INTRODUCTION:-

Our project Automatic Traffic Light Controlling At Zebra Crossings based on Machine Learning is one of the most needed project in most parts of our country.

In this project we are going to use python language. We'll read the sensor data through open cv and send the sensor data to IBM cloud.

Features included:

The traffic signals will be controlled at the zebra crossings according to the time
Sometimes there will be more people who want to cross the road and there may be less traffic which may affect the traffic signals
We can integrate a camera at the traffic signals and using the opencv we can count the number of people standing at the zebra crossing to cross the road.
Based on that count we can increase or decrease the signaling time which will be helpful for pedestrians to cross the road.
We can even display the countdown for the green signal by using the OLED display.
Admin can get the people to count and the signaling time through the web application

Purpose of making such system is to reduce the man power, upgrade the level of accuracy.


LITERATURE SURVEY:-

Existing problem: The problem with current traffic signals are, there are two types of signals. 1st one manual signal which can increase the risk of failure by the lack of concentration or taking a leave from work, this can be risky.

2nd type of traffic signals aye the automatic one, in which the lights glow in a particular interval of time in these kind of signals there is a lot of wastage of time.

Proposed solution: our project of automation of the traffic signals will count the number of people standing at zebra crossing and glow the traffic light signals according to it. In this way we can reduce the time of people and it'll smoothen the road transportation.

Block diagram:
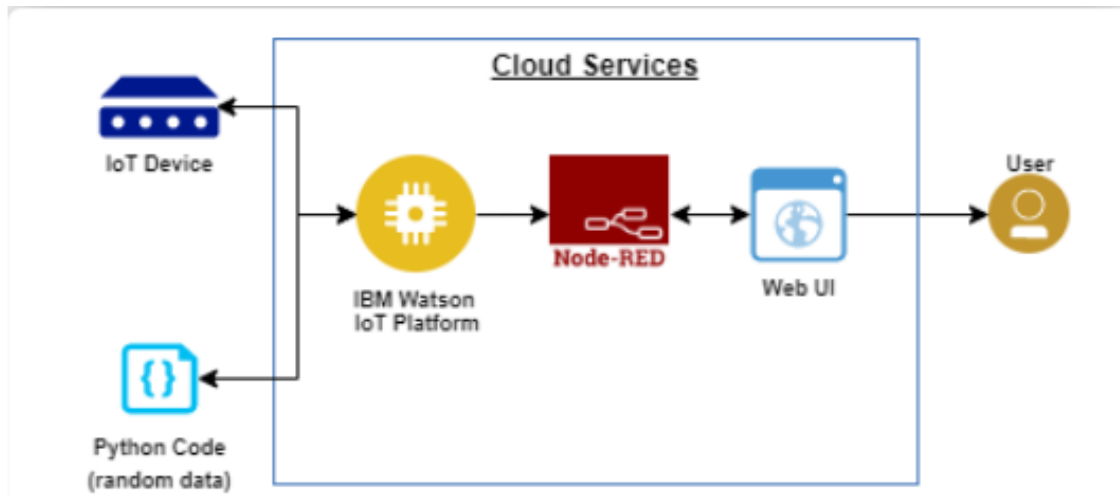
Hardware/software designing:


```python
import wiotp.sdk.device
import time
import random
import people_counter
import os


#count=people_counter.print( 'UP:',cnt_up)
#count=people_counter.print ('DOWN:',cnt_down)
myConfig = {
    "identity": {
        "orgId": "mawtlg",
        "typeId": "VIT-IOT-device",
        "deviceId":"12345"
    },
    "auth": {
        "token": "12345678"
    }
}

def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
    m=cmd.data['command']

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()


while True:
    seconds=int(input("how many seconds to wait-"))
    def time_display():
        #seconds=int(0)

        #seconds=int(input("how many seconds to wait"))
        for i in range(seconds):
            print(str(seconds-i) +"seconds remain")
            time.sleep(1)



    peoplecrossing=people_counter.cnt_up+people_counter.cnt_down
    if peoplecrossing<=10:
        print('Red light is ONN')
        print('green light is OFF')
```

File Edit Format Run Options Window Help

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            time.sleep(1)



    peoplecrossing=people_counter.cnt_up+people_counter.cnt_down
    if peoplecrossing<=10:
        print('Red light is ONN')
        print('green light is OFF')
        print('orange light os OFF')
        print('waiting time is one minute')
        time_display()
        myData={'Peoplewaiting':peoplecrossing, 'Signaltime':seconds}
        print("Published data Successfully: ", myData)
        client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
        client.commandCallback = myCommandCallback
        time.sleep(2)
    if peoplecrossing>=10:
        print('RED light is ONN')
        print('green light is OFF')
        print('orange light is OFF')
        print('waiting time is 2 minutes')
        time_display()
        myData={'Peoplewaiting':peoplecrossing, 'Signaltime':seconds}
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```
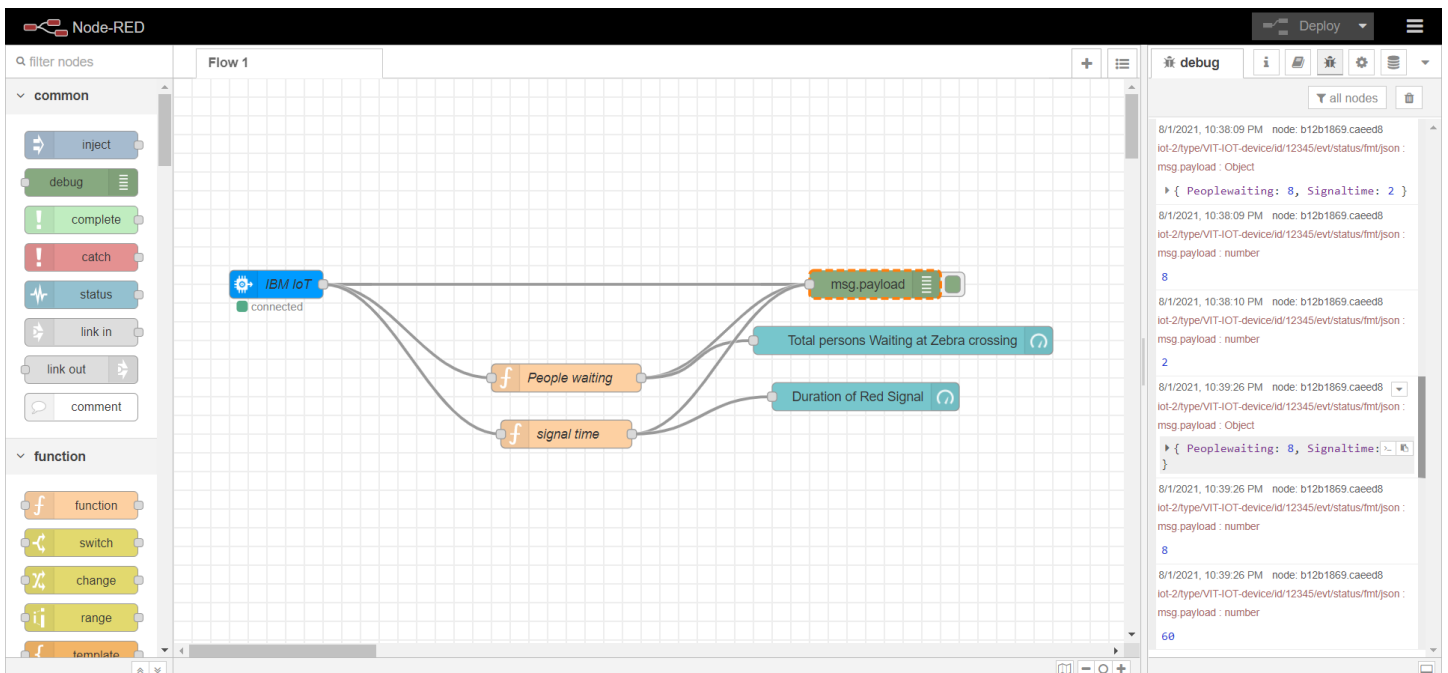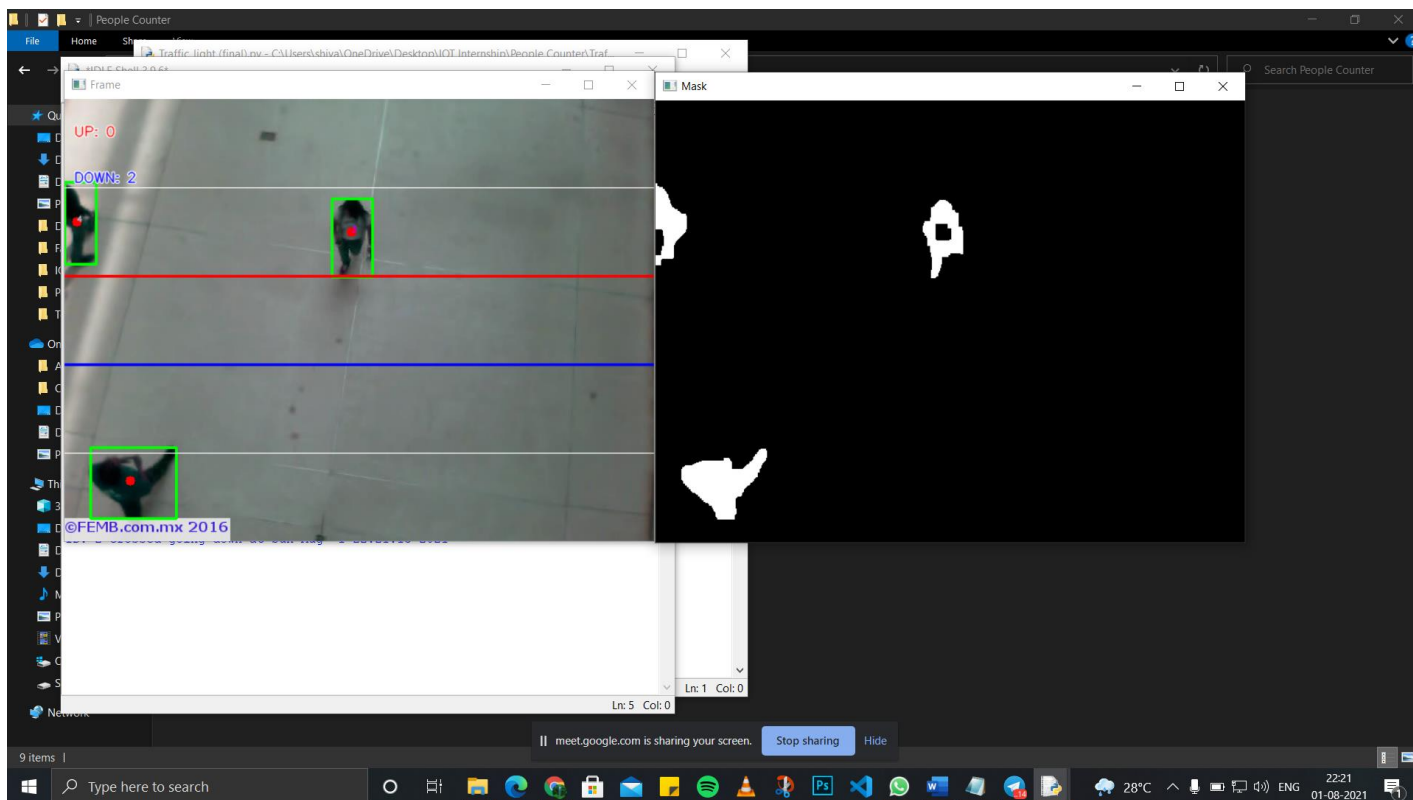

RESULTS:

```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\shiva\OneDrive\Desktop\IOT Internship\People Counter\Traffic_light (final).py
0 0.0
1 0.0
2 0.041666666666666664
3 640.0
4 480.0
5 24.0
6 1987535218.0
7 497.0
8 0.0
9 0.0
10 0.0
11 0.0
12 0.0
13 0.0
14 0.0
15 0.0
16 0.0
17 0.0
18 0.0
Area Threshold 1228.8
Red line y: 288
Blue line y: 192
ID: 1 crossed going down at Sun Aug  1 22:21:02 2021
ID: 2 crossed going down at Sun Aug  1 22:21:13 2021
ID: 3 crossed going down at Sun Aug  1 22:21:20 2021
ID: 5 crossed going up at Sun Aug  1 22:21:22 2021
ID: 7 crossed going down at Sun Aug  1 22:21:26 2021
ID: 9 crossed going up at Sun Aug  1 22:21:26 2021
ID: 10 crossed going up at Sun Aug  1 22:21:27 2021
ID: 9 crossed going down at Sun Aug  1 22:21:33 2021
EOF
UP: 3
DOWN: 5
2021-08-01 22:21:43,031   wiotp.sdk.device.client.DeviceClient  INFO    Connected successfully: d:mawtlg:VIT-IOT-device:12345
how many seconds to wait
```

```
9 0.0
10 0.0
11 0.0
12 0.0
13 0.0
14 0.0
15 0.0
16 0.0
17 0.0
18 0.0
Area Threshold 1228.8
Red line y: 288
Blue line y: 192
ID: 1 crossed going down at Sun Aug  1 22:21:02 2021
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ID: 7 crossed going down at Sun Aug  1 22:21:26 2021
ID: 9 crossed going up at Sun Aug  1 22:21:26 2021
ID: 10 crossed going up at Sun Aug  1 22:21:27 2021
ID: 9 crossed going down at Sun Aug  1 22:21:33 2021
EOF
UP: 3
DOWN: 5
2021-08-01 22:21:43,031   wiotp.sdk.device.client.DeviceClient  INFO    Connected successfully: d:mawtlg:VIT-IOT-device:12345
how many seconds to wait-15
Red light is ONN
green light is OFF
orange light os OFF
waiting time is one minute
15seconds remain
14seconds remain
13seconds remain
12seconds remain
11seconds remain
10seconds remain
9seconds remain
8seconds remain
7seconds remain
6seconds remain
5seconds remain
4seconds remain
3seconds remain
2seconds remain
1seconds remain
Published data Successfully:  {'Peoplewaiting': 8, 'Signaltime': 15}
how many seconds to wait-
```

Ln: 45 Col: 0
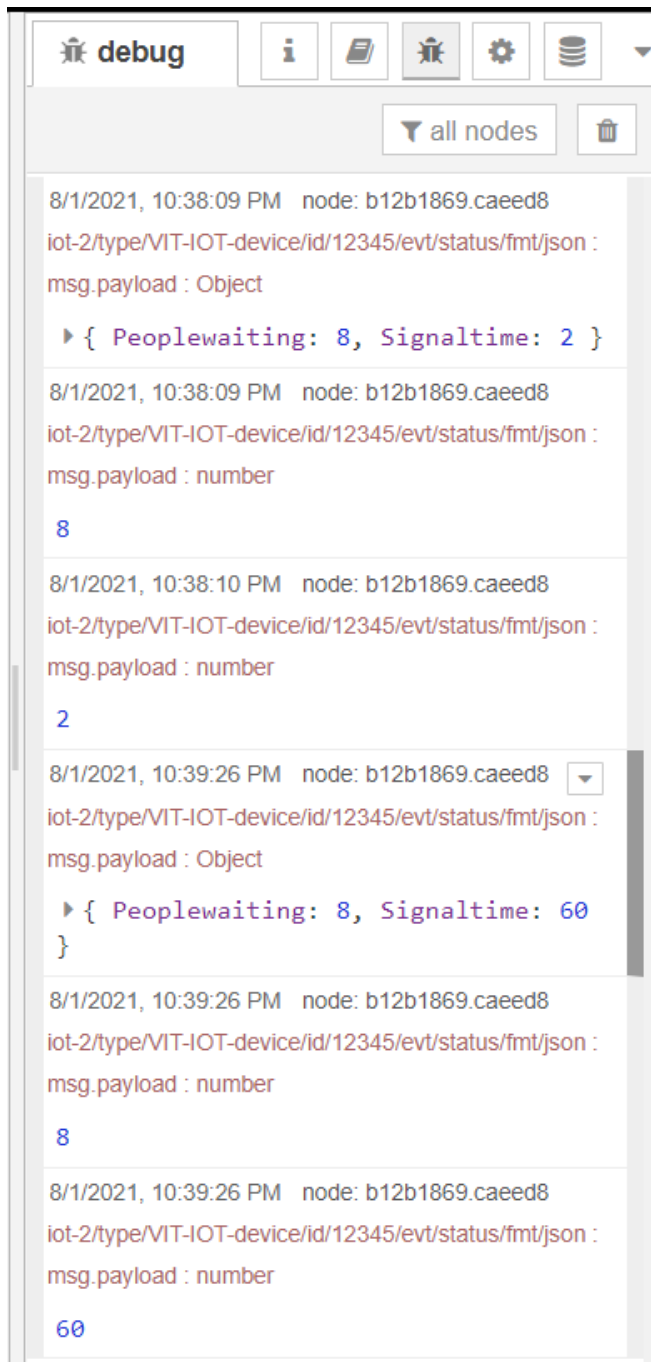
DISADVANTAGES: -

1. The system may get hacked and could not perform properly.

2. Sometimes it's possible that the sensor could predict wrong data.

3. It's possible that due to heavy traffic the system could misguide the vehicles.

4. If it suddenly stops there will be no one to handle the traffic for some time.

5. if some object come between the sensor and traffic it couldn't predict the data.

ADVANTAGES: -

 1. it will reduce the human power.

 2. it is more persisted than a man standing at signal

 3. comparatively very low cost.

 4. could save the time of people.

 5. in future it could be used of giving data to the automatic vehicles.

APPLICATIONS: -

 1. it could do a 24hrs job unlike a human for the same work.

 2. could be applied in uneven terrain.

 3. can be used in private sectors for domestic uses.

 4. can provide a large amount of data to the government for good surveillance.

 5. even can be used at railway crossings to reduce human labour.

CONCLUSION: - We would like to conclude our project

FUTURE SCOPE:-

 Our project of automation of traffic light signals can be used in the modern world it. could directly send sensor data to the

 automatic cars and the cars or other vehicles could use this data for providing the safe ride.

 It can also be used by government as well as private sector for good and persisted surveillance.

APPENDIX:-

Source CODE:

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import time
import random
import people_counter
import os


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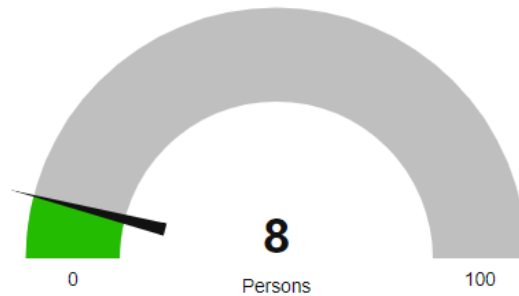
```python
        client.publishEvent(eventId="status", msgFormat="json",
data=myData, qos=0, onPublish=None)

        client.commandCallback = myCommandCallback

        time.sleep(2)

        if peoplecrossing>=10:

            print('RED light is ONN')

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            myData={'Peoplewaiting':peoplecrossing, 'Signaltime':seconds}

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            client.publishEvent(eventId="status", msgFormat="json",
data=myData, qos=0, onPublish=None)

            client.commandCallback = myCommandCallback

            time.sleep(2)


client.disconnect()
```
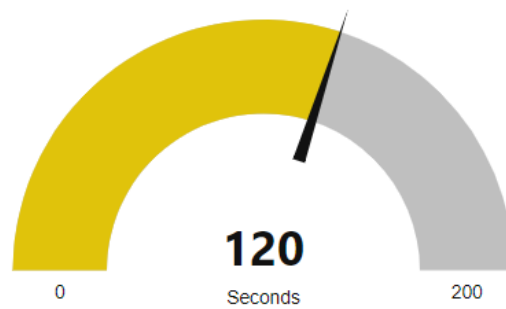
UI OUTPUT SCREENSHOT:

Total persons Waiting at Zebra crossing

8

0

Persons

100

Duration of Red Signal

120

0

Seconds

200

Google Drive Link for DEMO video:

https://drive.google.com/drive/folders/1N1qaHwH3NIszn0NaxVTh5FaMgq
eeDGIR?usp=sharing