## EARLY DETECTION OF FOREST FIRE USING DEEP LEARNING

# MODEL BUILDING PREDICTIONS

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Project Name	Project-Early detection of forest fire using deep
	learning

## **PREDICTIONS:**

The last and final step is to make use of our saved model to do predictions. For that we have a class in keras called load\_model. Load\_model is used to load our saved model h5 file (alert.h5).

## **IMPORT LIBRARIES:**

11/7/22, 12:35 AM Untitled8.ipynb - Colaboratory

→ Importing Keras libraries

import keras

Importing ImageDataGenerator from Keras

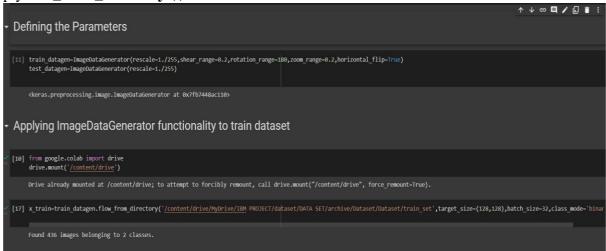
from keras.preprocessing.image import ImageDataGenerator

## **IMPORT ImageDataGenerator FROM KERAS:**

→ Importing Keras libraries	
[1] import keras	
▼ Importing ImageDataGenerator from Keras	
/ [13] from matplotlib import pyplot as plt from keras.preprocessing.image import ImageDataGenerator	
▼ Defining the Parameters	
▶ train_datagen=ImageDataGenerator(rescale=1./255, shear_range=0.2, rotation_range=180, zoom_range=0.2, horizontal_flip=True) test_datagen=ImageDataGenerator(rescale=1./255)	
г. - keras.preprocessing.image.ImageDataGenerator at 0x7fb7448ac110>	

## **APPLYING ImageDataGenerator to train dataset:**

plyflow\_from\_directory ()methodfor Train folder.



# APPLYING ImageDataGenerator to test dataset:

Applying the **flow\_from\_directory** ( ) methodfortest folder.



## **IMPORTING MODEL BUILDING LIBRARIES:**

11/8/22, 1:16 AM

Main code - Colaboratory

Importing Model Building Libraries

```
#to define the linear Initialisation import sequential
from keras.models import Sequential
#to add layers import Dense
from keras.layers import Dense
#to create Convolutional kernel import convolution2D
from keras.layers import Convolution2D
#import Maxpooling layer
from keras.layers import MaxPooling2D
#import flatten layer
from keras.layers import Flatten
import warnings
warnings.filterwarnings('ignore')
```

#### **INITIALIZING THE MODEL:**

Initializing the model

```
model=Sequential()
```

#### **ADDING CNN LAYERS:**

Adding CNN Layers

```
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
#add maxpooling layers
model.add(MaxPooling2D(pool_size=(2,2)))
#add faltten layer
model.add(Flatten())
```

#### **ADDING DENSE LAYERS:**

Add Dense layers

```
#add hidden layers
model.add(Dense(150,activation='relu'))
#add output layer
model.add(Dense(1,activation='sigmoid'))
```

#### **CONFIGURING THE LEARNING PROCESS:**

configuring the learning process

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

#### TRAINING THE MODEL:

Training the model

```
model.fit_generator(x_train,steps_per_epoch=14,epochs=10,validation_data=x_test,validation_
  Fnoch 1/10
  14/14 [==============] - 322s 19s/step - loss: 1.5998 - accuracy: 0.7
  Epoch 2/10
  Epoch 3/10
  Epoch 4/10
  Epoch 5/10
  Epoch 6/10
  14/14 [=============] - 30s 2s/step - loss: 0.1971 - accuracy: 0.926
  Epoch 7/10
  14/14 [============= ] - 32s 2s/step - loss: 0.1781 - accuracy: 0.928
  Epoch 8/10
  Epoch 9/10
  14/14 [==============] - 31s 2s/step - loss: 0.2306 - accuracy: 0.896
  Epoch 10/10
  14/14 [=========================== ] - 27s 2s/step - loss: 0.2593 - accuracy: 0.889
  <keras.callbacks.History at 0x7fd537101390>
  4
```

#### **SAVE THE MODEL:**

- Save the model

```
model.save("forest.h5")
```

#### **PREDICTIONS:**

Predictions

```
#import load model from keras.model
from keras.models import load_model
#import image from keras
from tensorflow.keras.preprocessing import image
import numpy as np
#import cv2
import cv2
#load the saved model
model=load_model('forest.h5')
img=image.load_img('/content/drive/MyDrive/IBM PROJECT/dataset/DATA SET/archive/Dataset/Da
x=image.img_to_array(img)
res=cv2.resize(x,dsize=(128,128),interpolation=cv2.INTER_CUBIC)
#expand the image shape
x=np.expand_dims(res,axis=0)
```