

“Automated Attendance Using Python”

ABSTRACT

The attendance is taken in every organization. Traditional approach for attendance is, professor calls student name & record attendance. For each lecture this is wastage of time. To avoid these losses, we are about to use automatic process which is based on image processing. In this project approach, we are using QRCode system. The first phase is pre-processing where the QRCode is processed through the step image processing. Second phase is feature extraction. Step by step execution of these techniques (Image Processing) helps to achieve the final output. The working of this project is to detect and recognize the QRCode and mark the attendance for the corresponding face in the database. Input of this project is QRCode detection and recognition and output is to mark the attendance. Our project is being presented as a solution for the Automatic Attendance Marking System. It is designed to be reliable and low power. The Automatic QRCode detection and recognition proposed to attendance marking in database acts as the solution for the automatic attendance marking system.

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CHAPTER 1

Introduction

Manual vs Automated Attendance System : Comparison



1.1 Python History

- Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.
- Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and UNIX shell and other scripting languages.
- Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL).
- Python is now maintained by a core development team at the institute,

although Guido van Rossum still holds a vital role in directing its progress.

- Nowadays, taking attendance manually by using paper and pen was one approach we used even though we knew the process seems slow and unproductive.
- Students play truant and trying to cheat on their attendance by asking friends to put initial on the attendance sheet
- This project proposed as an alternative solution for educators to streamline the process of taking the attendance by using QR Code
- This System uses Python Language for taking Attendance.
- Organizations of all sizes use attendance systems to record when students or employees start and stop work. Some organizations also keep detailed records of attendance issues such as who calls in sick and who comes in late. It is important to take the attendance of the students in the classroom automatically.
- The attendance monitoring system was created and it changed the way attendances were marked. The attendance monitoring system has made the lives of teachers and employers easier.
- When it comes to schools and universities, the attendance monitoring system is a great help for parents and teachers both.

1.2 Purpose

1. Reduce manual process by providing automated and a reliable attendance system using QR code technology.
2. Teacher can easily manage Attendance Using this Automated Process
3. Produce Daily reports for students (Attendance Sheet).
4. Marks Attendance more accurately in less time.

CHAPTER 2

METHODOLOGY

2.1 Define Problem

- Taking attendance manually by using paper and pen was one approach we used even though we knew the process seemed slow and unproductive.
- Students play truant and trying to cheat on their attendance by asking friends to put initial on the attendance sheet

2.2 Problem statement

- To simplify the Traditional way of Attendance using Python.....!
- To minimize wastage of time for taking Attendance.....!
- Design Program for Automatic Attendance....!
- To Develop a Program of Attendance Working Contactless

2.3 Problem solution (Idea)

i) Automated attendance management system using face recognition

Limitation:

Required high definition camera

High Configuration Computer System

ii) Automated attendance management system using RFID

Limitation:

Cannot be performed if student lose their student card

iii) Automated attendance management system using QRCode

2.4 Problem requirements

- 1) Python Language Knowledge
- 2) Laptop/PC

3) Webcam

2.5 Problem implementation

Used Python Module:

1. OpenCV Python :

OpenCV (Open Source Computer Vision Library) Used for Face Recognition and detection

2. Numpy :

NumPy is a python library used for working with arrays. It also has functions for working in the domain of linear algebra, Fourier transform, and matrices.

3. Pyzbar :

Read one-dimensional barcodes and **QRCode** from Python 2 and 3 using the Zbar library.

4. Pyttsx3 :

pyttsx3 is a text-to-speech conversion library in Python

5. Openpyxl :

Openpyxl is a Python library to read/write Excel **xlsx/xlsm/xltx/xltn** files.

2.6 Problem Solution:

```
import cv2 #READ FROM CAMERA
import numpy as np
import pyttsx3
from pyzbar.pyzbar import decode
from datetime import datetime
import time
import openpyxl
from openpyxl import load_workbook
import os

x = datetime.now()

cap = cv2.VideoCapture(0)#Capture Via Camera.
cap.set(3,640) # Width Of Camera
cap.set(4,480) # Height Of Camera
rollnop=[]
roll={
1: "Ayushi Bhandari",
2: "Gayatri Chaudhari",
3: "Srushti Chaudhary",
4: "Sujal Deore",
5: "Pawan Desale",
6: "Hemant Deshmukh",
7: "Vaishnavi Dusane",
8: "Naitik Fulfagar",
9: "Saeed Gadhekar",
10: "Payal Gaikwad",
11: "Vaibhavi Gangurde",
12: "Aditya Jadhav",
13: "Rahul Jadhav",
14: "Ujjwal Katore",
15: "Cancelled",
16: "Priti Khaire",
17: "Tanmay Khairnar",
18: "Rutuja Lomate",
19: "Ashwini Mali",
20: "Amey Mohole",
21: "Parth Pagar",
22: "Durgesh Pagar",
23: "Keshavdas Panpatil",
24: "Mayuri Pardeshi",
25: "Ritesh Pardeshi",
26: "Tanvi Pardeshi",
27: "Tejas Patil",
28: "Vishnavi Patil",
29: "Tilak Rokaya",
30: "Sudarshan Sanap",
31: "Taha Shaikh",
32: "Ajinkya Shinde",
33: "Sayee Shirsath",
34: "Aditya Sonawane",
35: "Sumedh Takalkar",
```

```

36: "Varad Tannu",
37: "Pranav Thorat",
38: "Aditya Tokare",
39: "Rutuja Vaidya",
40: "Aashish Wagh",
41: "Prajwal Wankhede",
42: "Prerana Patil",
43: "Ruchika Kapadnis",
    }
#-----
engine = pyttsx3.init()
voices = engine.getProperty('voices')
engine.setProperty('voice', voices[0].id) #changing index changes voices but only 0 and 1 are working
here
engine.setProperty('rate', 150) # setting up new voice rate
engine.setProperty('volume',1.0) # setting up volume level between 0 and 1
#-----

#def exc(loc):

#-----
dirName=x.strftime("%d") + "-" + x.strftime("%m") + "-" + x.strftime("%Y")
if not os.path.exists(dirName):
    os.mkdir(dirName)
    # print("Directory " , dirName , " Created ")
#-----

exce=1
wb = openpyxl.Workbook()
sheet = wb.active

while(exce<44):

    sheet['A1'] = "Roll No.:"
    sheet['B1'] = "Name:"
    sheet['C1'] = "In Time:"
    sheet['D1'] = x.strftime("%x")
    sheet['E1'] = "Present Students - "
    sheet['H1'] = "Sequence Of Student Attendance"
    #sheet['A4'] = "Roll No.:"
    c1 = sheet.cell(row= exce+1 , column = 1)
    c1.value = exce
    c2 = sheet.cell(row= exce+1 , column = 2)
    c2.value = (roll[exce])
    #c3 = sheet.cell(row= sd+1 , column = 3)
    #c3.value = now
    exce=exce+1
    wb.save(dirName+"/Attendance.xlsx")

#-----
now=str(datetime.now())

def decoder(image):
    gray_img = cv2.cvtColor(image,0) #Change Image In backend For Quicker Responce or Quicker
Getting scan
    barcode = decode(gray_img)

    for obj in barcode:

        points = obj.polygon
        (x,y,w,h) = obj.rect

```

```

pts = np.array(points, np.int32)
pts = pts.reshape((-1, 1, 2))
cv2.polylines(image, [pts], True, (0, 255, 0), 3)

barcodeData = obj.data.decode("utf-8")
barcodeType = obj.type
barcodeDataint = int(barcodeData)
string = "Hi Roll no. " + str(barcodeData)
st1= now
#exc(barcodeData)

cv2.putText(frame, string, (x,y), cv2.FONT_HERSHEY_SIMPLEX,0.8,(255,0,0), 2)
file1 = open(dirName+"/attendance.txt","a")
L = ["Roll No."+barcodeData+" "]
if barcodeDataint in roll and not barcodeDataint in rollnop :
    name=str(roll[barcodeDataint])
    print("Hello Roll No."+barcodeData+" "+name+now)
    text = ("Roll Number"+barcodeData+" "+name+" Present")
    engine.say(text)
    engine.runAndWait()
    #time.sleep(5)

# \n is placed to indicate EOL (End of Line)
#if barcodeDataint in roll and not in:
    file1.write("\n")
    file1.writelines(L)
    file1.write(now)
    file1.close()
    rollnop.append(barcodeDataint)
# sheet['E1'] = len(rollnop)
#-----
workbook = load_workbook(filename=dirName+"/Attendance.xlsx")
sheet = workbook.active
sd=int(barcodeData)
cm = sheet.cell(row= sd+1 , column = 3)
nai = datetime.now()
cm.value = nai.strftime("%X")
sheet['E2'] = len(rollnop)
listToStr = ','.join([str(elem) for elem in rollnop])
cm1 = sheet.cell(row= jio+2 , column = 8)
cm1.value = listToStr
workbook.save(filename=dirName+"/Attendance.xlsx")
#-----
elif barcodeDataint in rollnop:
    tex1 = " Duplicate Entry"
    print(tex1)
    engine.say(tex1)
    engine.runAndWait()
else:
    text = " Invalid Input "
    print(text)
    engine.say(text)
    engine.runAndWait()
    # time.sleep(5)

while True:
    jio=0
    ret, frame = cap.read()
    decoder(frame)
    jio=jio+1

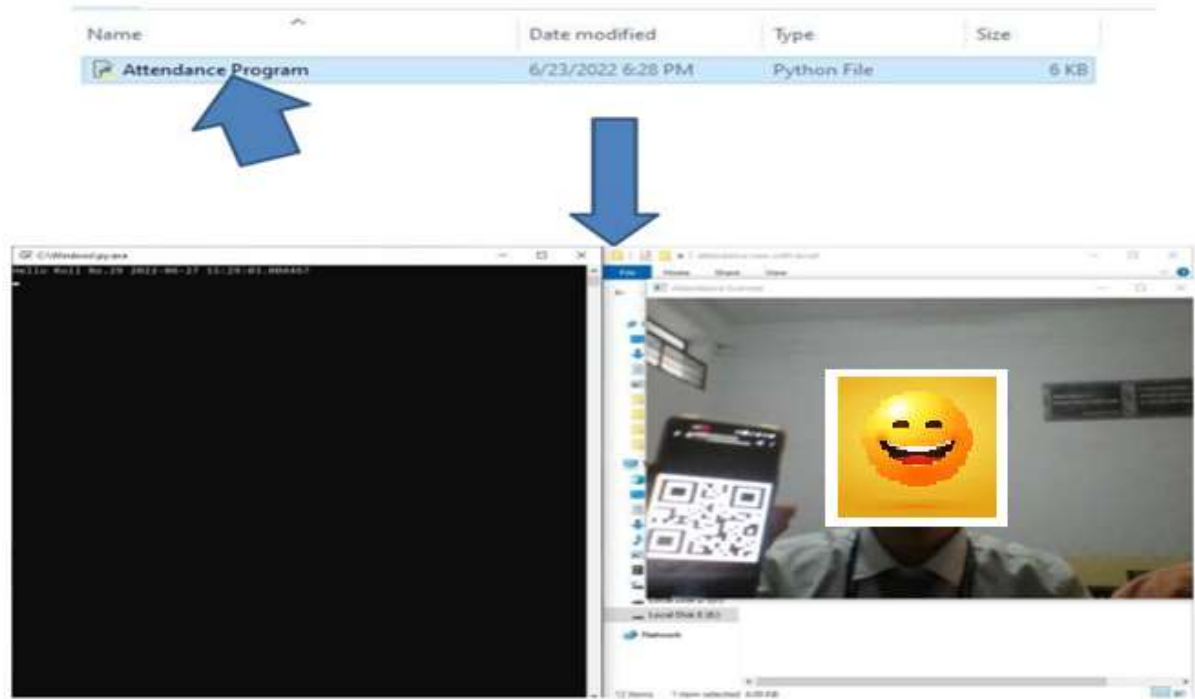
```

```
cv2.imshow('Attendance Scanner', frame)
code = cv2.waitKey(1)
```

```
if code == ord('q'):
    break
```

MADE BY - NAITIK FULFAGAR - 9021580363

Process:



Output:

	A	B	C	D	E	F	G	H	I	J
1	Roll No.:	Name:	In Time:	06/29/22	Present Students - 12			Sequence Of Student Attendance		
2		1 Ayushi Bhandari	16:48:16					5,8,29,36,41,17,1,40,3,4,6,7		
3		2 Gayatri Chaudhari								
4		3 Srushti Chaudhary	16:48:29							
5		4 Sujal Deore	16:48:36							
6		5 Pawan Desale	16:47:28							
7		6 Hemant Deshmukh	16:48:56							
8		7 Vaishnavi Dusane	16:49:05							
9		8 Naitik Fulfagar	16:47:37							
10		9 Saeed Gadhekar								
11		10 Payal Gaikwad								
12		11 Vaibhavi Gangurde								
13		12 Aditya Jadhav								
14		13 Rahul Jadhav								
15		14 Ujjwal Katore								
16		15 Cancelled								
17		16 Priti Khaire								
18		17 Tanmay Khairnar	16:48:07							
19		18 Rutuja Lomate								
20		19 Ashwini Mali								
21		20 Amey Mohole								
22		21 Parth Pagar								

CHAPTER 3

Results and Discussion

- The System is able to Mange Student Attendance Record Efficiently.
- The Systems is able to facilitate lecturers to collect data and information.
- Lecturers Can Easily monetize the attendance of students
- It Saves Time As Well As Paper

CHAPTER 4

Conclusion

- Our project takes out any plausibility of proxy also keep record of attendance of students in a well viable way. The general project is in charge of attendance of students
- This project decreases the work load on faculties. The additional focal points is that it is more dependable and the methodology is eco-accommodating as it diminishes paperwork
- Our Project is very efficient to avoid contact of Students, As in Covid-19 Crisis we have well understood importance of contactless.

CHAPTER 5

Reference

1. Python.
2. OpenCV Documentation.(Camera)
3. Numpy Documentation.(Calculation)
4. Pyzbar Documentation.(QRCode Decode)
5. Pyttsx3 Documentation.(Audio Play)
6. Openpyxl Documentation.(Excel)
7. Excel Documentation.