

PROJECT DEVELOPMENT PHASE

DELIVERY OF SPRINT-2

Date	09 November 2022
Team ID	PNT2022TMID33575
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 image
import 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')
testImgarray = image.img_to_array(testImg)
arrayImg
x = np.expand_dims(arrayImg , axis =
0)
X_images = np.vstack([x])
pred=model.predict(X_images)
Pred
x_train.class_indices
if (pred[0] > 0.5):
print("forest with fire")
else:
print("forest without fire")
```

```
Epoch 1/10
14/14 [=====] - 48s 3s/step - loss: 5.7642 - accuracy: 0.5550 - val_loss: 0.9342 - val_accuracy: 0.595
0
Epoch 2/10
14/14 [=====] - 21s 2s/step - loss: 0.4257 - accuracy: 0.8850 - val_loss: 0.1700 - val_accuracy: 0.925
0
Epoch 3/10
14/14 [=====] - 22s 2s/step - loss: 0.3181 - accuracy: 0.9003 - val_loss: 0.1161 - val_accuracy: 0.950
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: 0.1005 - val_accuracy: 0.966
0
Epoch 6/10
14/14 [=====] - 22s 2s/step - loss: 0.1942 - accuracy: 0.9080 - val_loss: 0.0938 - val_accuracy: 0.975
2
Epoch 7/10
14/14 [=====] - 21s 2s/step - loss: 0.1684 - accuracy: 0.9158 - val_loss: 0.1001 - val_accuracy: 0.942
3
Epoch 8/10
14/14 [=====] - 22s 2s/step - loss: 0.1872 - accuracy: 0.9266 - val_loss: 0.1573 - val_accuracy: 0.900
0
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: 0.0800 - val_accuracy: 0.975
2
```

```

[[217., 226., 179.],
 [ 79., 87., 58.],
 [ 46., 58., 0.],
 ...,
 [ 56., 72., 0.],
 [ 1., 39., 0.],
 [221., 229., 212.]]], dtype=float32)

```

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

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

1/1 [=====] - 14 14/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`