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  "Mounted at /content/drive\n"
33

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34

}
35

],
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"import tensorflow as tf\n",  
  
"import numpy as np\n",  
  
"from tensorflow import keras\n",  
  
"import os\n",  
  
"import cv2\n",  
  
"from tensorflow.keras.preprocessing.image import ImageDataGenerator\n",  
  
"from tensorflow.keras.preprocessing import image"  
  
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57
```

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```
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```

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```

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```
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```

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```
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(1.1.2)\n",
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96

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97

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98

"Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9->tensorflow) (3.4.1)\n",

99

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103

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104

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106

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110
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112
"Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.7/dist-packages (from requests-oauthlib>=0.7.0->google-auth-oauthlib<0.5,>=0.4.1->tensorboard<2.10,>=2.9->tensorflow) (3.2.2)\n",

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114
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117
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118

```
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(1.21.6)\n"  
  
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]  
  
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124  
  
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128  
  
" shear_range=0.2,\n",  
  
129  
  
" rotation_range=180,\n",  
  
130  
  
" zoom_range=0.2,\n",  
  
131  
  
" horizontal_flip=True)\n",
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	133
"test = ImageDataGenerator(rescale=1/255)"	
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	145
" target_size=(128,128), \n",	

```
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147
" class_mode = 'binary' )"
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163
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171
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172
" batch_size = 32, \n",
173
" class_mode = 'binary' )"

```

```
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```
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189
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191
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223
"from keras.models import Sequential\n",
224
"#to add layer import Dense\n",
225
"from keras.layers import Dense\n",
226
"#to create convolution kernel import convolution2D\n",
227
"from keras.layers import Convolution2D\n",
228
"#import Maxpooling layer\n",
229
"from keras.layers import MaxPooling2D\n",
```

	230
"#import flatten layer\n",	
	231
"from keras.layers import Flatten\n",	
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"import warnings\n",	
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"warnings.filterwarnings('ignore')"	
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```
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"model = keras.Sequential()\n",
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246
"model.add(MaxPooling2D(pool_size=(2,2)))\n",
247
"model.add(Convolution2D(32,(3,3),activation='relu'))\n",
248
"model.add(MaxPooling2D(pool_size=(2,2)))\n",
249
"model.add(Convolution2D(32,(3,3),activation='relu'))\n",
250
"model.add(MaxPooling2D(pool_size=(2,2)))\n",
251
"model.add(Convolution2D(32,(3,3),activation='relu'))\n",
252
"model.add(MaxPooling2D(pool_size=(2,2)))\n",
253
"model.add(Flatten())"
254
],
255
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```

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	265
"\n",	
	266
"model.add(Dense(1,activation='sigmoid'))"	
	267
],	
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},
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"model.compile(loss = 'binary_crossentropy',\n",
278
" optimizer = \"adam\",\n",
279
" metrics = [\"accuracy\"])"
280
],
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"metadata": {
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},
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"execution_count": 11,
285
"outputs": []
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```
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},
287
{
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289
"source": [
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"r = model.fit(train_dataset, epochs = 5, validation_data = test_dataset)"
291
],
292
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"colab": {
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295
},
296
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298
},
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{	
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"text": [
	305
"Epoch 1/5\n",	
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"14/14 [=====] - 92s 7s/step - loss: 0.5798 - accuracy: 0.6628 - val_loss: 0.3330 - val_accuracy:	
0.8595\n",	
	307
"Epoch 2/5\n",	
	308
"14/14 [=====] - 26s 2s/step - loss: 0.4139 - accuracy: 0.8280 - val_loss: 0.1400 - val_accuracy:	
0.9504\n",	
	309
"Epoch 3/5\n",	
	310
"14/14 [=====] - 26s 2s/step - loss: 0.2800 - accuracy: 0.8922 - val_loss: 0.1375 - val_accuracy:	
0.9587\n",	
	311
"Epoch 4/5\n",	
	312

```
"14/14 [=====] - 27s 2s/step - loss: 0.2440 - accuracy: 0.9014 - val_loss: 0.1224 - val_accuracy: 0.9669\n",
```

313

```
"Epoch 5/5\n",
```

314

```
"14/14 [=====] - 26s 2s/step - loss: 0.1856 - accuracy: 0.9243 - val_loss: 0.0586 - val_accuracy: 0.9752\n"
```

315

```
]
```

316

```
}
```

317

```
]
```

318

```
},
```

319

```
{
```

320

```
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```

321

```
"source": [
```

322

```
"predictions = model.predict(test_dataset)\n",
```

323

```
"predictions = np.round(predictions)"
```

324

```
],
```

325

```
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},
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```

```
"4/4 [=====] - 5s 1s/step\n"
```

```
]
```

```

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}
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]
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  }
}
```


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" [0.],\n",	
	418
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" [1.],\n",	
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" [1.],\n",	
	421
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	422
" [0.],\n",	
	423
" [0.],\n",	

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" [0.],\n",	
	427
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" [0.],\n",	
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" [0.],\n",	
	435
" [1.],\n",	
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" [0.],\n",	
	437
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" [1.],\n",	
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" [0.],\n",	
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" [0.],\n",	
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" [0.],\n",	
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" [0.],\n",	
	448
" [1.],\n",	
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	452
" [0.],\n",	
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" [1.],\n",	
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" [1.],\n",	
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" [0.],\n",	
	457
" [0.],\n",	
	458
" [1.],\n",	
	459
" [0.],\n",	
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" [0.],\n",	
	461
" [1.],\n",	
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" [1.],\n",	
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" [0.],\n",	
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" [0.],\n",	
	471
" [0.],\n",	
	472
" [1.],\n",	
	473
" [0.],\n",	
	474
" [0.],\n",	
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" [1.],\n",	
	476
" [0.],\n",	
	477
" [1.],\n",	
	478
" [1.],\n",	
	479
" [0.],\n",	

	480
" [1.],\n",	
	481
" [0.]], dtype=float32)"	
	482
]	
	483
},	
	484
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	485
"execution_count": 14	
	486
}	
	487
]	
	488
},	
	489
{	
	490
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	491
"source": [
	492
"print(len(predictions))"	
	493
],	

```
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494

495
"colab": {
496

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497

},
498

"id": "bEnOs5ewlvd7",
499

"outputId": "f58e5ce5-db13-4b04-c541-0cd7ababdb5e"
500

},
501

"execution_count": 15,
502

"outputs": [
503

{
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505

"name": "stdout",
506

"text": [
507

"121\n"
```

```
508
]
509
}
510
]
511
},
512
{
513
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514
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515
"model.save(\"/content/drive/MyDrive/archive (1)/forest1.h5\")"
516
],
517
"metadata": {
518
"id": "6QLmVFqFlx9Q"
519
},
520
"execution_count": 17,
521
"outputs": []
```

```
522
},
523
{
524
    "cell_type": "code",
525
    "source": [
526
        "#import load_model from keras.model\n",
527
        "from keras.models import load_model\n",
528
        "#import image class from keras\n",
529
        "import tensorflow as tf\n",
530
        "from tensorflow.keras.preprocessing import image\n",
531
        "#import numpy\n",
532
        "import numpy as np\n",
533
        "#import cv2\n",
534
        "import cv2"
535
    ],
```

```
"metadata": {
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```
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 $\},$

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"execution_count": 18,
```

```
"outputs": []
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```
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```

```
"model = load_model(\"/content/drive/MyDrive/archive (1)/forest1.h5\")"
```

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```
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```

```
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```

 $\},$


```
550
"execution_count": 19,
551
"outputs": []
552
},
553
{
554
"cell_type": "code",
555
"source": [
556
"def predictImage(filename):\n",
557
" img1 = image.load_img(filename,target_size=(128,128))\n",
558
" Y = image.img_to_array(img1)\n",
559
" X = np.expand_dims(Y,axis=0)\n",
560
" val = model.predict(X)\n",
561
" print(val)\n",
562
" if val == 1:\n",
563
" print(\" fire\")\n",
```

	564
" elif val == 0:\n",	
	565
" print(\"no fire\")"	
	566
],	
	567
"metadata": {	
	568
"id": "IKU2o8qxmLGO"	
	569
},	
	570
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	573
{	
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	575
"source": [
	576
"predictImage(\"/content/drive/MyDrive/Dataset/Dataset/test_set/with fire/19464620_401.jpg\")"	
	577
],	

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"metadata": {
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},
"execution_count": 26,
"outputs": [
  {
    "output_type": "stream",
    "name": "stdout",
    "text": [
      "1/1 [=====] - 0s 125ms/step\n",
```

```
592
"[[1.]]\n",
593
" fire\n"
594
]
595
}
596
]
597
},
598
{
599
"cell_type": "code",
600
"source": [
601
"pip install twilio"
602
],
603
"metadata": {
604
"colab": {
605
"base_uri": "https://localhost:8080/"
```

$\},$

```
"id": "L5ro8SE3mO86",
```

```
"outputId": "297e1bec-44cb-49a8-dc53-73b15b46cd30"
```

 $\},$

```
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```

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"outputs": [
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"name": "stdout",
```

```
"text": [
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"Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>",

```
"Collecting twilio\n",
```

```
" Downloading twilio-7.15.1-py2.py3-none-any.whl (1.4 MB)\n"
```

```
"\u001b[K | ██████████ | 1.4 MB 4.9 MB/s \n",
```

620
"\u001b[?25hRequirement already satisfied: requests>=2.0.0 in /usr/local/lib/python3.7/dist-packages (from twilio)
(2.23.0)\n",
621
"Requirement already satisfied: pytz in /usr/local/lib/python3.7/dist-packages (from twilio) (2022.6)\n",
622
"Collecting PyJWT<3.0.0,>=2.0.0\n",
623
" Downloading PyJWT-2.6.0-py3-none-any.whl (20 kB)\n",
624
"Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-packages (from requests>=2.0.0->twilio)
(2.10)\n",
625
"Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dist-packages (from requests>=2.0.0->twilio)
(3.0.4)\n",
626
"Requirement already satisfied: urllib3!=1.25.0,!<1.25.1,<1.26,>=1.21.1 in /usr/local/lib/python3.7/dist-packages (from
requests>=2.0.0->twilio) (1.24.3)\n",
627
"Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/dist-packages (from requests>=2.0.0->twilio)
(2022.9.24)\n",
628
"Installing collected packages: PyJWT, twilio\n",
629
"Successfully installed PyJWT-2.6.0 twilio-7.15.1\n"
630
]
631
}
632

```
]
633

},
634

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636

  "source": [
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    "pip install playsound"
638

  ],
639

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642

    },
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645

  },
646
```

```
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647

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"name": "stdout",
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"Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/",
653

"Collecting playsound\n",
654

" Downloading playsound-1.3.0.tar.gz (7.7 kB)\n",
655

"Building wheels for collected packages: playsound\n",
656

" Building wheel for playsound (setup.py) ... \u001b[?25l\u001b[?25hdone\n",
657

" Created wheel for playsound: filename=playsound-1.3.0-py3-none-any.whl size=7035
sha256=6cc8a594765dc045811d54129bc5e3fbe95669eecf509234f657cb6a9be4eb0c\n",
658

" Stored in directory: /root/.cache/pip/wheels/ba/f8/bb/ea57c0146b664dca3a0ada4199b0ecb5f9dfcb7b7e22b65ba2\n",
659

"Successfully built playsound\n",
```



```
660
"Installing collected packages: playsound\n",
661
"Successfully installed playsound-1.3.0\n"
662
]
663
}
664
]
665
},
666
{
667
"cell_type": "code",
668
"source": [
669
"#import opencv library\n",
670
"import cv2\n",
671
"#import numpy\n",
672
"import numpy as np\n",
673
"#import image function from keras\n",
```

```
674
"from keras.preprocessing import image\n",
675
"#import load_model from keras\n",
676
"from keras.models import load_model\n",
677
"#import client from twilio API\n",
678
"from twilio.rest import Client\n",
679
"#import playsound package\n",
680
"from playsound import playsound"
681
],
682
"metadata": {
683
"colab": {
684
"base_uri": "https://localhost:8080/"
685
},
686
"id": "lRYUXaKdnnA_",
687
"outputId": "c0e95e37-90e6-4af0-ca72-c65019c4bf19"
```

```
},
```

```
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```
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```

```
{
```

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```

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"name": "stderr",
```

```
"text": [
```

```
"WARNING:playsound:playsound is relying on another python subprocess. Please use `pip install pygobject` if you want  
playsound to run more efficiently.\n"
```

```
]
```

```
}
```

```
]
```

```
},
```

```
{
```

"cell_type": "code",	702
"source": [703
"#load the saved model\n",	704
"model = load_model(r'/content/drive/MyDrive/archive (1)/forest1.h5')\n",	705
"#define video\n",	706
"video = cv2.VideoCapture('/content/Fighting Fire with Fire _ Explained in 30 Seconds.mp4')\n",	707
"#define the features\n",	708
"name = ['forest', 'with forest']"	709
],	710
"metadata": {	711
"id": "p6I7mDNen2KO"	712
},	713
"execution_count": 30,	714
"outputs": []	715

```
},
716

{
717

"cell_type": "code",
718

"source": [
719

"account_sid = 'ACde2b15dad8f6e39c32b35eaa64921cf2'\n",
720

"auth_token = '1928bb64202abc74a3ff94b70d5deec4'\n",
721

"client = Client(account_sid, auth_token)\n",
722

"\n",
723

"message = client.messages \n\n",
724

".create(\n",
725

" body='Forest fire is detected , stay alert',\n",
726

" from_='+16075363954',\n",
727

" to='+919488200286'\n",
728

" )\n",
729
```

"\n",	730
"print(message.sid)"	731
],	732
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},	736
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"outputId": "79041895-7dda-4771-9d49-f39072dd4bcb"	738
},	739
"execution_count": 32,	740
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"name": "stdout",	744
"text": [745
"SMcd33e58fa6f60aa349ecba81dce9b48d\n"	746
]	747
}	748
]	749
},	750
{	751
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"source": [753
"#import opencv library\n",	754
"import cv2\n",	755
"#import numpy\n",	756
"import numpy as np\n",	757

```
"#import images and load_model function from keras\n",  
  
"from keras_preprocessing import image\n",  
  
"from keras.models import load_model\n",  
  
"#import client from twilio API\n",  
  
"from twilio.rest import Client\n",  
  
"#import playsound package\n",  
  
"from playsound import playsound\n",  
  
"\n",  
  
"#load the saved model\n",  
  
"model = load_model(r'/content/drive/MyDrive/archive (1)/forest1.h5')\n",  
  
"video = cv2.VideoCapture('/content/Fighting Fire with Fire _ Explained in 30 Seconds.mp4')\n",  
  
"name = ['forest', 'with fire']  
  
],  
  
"metadata": {  
  

```

758
759
760
761
762
763
764
765
766
767
768
769
770
771

"id": "INprEvNEoPSy"	772
,	773
"execution_count": 33,	774
"outputs": []	775
,	776
{	777
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"source": [],	779
"metadata": {	780
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,	782
"execution_count": null,	783
"outputs": []	784
}	785

]

786

}