

**PROJECT DEVOLPMENT PHASE  
DELIVERY OF SPRINT-2**

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Team ID	31445-1660200428
Project Name	Emerging methods for the early detection of forest fires

**Executable ProgramModel**

**Building:**

```
model.add(Dense(150,activation='relu')) model.add(Dense(1,activation='sigmoid'))
model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'])
len(x_train)
len(x_test) model.fit_generator(x_train,steps_per_epoch=len(x_train),epochs=10,
                                validation_data=x_test,validation_steps=len(x_test)) import
tensorflow as tf
from keras.models import load_model
from tensorflow.keras.preprocessing import imageimport
numpy as np
import cv2 model.save('forestfire.h5')
model=load_model('forestfire.h5')testImg =
image.load_img(r'C:\Users\win\Desktop\Project_NT\test_set\forest\_101542074_g
ettyimages_956391468.jpg')
testImgarrayImg = image.img_to_array(testImg)
arrayImg
x = np.expand_dims(arrayImg , axis = 0)X
images = np.vstack([x])
pred=model.predict(images)
Pred x_train.class_indicesif
(pred[0] > 0.5):
    print("forest with fire")else:
    print("forest without fire")
```

```

Epoch 1/10
14/14 [=====] - 46s 3s/step - loss: 3.7642 - accuracy: 0.5550 - val_loss: 0.9342 - val_accuracy: 0.595
0
Epoch 2/10
14/14 [=====] - 21s 2s/step - loss: 0.4257 - accuracy: 0.8050 - val_loss: 0.1760 - val_accuracy: 0.925
6
Epoch 3/10
14/14 [=====] - 22s 2s/step - loss: 0.2191 - accuracy: 0.9083 - val_loss: 0.1141 - val_accuracy: 0.958
7
Epoch 4/10
14/14 [=====] - 22s 2s/step - loss: 0.2520 - accuracy: 0.8991 - val_loss: 0.1058 - val_accuracy: 0.975
2
Epoch 5/10
14/14 [=====] - 22s 2s/step - loss: 0.2192 - accuracy: 0.9014 - val_loss: 0.1065 - val_accuracy: 0.966
9
Epoch 6/10
14/14 [=====] - 22s 2s/step - loss: 0.1942 - accuracy: 0.9106 - val_loss: 0.0938 - val_accuracy: 0.975
2
Epoch 7/10
14/14 [=====] - 21s 2s/step - loss: 0.1684 - accuracy: 0.9358 - val_loss: 0.1383 - val_accuracy: 0.942
1
Epoch 8/10
14/14 [=====] - 22s 2s/step - loss: 0.1872 - accuracy: 0.9266 - val_loss: 0.1577 - val_accuracy: 0.900
8
Epoch 9/10
14/14 [=====] - 25s 2s/step - loss: 0.1643 - accuracy: 0.9312 - val_loss: 0.0874 - val_accuracy: 0.983
5
Epoch 10/10
14/14 [=====] - 62s 5s/step - loss: 0.1640 - accuracy: 0.9220 - val_loss: 0.0809 - val_accuracy: 0.975
2

```

```

[[217., 226., 179.],
 [ 79.,  87., 218.],
 [ 48.,  58.,   0.],
 ...,
 [ 16.,  72.,   0.],
 [  1.,  39.,   0.],
 [221., 223., 212.]]], dtype=float32)

```

In [25]: `images = np.vstack([x])`

In [26]: `pred=model.predict(images)`  
`pred`

1/1 [=====] - 1s 1s/step

Out[26]: `array([[0.]], dtype=float32)`

In [27]: `x_train.class_indices`

Out[27]: `{'forest': 0, 'with fire': 1}`

In [28]: `if (pred[0] > 0.5):`  
 `print("forest with fire")`  
`else:`  
 `print("forest without fire")`  
  
`forest without fire`