Sprint 4

Date	19 November 2022
Team ID	PNT2022TMID47488
Project Name	Project - Emerging Methods for Early Detection of Forest Fires
Maximum Sprint Points	20 points

1. Creation of Model in IBM Cloud and downloading it locally

```
spark-mllib_3.0-scala_2.12     09f4cff0-90a7-5899-b9ed-1ef348aebdee  base
pytorch-onnx_rt22.1-py3.9      0b848dd4-e681-5599-be41-b5f6fccc6471  base
ai-function_0.1-py3.6          0cdb0f1e-5376-4f4d-92dd-da3b69aa9bda  base
shiny-r3.6                     0e6e79df-875e-4f24-8ae9-62dcc2148306  base
tensorflow_2.4-py3.7-horovod   1092590a-307d-563d-9b62-4eb7d64b3f22  base
pytorch_1.1-py3.6              10ac12d6-6b30-4ccd-8392-3e922c096a92  base
tensorflow_1.15-py3.6-ddl      111e41b3-de2d-5422-a4d6-bf776828c4b7  base
autoai-kb_rt22.2-py3.10        125b6d9a-5b1f-5e8d-972a-b251688ccf40  base
runtime-22.1-py3.9             12b83a17-24d8-5082-900f-0ab31fbfd3cb  base
scikit-learn_0.22-py3.6        154010fa-5b3b-4ac1-82af-4d5ee5abbc85  base
default_r3.6                   1b70aec3-ab34-4b87-8aa0-a4a3c8296a36  base
pytorch-onnx_1.3-py3.6         1bc6029a-cc97-56da-b8e0-39c3880dbbe7  base
kernel-spark3.3-r3.6           1c9e5454-f216-59dd-a20e-474a5cdf5988  base
pytorch-onnx_rt22.1-py3.9-edt  1d362186-7ad5-5b59-8b6c-9d0880bde37f  base
tensorflow_2.1-py3.6           1eb25b84-d6ed-5dde-b6a5-3fbdf1665666  base
spark-mllib_3.2                20047f72-0a98-58c7-9ff5-a77b012eb8f5  base
tensorflow_2.4-py3.8-horovod   217c16f6-178f-56bf-824a-b19f20564c49  base
runtime-22.1-py3.9-cuda        26215f05-08c3-5a41-a1b0-da66306ce658  base
do_py3.8                       295addb5-9ef9-547e-9bf4-92ae3563e720  base
...
autoai-kb_3.1-py3.7            632d4b22-10aa-5180-88f0-f52dfb6444d7  base
pytorch-onnx_1.7-py3.8         634d3cdc-b562-5bf9-a2d4-ea90a478456b  base
------------------------------  ------------------------------------  ----
Note: Only first 50 records were displayed. To display more use 'limit' parameter.
```

```
[37]
software_spec_uid = client.software_specifications.get_uid_by_name ('tensorflow_rt22.1-py3.9')
software_spec_uid
```

[37]

```
'acd9c798-6974-5d2f-a657-ce06e986df4d'
```

```
model_details= client.repository.store_model (model= 'image-classification-model_new.tgz'
,meta_props={
client.repository.ModelMetaNames.NAME:'CNN',
client.repository.ModelMetaNames.TYPE:"tensorflow_2.7",
client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_spec_uid
}
                                                    )
model_id= client.repository.get_model_id (model_details)
```

[38]

```
model_id
```

[39]

```
'3dae6756-d295-4131-b79b-9b22fcc661b8'
```

```
client.repository.download (model_id, 'my_model4.tar.gz')
```

[41]

```
Successfully saved model content to file: 'my_model4.tar.gz'

'/home/wsuser/work/my_model4.tar.gz'
```

```
def guid_from_space_name(client, space_name ):
    space = client.spaces.get_details()
    #print (space)
    return (next(item for item in space ['resources'] if item ['entity']['name']== space_name)['metadata']['id'])
```

```
space_uid = guid_from_space_name(client, 'Forest_fire_model')
print ('Space ID = ' + space_uid)
```

```
Space ID = 591e1daf-f677-4b5f-9dba-5dba20311381
```

```
client.set.default_space(space_uid)
```

```
'SUCCESS'
```

```
client.software_specifications.list()
```

```
Output exceeds the size limit. Open the full output data in a text editor
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NAME                            ASSET_ID                              TYPE
default_py3.6                   0062b8c9-8b7d-44a0-a9b9-46c416adcbd9  base
kernel-spark3.2-scala2.12       020d69ce-7ac1-5e68-ac1a-31189867356a  base
pytorch-onnx_1.3-py3.7-edt      069ea134-3346-5748-b513-49120e15d288  base
scikit-learn_0.20-py3.6         09c5a1d0-9c1e-4473-a344-eb7b665ff687  base
spark-mllib_3.0-scala_2.12      09f4cff0-90a7-5899-b9ed-1ef348aebdee  base
```
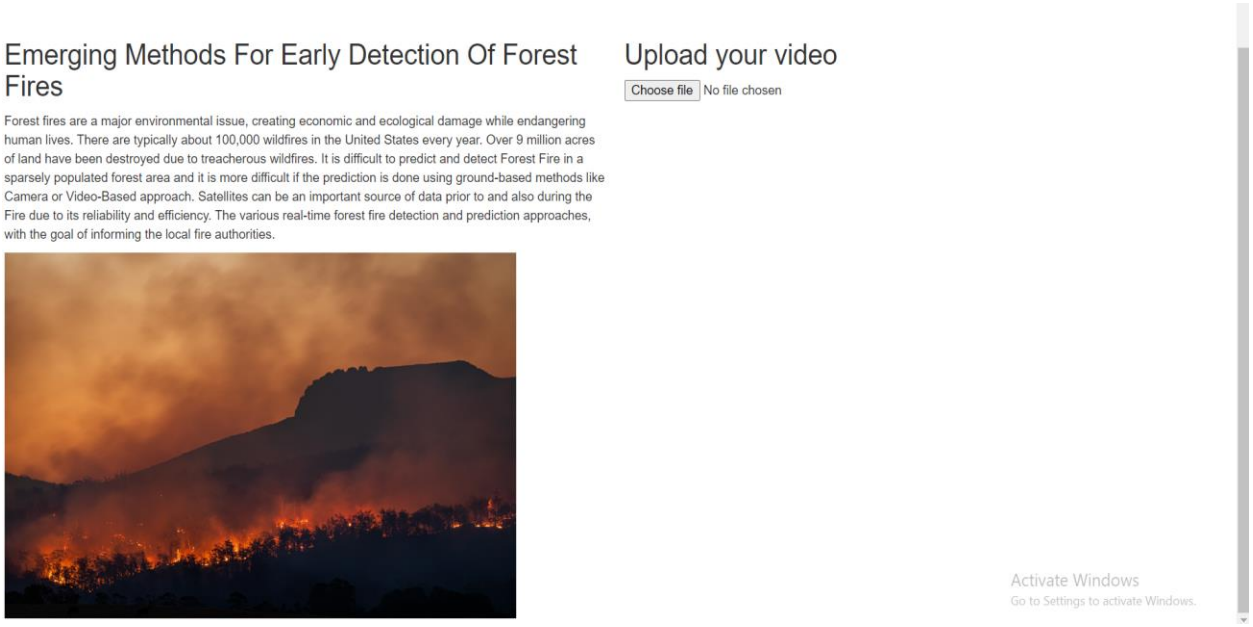
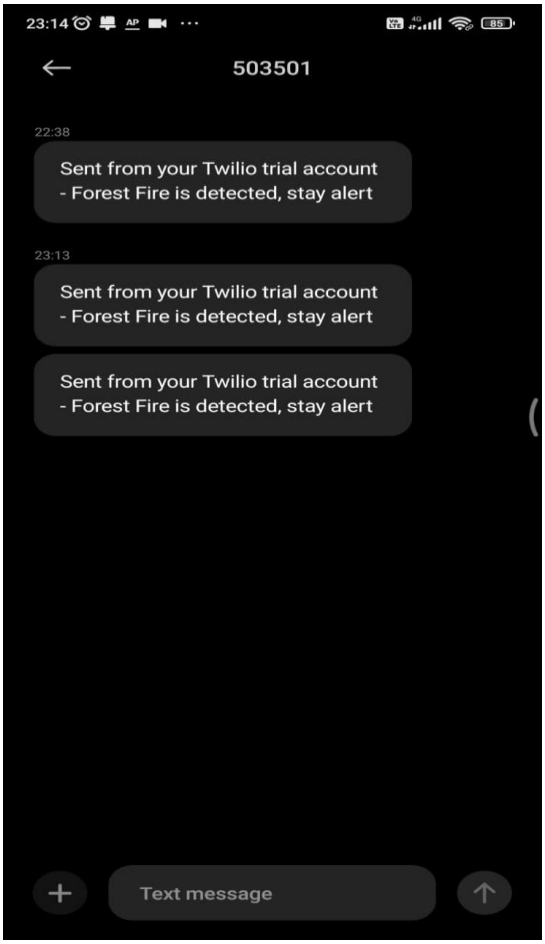

2. Designing of webpage & Integrating with the Model and twilio services

```python
import requests
from tensorflow.keras.preprocessing import image
from tensorflow.keras.models import load_model
import numpy as np
import pandas as pd
import tensorflow as tf
from flask import Flask, request, render_template, redirect, url_for
import os
from werkzeug.utils import secure_filename
from tensorflow.python.keras.backend import set_session
from twilio.rest import Client
from playsound import playsound
import cv2

#load the forest fire model from IBM Watson Studio.
model = load_model("Forest_fire.h5")

#home page
app= Flask(__name__, template_folder='template')
@app.route("/")
def index():
    return render_template('index.html')
    video=cv2.VideoCapture(r'C:\Users\admin\Downloads\ai\forest_fire_1.mp4')

    while (1):
        success, frame= video.read()
        cv2.imwrite('forest.jpg', frame)
        img= image.load_img('forest.jpg', target_size=(64,64,3))
        x=image.img_to_array(img)
        x=np.expand_dims(x,axis=0)
        pred=model.predict(x)
        p= int(pred[0])
        print (p)
        name=['forest without fire','forest with fire']
        cv2.putText(frame, 'predicted class ='+str(name[p]), (100,100), cv2.FONT_HERSHEY_SIMPLEX, 1, (0,0,0),1)
        if pred[0]==1:
            account_sid = 'AC8d900acfe2f3400cbed2b4a9abbcda90'
            auth_token= '6d169a03f7ef5659901e40f2b5403931'
            client = Client (account_sid, auth_token)
            message = client.messages      .create(
                body='Forest Fire is detected, stay alert',
                from_= '+18176702460',
                to='+919962278677')
            print(message.sid)
            print ('Fire detected')
            print ('Message Sent')
            cv2.imshow('image',frame)
        else:
            print ('No Danger')
            cv2.imshow('image',frame)
            if cv2.waitKey(1) & 0xFF == ord('a'):
                break

    video.release()
    cv2.destroyAllWindows()
app.run(host='0.0.0.0' , port=5001)
if __name__ == "__main__":
    app.run(debug=True)
```



Results:


23:14
503501
22:38
Sent from your Twilio trial account
- Forest Fire is detected, stay alert
23:13
Sent from your Twilio trial account
- Forest Fire is detected, stay alert
Sent from your Twilio trial account
- Forest Fire is detected, stay alert
Text message