

PROJECT DEVELOPMENT PHASE

SPRINT-4

Team ID	PNT2022TMID21552
Project Name	EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES

In this sprint we have deployed the model into a website and tested codes.

Website code:

app.py

```
from flask import Flask, render_template, request
```

```
from keras.models import load_model
```

```
from keras.preprocessing import image
```

```
from twilio.rest import Client
```

```
import math
```

```
app = Flask(__name__)
```

```
dic = {0 : 'forest', 1 : 'with fire'}
```

```
model = load_model('forests.h5')
```

```
model.make_predict_function()
```

```
def predict_label(img_path):
```

```
    i = image.load_img(img_path, target_size=(128,128))
```

```
    i = image.img_to_array(i)/255.0
```

```
    i = i.reshape(1, 128,128,3)
```

```
    account_sid='AC33e4f23328753859047817ac8815083b'
```

```
    auth_token = 'ec85f2a8b7e067400404fd9c0c565797'
```

```
    client=Client(account_sid,auth_token)
```

```
    pred= model.predict(i)
```

```

if(pred==[[1.]]):
    message=client.messages \
    .create(
        body='FOREST FIRE IS DETECTED IN AREA,stay alert',
        #use twilio free number
        from_='+12535288281',
        #to number
        to='+918610505460')
    msg= " FOREST FIRE DETECTED"
else:
    msg= "NO FOREST FIRE DETECTED"
return msg
# routes
@app.route("/", methods=['GET', 'POST'])
def main():
    return render_template("index.html")
@app.route("/about")
def about_page():
    return "This website helps in forest fire detection..!!!"
@app.route("/submit", methods = ['GET', 'POST'])
def get_output():
    if request.method == 'POST':
        img = request.files['my_image']
        img_path = "static/" + img.filename
        img.save(img_path)
        p = predict_label(img_path)

        return render_template("index.html", prediction = p, img_path = img_path)
if __name__ == '__main__':
    #app.debug = True
    app.run(debug = True)

```

Home.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Simple HTML HomePage</title>
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/5.15.3/css/all.min.css">
  <style>
    @import url('https://fonts.googleapis.com/css2?family=Sriracha&display=swap');

    body {
      margin: 0;
      box-sizing: border-box;
    }

    /* CSS for header */
    .header {
      display: flex;
      justify-content: space-between;
      align-items: center;
      background-color: #f5f5f5;
    }

    .header .logo {
      font-size: 25px;
      font-family: 'Sriracha', cursive;
      color: #000;
      text-decoration: none;
      margin-left: 30px;
    }
```

```
.nav-items {  
  display: flex;  
  justify-content: space-around;  
  align-items: center;  
  background-color: #f5f5f5;  
  margin-right: 20px;  
}
```

```
.nav-items a {  
  text-decoration: none;  
  color: #000;  
  padding: 35px 20px;  
}
```

```
/* CSS for main element */
```

```
.intro {  
  display: flex;  
  flex-direction: column;  
  justify-content: center;  
  align-items: center;  
  width: 100%;  
  height: 520px;  
  background: linear-gradient(to bottom, rgba(0, 0, 0, 0.5) 0%, rgba(0, 0, 0, 0.5) 100%),  
url("https://magazine.columbia.edu/sites/default/files/styles/full_width_card/public/2018-  
09/Wild-fires.jpg?itok=8pfGkL7z");  
  background-size: cover;  
  background-position: center;  
  background-repeat: no-repeat;  
}
```

```
.intro h1 {  
  font-family: sans-serif;
```

```
font-size: 60px;
color: #fff;
font-weight: bold;
text-transform: uppercase;
margin: 0;
}
```

```
.intro p {
font-size: 20px;
color: #d1d1d1;
text-transform: uppercase;
margin: 20px 0;
}
```

```
.intro button {
background-color: #5edaf0;
color: #000;
padding: 10px 25px;
border: none;
border-radius: 5px;
font-size: 20px;
font-weight: bold;
cursor: pointer;
box-shadow: 0px 0px 20px rgba(255, 255, 255, 0.4)
}
```

```
.achievements {
display: flex;
justify-content: space-around;
align-items: center;
padding: 40px 80px;
}
```

```
.achievements .work {  
  display: flex;  
  flex-direction: column;  
  justify-content: center;  
  align-items: center;  
  padding: 0 40px;  
}
```

```
.achievements .work i {  
  width: fit-content;  
  font-size: 50px;  
  color: #333333;  
  border-radius: 50%;  
  border: 2px solid #333333;  
  padding: 12px;  
}
```

```
.achievements .work .work-heading {  
  font-size: 20px;  
  color: #333333;  
  text-transform: uppercase;  
  margin: 10px 0;  
}
```

```
.achievements .work .work-text {  
  font-size: 15px;  
  color: #585858;  
  margin: 10px 0;  
}
```

```
/* CSS for footer */
```

```
.footer {  
  display: flex;  
  justify-content: space-between;  
  align-items: center;  
  background-color: #302f49;  
  padding: 40px 80px;  
}
```

```
.footer .copy {  
  color: #fff;  
}
```

```
.bottom-links {  
  display: flex;  
  justify-content: space-around;  
  align-items: center;  
  padding: 10px 0;  
}
```

```
.bottom-links .links {  
  display: flex;  
  flex-direction: column;  
  justify-content: center;  
  align-items: center;  
  padding: 0 120px;  
}
```

```
.bottom-links .links span {  
  font-size: 20px;  
  color: #fff;  
  text-transform: uppercase;  
  margin: 20px 0;
```

```
}
```

```
.bottom-links .links a {  
  text-decoration: none;  
  color: #a1a1a1;  
  padding: 10px 120px;  
}
```

```
</style>
```

```
</head>
```

```
<body>
```

```
<header class="header">
```

```
<a href="#" class="logo">Forest Fire Detection</a>
```

```
<nav class="nav-items">
```

```
<a class="active" href="home.html">Home</a>
```

```
<a href="detect.html">Detect</a>
```

```
</nav>
```

```
</header>
```

```
<main>
```

```
<div class="intro">
```

```
<h1>Emerging Methods For Early Detection Of Forest Fire</h1>
```

```
<p>This is a website that helps in early detection of fires in order to help preserve  
wildlife.</p>
```

```
</div>
```

```
<h1><center>DID YOU KNOW ? <center></h1>
```

```
<div class="achievements">
```

```
<div class="work">
```

```
<p class="work-text">Since 1983, the National Interagency Fire Center has documented an  
average of approximately 70,000 wildfires per year.</p>
```


</div>

<div class="work">

<p class="work-text">The largest forest fire was the Miramichi Fire in New Brunswick, Canada in 1825 which destroyed about 3 million acres (12150 km²). this fire killed 160 people.</p>

</div>

<div class="work">

<p class="work-text"> At least 60 per cent of districts in India are affected by forest fires each year</p>

</div>

</div>

<footer class="footer">

<div class="bottom-links">

<div class="links">

DEVELOPED BY

Monisha M

Nishanthini V

Reenasree S

Shruti S

Sreeram B

</div>

<div class="links">

Social Links

<i class="fab fa-facebook"></i>

<i class="fab fa-twitter"></i>

<i class="fab fa-instagram"></i>

</div>

</div>

</footer>

</body>

</html>

Index.html

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<meta http-equiv="X-UA-Compatible" content="ie=edge">

<title>Predict</title>

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.min.css">

<link href="https://cdn.bootcss.com/bootstrap/4.0.0/css/bootstrap.min.css" rel="stylesheet">

<script src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.min.js"></script>

<script src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></script>

<script src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstrap.min.js"></script>

<link href="{{ url_for('static', filename='css/main.css') }}" rel="stylesheet">

<style>

body

{

background-image: linear-gradient(to right, #ffbd5, #b20a2c);

background-size: cover;

}

.header {

display: flex;

justify-content: space-between;

align-items: center;

background-color: #f5f5f5;

}

.header .logo {

font-size: 25px;

```
font-family: 'Sriracha', cursive;
color: #000;
text-decoration: none;
margin-left: 30px;
}
```

```
.nav-items {
display: flex;
justify-content: space-around;
align-items: center;
background-color: #f5f5f5;
margin-right: 20px;
}
```

```
.nav-items a {
text-decoration: none;
color: #000;
padding: 35px 20px;
}
```

```
.bar
{
margin: 0px;
padding:20px;
background-color:white;
opacity:0.6;
color:black;
font-family:'Roboto',sans-serif;
font-style: italic;
border-radius:20px;
font-size:25px;
}
```

a

```

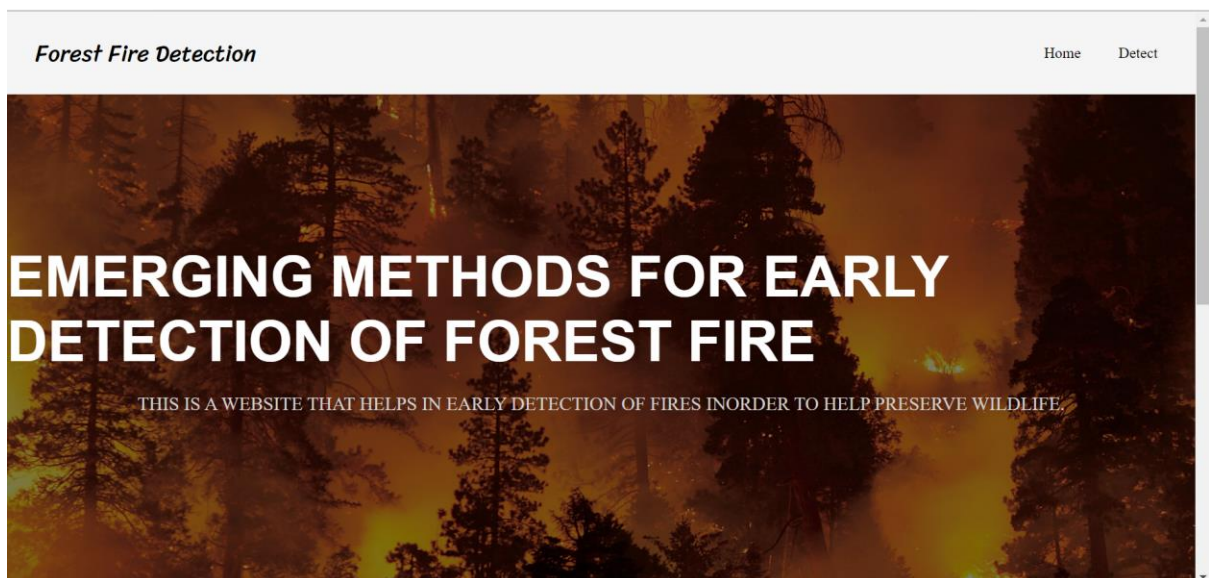
{
color:grey;
float:right;
text-decoration:none;
font-style:normal;
padding-right:20px;
}
.div{
background-color: lightgrey;
width: 500px;
border: 10px solid peach;
padding: 20px;
margin: 20px;
height: 500px;
}
</style>
</head>
<body>
<header class="header">
<a href="#" class="logo">Forest Fire Detection</a>
<nav class="nav-items">
<a class="active" href="home.html">Home</a>
<a href="detect.html">Detect</a>
</nav>
</header>
<br>
<div>
<br>
<br>
<h1><center><font color="black" size="5" ><b>Upload image to detect forest fire
</center></b></font></h1><br><br>
<div style="margin-left: 450px;">

```

```

<form id="upload-file" method="post" enctype="multipart/form-data">
  <label for="imageUpload" class="upload-label">
    Choose...
  </label>
  <input type="file" name="file" id="imageUpload" accept=".png, .jpg, .jpeg">
</form>
<center> <div class="image-section" style="display:none;">
  <div class="img-preview">
    <div id="imagePreview">
      </div></center>
    </div>
    <center><div>
      <button type="button" class="btn btn-primary btn-lg " id="btn-predict">Detect forest
fire</button>
    </center></div>
  </div>
</div>
</html>

```



DID YOU KNOW ?

Since 1983, the National Interagency Fire Center has documented an average of approximately 70,000 wildfires per year.

The largest forest fire was the Miramichi Fire in New Brunswick, Canada in 1825 which destroyed about 3 million acres (12150 km²). this fire killed 160 people.

At least 60 per cent of districts in India are affected by forest fires each year

DEVELOPED BY

Monisha M

Nishanthini V

Reenasree S

Shruti S

Sreeram B

SOCIAL LINKS



Forest Fire Detection

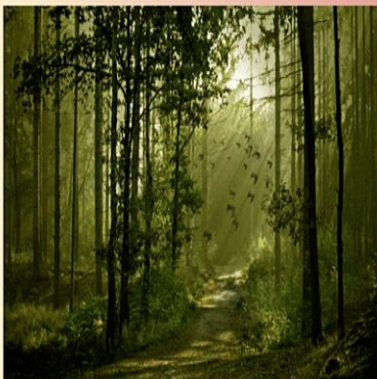
[Home](#) [Detect](#)

Upload Forest images :

No file chosen

Upload Forest images :

No file chosen




Your Prediction : *NO FOREST FIRE DETECTED*

Upload Forest images :

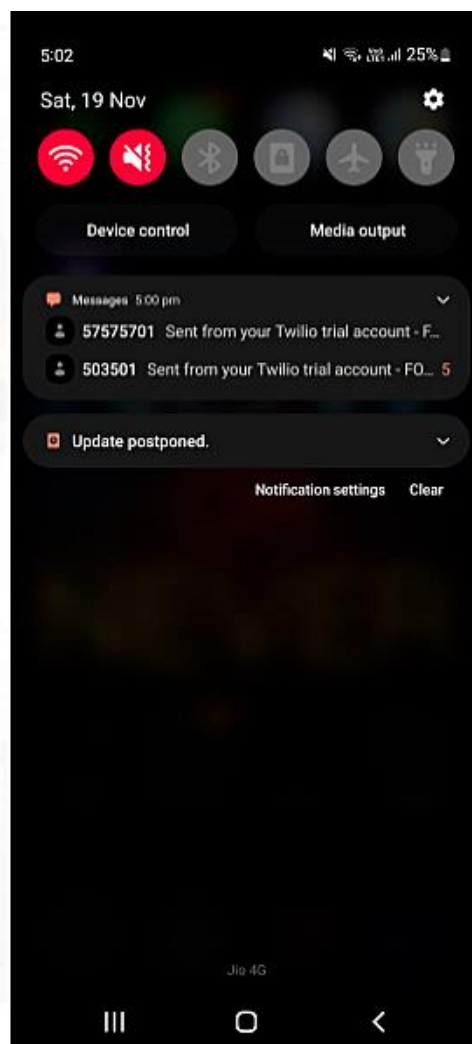
Choose File

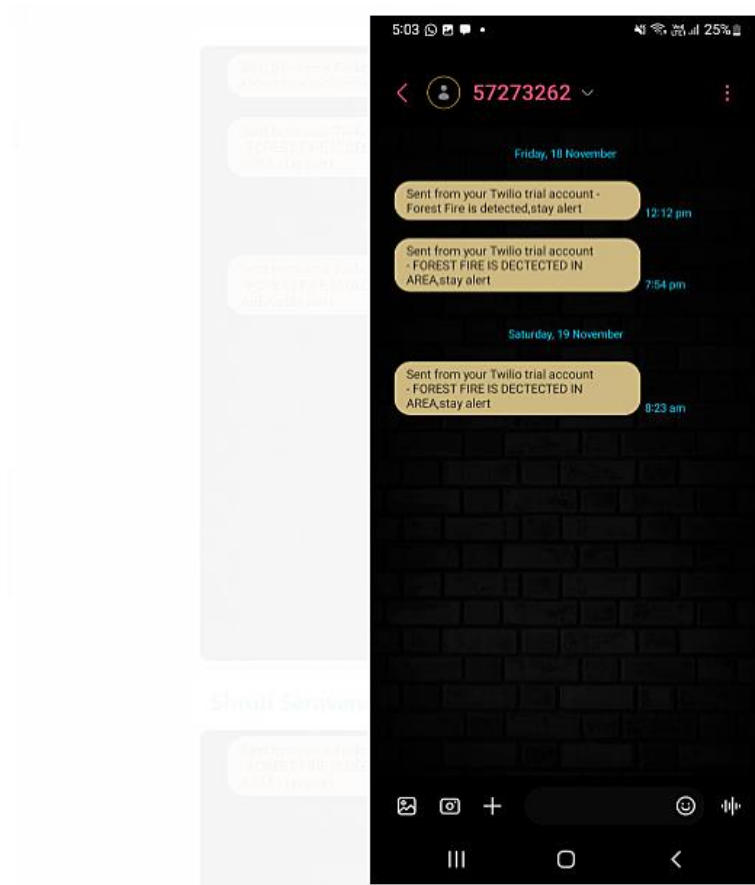
No file chosen

Submit



Your Prediction : *FOREST FIRE DETECTED*





TESTING:

1. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

| Resolution | Severity 1 | Severity 2 | Severity 3 | Severity 4 | Subtotal |
|----------------|------------|------------|------------|------------|----------|
| By Design | 2 | 4 | 2 | 3 | 11 |
| Duplicate | 1 | 0 | 5 | 1 | 7 |
| External | 2 | 3 | 0 | 3 | 8 |
| Fixed | 11 | 12 | 19 | 7 | 49 |
| Not Reproduced | 0 | 3 | 0 | 1 | 4 |
| Skipped | 0 | 0 | 1 | 0 | 1 |
| Won't Fix | 0 | 1 | 0 | 1 | 2 |
| Totals | 24 | 14 | 13 | 26 | 77 |

2. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

| Section | Total Cases | Not Tested | Fail | Pass |
|------------------------|-------------|------------|------|------|
| Classification of fire | 10 | 0 | 0 | 10 |
| Website | 12 | 0 | 0 | 12 |
| Security | 2 | 0 | 0 | 2 |
| Outsource Shipping | 4 | 0 | 0 | 4 |
| Exception Reporting | 9 | 0 | 0 | 9 |
| Final Report Output | 32 | 0 | 0 | 32 |
| Version Control | 7 | 0 | 0 | 7 |

Performance Metrics:

| S. no | Parameters | Values | Screenshot |
|-------|---------------|--------|---|
| 1 | Model Summary | | <div><div><div></div></div><div><div>1 model.summary()</div><div>Model: "sequential"</div><div><div><div>Layer (type)</div><div>Output Shape</div></div><div>=====</div><div><div>conv2d (Conv2D)</div><div>(None, 126, 126, 32)</div></div><div><div>max_pooling2d (MaxPooling2D)</div><div>(None, 63, 63, 32)</div></div><div><div>flatten (Flatten)</div><div>(None, 127008)</div></div><div><div>dense (Dense)</div><div>(None, 150)</div></div><div><div>dense_1 (Dense)</div><div>(None, 1)</div></div><div>=====</div><div>Total params: 19,052,397</div><div>Trainable params: 19,052,397</div><div>Non-trainable params: 0</div></div></div></div> |

| 2 | Accuracy | Training Accuracy - 0.9344 | Validation Accuracy - 0.9801 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------|----------------------------|------------------------------|-------|-------------------|---------------------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|---|-------|-------|
| <pre>[29] 1 print(np.average(y.history['accuracy']))</pre> <p>0.9344036757946015</p> <pre>1 print(y.history['accuracy'])</pre> <p>[0.9128440618515015, 0.9288991093635559, 0.94495415687561]</p> <pre>1 print(np.average(y.history['val_accuracy']))</pre> <p>0.980165296792984</p> <pre>[24] 1 print(y.history['val_accuracy'])</pre> <p>[0.9504132270812988, 0.9834710955619812, 0.980165296792984]</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"><caption>Training and Validation Accuracy Data</caption><thead><tr><th>Epoch</th><th>Training Accuracy</th><th>Validation Accuracy</th></tr></thead><tbody><tr><td>0</td><td>0.920</td><td>0.983</td></tr><tr><td>1</td><td>0.918</td><td>0.983</td></tr><tr><td>2</td><td>0.920</td><td>0.983</td></tr><tr><td>3</td><td>0.943</td><td>0.967</td></tr><tr><td>4</td><td>0.927</td><td>0.959</td></tr><tr><td>5</td><td>0.925</td><td>0.983</td></tr><tr><td>6</td><td>0.943</td><td>0.943</td></tr><tr><td>7</td><td>0.922</td><td>0.934</td></tr><tr><td>8</td><td>0.925</td><td>0.983</td></tr><tr><td>9</td><td>0.948</td><td>0.967</td></tr></tbody></table> | | | | Epoch | Training Accuracy | Validation Accuracy | 0 | 0.920 | 0.983 | 1 | 0.918 | 0.983 | 2 | 0.920 | 0.983 | 3 | 0.943 | 0.967 | 4 | 0.927 | 0.959 | 5 | 0.925 | 0.983 | 6 | 0.943 | 0.943 | 7 | 0.922 | 0.934 | 8 | 0.925 | 0.983 | 9 | 0.948 | 0.967 |
| Epoch | Training Accuracy | Validation Accuracy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0.920 | 0.983 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.918 | 0.983 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0.920 | 0.983 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0.943 | 0.967 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0.927 | 0.959 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0.925 | 0.983 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0.943 | 0.943 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0.922 | 0.934 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 0.925 | 0.983 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 0.948 | 0.967 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |