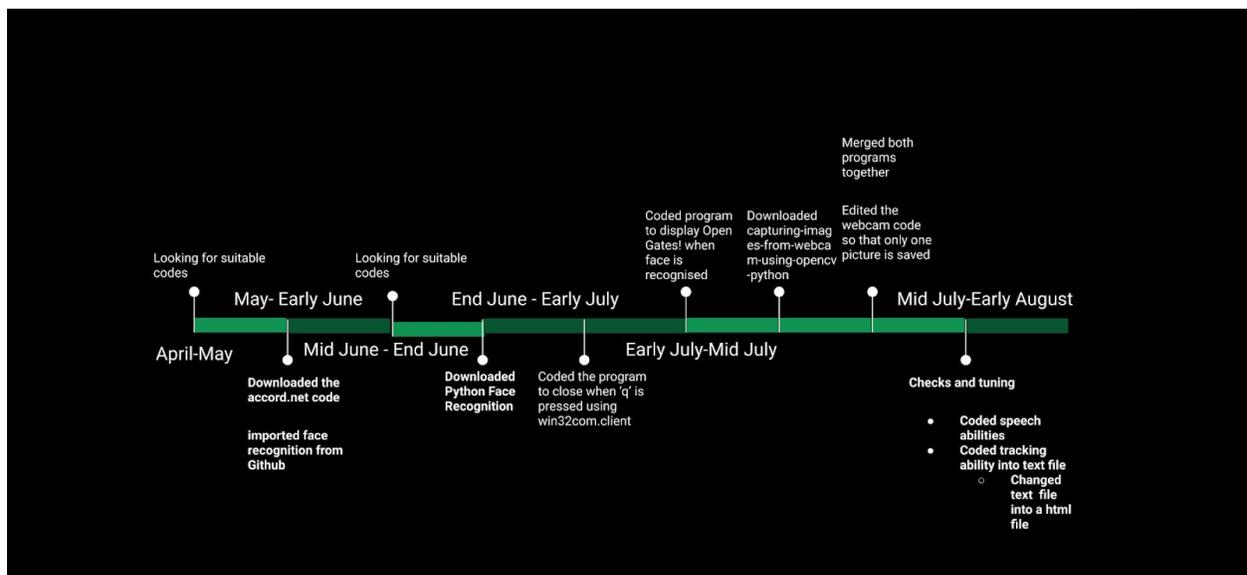
On to how facial recognition is able to detect the health and wellbeing of citizens. An example of this technology is Face2Gene, which allows clinicians to detect strange or irregular diseases for their patients, in which face recognition has helped diagnose the disease in 96% of cases. In a separate case, it was able to identify a patient with unusual symptoms, identifying it as an unusual case of the rare Wiedemann–Steine syndrome.

### 3. STUDY AND METHODOLOGY

#### Our job distributions.

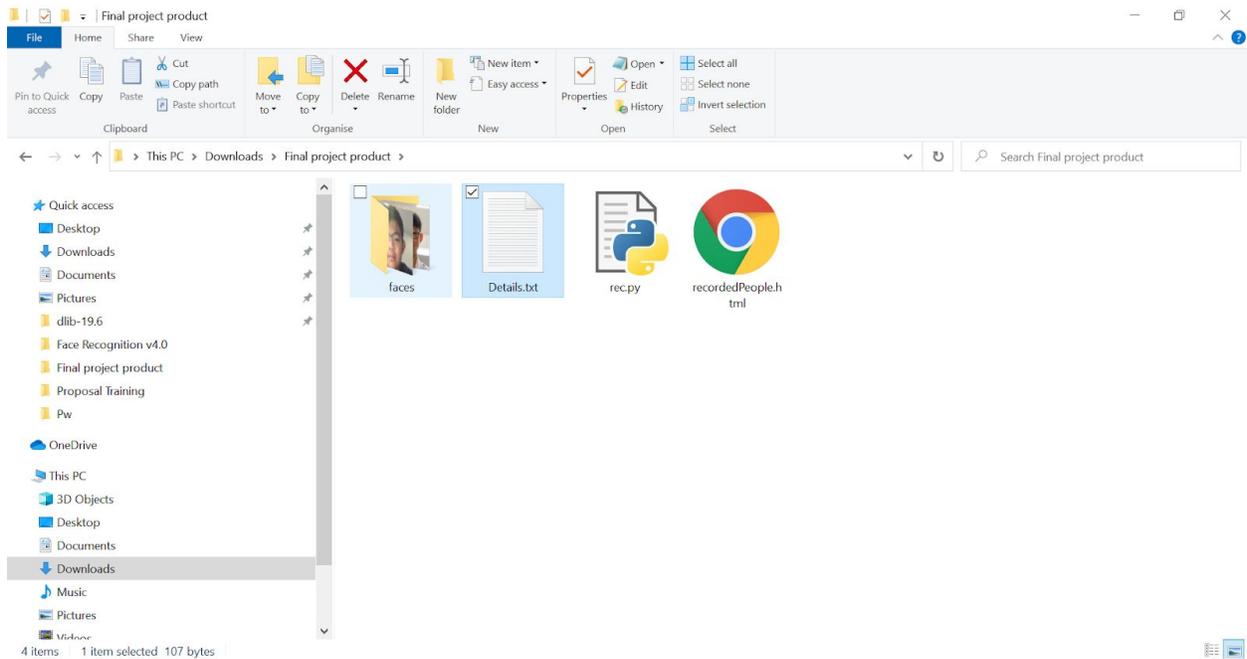
Javier coded the main software for the facial recognition as well as attached the codes together. Daryl did the slides, the literature review as well as the final product review in the form of a video. He also completed testing and research for the project. Kyan managed to find a software to activate the webcam of the computer.

#### Image of our project timeline:

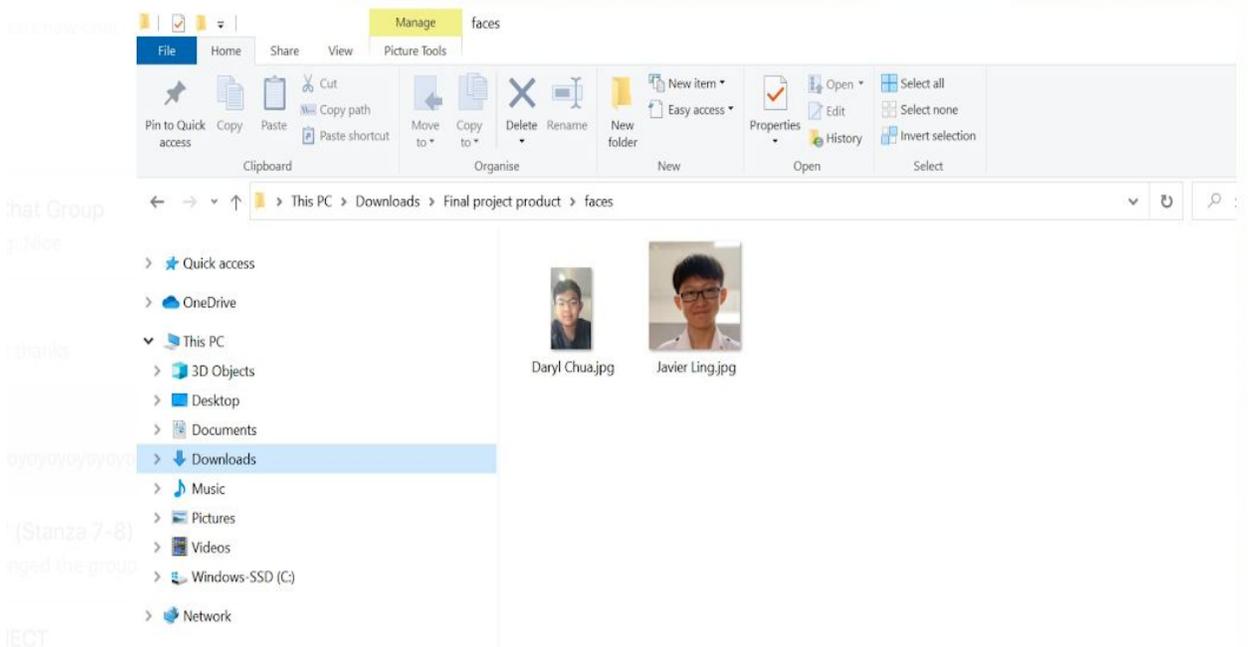


## 4. OUTCOMES, ANALYSIS AND DISCUSSIONS

### Pictures of our product files:

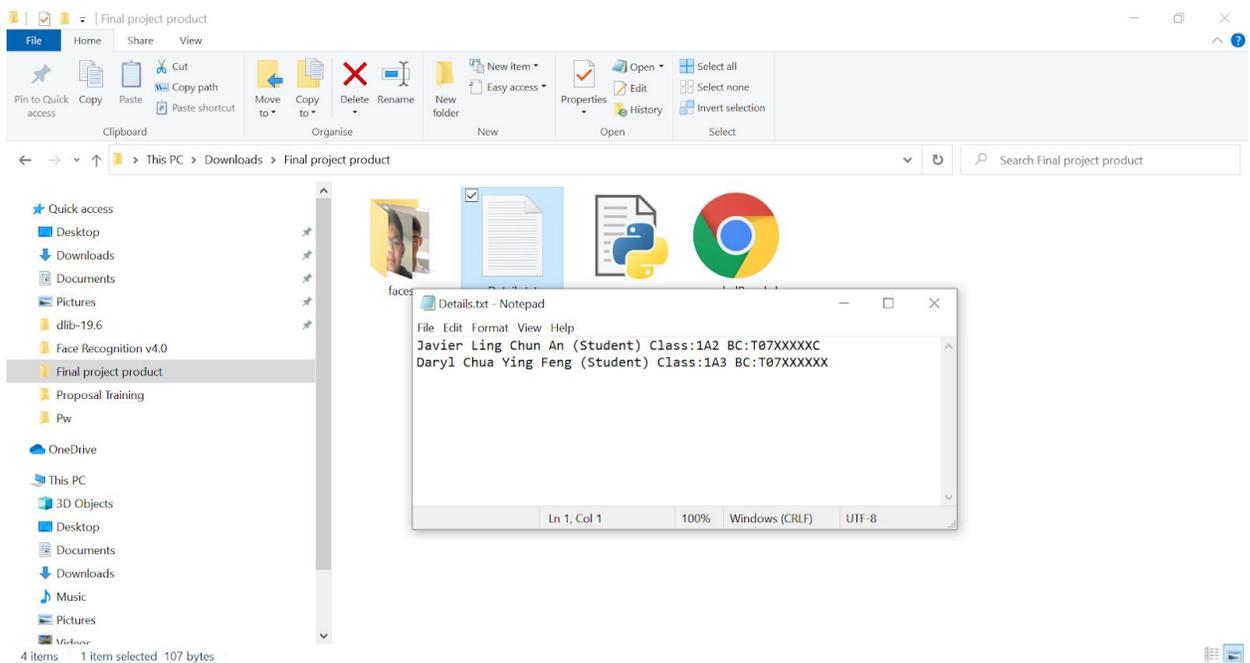


1. This is where the folder of faces, information file, program code and the html file is stored together in the computer so they can be referenced with each other easily.



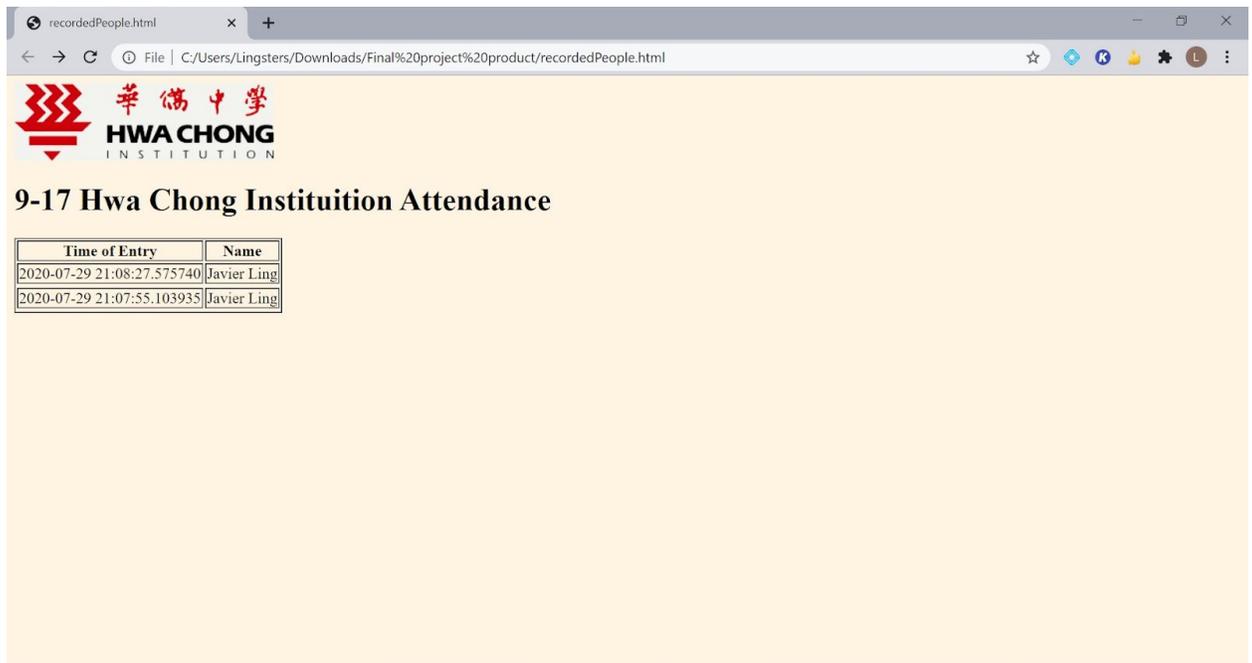
2. This folder is where people have to store their faces before being able to be recognised by our facial recognition software

**Information file :**



3. This where the details of the students are stored.
4. When the program recognises the students, it will look for their name here, take the entire line that the name is on and display it in the html file as a tooltip.

**Attendance HTML file:**



5. This is where the names of the people recognised and the date and time of execution is stored.

**Pictures of our product in action:**



3. Webcam activated to take a picture of the face

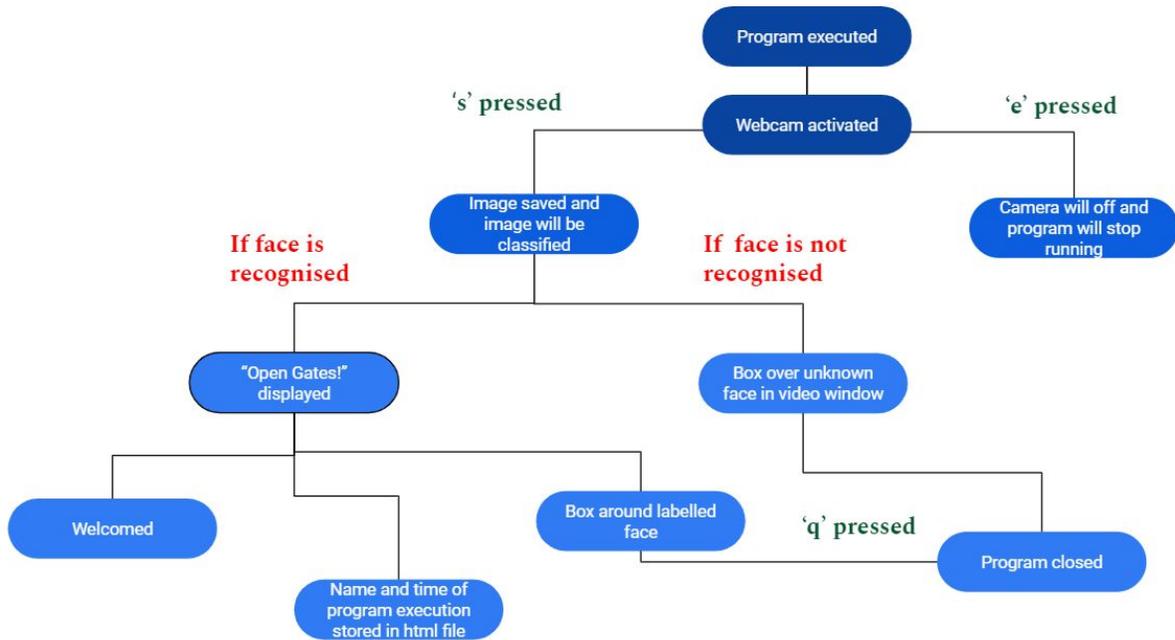


4. The picture is converted into grayscale.



5.Face is recognised and the name is identified in a blue rectangle.

**Graph of out program:**



## **5. Implications and Recommendations**

If we had the chance, we would improve our software's accuracy. At the moment, there aren't many images stored in the folder, the facial recognition software would hence look for the picture that best suits the facial location it looks for the best known index and facial expression of the person that is taking the current photo. This offers a large bandwidth of expressions as faces might get wrongly identified. This would result in mistakes in attendance or the security being breached. We would improve this by adding more pictures as well as make the facial recognition software accurate so that it looks for exact face location.

We would include a login page so that anyone who would like to access the HTML attendance file has to be authorised by the school. This is to prevent outsiders or unauthorised people from viewing the contents stored in the HTML file.

#### 4. CONCLUSION

##### **Our reflections from this year's project work.**

Javier: This project gave us the chance to come to a deeper understanding about what coding is and that it is not as easy as it would seem. It requires a strong will to persevere and an immense interest in the subject. The year also allowed me to understand that the coding is more than just simple commands that allow us to give instructions to computers. It is a new language entirely.

Daryl: From this project, I learnt that we have to stay on task and try not to stray off topic when doing discussions. Should 1 member not do their share in the project work, whatever the rest have done will come crumbling down and their efforts would be in vain. This year's program also helped me to gain a deeper understanding and knowledge of how coding works and the importance of it.

Kyan: I have learnt that coding is not an easy task and requires lots of hard work and dedication. It requires a strong will as you will definitely encounter some problems with your code. I have learnt more about the variety of code such as c#, c++, python and much more. I have learnt how to use them, what the languages are used for and etc.

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