

```
!pip install tensorflow
!pip install opencv-python
!pip install opencv-contrib-python
import tensorflow as tf
import numpy as np
from tensorflow import keras
import os
import cv2
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.preprocessing import image
```

Requirement already satisfied: tensorflow in c:\users\naren karthick\anaconda3\lib\site-packages (2.10.0)

Requirement already satisfied: libclang>=13.0.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (14.0.6)

Requirement already satisfied: packaging in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (20.9)

Requirement already satisfied: absl-py>=1.0.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.3.0)

Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (0.27.0)

Requirement already satisfied: wrapt>=1.11.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.12.1)

Requirement already satisfied: tensorboard<2.11,>=2.10 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (2.10.1)

Requirement already satisfied: tensorflow-estimator<2.11,>=2.10.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (2.10.0)

Requirement already satisfied: h5py>=2.9.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (2.10.0)

Requirement already satisfied: opt-einsum>=2.3.2 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (3.3.0)

Requirement already satisfied: keras-preprocessing>=1.1.1 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.1.2)

Requirement already satisfied: grpcio<2.0,>=1.24.3 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.50.0)

Requirement already satisfied: gast<=0.4.0,>=0.2.1 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (0.4.0)

Requirement already satisfied: typing-extensions>=3.6.6 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (3.7.4.3)

Requirement already satisfied: flatbuffers>=2.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (22.10.26)

Requirement already satisfied: keras<2.11,>=2.10.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (2.10.0)

Requirement already satisfied: astunparse>=1.6.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.6.3)

Requirement already satisfied: six>=1.12.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.15.0)

Requirement already satisfied: google-pasta>=0.1.1 in c:\users\naren

karthick\anaconda3\lib\site-packages (from tensorflow) (0.2.0)
Requirement already satisfied: setuptools in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (52.0.0.post20210125)
Requirement already satisfied: numpy>=1.20 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (1.20.1)
Requirement already satisfied: termcolor>=1.1.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (2.1.0)
Requirement already satisfied: protobuf<3.20,>=3.9.2 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorflow) (3.19.6)
Requirement already satisfied: wheel<1.0,>=0.23.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from astunparse>=1.6.0->tensorflow) (0.36.2)
Requirement already satisfied: google-auth<3,>=1.6.3 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (2.14.1)
Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (0.4.6)
Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (0.6.1)
Requirement already satisfied: markdown>=2.6.8 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (3.4.1)
Requirement already satisfied: werkzeug>=1.0.1 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (1.0.1)
Requirement already satisfied: requests<3,>=2.21.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (2.28.1)
Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (1.8.1)
Requirement already satisfied: rsa<5,>=3.1.4 in c:\users\naren karthick\anaconda3\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (4.9)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (5.2.0)
Requirement already satisfied: pyasn1-modules>=0.2.1 in c:\users\naren karthick\anaconda3\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (0.2.8)
Requirement already satisfied: requests-oauthlib>=0.7.0 in c:\users\naren karthick\anaconda3\lib\site-packages (from google-auth-oauthlib<0.5,>=0.4.1->tensorboard<2.11,>=2.10->tensorflow) (1.3.1)
Requirement already satisfied: importlib-metadata>=4.4 in c:\users\naren karthick\anaconda3\lib\site-packages (from markdown>=2.6.8->tensorboard<2.11,>=2.10->tensorflow) (5.0.0)
Requirement already satisfied: zipp>=0.5 in c:\users\naren karthick\anaconda3\lib\site-packages (from importlib-metadata>=4.4-

```

>markdown>=2.6.8->tensorboard<2.11,>=2.10->tensorflow) (3.4.1)
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in c:\users\naren
karthick\anaconda3\lib\site-packages (from pyasn1-modules>=0.2.1-
>google-auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (0.4.8)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (2020.12.5)
Requirement already satisfied: idna<4,>=2.5 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (2.10)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\
naren karthick\anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (2.1.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (1.26.12)
Requirement already satisfied: oauthlib>=3.0.0 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests-oauthlib>=0.7.0-
>google-auth-oauthlib<0.5,>=0.4.1->tensorboard<2.11,>=2.10-
>tensorflow) (3.2.2)
Requirement already satisfied: pyparsing>=2.0.2 in c:\users\naren
karthick\anaconda3\lib\site-packages (from packaging->tensorflow)
(2.4.7)
Requirement already satisfied: opencv-python in c:\users\naren
karthick\anaconda3\lib\site-packages (4.6.0.66)
Requirement already satisfied: numpy>=1.14.5 in c:\users\naren
karthick\anaconda3\lib\site-packages (from opencv-python) (1.20.1)
Collecting opencv-contrib-python
  Downloading opencv_contrib_python-4.6.0.66-cp36-abi3-win_amd64.whl
(42.5 MB)
Requirement already satisfied: numpy>=1.17.3 in c:\users\naren
karthick\anaconda3\lib\site-packages (from opencv-contrib-python)
(1.20.1)
Installing collected packages: opencv-contrib-python
Successfully installed opencv-contrib-python-4.6.0.66

```

```

train=ImageDataGenerator(rescale=1./255,
                        shear_range=0.2,
                        rotation_range=180,
                        zoom_range=0.2,
                        horizontal_flip=True)

train = ImageDataGenerator(rescale=1/255)
test = ImageDataGenerator(rescale=1/255)

train_dataset = train.flow_from_directory(r"C:\Users\Naren Karthick\
Desktop\Dataset\train_set",
                                         target_size=(128,128),
                                         batch_size = 32,
                                         class_mode = 'binary' )

```

Found 436 images belonging to 2 classes.

```
test_dataset = test.flow_from_directory(r"C:\Users\Naren Karthick\
Desktop\Dataset\test_set",
                                       target_size=(128,128),
                                       batch_size = 32,
                                       class_mode = 'binary' )
```

Found 121 images belonging to 2 classes.

```
test_dataset.class_indices
```

```
{'forest': 0, 'with fire': 1}
```

```
from keras.models import Sequential
from keras.layers import Dense
from keras.layers import Convolution2D
from keras.layers import MaxPooling2D
from keras.layers import Flatten
import warnings
warnings.filterwarnings('ignore')

model = keras.Sequential()
model.add(Convolution2D(32,
(3,3),input_shape=(128,128,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Convolution2D(32,(3,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Convolution2D(32,(3,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Convolution2D(32,(3,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())

model.add(Dense(150,activation='relu'))

model.add(Dense(1,activation='sigmoid'))

model.compile(loss = 'binary_crossentropy',
              optimizer = "adam",
              metrics = ["accuracy"])
```

```
r = model.fit(train_dataset, epochs = 5, validation_data =
test_dataset)
```

Epoch 1/5

```
14/14 [=====] - 91s 6s/step - loss: 0.5912 -
accuracy: 0.6628 - val_loss: 0.4072 - val_accuracy: 0.8430
```

Epoch 2/5

```
14/14 [=====] - 53s 4s/step - loss: 0.4079 -
accuracy: 0.8303 - val_loss: 0.2781 - val_accuracy: 0.8843
```

Epoch 3/5

```
14/14 [=====] - 49s 4s/step - loss: 0.3785 -
accuracy: 0.8165 - val_loss: 0.1743 - val_accuracy: 0.9752
```

```
Epoch 4/5
14/14 [=====] - 52s 4s/step - loss: 0.2369 -
accuracy: 0.9197 - val_loss: 0.0972 - val_accuracy: 0.9587
```

```
Epoch 5/5
14/14 [=====] - 51s 4s/step - loss: 0.1540 -
accuracy: 0.9381 - val_loss: 0.0341 - val_accuracy: 1.0000
```

```
predictions = model.predict(test_dataset)
predictions = np.round(predictions)
```

```
4/4 [=====] - 16s 3s/step
```

```
predictions
```

```
array([[1.],
       [1.],
       [0.],
       [0.],
       [0.],
       [0.],
       [0.],
       [0.],
       [1.],
       [1.],
       [0.],
       [0.],
       [1.],
       [0.],
       [0.],
       [1.],
       [0.],
       [1.],
       [0.],
       [1.],
       [1.],
       [0.],
       [0.],
       [0.],
       [0.],
       [0.],
       [1.],
       [0.],
       [0.],
       [0.],
       [0.],
       [1.],
       [0.],
       [1.],
       [0.]])
```

[0.],
[1.],
[1.],
[1.],
[0.],
[1.],
[1.],
[1.],
[1.],
[0.],
[1.],
[1.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[1.],
[0.],
[1.],
[1.],
[0.],
[0.],
[1.],
[0.],
[0.],
[1.],
[1.],
[1.],
[1.],
[1.],
[1.],
[0.],
[1.],
[0.],
[0.],
[0.],
[1.],
[0.],
[1.],
[0.],
[0.],
[1.],
[0.],
[0.],
[1.],
[1.],

```

[1.],
[0.],
[0.],
[1.],
[0.],
[0.],
[1.],
[1.],
[0.],
[1.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[0.],
[1.],
[1.],
[1.],
[0.],
[0.],
[1.],
[0.],
[1.],
[1.],
[0.],
[1.],
[1.],
[0.],
[0.]], dtype=float32)

print(len(predictions))

121

model.save("forestfire.h5")

ls

Volume in drive C has no label.
Volume Serial Number is 5CC8-3212

Directory of C:\Users\Naren Karthick

13-11-2022  18:59    <DIR>          .
04-09-2022  04:43    <DIR>          ..
11-11-2022  17:52    <DIR>          .conda

```

```

22-09-2022 13:54          25 .condarc
22-09-2022 13:53      <DIR>    .continuum
13-11-2022 18:40      <DIR>    .ipynb_checkpoints
11-11-2022 19:17      <DIR>    .ipython
12-11-2022 13:32      <DIR>    .jupyter
11-11-2022 18:44      <DIR>    .keras
11-11-2022 18:19      <DIR>    .matplotlib
13-11-2022 14:11          116 .node_repl_history
11-11-2022 17:03      <DIR>    anaconda3
11-11-2022 19:14      326,807,773 archive.zip
13-11-2022 17:49      43,115,882 B3_IBM_model.tar.gb
04-09-2022 04:27      <DIR>    Contacts
13-11-2022 17:03          40,484 Deployment (1).ipynb
13-11-2022 17:52          41,849 Deployment.ipynb
13-11-2022 17:12      <DIR>    Desktop
05-09-2022 08:10      <DIR>    Documents
13-11-2022 17:11      <DIR>    Downloads
04-09-2022 04:27      <DIR>    Favorites
13-11-2022 18:58          2,483,648 forestfire.h5
13-11-2022 16:33      43,115,882 forestfire-classification.tgz
11-11-2022 19:18          740 Image Preprocessing .ipynb
11-11-2022 21:19          15,356 Image Preprocessing1.ipynb
12-11-2022 17:11          2,044 Image preprocessing2.ipynb
04-09-2022 04:27      <DIR>    Links
12-11-2022 18:54          3,986,428 Model Building .ipynb
04-09-2022 04:27      <DIR>    Music
12-11-2022 20:13          30,683,136 node-v18.12.1-x64.msi
13-11-2022 18:25      <DIR>    OneDrive
13-11-2022 18:59          18,791 OpenCv.ipynb
21-10-2022 18:06      <DIR>    Pictures
12-11-2022 19:06      396,601,896 pycharm-community-2022.2.3.exe
04-09-2022 04:27      <DIR>    Saved Games
04-09-2022 04:43      <DIR>    Searches
11-11-2022 00:03      <DIR>    Videos
          15 File(s)      846,914,050 bytes
          22 Dir(s)   381,037,072,384 bytes free

```

```

from keras.models import load_model
import tensorflow as tf
from tensorflow.keras.preprocessing import image
import numpy as np
import cv2

model = load_model("forestfire.h5")

def predictImage(filename):
    img1 = image.load_img(filename,target_size=(128,128))
    Y = image.img_to_array(img1)
    X = np.expand_dims(Y,axis=0)
    val = model.predict(X)
    print(val)

```



```
if val == 1:
    print(" fire")
elif val == 0:
    print("no fire")
```

```
predictImage(r"C:\Users\Naren Karthick\Desktop\Dataset\test_set\with
fire\forestfire.jpg")
```

```
1/1 [=====] - 1s 717ms/step
[[1.]]
fire
```

```
!pip install twilio
```

```
Requirement already satisfied: twilio in c:\users\naren karthick\
anaconda3\lib\site-packages (7.15.2)
Requirement already satisfied: pytz in c:\users\naren karthick\
anaconda3\lib\site-packages (from twilio) (2021.1)
Requirement already satisfied: PyJWT<3.0.0,>=2.0.0 in c:\users\naren
karthick\anaconda3\lib\site-packages (from twilio) (2.6.0)
Requirement already satisfied: requests>=2.0.0 in c:\users\naren
karthick\anaconda3\lib\site-packages (from twilio) (2.28.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests>=2.0.0->twilio)
(1.26.12)
Requirement already satisfied: idna<4,>=2.5 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests>=2.0.0->twilio)
(2.10)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests>=2.0.0->twilio)
(2020.12.5)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\
naren karthick\anaconda3\lib\site-packages (from requests>=2.0.0-
>twilio) (2.1.1)
```

```
!pip install playsound
```

```
Requirement already satisfied: playsound in c:\users\naren karthick\
anaconda3\lib\site-packages (1.3.0)
```

```
import cv2
```

```
import numpy as np
```

```
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(r'C:\Users\Naren Karthick\Desktop\Forest
Fire.mp4')

name = ['forest', 'with forest']

account_sid = 'AC881e355bbd1b32a121d96137a6aa4c3a'
auth_token = '7fa9e1d4490f3cefe09b223fad130f04'
client = Client(account_sid, auth_token)

message = client.messages \
    .create(
        body='Forest fire is detected , stay alert',
        from_='+13023034824',
        to='+=918778227402'
    )

print(message.sid)

SMf73b13bb50f6ad3df8a2a3dff2113a7c

import cv2
import numpy as np
from keras_preprocessing import image
from keras.models import load_model
from twilio.rest import Client
from playsound import playsound

#load the saved model
model = load_model(r'forestfire.h5')
video = cv2.VideoCapture(r'C:\Users\Naren Karthick\Desktop\Forest
Fire.mp4')
name = ['forest', 'with forest']

ls

Volume in drive C has no label.
Volume Serial Number is 5CC8-3212

Directory of C:\Users\Naren Karthick

13-11-2022  19:21    <DIR>          .
04-09-2022  04:43    <DIR>          ..
11-11-2022  17:52    <DIR>          .conda
22-09-2022  13:54                25 .condarc
22-09-2022  13:53    <DIR>          .continuum
13-11-2022  18:40    <DIR>          .ipynb_checkpoints
11-11-2022  19:17    <DIR>          .ipython

```

12-11-2022	13:32	<DIR>	.jupyter
11-11-2022	18:44	<DIR>	.keras
11-11-2022	18:19	<DIR>	.matplotlib
13-11-2022	14:11		116 .node_repl_history
11-11-2022	17:03	<DIR>	anaconda3
11-11-2022	19:14		326,807,773 archive.zip
13-11-2022	17:49		43,115,882 B3_IBM_model.tar.gb
04-09-2022	04:27	<DIR>	Contacts
13-11-2022	17:03		40,484 Deployment (1).ipynb
13-11-2022	17:52		41,849 Deployment.ipynb
13-11-2022	19:12	<DIR>	Desktop
05-09-2022	08:10	<DIR>	Documents
13-11-2022	17:11	<DIR>	Downloads
04-09-2022	04:27	<DIR>	Favorites
13-11-2022	18:58		2,483,648 forestfire.h5
13-11-2022	16:33		43,115,882 forestfire-classification.tgz
11-11-2022	19:18		740 Image Preprocessing .ipynb
11-11-2022	21:19		15,356 Image Preprocessing1.ipynb
12-11-2022	17:11		2,044 Image preprocessing2.ipynb
04-09-2022	04:27	<DIR>	Links
12-11-2022	18:54		3,986,428 Model Building .ipynb
04-09-2022	04:27	<DIR>	Music
12-11-2022	20:13		30,683,136 node-v18.12.1-x64.msi
13-11-2022	18:25	<DIR>	OneDrive
13-11-2022	19:21		26,235 OpenCv.ipynb
21-10-2022	18:06	<DIR>	Pictures
12-11-2022	19:06		396,601,896 pycharm-community-2022.2.3.exe
04-09-2022	04:27	<DIR>	Saved Games
04-09-2022	04:43	<DIR>	Searches
11-11-2022	00:03	<DIR>	Videos
			15 File(s) 846,921,494 bytes
			22 Dir(s) 381,040,427,008 bytes free