

```

import pandas as pd

import numpy as np
import tensorflow
from tensorflow.keras.models import Sequential
from tensorflow.keras import layers
from keras.layers import Dense
from keras.layers import Conv2D
from keras.layers import MaxPooling2D, Dropout
from keras.layers import Flatten

model=Sequential()

model.add(Conv2D(32, (3,3), activation = "relu", input_shape =
(64,64,3)))

model.add(MaxPooling2D(pool_size=(2,2)))

model.add(Flatten())

model.add(Dense(units=128, activation='relu'))

model.add(Dense(units=46, activation='softmax'))

model.summary()

Model: "sequential_1"

```

Layer (type)	Output Shape	Param #
conv2d_1 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_1 (MaxPooling 2D)	(None, 31, 31, 32)	0
flatten_1 (Flatten)	(None, 30752)	0
dense_2 (Dense)	(None, 128)	3936384
dense_3 (Dense)	(None, 46)	5934
Total params: 3,943,214		
Trainable params: 3,943,214		
Non-trainable params: 0		

```

model.compile(optimizer='adam', loss='sparse_categorical_crossentropy',
metrics=['accuracy'])

```

```

from keras.preprocessing.image import ImageDataGenerator

```

```
train_datagen =  
ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_flip=True)  
test_datagen = ImageDataGenerator(rescale=1./255)  
  
x_train = train_datagen.flow_from_directory(r"C:\Users\Naren Karthick\Desktop\Dataset\train_set",target_size=(64,64),batch_size=32,color_mode="rgb",class_mode="sparse")  
x_test = test_datagen.flow_from_directory(r"C:\Users\Naren Karthick\Desktop\Dataset\test_set",target_size=(64,64),batch_size=32,color_mode="rgb",class_mode="sparse")  
  
Found 436 images belonging to 2 classes.  
Found 121 images belonging to 2 classes.  
  
model.fit(x_train, epochs=20, steps_per_epoch=len(x_train))
```

```
Epoch 1/20  
14/14 [=====] - 45s 3s/step - loss: 1.2970 - accuracy: 0.6560  
Epoch 2/20  
14/14 [=====] - 33s 2s/step - loss: 0.3180 - accuracy: 0.8761  
Epoch 3/20  
14/14 [=====] - 32s 2s/step - loss: 0.1810 - accuracy: 0.9106  
Epoch 4/20  
14/14 [=====] - 31s 2s/step - loss: 0.1526 - accuracy: 0.9404  
Epoch 5/20  
14/14 [=====] - 36s 3s/step - loss: 0.1545 - accuracy: 0.9220  
Epoch 6/20  
14/14 [=====] - 32s 2s/step - loss: 0.1391 - accuracy: 0.9381  
Epoch 7/20  
14/14 [=====] - 32s 2s/step - loss: 0.1280 - accuracy: 0.9404  
Epoch 8/20  
14/14 [=====] - 30s 2s/step - loss: 0.1139 - accuracy: 0.9587  
Epoch 9/20  
14/14 [=====] - 30s 2s/step - loss: 0.1605 - accuracy: 0.9312  
Epoch 10/20  
14/14 [=====] - 31s 2s/step - loss: 0.1202 - accuracy: 0.9427  
Epoch 11/20  
14/14 [=====] - 33s 2s/step - loss: 0.1381 - accuracy: 0.9404  
Epoch 12/20
```

```

14/14 [=====] - 31s 2s/step - loss: 0.1018 -
accuracy: 0.9702
Epoch 13/20
14/14 [=====] - 32s 2s/step - loss: 0.0819 -
accuracy: 0.9656
Epoch 14/20
14/14 [=====] - 32s 2s/step - loss: 0.0972 -
accuracy: 0.9610
Epoch 15/20
14/14 [=====] - 30s 2s/step - loss: 0.0723 -
accuracy: 0.9725
Epoch 16/20
14/14 [=====] - 30s 2s/step - loss: 0.0658 -
accuracy: 0.9794
Epoch 17/20
14/14 [=====] - 30s 2s/step - loss: 0.0733 -
accuracy: 0.9771
Epoch 18/20
14/14 [=====] - 31s 2s/step - loss: 0.1335 -
accuracy: 0.9312
Epoch 19/20
14/14 [=====] - 30s 2s/step - loss: 0.1192 -
accuracy: 0.9472
Epoch 20/20
14/14 [=====] - 30s 2s/step - loss: 0.1397 -
accuracy: 0.9404

```

<keras.callbacks.History at 0x23451db2850>

ls

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

Directory of C:\Users\Naren Karthick

```

12-11-2022  18:08    <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
12-11-2022  17:24    <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
11-11-2022  17:03    <DIR>          anaconda3
11-11-2022  19:14                326,807,773 archive.zip
04-09-2022  04:27    <DIR>          Contacts
12-11-2022  17:21    <DIR>          Desktop
05-09-2022  08:10    <DIR>          Documents

```

```

12-11-2022 17:21 <DIR> Downloads
04-09-2022 04:27 <DIR> Favorites
12-11-2022 17:53 47,353,024 forestfire.h5
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 18:08 14,120 Model Building .ipynb
04-09-2022 04:27 <DIR> Music
10-11-2022 23:17 <DIR> OneDrive
21-10-2022 18:06 <DIR> Pictures
04-09-2022 04:27 <DIR> Saved Games
04-09-2022 04:43 <DIR> Searches
11-11-2022 00:03 <DIR> Videos
7 File(s) 374,193,082 bytes
22 Dir(s) 384,470,372,352 bytes free

```

pwd

'C:\\Users\\Naren Karthick'

model.save("forestfire.h5")

ls

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

Directory of C:\\Users\\Naren Karthick

```

12-11-2022 18:10 <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
12-11-2022 17:24 <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
11-11-2022 17:03 <DIR> anaconda3
11-11-2022 19:14 326,807,773 archive.zip
04-09-2022 04:27 <DIR> Contacts
12-11-2022 17:21 <DIR> Desktop
05-09-2022 08:10 <DIR> Documents
12-11-2022 17:21 <DIR> Downloads
04-09-2022 04:27 <DIR> Favorites
12-11-2022 18:14 47,353,048 forestfire.h5
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 18:10 14,630 Model Building .ipynb
04-09-2022 04:27 <DIR> Music
10-11-2022 23:17 <DIR> OneDrive
21-10-2022 18:06 <DIR> Pictures
04-09-2022 04:27 <DIR> Saved Games
04-09-2022 04:43 <DIR> Searches
11-11-2022 00:03 <DIR> Videos
          7 File(s) 374,193,616 bytes
          22 Dir(s) 384,469,266,432 bytes free

```

```
from keras.models import load_model
```

```
from tensorflow.keras.preprocessing import image
```

```
import numpy as np
```

```
!pip install opencv-python
```

```
Collecting opencv-python
```

```
Using cached opencv_python-4.6.0.66-cp36-abi3-win_amd64.whl (35.6 MB)
```

```
Requirement already satisfied: numpy>=1.17.3 in c:\users\naren  
karthick\anaconda3\lib\site-packages (from opencv-python) (1.20.1)
```

```
Installing collected packages: opencv-python
```

```
Successfully installed opencv-python-4.6.0.66
```

```
import cv2
```

```
model = load_model("forestfire.h5")
```

```
img = image.load_img(r'C:\Users\Naren Karthick\Desktop\Data Set\  
Dataset\Dataset\test_set\with fire\  
b2683a16be44f230a90f50bb944315e994b43042e43df798bb4feaf27e0f8bc8.jpg')
```

```
x = image.img_to_array(img)
```

```
res = cv2.resize(x,dsize=(128,128),interpolation=cv2.INTER_CUBIC)
```

```
img
```



```
x = np.expand_dims(x,axis = 0)
pred = model.predict(x_train)
pred
```

14/14 [=====] - 45s 3s/step

```
array([[1.0000000e+00, 6.7479867e-12, 7.5567395e-19, ..., 3.5867293e-
15,
        6.2255773e-16, 3.2628154e-15],
       [9.9994636e-01, 2.6501093e-05, 1.2889150e-08, ..., 4.2572020e-
07,
        2.1382685e-07, 5.8927327e-07],
       [9.9965549e-01, 2.8003295e-04, 8.8186844e-08, ..., 7.6502948e-
07,
        5.7591427e-07, 9.2841850e-07],
       ...,
       [7.5766561e-03, 9.9242181e-01, 6.5295012e-08, ..., 1.9949618e-
09,
        1.4114412e-08, 1.7105979e-09],
       [1.1927463e-04, 9.9988031e-01, 5.1217466e-08, ..., 5.0179766e-
10,
        3.1853780e-09, 2.4303284e-10],
       [1.1197172e-01, 8.8801783e-01, 2.0486947e-07, ..., 2.0454452e-
08,
        8.1707476e-08, 1.7954127e-08]], dtype=float32)
```



```
img = image.load_img(r'C:\Users\Naren Karthick\Desktop\Data Set\
Dataset\Dataset\train_set\forest\with_fire (261).jpg')
x = image.img_to_array(img)
res = cv2.resize(x,dsize=(128,128),interpolation=cv2.INTER_CUBIC)
img
```



```
ls
```

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

```
Directory of C:\Users\Naren Karthick
```

```
12-11-2022  18:38    <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
12-11-2022  17:24    <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
11-11-2022  17:03    <DIR>          anaconda3
11-11-2022  19:14                326,807,773 archive.zip
04-09-2022  04:27    <DIR>          Contacts
12-11-2022  17:21    <DIR>          Desktop
05-09-2022  08:10    <DIR>          Documents
12-11-2022  17:21    <DIR>          Downloads
```

```

04-09-2022 04:27 <DIR> Favorites
12-11-2022 18:14 47,353,048 forestfire.h5
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 18:38 3,977,927 Model Building .ipynb
04-09-2022 04:27 <DIR> Music
10-11-2022 23:17 <DIR> OneDrive
21-10-2022 18:06 <DIR> Pictures
04-09-2022 04:27 <DIR> Saved Games
04-09-2022 04:43 <DIR> Searches
11-11-2022 00:03 <DIR> Videos
7 File(s) 378,156,913 bytes
22 Dir(s) 384,367,251,456 bytes free

```

pred

```

array([[1.0000000e+00, 6.7479867e-12, 7.5567395e-19, ..., 3.5867293e-
15,
        6.2255773e-16, 3.2628154e-15],
       [9.9994636e-01, 2.6501093e-05, 1.2889150e-08, ..., 4.2572020e-
07,
        2.1382685e-07, 5.8927327e-07],
       [9.9965549e-01, 2.8003295e-04, 8.8186844e-08, ..., 7.6502948e-
07,
        5.7591427e-07, 9.2841850e-07],
       ...,
       [7.5766561e-03, 9.9242181e-01, 6.5295012e-08, ..., 1.9949618e-
09,
        1.4114412e-08, 1.7105979e-09],
       [1.1927463e-04, 9.9988031e-01, 5.1217466e-08, ..., 5.0179766e-
10,
        3.1853780e-09, 2.4303284e-10],
       [1.1197172e-01, 8.8801783e-01, 2.0486947e-07, ..., 2.0454452e-
08,
        8.1707476e-08, 1.7954127e-08]], dtype=float32)

```

```

!pip install twilio
!pip install playsound

```

Collecting twilio

```

Using cached twilio-7.15.2-py2.py3-none-any.whl (1.4 MB)
Requirement already satisfied: pytz in c:\users\naren karthick\
anaconda3\lib\site-packages (from twilio) (2021.1)
Requirement already satisfied: requests>=2.0.0 in c:\users\naren
karthick\anaconda3\lib\site-packages (from twilio) (2.25.1)
Collecting PyJWT<3.0.0,>=2.0.0
Downloading PyJWT-2.6.0-py3-none-any.whl (20 kB)
Requirement already satisfied: chardet<5,>=3.0.2 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests>=2.0.0->twilio)

```



```

(4.0.0)
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: urllib3<1.27,>=1.21.1 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests>=2.0.0->twilio)
(1.26.4)
Requirement already satisfied: idna<3,>=2.5 in c:\users\naren
karthick\anaconda3\lib\site-packages (from requests>=2.0.0->twilio)
(2.10)
Installing collected packages: PyJWT, twilio
Successfully installed PyJWT-2.6.0 twilio-7.15.2
Collecting playsound
  Using cached playsound-1.3.0.tar.gz (7.7 kB)
Building wheels for collected packages: playsound
  Building wheel for playsound (setup.py): started
  Building wheel for playsound (setup.py): finished with status 'done'
  Created wheel for playsound: filename=playsound-1.3.0-py3-none-
any.whl size=7026
sha256=c7fc3b7e9ad6c0f4544b587a58566bf2d179398837bb6e54ca32f4c355663e0
e
  Stored in directory: c:\users\naren karthick\appdata\local\pip\
cache\wheels\73\cd\cf\
9750b618d54bd81c20e4c34fb24a423a5b095920367cdb3f71
Successfully built playsound
Installing collected packages: playsound
Successfully installed playsound-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
from playsound import playsound

model = load_model(r'forestfire.h5')

video = cv2.VideoCapture(0)

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

ls

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

Directory of C:\Users\Naren Karthick

12-11-2022  18:44    <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
12-11-2022	17:24	<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
11-11-2022	17:03	<DIR>		anaconda3
11-11-2022	19:14		326,807,773	archive.zip
04-09-2022	04:27	<DIR>		Contacts
12-11-2022	18:45	<DIR>		Desktop
05-09-2022	08:10	<DIR>		Documents
12-11-2022	18:48	<DIR>		Downloads
04-09-2022	04:27	<DIR>		Favorites
12-11-2022	18:14		47,353,048	forestfire.h5
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	18:44		3,984,212	Model Building .ipynb
04-09-2022	04:27	<DIR>		Music
10-11-2022	23:17	<DIR>		OneDrive
21-10-2022	18:06	<DIR>		Pictures
04-09-2022	04:27	<DIR>		Saved Games
04-09-2022	04:43	<DIR>		Searches
11-11-2022	00:03	<DIR>		Videos
		7 File(s)	378,163,198 bytes	
		22 Dir(s)	384,339,755,008 bytes free	