Face Recognition based Attendance System

The problem

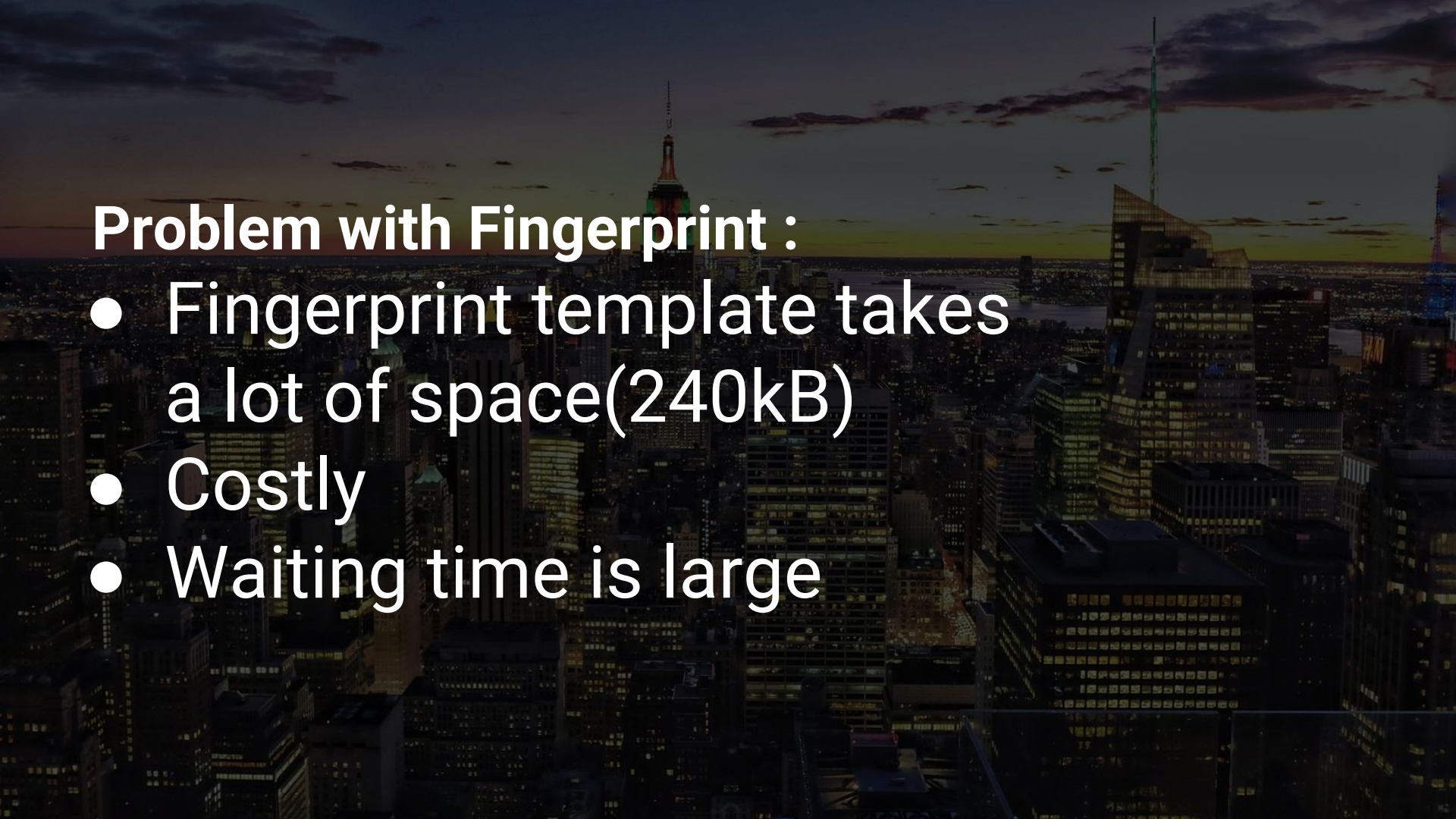
- 5-10 mins is wasted for taking attendance.
- Statistical data is hard to compute and analyze.
- False attendance and proxy.

Best possible solutions

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

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

Disadvantages :

- Facial constraint
- Processing is slow

Advantages :

- Affordable
- One - time investment
- Easy to use

How it works

Step 1

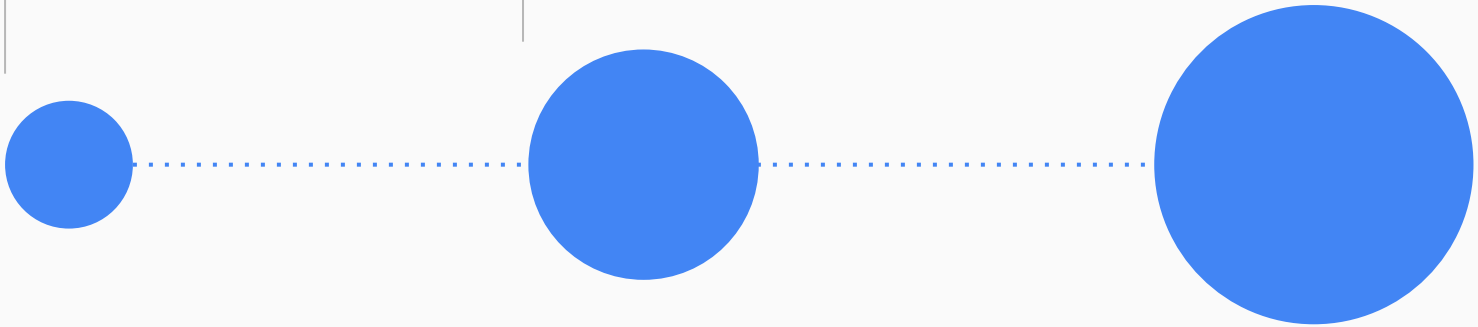
Create and train the dataset(one time only)

Step 2

Detect and crop the faces in an input image

Step 3

Recognize faces and modify the attendance in the excel sheet

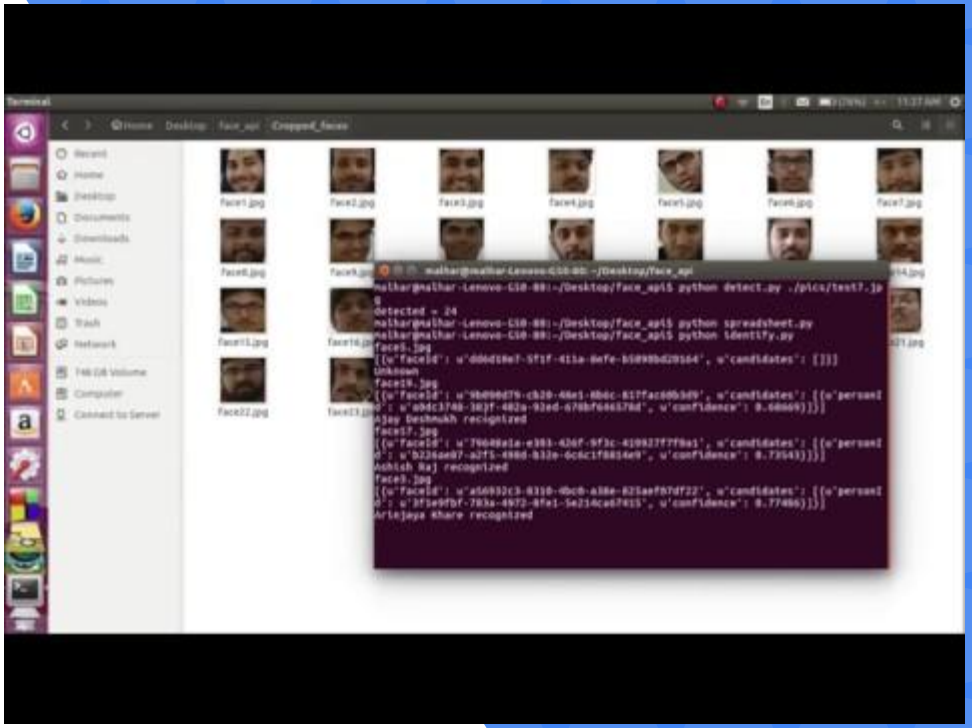


Technologies used :

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

Implemented on Python2.7

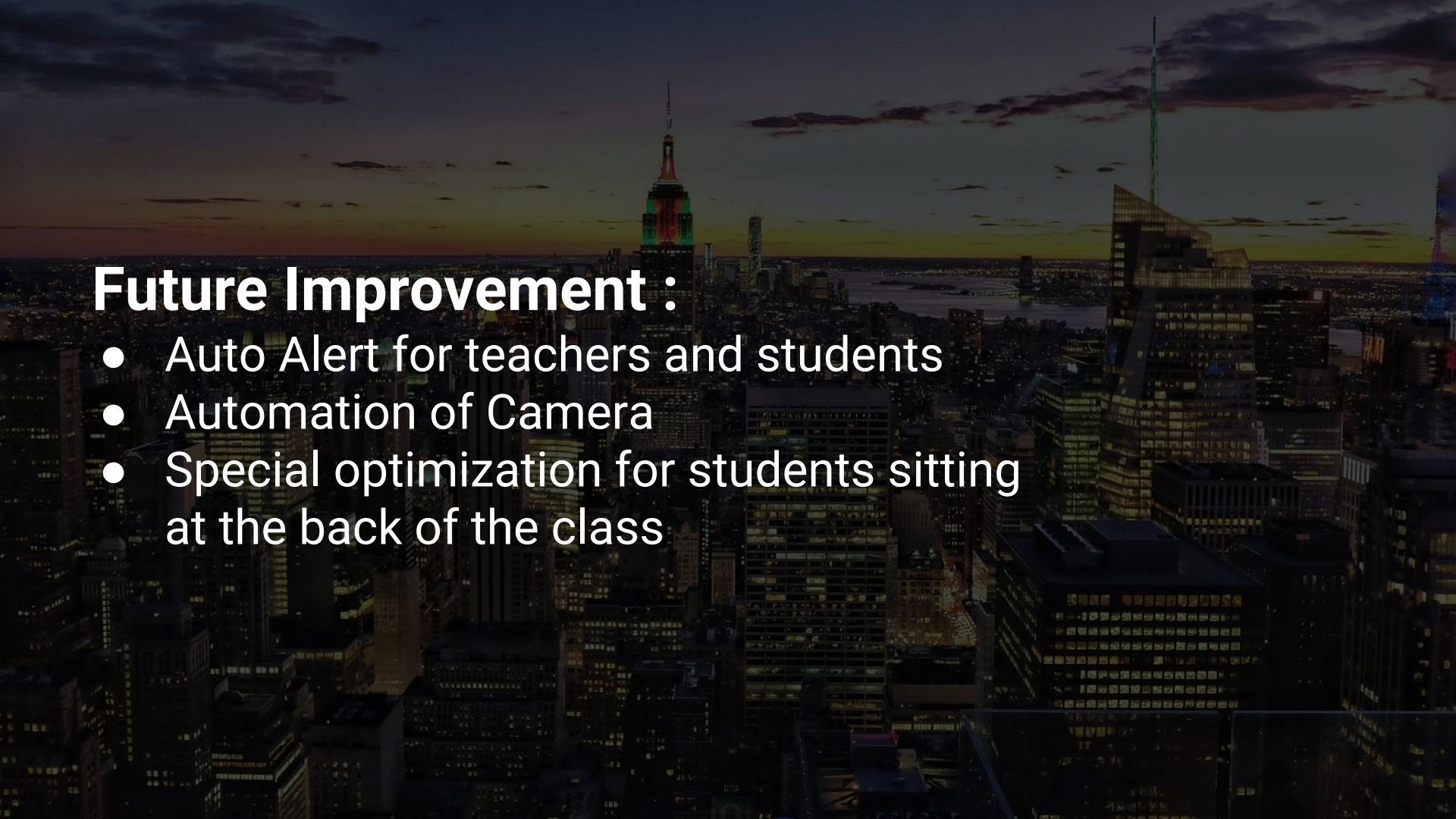
Video


malhar@malhar-Lenovo-G50-80:~/Desktop/face_api
malhar@malhar-Lenovo-G50-80:~/Desktop/face_api$ python detect.py ./pics/test7.jp
g
detected = 24
malhar@malhar-Lenovo-G50-80:~/Desktop/face_api$ python spreadsheet.py
malhar@malhar-Lenovo-G50-80:~/Desktop/face_api$ python identify.py
face5.jpg
[{u'faceId': u'd004580f-5f1f-411a-8efe-b1099bd29164', u'candidates': []}]
Unknown
face19.jpg
[{u'faceId': u'9b0980f9-cb20-46e1-8bdc-817face0b3d9', u'candidates': [{u'personI
d': u'a04c1748-302f-482a-92ed-670bf646178d', u'confidence': 0.68669}]}]
Ajay Deshmukh recognized
face17.jpg
[{u'faceId': u'79d48a1a-e301-42df-9f3c-410027f7f0a1', u'candidates': [{u'personI
d': u'b226ae07-a2f5-498d-b32e-0c6c1f8814e9', u'confidence': 0.73543}]}]
Ashish Raj recognized
face3.jpg
[{u'faceId': u'a16932c3-8310-4bc0-a38e-825aefb7df22', u'candidates': [{u'personI
d': u'3f1e9fbf-703a-4972-8fa1-5e214ca67415', u'confidence': 0.77486}]}]
Arlejaya Khare recognized

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



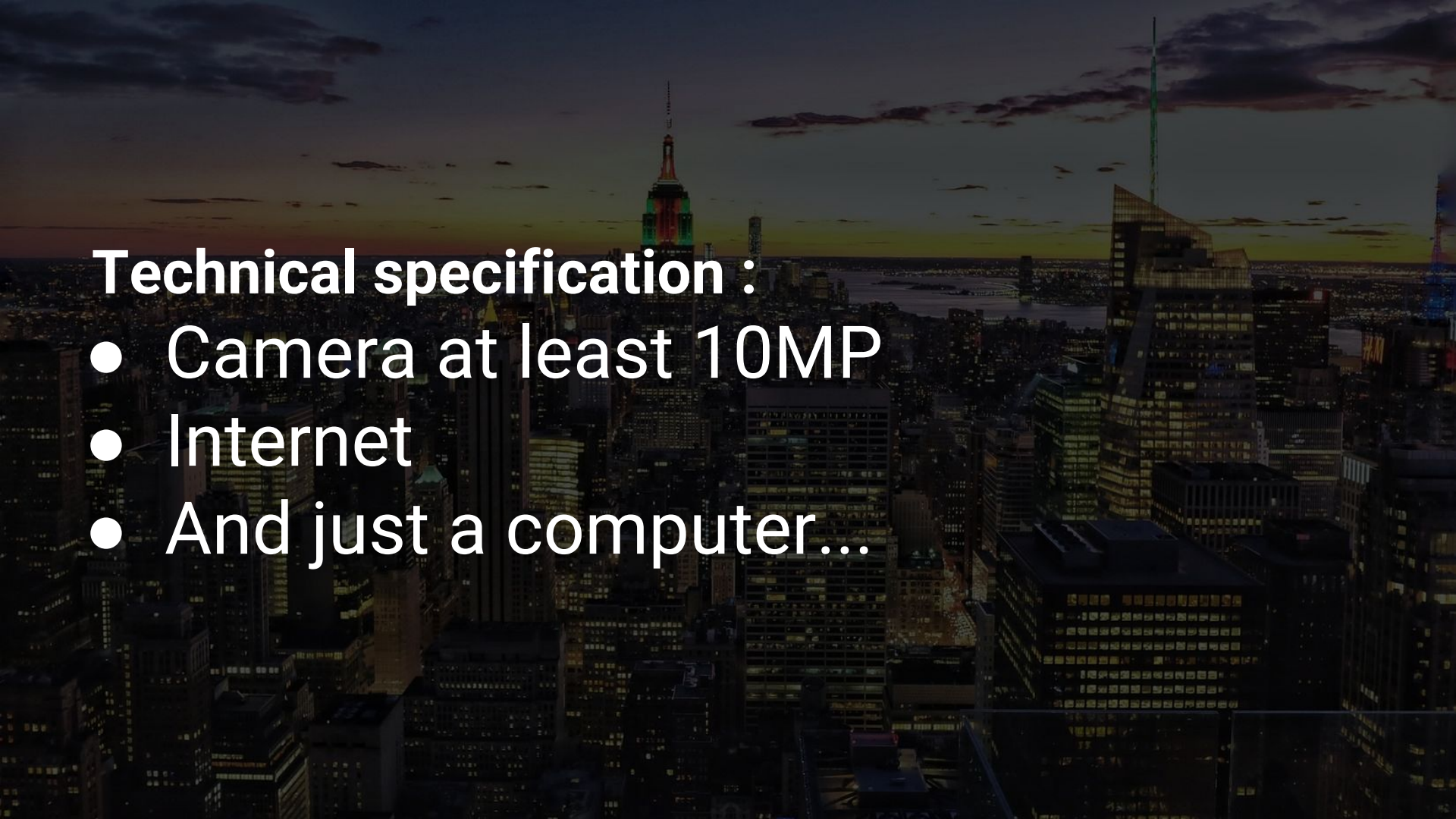
Future Improvement :

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

Cost Comparison

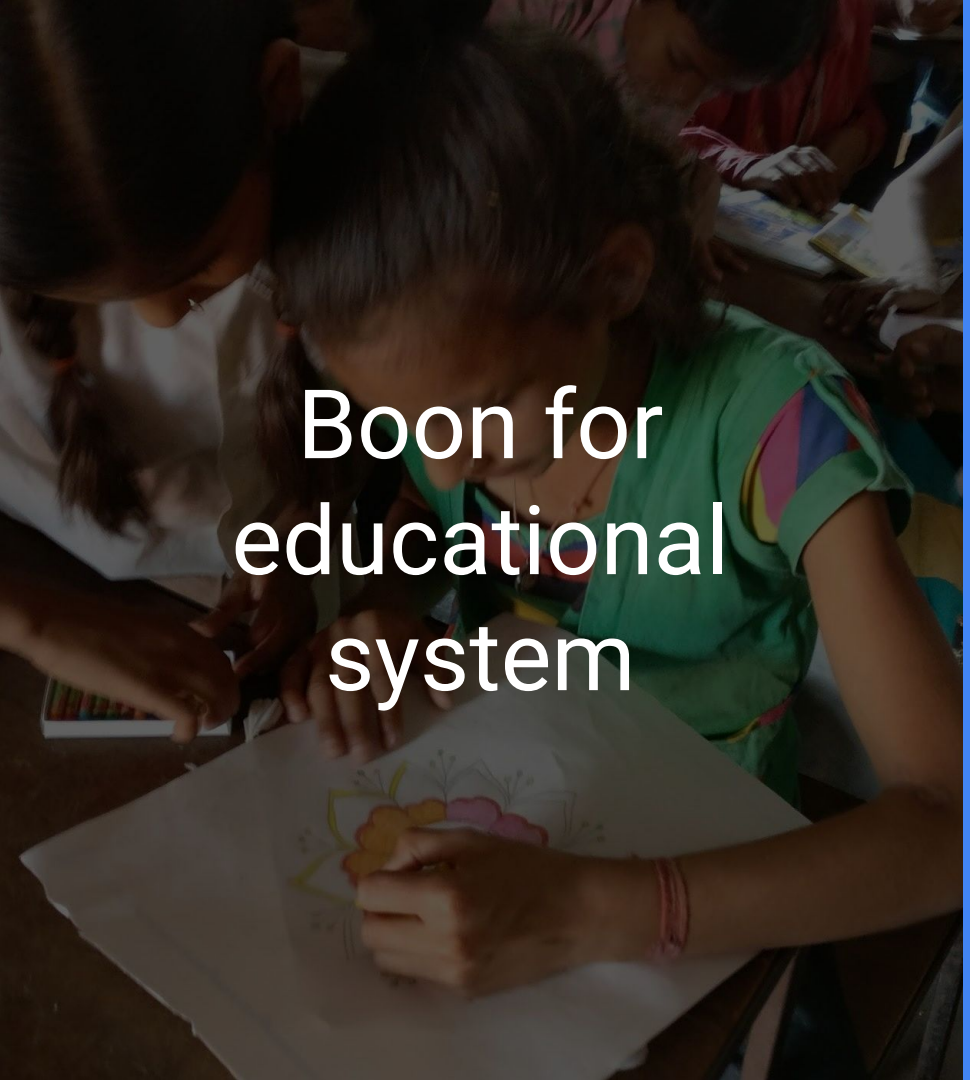
- RFID scanner(Rs. 3000+)
- Finger Print Scanner(Rs. 2000+)


Cost for this product :
Under Rs. 1,000



Technical specification :

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



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