

AUTOMATIC FIRE DETECTION SYSTEM

ระบบตรวจจับไฟไหม้

PROJECT IN 261492 COURSE,
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MOTIVATION

-ปัญหาไฟไหม้ก่อให้เกิดความสูญเสียที่ร้ายแรง



-การตรวจจับไฟไหม้แบบเดิมของหอดูไฟมีข้อเสีย



Objective

พัฒนาเว็บแอปพลิเคชันสำหรับการทำนายภาพที่ได้
จากมุมมองสูงว่าเกิดคันไฟใหม่ขึ้นหรือไม่ได้



SCOPE

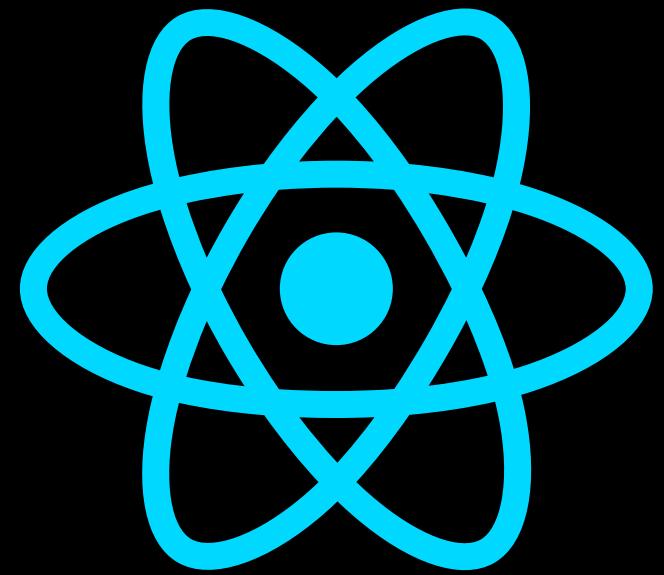
HARDWARE

1. อุปกรณ์สามารถเข้าใช้งานเว็บแอพพลิเคชัน

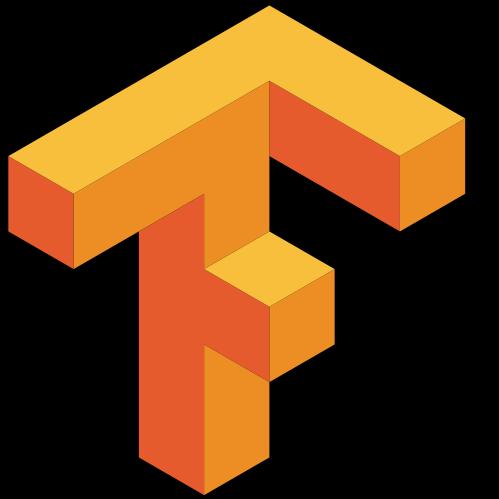
SOFTWARE

1. ระบบใช้สำหรับการตรวจจับควันไฟจากไฟใหม่
จากรูปในลักษณะมุ่งสูงจากหอดูไฟเก่าที่นั่น
2. รูปที่สามารถตรวจจับได้เป็นรูปสีเก่าที่นั่น

Technology



FRONT-END



TENSORFLOW



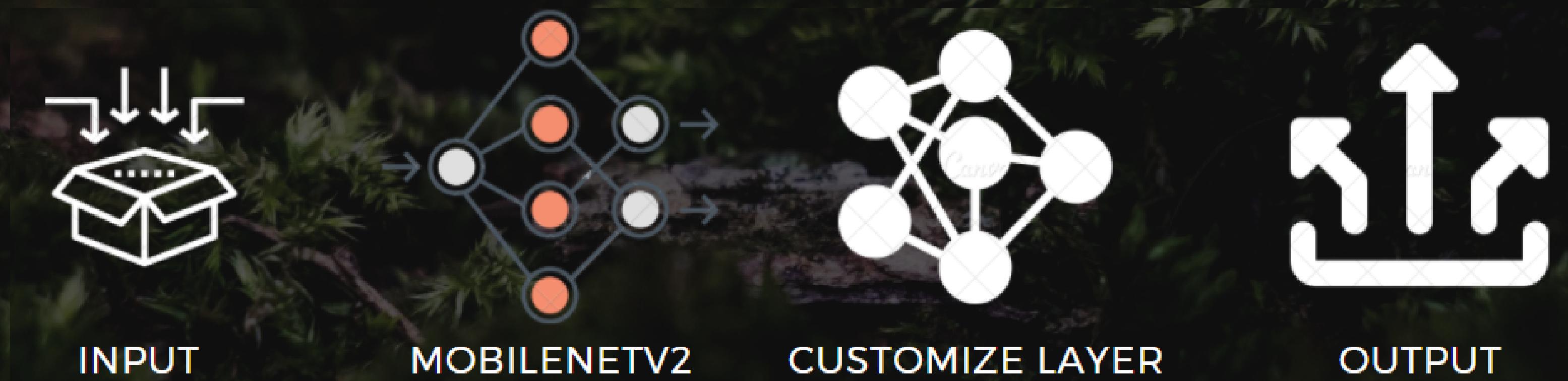
KERAS



FLASK

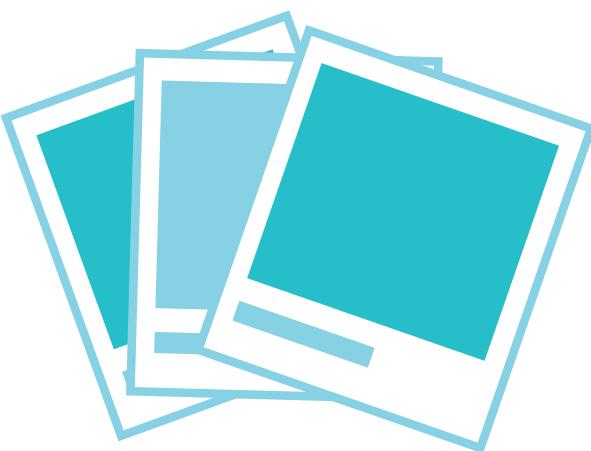
METHOD

MODEL

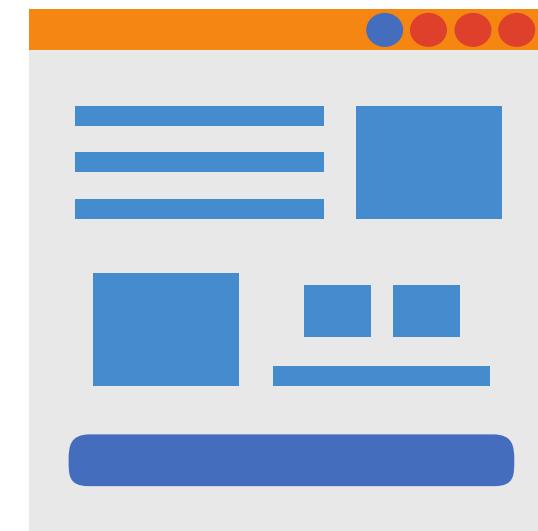


TRANSFER LEARNING : FINE-TUNNING

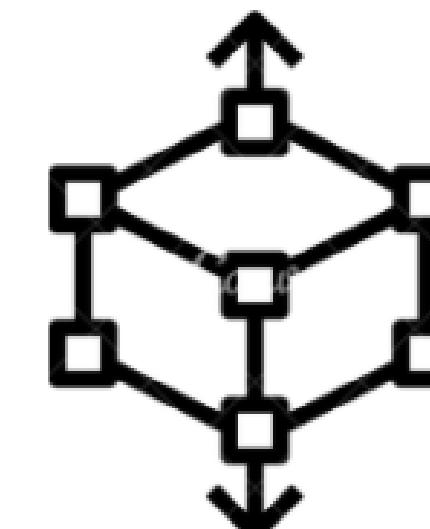
SYSTEM FLOW



INPUT VIDEO



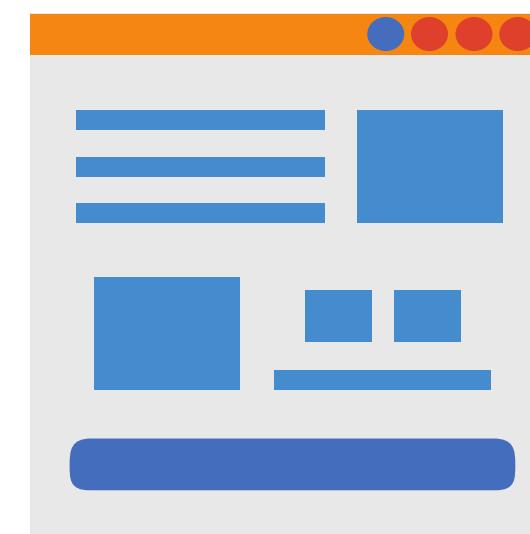
WEB APPLICATION



MODEL



OUTPUT DATA



WEB
APPLICATION

DATASET



DATASET



遵义市 石门山

DATASET

Found 2329 images belonging to 2 classes.

Found 394 images belonging to 2 classes.

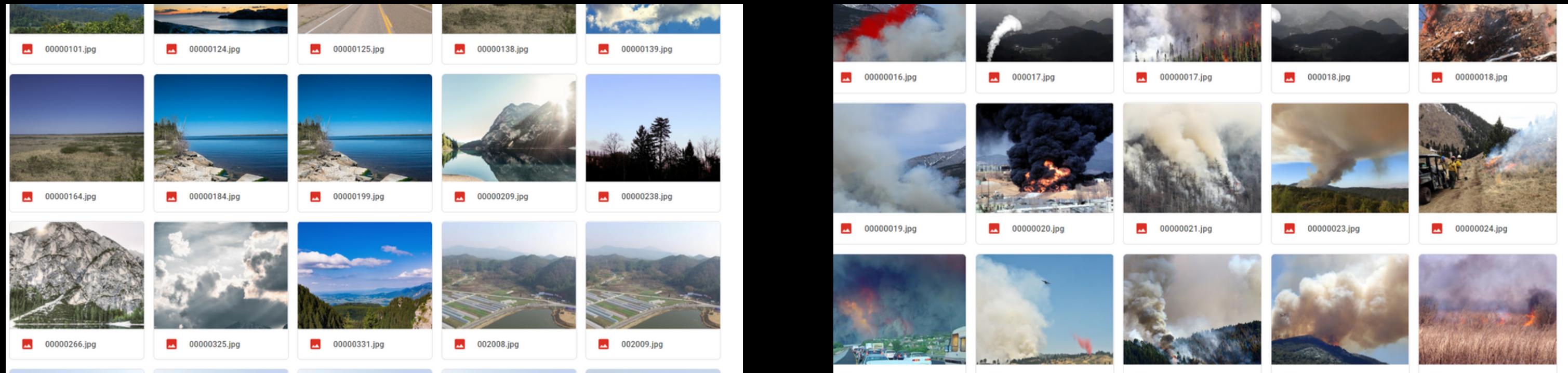
**TRAIN &
VALIDATION**

Found 125 images belonging to 2 classes.

TEST

TOTAL 2,723 IMAGE

DATASET



```
# Evaluate the model on the test data using `evaluate`  
print("Evaluate on test data")  
results = model.evaluate(test_generator, batch_size=1)  
print("test loss, test acc:", results)
```



Evaluate on test data
125/125 [=====] - 11s 91ms/step - loss: 0.0000e+00 - accuracy: 0.7760
test loss, test acc: [0.0, 0.7760000228881836]

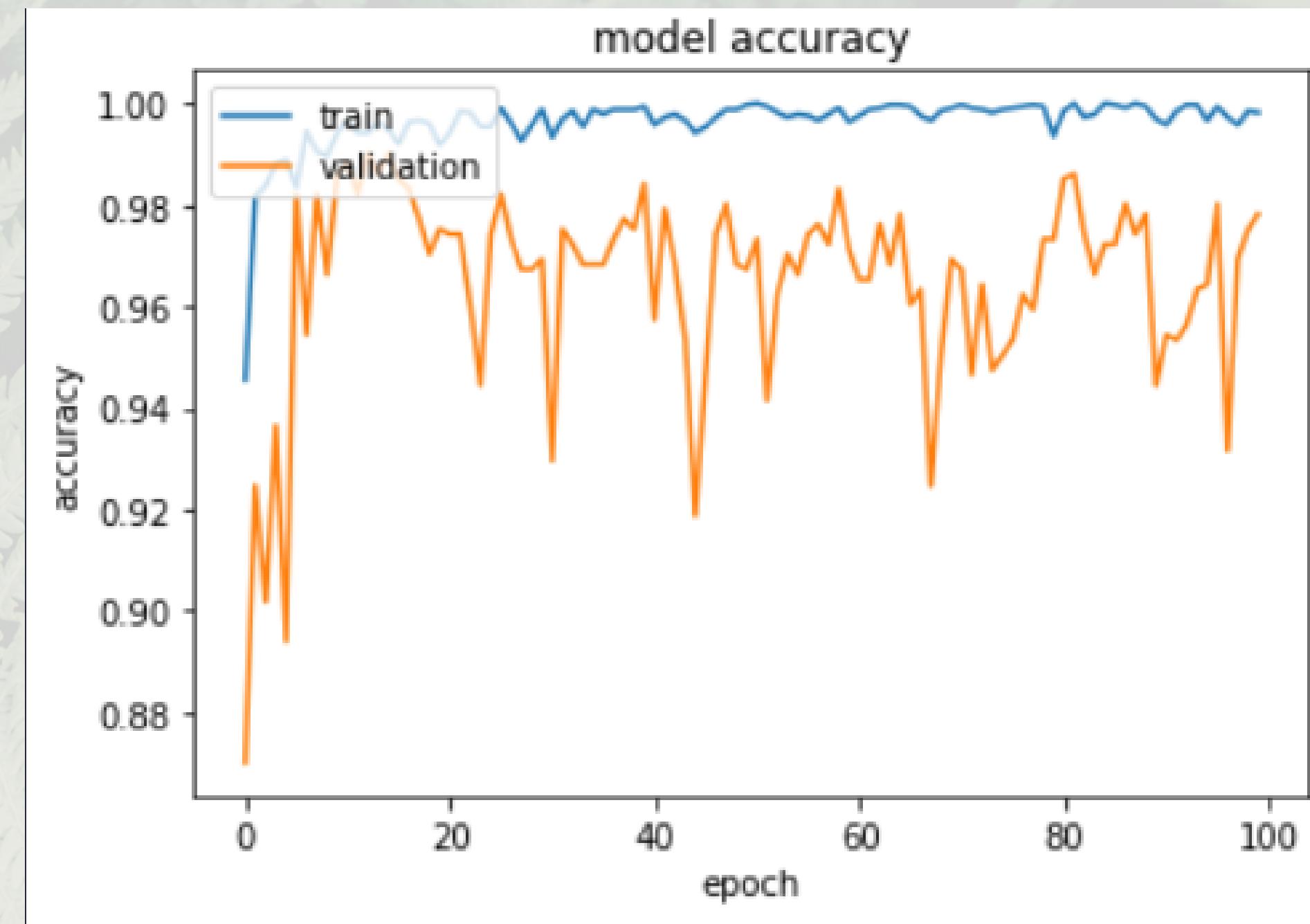
DATASET



DATASET



TRAIN MODEL



DATASET

```
Found 3283 images belonging to 2 classes.  
Found 1021 images belonging to 2 classes.
```

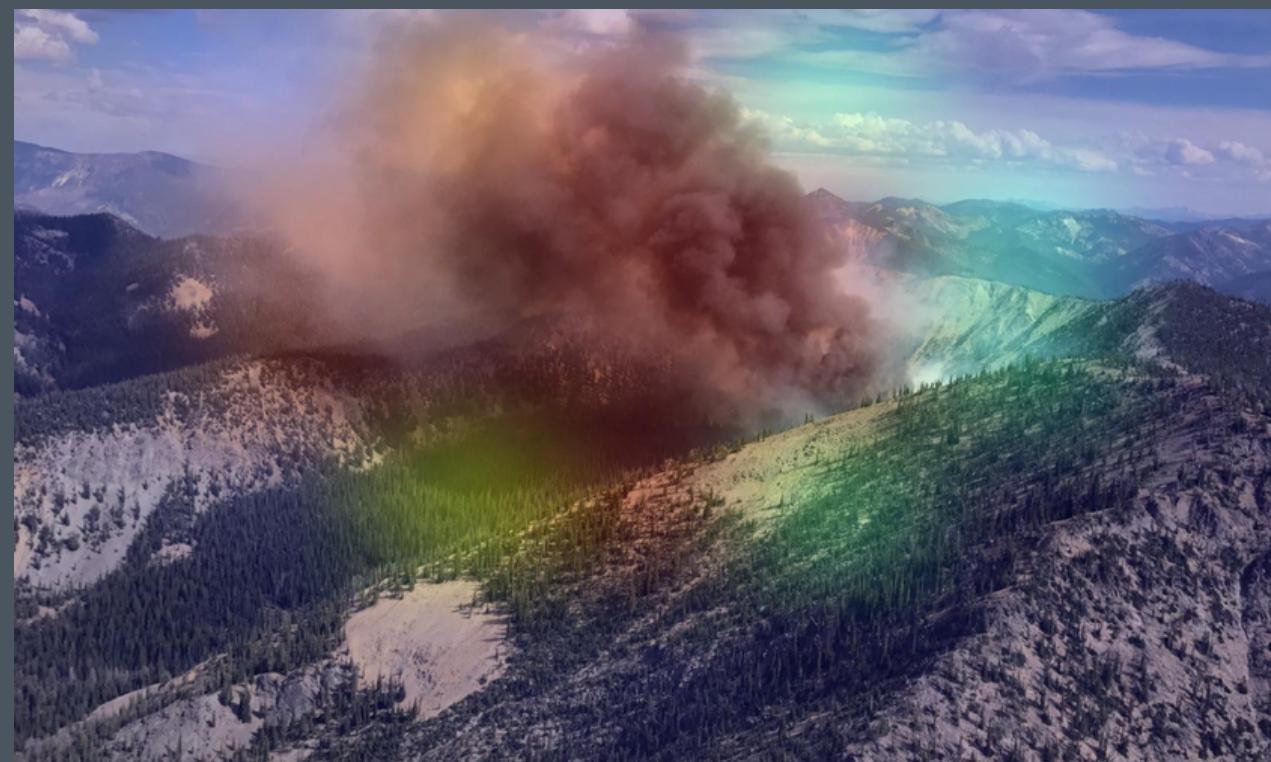
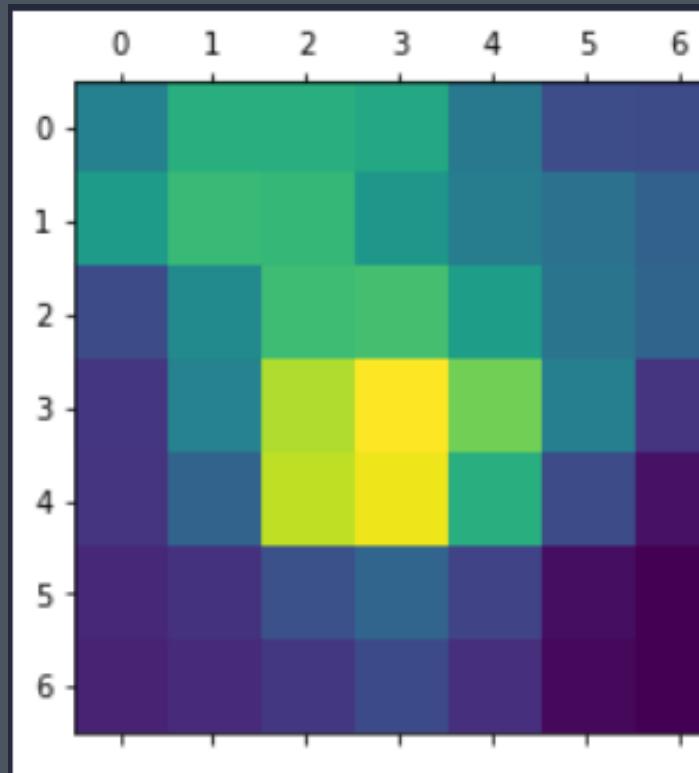
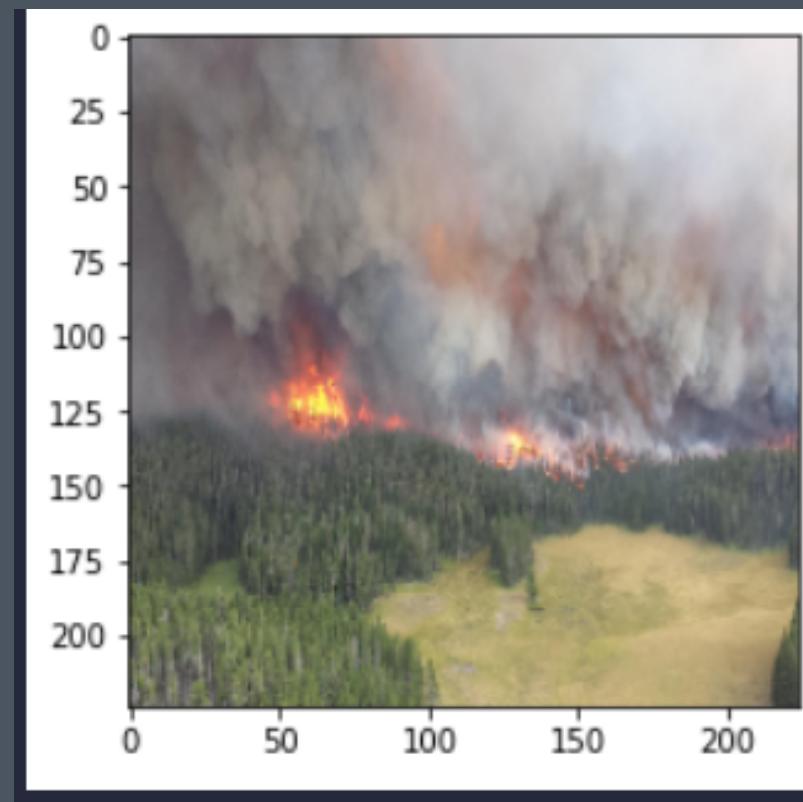
TOTAL NEW DATASET 1,581 IMAGE

TOTAL DATASET 4,304 IMAGE

```
Evaluate on test data  
125/125 [=====] - 44s 347ms/step - loss: 0.0767 - accuracy: 0.9760  
test loss, test acc: [0.07671535760164261, 0.9760000109672546]
```

**** CHANGE LAST LAYER TO 2 NODE**

GRAD-CAM



USER INTERFACE

Automatic Fire Detection

WildfireSmoke Video

Summary

Choose File No file chosen

Submit

USER INTERFACE

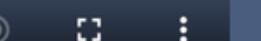
Automatic Fire Detection

WildfireSmoke Video

Summary



▶ 0:00 / 0:19



Choose File smoke8.mp4

Submit

USER INTERFACE

Automatic Fire Detection

WildfireSmoke Video



▶ 0:00 / 0:19

Summary

MODEL PREDICT smoke AT 0 S

MODEL PREDICT smoke AT 1.44 S

MODEL PREDICT smoke AT 2.89 S

MODEL PREDICT smoke AT 4.33 S

MODEL PREDICT smoke AT 5.77 S

MODEL PREDICT smoke AT 7.21 S

MODEL PREDICT smoke AT 8.65 S

MODEL PREDICT smoke AT 10.1 S

MODEL PREDICT smoke AT 11.54 S

Choose File smoke8.mp4

Submit

USER INTERFACE



smoke1.mp4 : normal 9 frame , smoke 5 frame
smoke2.mp4 : normal 7 frame , smoke 7 frame
smoke3.mp4 : normal 0 frame , smoke 14 frame
smoke4.mp4 : normal 0 frame , smoke 14 frame
smoke6.mp4 : normal 0 frame , smoke 14 frame
smoke7.mp4 : normal 0 frame , smoke 14 frame
smoke8.mp4 : normal 0 frame , smoke 14 frame
smoke9.mp4 : normal 0 frame , smoke 14 frame
smokeButnormal.mp4 : normal 14 frame
smokeButnormal2.mp4 : normal 14 frame

normal1.mp4 : normal 14 frame , smoke 0 frame
normal2.mp4 : normal 7 frame , smoke 1 frame
normal3.mp4 : normal 8 frame , smoke 0 frame

mixVideo.mp4 : normal 6 frame , smoke 8 frame

correct 100 % : 9 video
correct 87.5 % : 1 video
correct 50% : 1 video
correct 35.7% : 1 video
correct 0 % : 2 video

total : 14 video

A dense background of fern leaves in various shades of green, creating a natural and organic feel.

DEMO



