PROJECT REPORT
NATURAL DISASTER INTENSITY ANALIYSIS AND CLASSIFICATION USING AI

1. INTRODUCTION
1.1 Project Overview

Millions of people are affected by natural disasters every year, and their impact can be calamitous. From the destruction of buildings to the spread of disease, natural disasters can devastate entire countries overnight. Tsunamis, earthquakes and typhoons do not just wreak havoc on land; they also disrupt people's lives in both densely populated cities and remote villages. Endangered species are especially vulnerable when habitat is destroyed. Water quality is impacted when sewage treatment facilities flood or debris enters reservoirs and waterways. Beaches move and change shape due to storm surges.

1.2 purpose

The main purpose of this project is to provide natural disaster intensity analiysis and classification using AI (Artificial Intelligence).AI can enhance earthquake detection and tsunami warning using geological information from research centres around the world.For instance, drones and robots have been used to locate survivors and transmit information to emergency teams.

2.LITERATURE SURVEY
2.1 Existing problem

Natural disasters have a significant impact on the public health and well-being of populations affected. Negative health impacts can be direct (e.g., injuries) or indirect (e.g., malnutrition and increase in infectious diseases). In the aftermaths of a natural disaster, these health issues are compounded by the damage done to health systems, water and sanitation infrastructure, and the displacement of communities affected.

2.2 References

Sara Saravi, Roy Kalawsky, May 2019) The paper highlights the use of artificial intelligence, how it can be used to prevent and be prepared for events. The decision making and measures that can be done based on the data gathered to improve resilience can be identified.(Muhammad Arslan, Ana-Maria Roxin, Christophe Cruz, January 2018) It provides a literature review of various papers

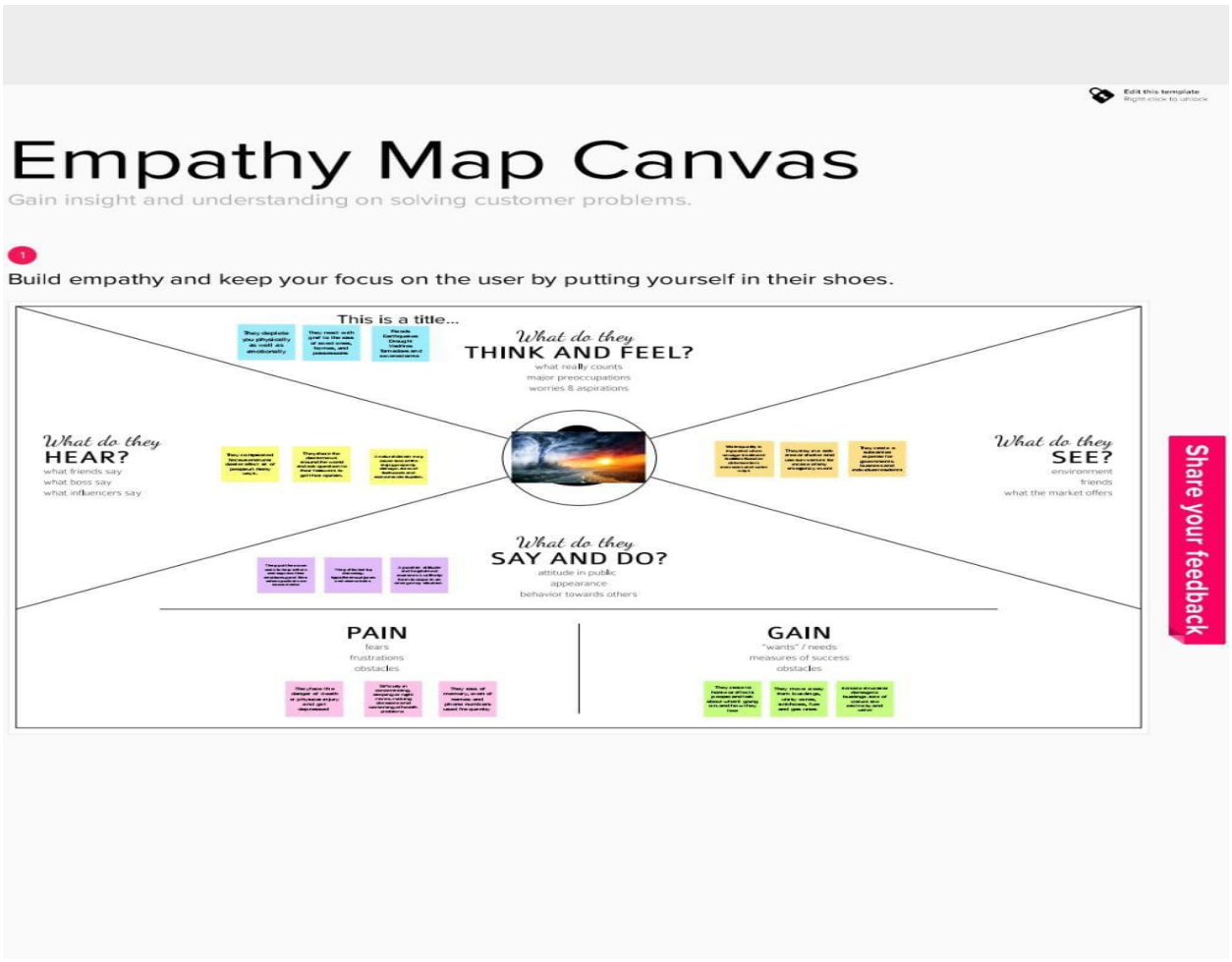
and illustrates findings for disaster management. It aims to integrate components to a region level for management of disaster.(Khaled M. Khalil, M. Abdel-Aziz, Taymour T. Nazmy) The research showcases the benefits of artificial intelligence technologies in crisis response and discusses the role of AI technologies such as robotics, ontology and semantic web, and multi-agent systems in crisis response. (Muhammad Imran, Carlos Castillo, Patrick Meier, April 2014) The research discusses how the data captured during disaster can be used to tackle any events of disaster in future and how humans and machines can work together for disaster response.

3.3 Problem Statement Definition

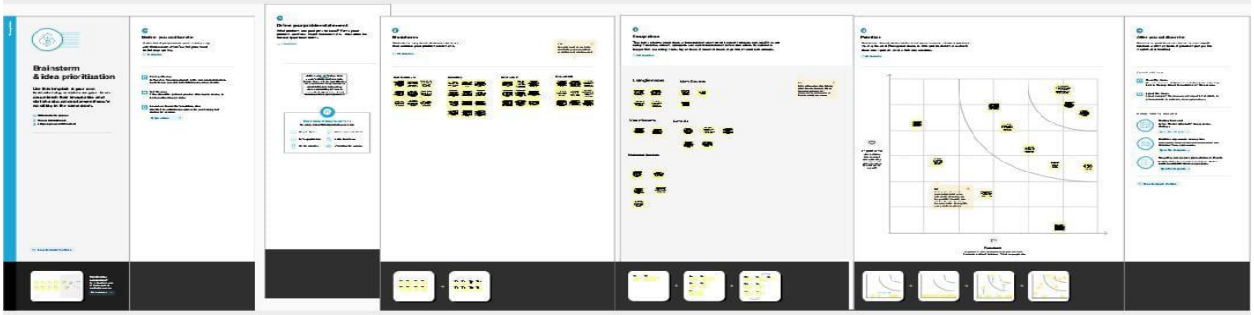
In our daily we are facing more natural disasters in our state and in many countries like Covid, flood, earthquake, volcanic eruptions etc. Disaster leads to various issues and development of artificial intelligence would fill the gap of management before any event occurs to reduce the impact of loss. By using AI we can predict natural disaster by AI systems can be trained with the help of seismic data to analyse the magnitude and patterns of earth quakes and predict the location of earthquakes. It can predict flood simulatons and monitor flooding .AI based algorithms can organize disaster data in the order of severity andit can identify climate patterns at risk areas and populations, and send early warnings for potentially disastrous weather events.

3.IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation and Brainstorming



3.3 Proposed Solution

AI-based solutions enable governments to accelerate the execution of planned projects and reduce the potential recovery cost from post-natural hazards. AI solutions will have an adoption and learning curve for government departments as the outputs from these solutions will have to go through compliance and regulatory approvals.

3.4 Problem Solution Fit

The customer face many problems during disaster. It will come in the form of Hazardous waste, Property damage, Structural damage to buildings. Loss of utilities like electricity and water. Debris cleanup and waste management solution. Infrastructure-related problems such as closed roads and communication losses. AI systems can help with seismic data to analyse the magnitude and patterns of disasters and predict the location of disasters and it's

aplications with the help of rainfall records and flood simulations. It use satellite to predict and monitor the path and intensity of disasters.

4. REQUIREMENT ANALYSIS

4.1 Functional Requirements

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Reporting	Markets in Financial Instruments Directive II, Monetary Authority of Singapore, Artificial Intelligence repoorting.
FR-2	Compliance to Laws or Regulations	Robust and Reliable Safe and Secure.
FR-3	External Interface	Virtual agents and natural language generation.
FR-4	Business Rules	support data based decisions and is not an autonomous system.
FR-5	Authentication	3D biometric facial recognition technology.
FR-6	Transaction Processing	Dubbed IBM z16, Big Blue.

4.2 Non Functional Requirements

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

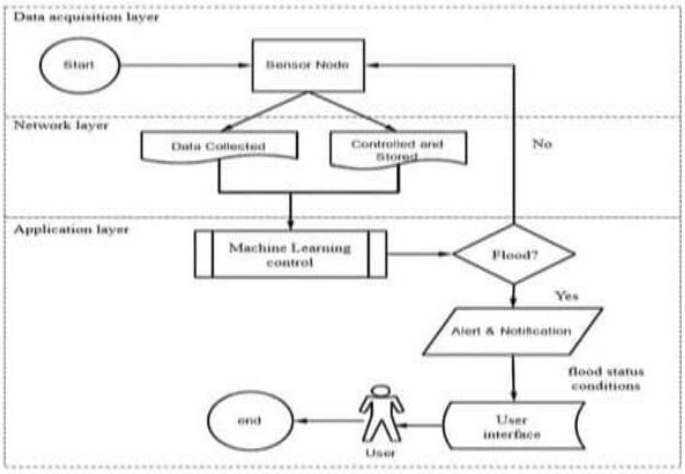
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Used for protecting infrastructure, people, social and natural environment, reliance performance and fast recovery.
NFR-2	**Security**	Artificial intelligence product helps security personnel detect threats by scanning the underside of passing vehicles.
NFR-3	**Reliability**	AI can help disaster management teams assign risk scores to public and private properties, enabling them to gauge infrastructure vulnerability in the event of a catastrophe. AI for disaster recovery would be to analyze real-time CCTV footage to identify emergencies and sound the alarm.
NFR-4	**Performance**	AI systems can detect urgency by analysing the tone of speech, filtering out redundant or even less urgent calls and sorting them depending on the seriousness of the problem.
NFR-5	**Availability**	AI software currently being used in everyday life like Voice assistants, image recognition for face unlock in cellphones, and ML-based financial fraud detection and it can be available to detect and monitor the affected areas during the pandemic time.
NFR-6	**Scalability**	Roughly 6,800 natural disasters take place every year, around the globe. It indicates that almost 68,000 people lose their lives.

5. PROJECT DESIGN

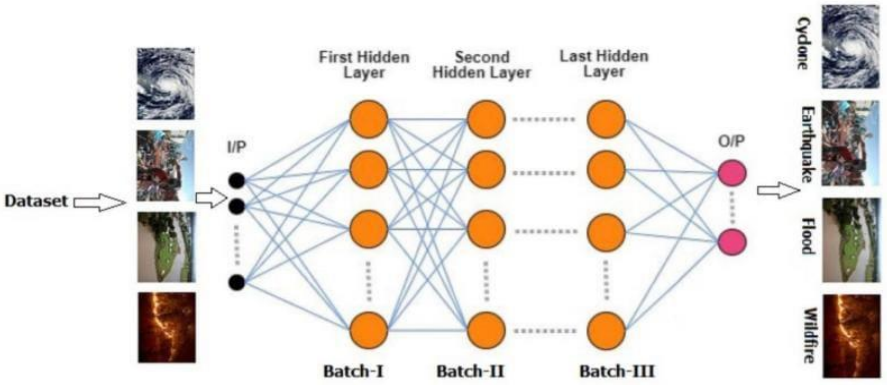
5.1 Data Flow Diagrams

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



5.2 Solution & Technical Architecture



5.3 User Stories

User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority
Customer (Professional)	Remote Sensing	USN-1	As a user, I can find a method more efficient and advanced.	I can visualize the critical vulnerabilities & damages.	High
	Physical Features	USN-2	As a user, I can find it gathering information and tracking.	I can collect the information from affected areas and track the people who are affected.	High
	Security	USN-3	As a user, I can provide useful information to decision-makers, helping to establish global peace and security.	I can reach near real time insights at the ground level.	Low
	Results	USN-4	As a user, I can rely on the results without any suspicion.	The technique is almost 100% efficient as it involves Modern techniques incorporated with Machine Learning	Medium
		USN-5	As a user, I can get the results on the spot immediately after the sensing.	It prevents further delay in the risk identification and warning.	High
Customer (Affected People)	Safety	USN-6	As a user,I may not enter the damaged buildings or home.	I will not enter into the damaged buildings because floodwaters remain around the building and Authorities have not declared it safe to enter.	High
Customer (Public Sector)	Cost effectiveness	USN-7	As a user,I can reach many people suffering from no food and shelter.	I will rescue the affected people and increase the national insurance resilence.	Medium
	Results	USN-8	As a user, I can complete the sensing process within minute for an affected people.	The random results generated by the device saves people and time.	High

6. PROJECT PLANNING & SCHDULING

6.1 Sprint Planning & Estimation

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Remote Sensing	USN-1	As a user, I can find a method more efficient and advanced.	2	High	P. Santhiya
Sprint-1		USN-2	As a user, I can visualize the critical vulnerabilities & damages.	1	High	G. Rajeshwari
Sprint-2	Physical Features	USN-3	As a user, I can , find it gathering information and tracking.	2	Low	R..L Ragavi
Sprint-1		USN-4	As a user, I can collect the	2	Medium	V.

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
			information from affected areas and track the people who are affected.			Sindhuja P.Santhiya
Sprint-1	Security	USN-5	As a user, I can provide useful information to decision-makers, helping to establish global peace and security.	1	High	R..L Ragavi G. Rajeshwari
	Results	USN-6	As a user, I can rely on the results without any suspicion.	3	Medium	P. Santhiya G. Rajeshwari
		USN-7	As a user, I can get the results on the spot immediately after the sensing.	5	High	V. Sindhuja R.L Ragavi
	Safety	USN-8	As a user,I may not enter the damaged buildings or home.		High	G. Rajeshwari V.Sindhuja
		USN-9	As a user, I will not enter into the damaged buildings because floodwaters remain around the building and Authorities have not	7	Medium	R.L Ragavi P. Santhiya

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Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
			declared it safe to enter.			
	Cost effectiveness	USN-10	As a user,I can reach many people suffering from no food and shelter.	10	Medium	R. .L Ragavi G. Rajeshwari
	Results	USN-11	As a user, I can complete the sensing process within minute for an affected people.	12	High	V. Sindhuja P. Santhiya

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 NOV 2022
Sprint-3	20	6 Days	07 Nov2022	12 Nov 2022	20	12 Nov 2022

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

7. CODING & SOLUTIONING

7.1 Feature 1

```
#!/usr/bin/env python
# coding: utf-8
 # In[ ]:
 import requests import csv from csv
 import DictReader import pandas as pd
 import numpy as np from pandas
 import Series, DataFrame import
 matplotlib.pyplot as plt from
 matplotlib import rcParams import
  seaborn as sb
  # below lines are important when you get KeyError: 'PROJ_LIB' import
  os import conda conda_file_dir = conda.file
  conda_dir = conda_file_dir.split('lib')[0]
  proj_lib = os.path.join(os.path.join(conda_dir, 'share'), 'proj') os.environ["PROJ_LIB"] = proj_lib from
   mpl_toolkits.basemap import Basemap
```

output:

	time	latitude	longitude	depth	mag	magType	nst	gap	dmin	rms	...	updated	place	type	horizontalError	d
0	2020-02-12T08:59:25.286Z	-24.1641	-176.1798	92.01	5.2	mb	NaN	90	5.296	1.32	...	2020-02-12T09:15:18.040Z	South of the Fiji Islands	earthquake	10.7	
1	2020-02-12T05:55:09.989Z	0.7902	98.9466	81.22	4.5	mb	NaN	98	1.462	0.85	...	2020-02-12T06:20:16.040Z	73km SSW of Padangsidempuan, Indonesia	earthquake	7.3	
2	2020-02-12T00:43:19.540Z	52.6402	171.8590	10.00	4.9	mb	NaN	146	1.369	0.67	...	2020-02-12T01:02:31.040Z	92km WSW of Attu Station, Alaska	earthquake	10.7	
3	2020-02-11T21:42:43.476Z	-20.9359	-70.7684	10.00	4.6	mwr	NaN	139	0.899	1.25	...	2020-02-12T01:06:24.938Z	102km SW of Iquique, Chile	earthquake	4.0	
4	2020-02-11T21:04:16.649Z	4.5291	83.4764	10.00	4.7	mb	NaN	101	3.878	1.03	...	2020-02-12T08:44:21.249Z	North Indian Ocean	earthquake	8.9	

5 rows x 22 columns

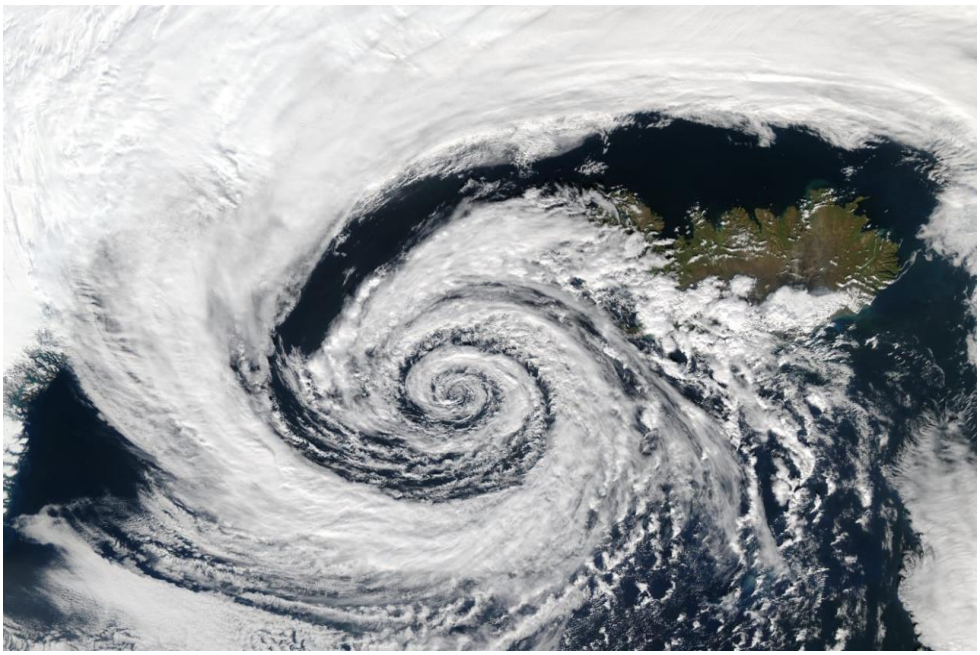
7.2 code

```
 <!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">
<linkhref="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css
" rel="stylesheet" integrity="sha384-
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi
" crossorigin="anonymous">
<title>Nalaiya Thiran</title>
</head>
<body>
<div class="card text-center">
<div class="card-header">
<ul class="nav nav-tabs card-header-tabs">
```

```
          <li class="nav-item">
            <a class="nav-link active" aria-current="true" href="home.html" style="font-size: 24px;">Home</a>
          </li>
          <li class="nav-item">
            <a class="nav-link" href="intro.html" style="font-size: 24px;">Introduction</a>
          </li>
          <li class="nav-item">
            <a class="nav-link" href="upload.html" style="font-size: 24px;">Upload</a>
          </li>
        </ul>
        <h3 style="float: right;">Natural Disaster Analysis using AI</h3>
      </div>
    </div>
    <div class = "container" style="text-align: center;">
    <div class="card" style="width: 18rem; padding: 10px; margin: 40px; margin-left: 40px;display:inline-block">
      <img class="card-img-top" src="{{ url_for('static', filename='cyclone.jpg') }}" alt="Card image cap">
      <div class="card-body" >
        <h5 class="card-title">Cyclone</h5>
        <p class="card-text">Cyclones are large revolving tropical storms caused by winds blowing around a central area of low atmospheric pressure.</p>
        <a href="https://en.wikipedia.org/wiki/Cyclone" class="btn btn-primary">Know more</a>
      </div>
    </div>
    <div class="card" style="width: 18rem; padding: 10px; margin: 40px; margin-left: 40px;display:inline-block">
      <img class="card-img-top" src="{{ url_for('static', filename='earthquake.jpg') }}" alt="Card image cap">
      <div class="card-body" >
        <h5 class="card-title">Earthquake</h5>
        <p class="card-text">An earthquake is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the fault or fault plane.</p>
        <a href="https://en.wikipedia.org/wiki/Earthquake" class="btn btn-primary">Know more</a>
```

```
      </div>
      </div>
    </div>
    <div class = "container" style="text-align: center;">
      <div class="card" style="width: 18rem; padding: 10px; margin: 40px; margin-left: 40px;display:inline-block">
        <img class="card-img-top" src="{{ url_for('static', filename='flood.jpg') }}" alt="Card image cap">
        <div class="card-body" >
          <h5 class="card-title">Flood</h5>
          <p class="card-text">Flood is a natural occurrence which turns to the overflow of water. It is highly dangerous sometimes; it wipes away the entire city and town.</p>
          <a href="https://en.wikipedia.org/wiki/Flood" class="btn btn-primary">Know more</a>
        </div>
      </div>
      <div class="card" style="width: 18rem; padding: 10px; margin: 40px; margin-left: 40px;display:inline-block">
        <img class="card-img-top" src="{{ url_for('static',filename='wildfire.jpg') }}" alt="Card image cap">
        <div class="card-body" >
          <h5 class="card-title">Wild Fire</h5>
          <p class="card-text">Wildfire, also called forest, bush or vegetation fire, can be described as any uncontrolled and non-prescribed combustion in a natural setting.</p>
          <a href="https://en.wikipedia.org/wiki/Wildfire" class="btn btn-primary">Know more</a>
        </div>
        </div>
      </div>
</body>
</html>
```

output:



code

```
import numpy as np
import tensorflow
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense,Conv2D,MaxPooling2D,Flatten
model=Sequential()
model.add(Conv2D(32,(3,3),input_shape=(64,64,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Conv2D(32,(3,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.add(Dense(units=128,activation='relu'))
model.add(Dense(units=4,activation='softmax'))
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accurac
y'])
```

model.summary()

output

Model: "sequential_1"

_____

Layer (type)	Output Shape	Param #
conv2d_2 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_2 (MaxPooling 2D)	(None, 31, 31, 32)	0
conv2d_3 (Conv2D)	(None, 29, 29, 32)	9248
max_pooling2d_3 (MaxPooling 2D)	(None, 14, 14, 32)	0
flatten_1 (Flatten)	(None, 6272)	0
dense_2 (Dense)	(None, 128)	802944
dense_3 (Dense)	(None, 4)	516

Total params: 813,604
Trainable params: 813,604
Non-trainable params: 0

_____

Code

```
 model.save('analysis.h5')
model_json=model.to_json()
with open("model-bw.json","w") as json_file:  json_file.write(model_json)
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
model=load_model('analysis.h5')
x_train.class_indices
```

Output

```
{'Cyclone': 0, 'Earthquake': 1, 'Flood': 2, 'Wildfire': 3}
```

8.TESTING

8.1 Test Cases

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID	Executed By
HomePage_TC_OO1	Functional	Home Page	Verify user is able to see the home page when click on the Local host ID		1 .Click on the local host ID 2 Verify Home page displayed or not	https://127.0.0.1:5000	Home page should display	Working as expected	Pass				
HomePage_TC_OO2	UI	Home Page	Verify the UI elements in Home page		1.Click on the Local host ID 3.Verify Home page with below UI elements :a.Home b.Intro page c.Open Web Cam	https://127.0.0.1:5000	Application should show below UI elements :a.Home b.Intro page c.Open web cam	Working as expected	pass				
HomePage_TC_OO3	UI	Home	Verify user is able to see the some definition of natural disaster in Home		1.Click on the local host ID 2.Click on Home 3.Verify Home with below UI elements. a.Cyclone with definition b.Earth quake with definition c.Wilde Fire with definition d.Flood with definition	https://127.0.0.1:5000	Application should show below UI elements a.Cyclone with definition b.Earth quake with definition c.Wilde Fire with definition d.Flood with definition	Working as expected	Pass				
HomePage_TC_OO4	UI	Intro Page	Verify user is able to see introduction in Intro page		1.Click on the local host ID 2.Click on intro page 3.Verify Intro page with some introduction	https://127.0.0.1:5000	Application should show Some introduction about natural disaster	Working as expected	pass				
HomePage_TC_OO4	UI	Open web cam	Verify user is able to see UI elements in open web cam		1 .Click on the local host ID 2.Click on the Open web cam 3.Verify open web cam with below elements a.Upload b.Predict	https://127.0.0.1:5000	Application should show Upload button and predict button	Working as expected	Pass				
HomePage_TC_OO5	UI	Upload	Verify user is able to upload an image		1 .Click on the local host ID 2.Click on the Open web cam 3.click on the Upload button 4.verify user to see images to upload in upload button 5.click on any image shows in upload button	https://127.0.0.1:5000	Application should upload an image	Working as expected	pass				
Home age_TC_006	UI	Predict			1.Click on the local host ID 2.Click on the Open web cam 3.click on the Upload button 4.Click on the image to upload 5.Click on the predict button 6.Verify user able to see output image	https://127.0.0.1:5000	Application should show output ima	working as expected	Fail	Output image not shows			

8.2 User Acceptance Testing

Resolution	Severity1	Severity2	Severity3	Severity4	Subtotal
By Design	6	3	2	1	12
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	12	2	4	5	23
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won'tFix	0	3	2	1	6
Totals	21	11	13	9	54

9.RESULTS

9.1 Performance Metrics

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-	model.summary() Model: "sequential" Layer (type) Output Shape Param # conv2d (Conv2D) (None, 62, 62, 32) 896 max_pooling2d (MaxPooling2D) (None, 31, 31, 32) 0 conv2d_1 (Conv2D) (None, 29, 29, 32) 9248 max_pooling2d_1 (MaxPooling 2D) (None, 14, 14, 32) 0 flatten (Flatten) (None, 6272) 0 dense (Dense) (None, 128) 802944 dense_1 (Dense) (None, 4) 516
2.	Accuracy	Training Accuracy - Validation Accuracy -	loss: 0.5239 - accuracy: 0.7857 - val_loss: 0.7225 - val_accuracy: 0.7576 loss: 0.4353 - accuracy: 0.8363 - val_loss: 0.7533 - val_accuracy: 0.7323 loss: 0.3964 - accuracy: 0.8544 - val_loss: 1.0389 - val_accuracy: 0.6364 loss: 0.3662 - accuracy: 0.8767 - val_loss: 0.5903 - val_accuracy: 0.7273 loss: 0.4363 - accuracy: 0.8342 - val_loss: 0.5633 - val_accuracy: 0.7475 loss: 0.3292 - accuracy: 0.8814 - val_loss: 0.5497 - val_accuracy: 0.7577

10.ADVANTAGES & DISADVANTAGES

ADVANTAGES

1. Faster and accurate predictions through neural network
2. It reduces human risk by replacing humans in sensitive areas
3. Humans also need breaks and time offs to balance their work life

But AI canwork endlessly without breaks.

4. With the use of various AI- based techniques, we can also anticipate today's weatherand thedays ahead.
5. Helpful in getting life back on track..
6. Their Alert nature able to respond effectively and efficiently which defend the societyfromlarge scale damages.

DISADVANTAGE

1. It involves huge money to be equipped.
2. Problems faced in life basic needs.
3. One application of artificial intelligence is a robot, which is displacing occupations and increasing unemployment .
4. Machines can perform only those tasks which they are designed or programmed to do, anything out of that they tend to crash or give irrelevant outputs which could be a major backdrop.

11. CONCLUSION

Many researchers have attempted to use different deep learning methods for detection of natural disasters. However, the detection of natural disasters by using deep learning techniques still faces various issues due to noise and serious class imbalance problems.To address these problems, we proposed a multilayered deep convolutional neural network for detection and intensity classification of natural disasters. The proposed method works in two blocks—one for detection of natural disaster occurrence and the second block is used to remove imbalanced class issues.The results were calculated as average statistical values: sensitivity, 97.54%; specificity, 98.22%; accuracy rate, 99.92%; precision, 97.79%; and F1-score, 97.97% for the proposed model. The proposed model achieved the highest accuracy as compared to other state-of-the-art methods due to its multilayered structure. The proposed model performs significantly better for natural disaster detection and classification, but in the future the model can be used for various natural disaster detection processes.

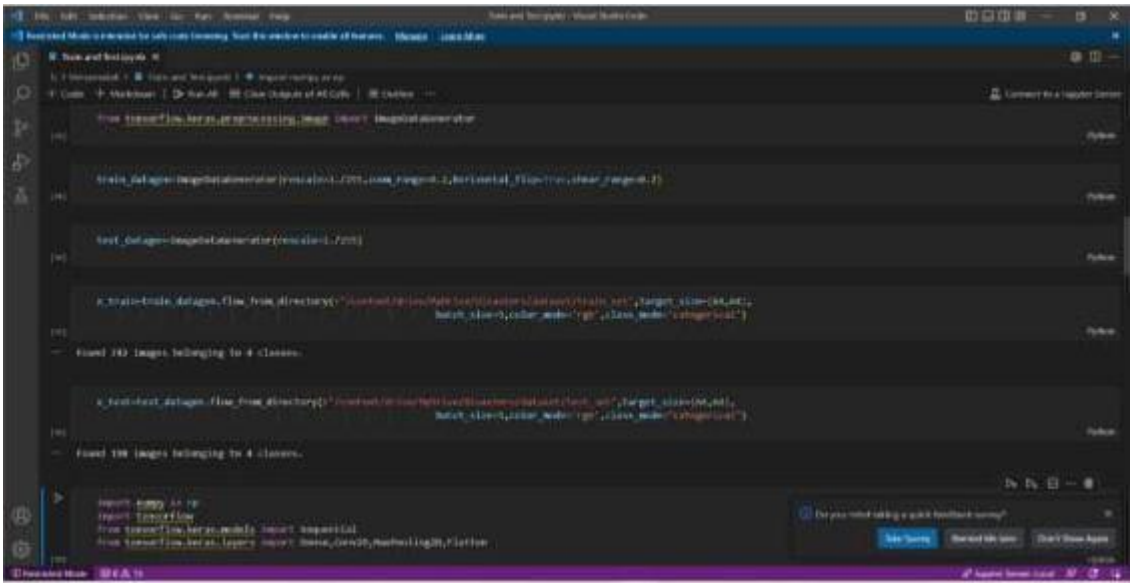
12. FUTURE SCOPE

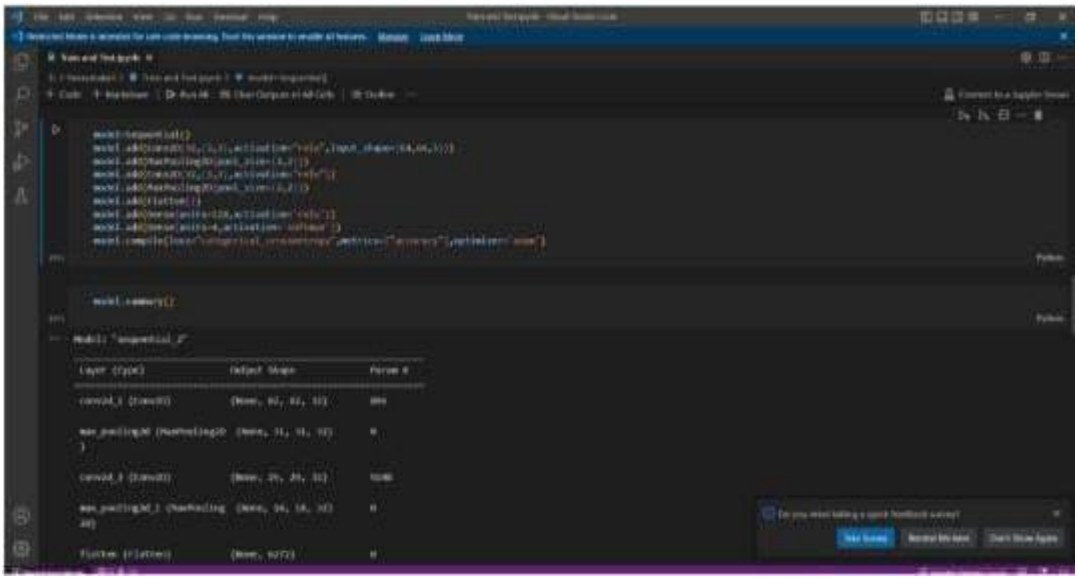
AI -smart technology, which has enabled accurate and speedy solutions. If harnessed properly, the technology has the potential of predicting, preventing and providing response faster than ever.AI data setups are trained to predict seismic data to analyze the patterns of earthquake occurrences, rainfall records and monitor flooding, measure the intensityhurricanes and read the geological data to understand volcanic eruptions, such systems canreduce the catastrophic impact of natural disasters. Last year, Google's Pilot project to monitor flood in India with the help of AI, was a successful one – it was a Patna project. They were able to predict floods and the regions that it would be affected due to the natural disaster with anaccuracy of over 90%. It was possible owing to the combination of data from government agencies that provide on-ground information – from measuring devices placed on the spot and satellite captured images of flood-prone areas. They ran hundreds of thousands of simulations on its machine learning (ML) models to predict the flow of water.In thefuture, leveraging AI can help disaster management bodies install drones, sensors and robots to provide accurate information about damaged buildings and landscapes, potential floods, making rescue missions safer and less time-consuming. There is a need for smart technology to be integrated within our local communities. Immediate response and tech-based solutions can help reduce the extent of damage. However, since AI is based on machine codes, there is a scope of limitations and errors. However, the amalgamation of human, empathy and alertness, could do wonders in the field of crisis management.

13. APPENDIX

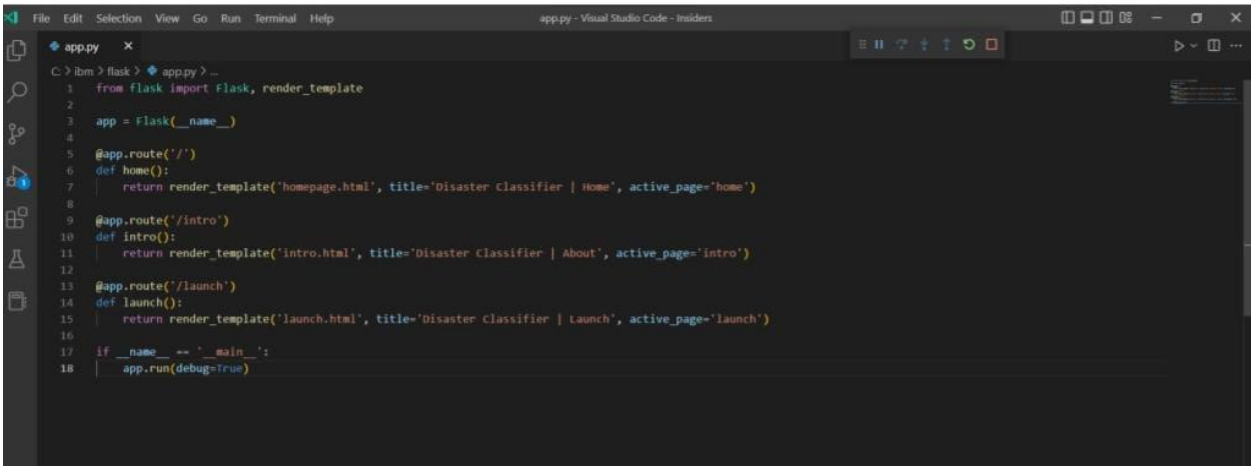
Source code

Model creation

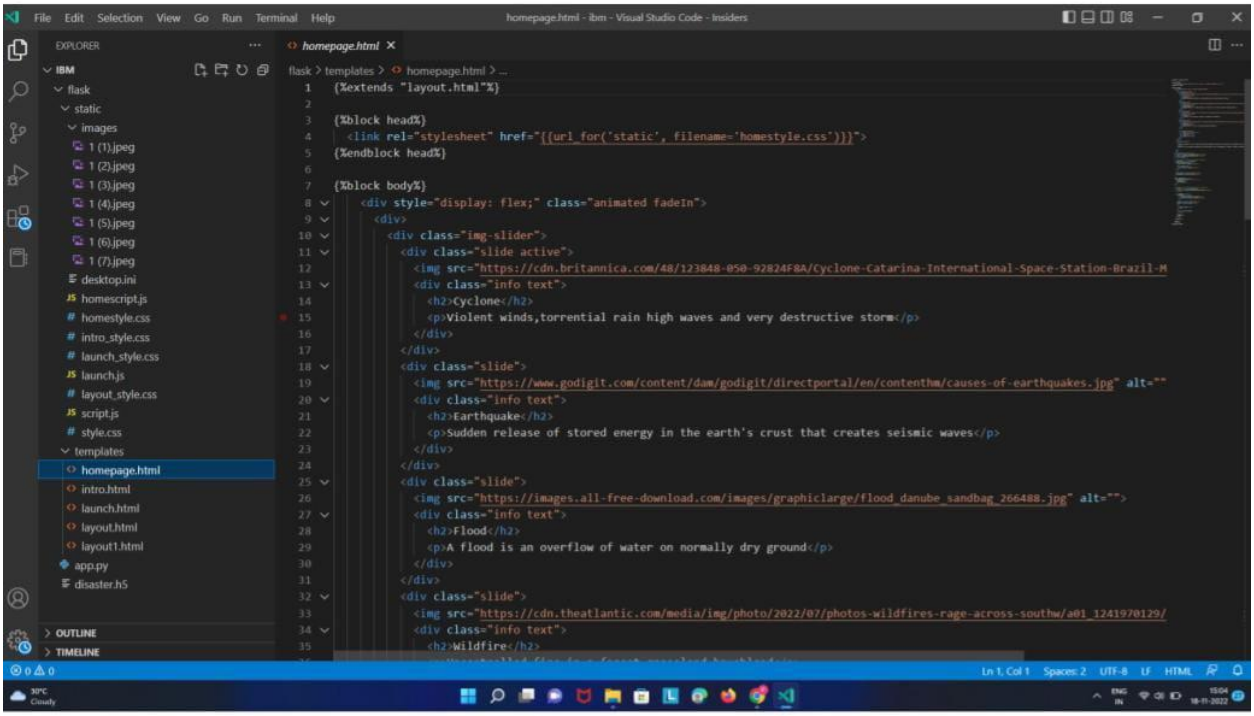




Flask app.py



HTML Code



GITHUB:

https://github.com/IBM-EPBL/IBM-Project-40250-1660626698

PROJECT DEMO:

https://drive.google.com/file/d/1m0zpx365_KpZiFo5gEcbDUYGZcBxV6IR/view?usp=drivesdk