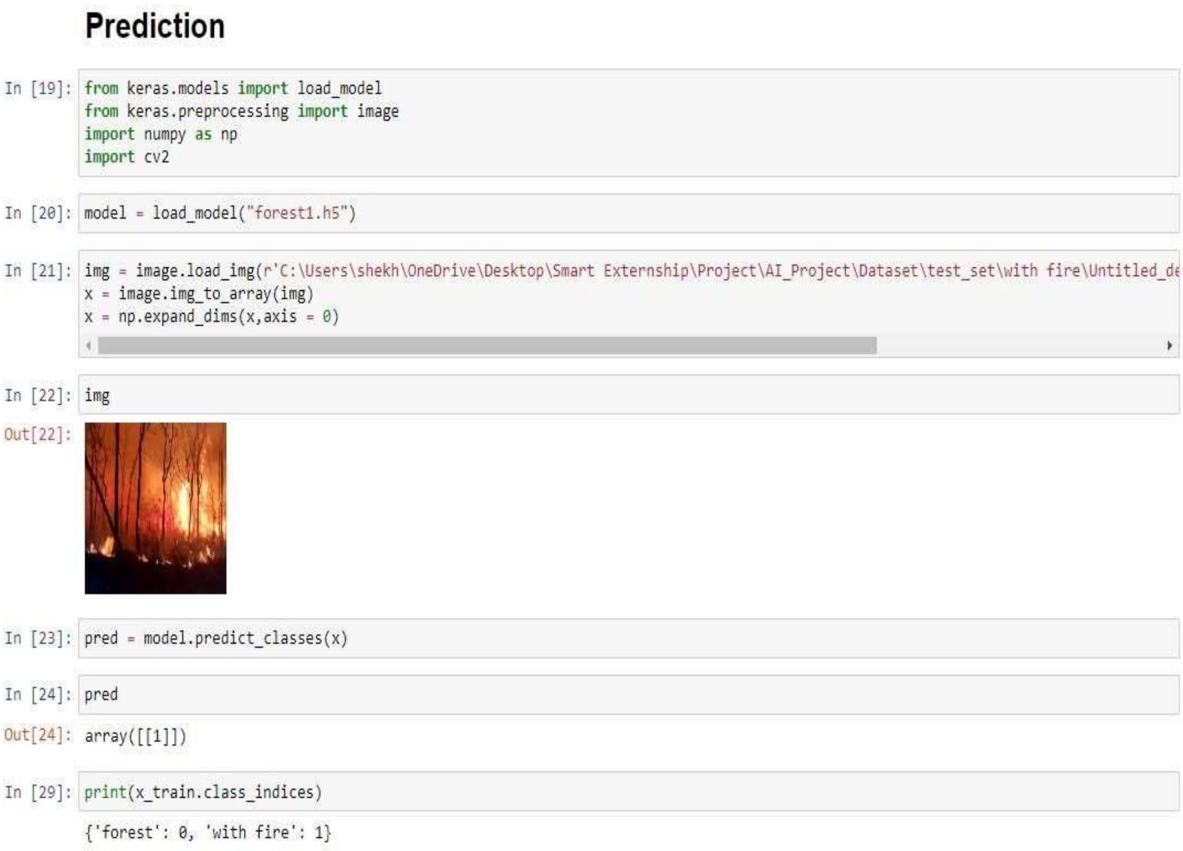
Results:

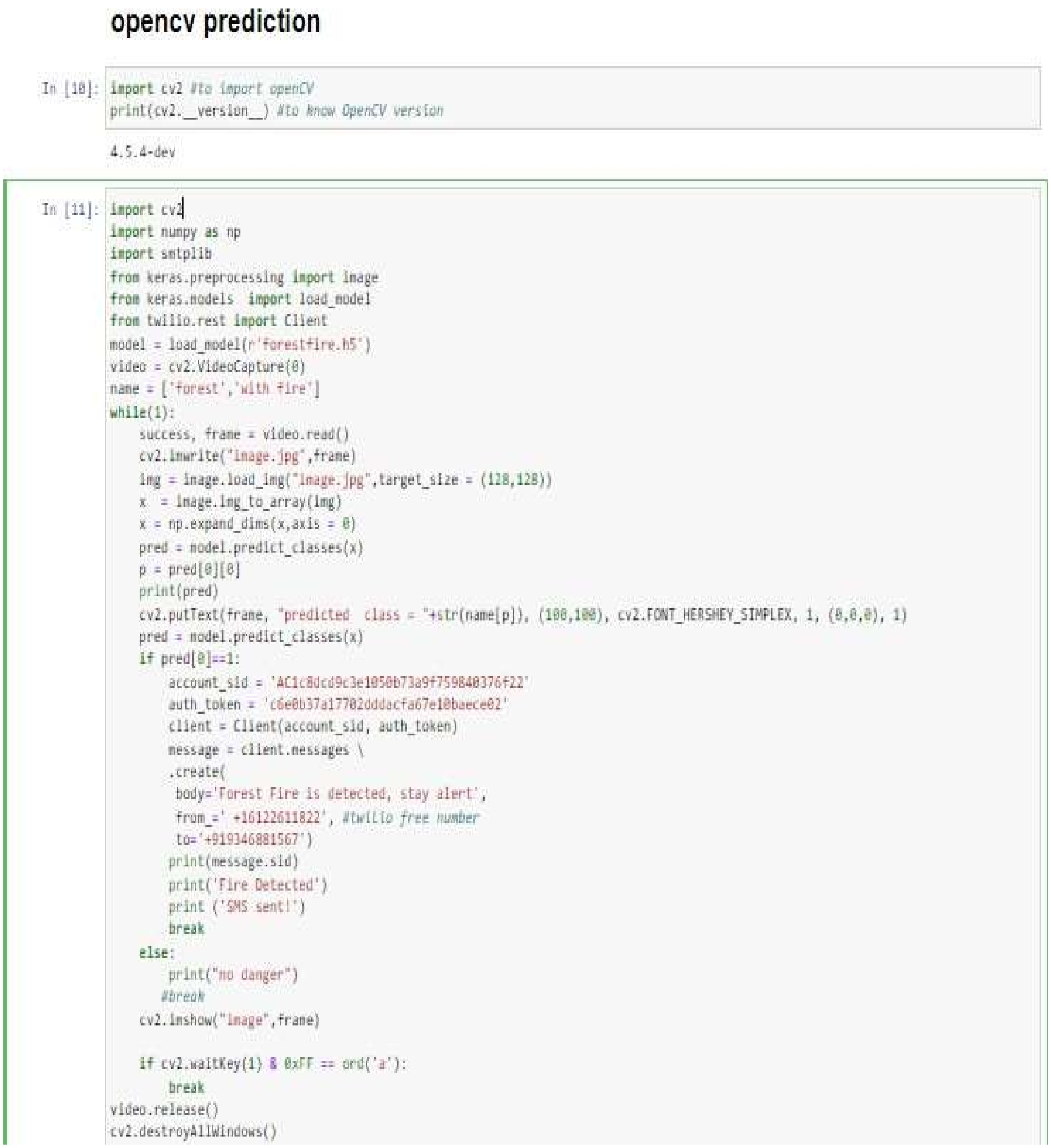
Here. We are predicting using an image whether it contains fire or not. So after loading the image, the image should be converted into an array and array is used to predict the output using our model named “forest1.h5”.



Prediction

```
In [19]: from keras.models import load_model
         from keras.preprocessing import image
         import numpy as np
         import cv2

In [20]: model = load_model("forest1.h5")

In [21]: img = image.load_img(r'C:\Users\shekh\OneDrive\Desktop\Smart Externship\Project\AI_Project\Dataset\test_set\with fire\Untitled_de
         x = image.img_to_array(img)
         x = np.expand_dims(x,axis = 0)

In [22]: img
Out[22]:

In [23]: pred = model.predict_classes(x)

In [24]: pred
Out[24]: array([[1]])

In [29]: print(x_train.class_indices)
         {'forest': 0, 'with fire': 1}
```

Here, we are predicting using opencv which uses local machines camera and through the camera it predicts the output. If it detects fire then it sends sms to the user through twilio.



opencv prediction

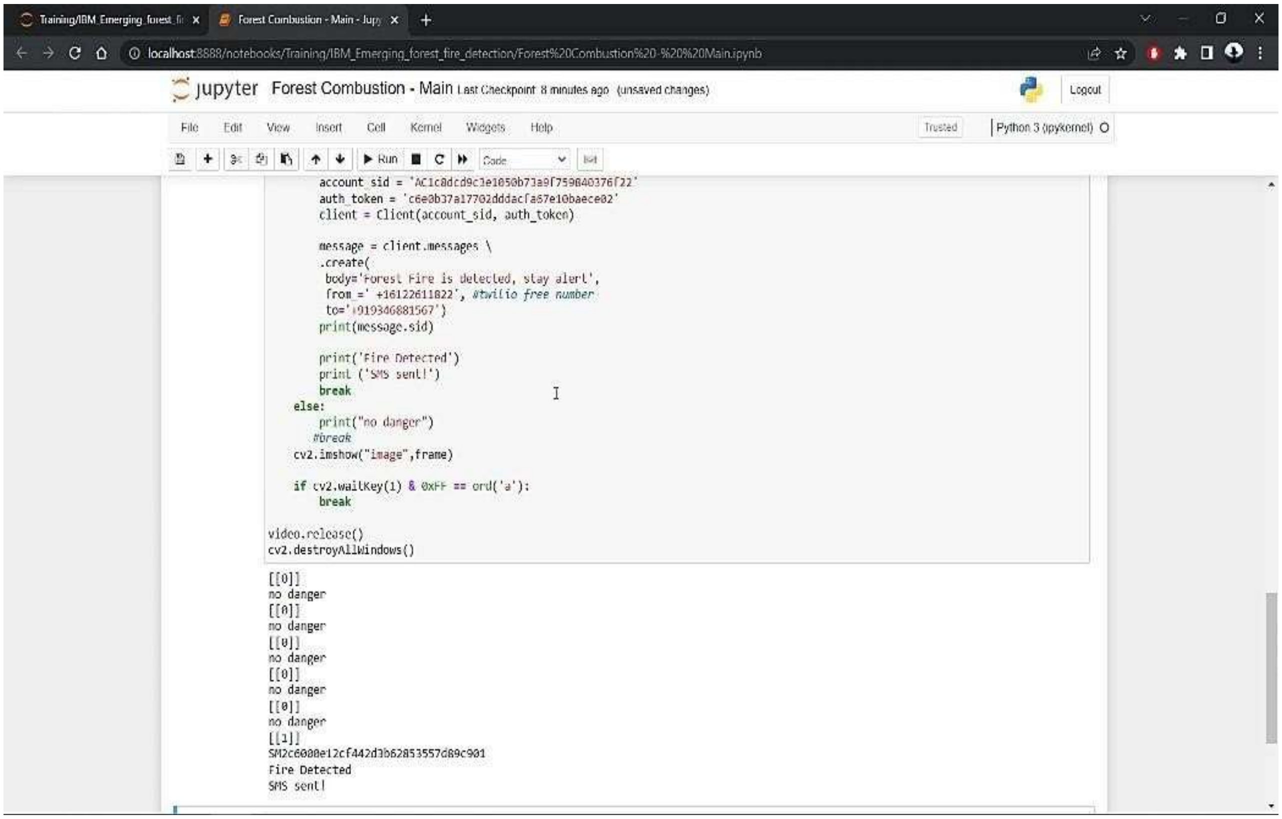
In [10]:

```
import cv2 #to import openCV
print(cv2.__version__) #to know OpenCV version
```

```
4.5.4-dev
```

In [11]:

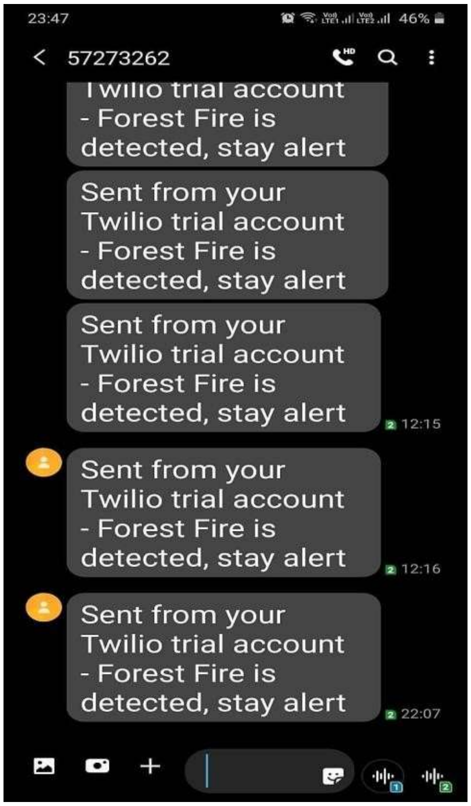
```
import cv2
import numpy as np
import smtplib
from keras.preprocessing import image
from keras.models  import load_model
from twilio.rest import Client
model = load_model(r'forestfire.h5')
video = cv2.VideoCapture(0)
name = ['forest','with fire']
while(1):
    success, frame = video.read()
    cv2.imwrite("image.jpg",frame)
    img = image.load_img("image.jpg",target_size = (128,128))
    x  = image.img_to_array(img)
    x = np.expand_dims(x,axis = 0)
    pred = model.predict_classes(x)
    p = pred[0][0]
    print(pred)
    cv2.putText(frame, "predicted  class = "+str(name[p]), (100,100), cv2.FONT_HERSHEY_SIMPLEX, 1, (0,0,0), 1)
    pred = model.predict_classes(x)
    if pred[0]==1:
        account_sid = 'AC1c8dcd9c3e1050b73a9f759840376f22'
        auth_token = 'c6e0b37a17702dddacfa67e10baece02'
        client = Client(account_sid, auth_token)
        message = client.messages \
        .create(
         body='Forest Fire is detected, stay alert',
         from_=' +16122611822', #twilio free number
         to='+919346881567')
        print(message.sid)
        print('Fire Detected')
        print ('SMS sent!')
        break
    else:
        print("no danger")
       #break
    cv2.imshow("image",frame)

    if cv2.waitKey(1) & 0xFF == ord('a'):
        break
video.release()
cv2.destroyAllWindows()
```


Training/IBM_Emerging_forest_fi
Forest Combustion - Main - Jupy
localhost:8888/notebooks/Training/IBM_Emerging_forest_fire_detection/Forest%20Combustion%20-%20%20Main.ipynb
jupyter
Forest Combustion - Main Last Checkpoint 8 minutes ago (unsaved changes)
Logout
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Trusted
Python 3 (ipykernel)
Run
Code

```
        account_sid = 'AC1c0dcd9c1e1050b73a9f759840376f22'
        auth_token = 'c6e0b37a17702dddacfa67e10baece02'
        client = Client(account_sid, auth_token)

        message = client.messages \
        .create(
         body='Forest Fire is detected, stay alert',
         from_=' +16122611822', #twilio free number
         to='+919346881567')
        print(message.sid)

        print('Fire Detected')
        print ('SMS sent!')
        break
    else:
        print("no danger")
       #break
    cv2.imshow("image",frame)

    if cv2.waitKey(1) & 0xFF == ord('a'):
        break

video.release()
cv2.destroyAllWindows()
```

```
[[0]]
no danger
[[0]]
no danger
[[0]]
no danger
[[0]]
no danger
[[0]]
no danger
[[1]]
SM2c6000e12cf442d3b62853557d89c901
Fire Detected
SMS sent!
```

<u>SMS message through Twilio:</u>



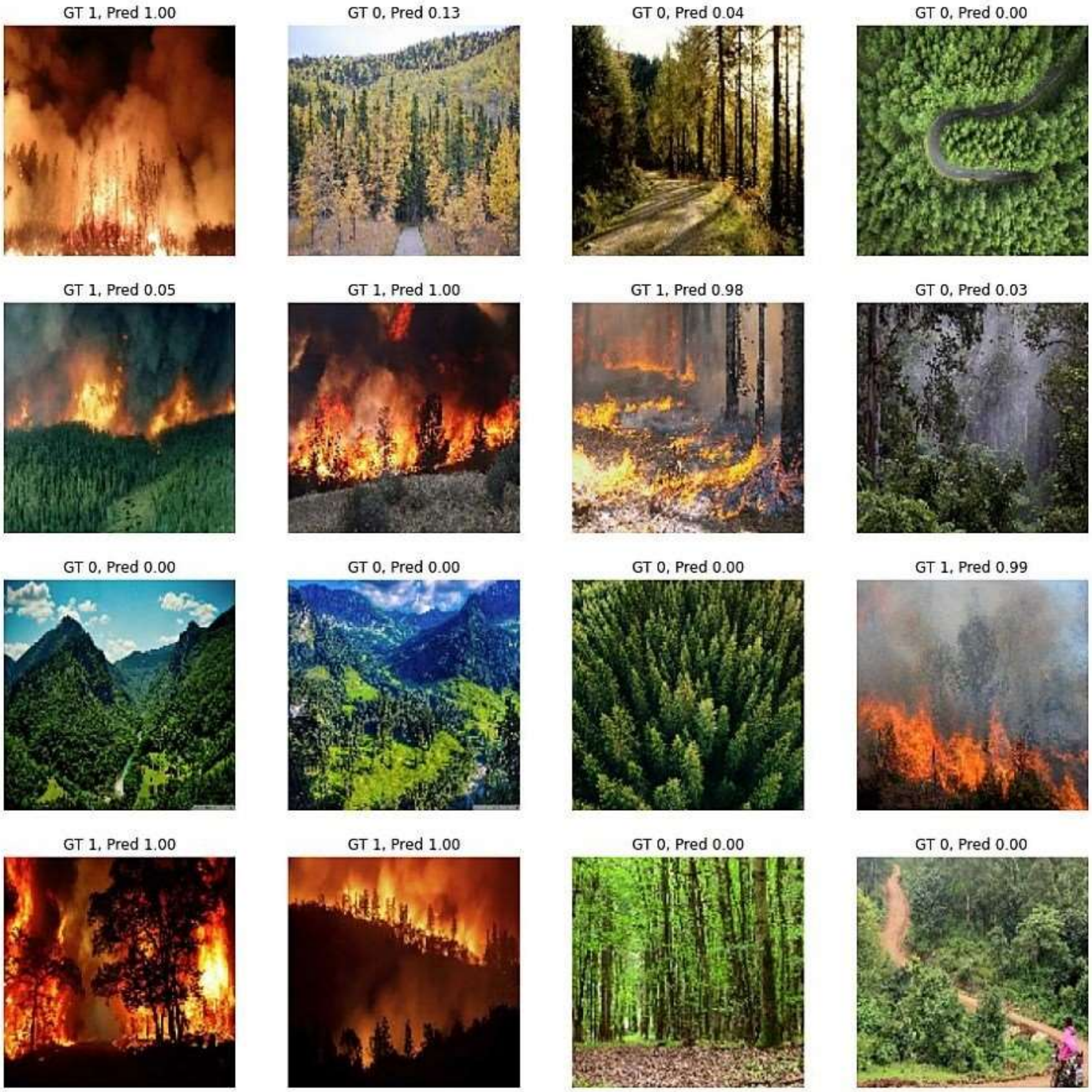
Twilio trial account - Forest Fire is detected, stay alert

Sent from your Twilio trial account - Forest Fire is detected, stay alert

Sent from your Twilio trial account - Forest Fire is detected, stay alert
12:15

Sent from your Twilio trial account - Forest Fire is detected, stay alert
12:16

Sent from your Twilio trial account - Forest Fire is detected, stay alert
22:07


GT 1, Pred 1.00
GT 0, Pred 0.13
GT 0, Pred 0.04
GT 0, Pred 0.00
GT 1, Pred 0.05
GT 1, Pred 1.00
GT 1, Pred 0.98
GT 0, Pred 0.03
GT 0, Pred 0.00
GT 0, Pred 0.00
GT 0, Pred 0.00
GT 1, Pred 0.99
GT 1, Pred 1.00
GT 1, Pred 1.00
GT 0, Pred 0.00
GT 0, Pred 0.00