

Face Recognition based Attendance System



The problem

- 5-10 mins is wasted for taking attendance.
- Statistical data is hard to compute and analyze.
- False attendance and proxy.





Best possible solutions

- Scanning ID cards
- Use finger print
- Use Face Recognition

An aerial photograph of the New York City skyline at dusk. The sky is a mix of dark blue and orange, with scattered clouds. The city lights are visible, and the Empire State Building stands out prominently in the center with its red and green top. Other skyscrapers are visible on the right and left sides of the frame.

Problem with RFID Scanner :

- Costly
- False Attendance
- Waiting time large

Problem with Fingerprint :

- Fingerprint template takes a lot of space(240kB)
- Costly
- Waiting time is large

Face Recognition

An aerial photograph of the New York City skyline at dusk. The sky is a mix of dark blue and orange, with scattered clouds. The city is densely packed with skyscrapers, many of which are illuminated with their lights. The Empire State Building is prominent in the center, with its top lit in red and green. The Hudson River is visible on the right side of the image.

Disadvantages :

- Facial constraint
- Processing is slow

An aerial photograph of the New York City skyline at dusk. The sky is a mix of dark blue and orange, with scattered clouds. The city is densely packed with skyscrapers, many of which are illuminated with their lights. The Empire State Building is prominent in the center, with its top lit in red and green. The Hudson River is visible on the left, and the East River is on the right. The overall scene is a vibrant and detailed representation of a major metropolitan area.

Advantages :

- Affordable
- One - time investment
- Easy to use

How it works

Step 1

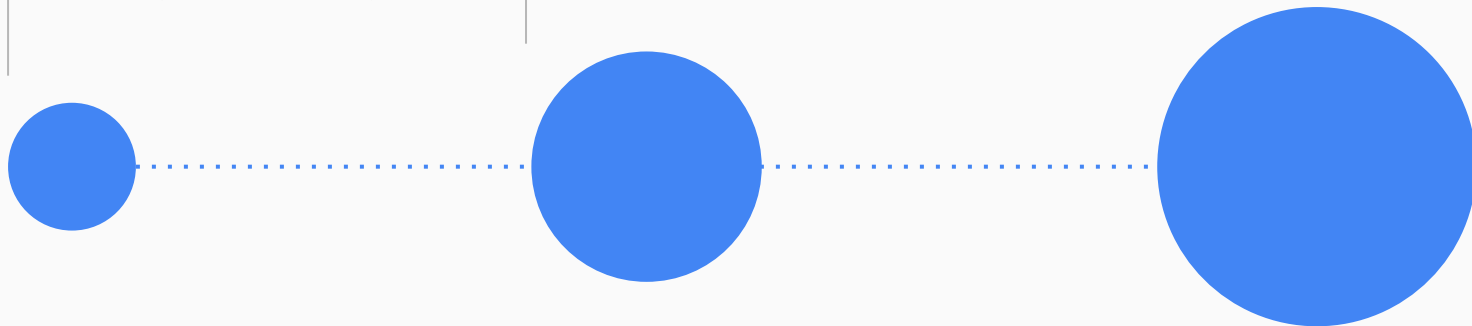
Create and train the dataset(one time only)

Step 2

Detect and crop the faces in an input image

Step 3

Recognize faces and modify the attendance in the excel sheet



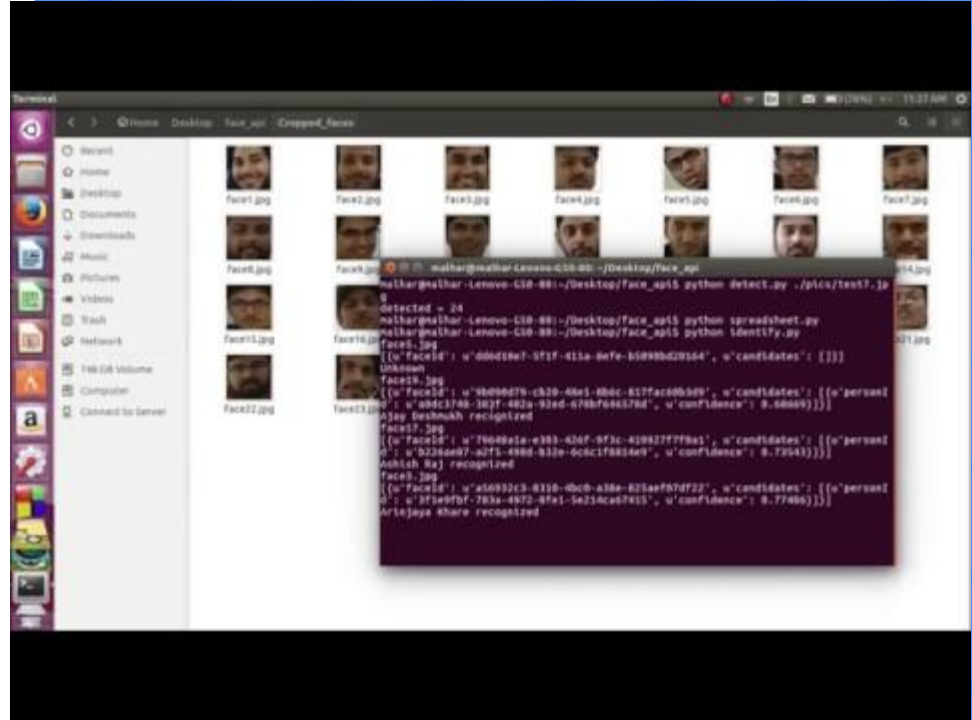


Technologies used :

- dlib library
- Microsoft Cognitive Face API
- Openpyxl
- sqlite3

Implemented on Python2.7

Video



Results

Image Name	Present	Detected	Recognized	Unknown	No face detected by api	Percentage recognized
test1.jpg	24	19	18	0	1	75.00%
test2.jpg	24	22	20	0	2	83.33%
test3.jpg	20	17	15	1	1	75.00%
test4.jpg	24	23	23	0	0	95.83%
test5.jpg	23	23	20	2	1	86.95%
test6.jpg	18	18	16	2	0	88.88%
test7.jpg	24	24	23	0	0	95.83%

- No false recognition i.e., either the face recognized was correct or unknown
- We tested it on a class filled with 24 students at different parts of the classroom(both densely and sparsely populated) and it marks the attendance of all of them

An aerial photograph of a city skyline at dusk. The sky is a mix of dark purple, blue, and orange. The city is densely packed with skyscrapers. The Empire State Building is prominently featured in the center, with its top section illuminated in red and green. Other buildings are lit up with various colors, and the city lights are visible against the dark sky.

Future Improvement :

- Auto Alert for teachers and students
- Automation of Camera
- Special optimization for students sitting at the back of the class



Cost Comparison

- RFID scanner(Rs. 3000+)
- Finger Print Scanner(Rs. 2000+)

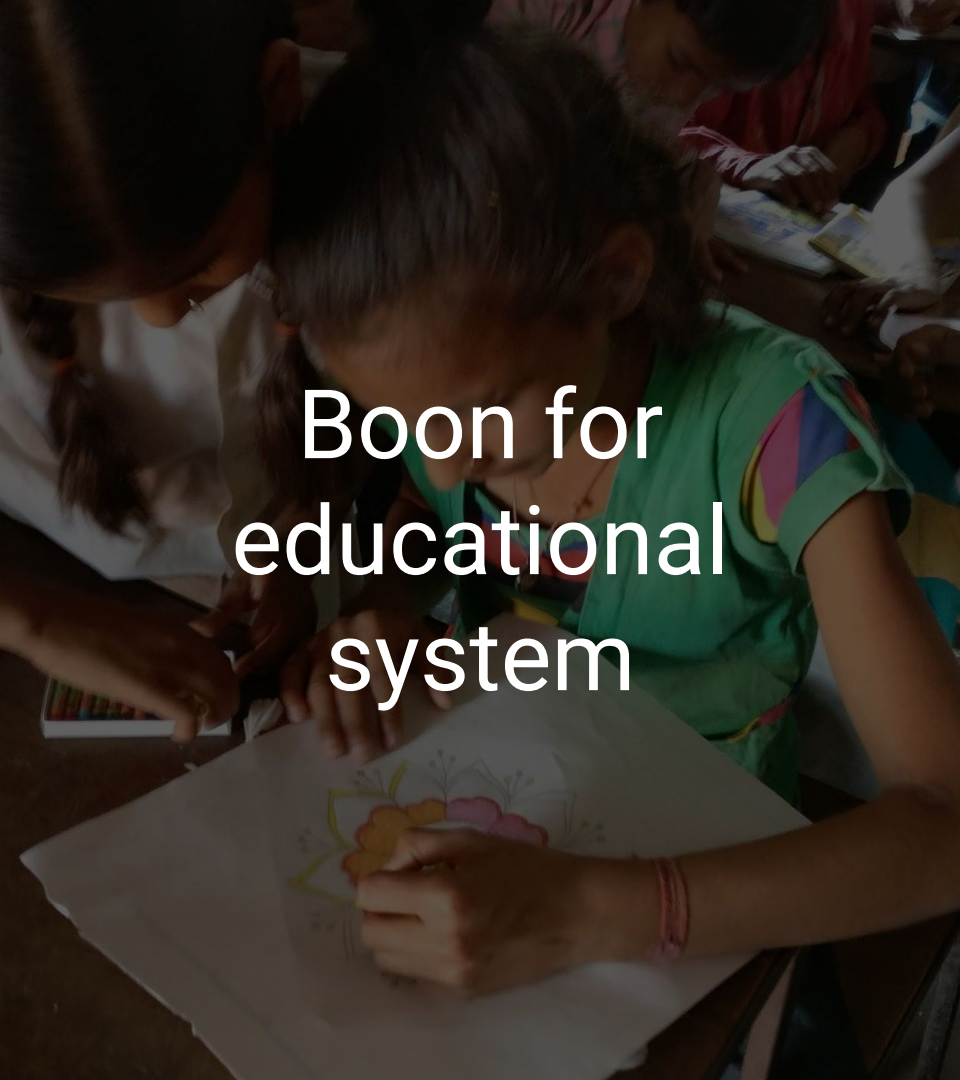
An aerial view of the New York City skyline at dusk. The sky is a mix of dark blue and orange, with scattered clouds. The city lights are visible, and the Empire State Building stands out prominently in the center. The text is overlaid on the left side of the image.

Cost for this product :
Under Rs. 1,000

An aerial view of the New York City skyline at dusk. The sky is a mix of dark blue and orange, with scattered clouds. The city lights are visible, and the Empire State Building stands out prominently in the center. Other skyscrapers are visible on either side, and the water of the harbor is in the background.

Technical specification :

- Camera at least 10MP
- Internet
- And just a computer...

A photograph of children in a classroom setting, focused on drawing or coloring on a large sheet of paper. One child in the foreground is wearing a green shirt and is actively drawing a colorful flower. Other children are visible in the background, also engaged in similar activities. The image is dimly lit, with the text overlaid in white.

Boon for educational system

- Action against “Flying Schools” can be taken, hence enhancing education
- Easy to record and analyze the statistics without any manipulation

References :

- OpenCV Documentation - http://docs.opencv.org/2.4/modules/contrib/doc/facerec/facerec_tutorial.html
- Dlib Documentation - <http://dlib.net/imaging.html>
- Microsoft Face API - <https://www.microsoft.com/cognitive-services/en-us/face-api>
- Openpyxl - <https://openpyxl.readthedocs.io/en/default/>

Thank You